FES 12-24 • DOE/EIS-0403

Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States

Volume 6, Part 2

Appendices J–O

July 2012

Bureau of Land Management

U.S. Department of Energy

Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States (FES 12-24; DOE/EIS-0403)

Responsible Agencies: The U.S. Department of the Interior (DOI) Bureau of Land Management (BLM) and the U.S. Department of Energy (DOE) are co-lead agencies. Nineteen cooperating agencies participated in the preparation of this PEIS: U.S. Department of Defense; U.S. Bureau of Reclamation; U.S. Fish and Wildlife Service; U.S. National Park Service; U.S. Environmental Protection Agency, Region 9; U.S. Army Corps of Engineers, South Pacific Division; Arizona Game and Fish Department; California Energy Commission; California Public Utilities Commission; Nevada Department of Wildlife; N-4 Grazing Board, Nevada; Utah Public Lands Policy Coordination Office; Clark County, Nevada, including Clark County Department of Aviation; Doña Ana County, New Mexico; Esmeralda County, Nevada; Eureka County, Nevada; Lincoln County, Nevada; Nye County, Nevada; and Saguache County, Colorado.

Locations: Arizona, California, Colorado, Nevada, New Mexico, and Utah.

Contacts: *For further information about this PEIS, contact:* Shannon Stewart, BLM Washington Office, e-mail: shannon_stewart@blm.gov, phone: (202) 912-7219; or Jane Summerson, DOE Solar PEIS Document Manager, e-mail: jane.summerson@ee.doe.gov, phone: (202) 287-6188; or visit the PEIS Web site at http://solareis.anl.gov.

Abstract: The BLM and DOE have jointly prepared this PEIS to evaluate actions that the agencies are considering taking to further facilitate utility-scale solar energy development in six southwestern states.[1] For the BLM, this includes the evaluation of a new Solar Energy Program applicable to solar development on BLM-administered lands. For DOE, it includes the evaluation of developing new guidance to further facilitate utility-scale solar energy development and maximize the mitigation of associated potential environmental impacts. This Solar PEIS evaluates the potential environmental, social, and economic effects of the agencies' proposed actions and alternatives in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's regulations for implementing NEPA (Title 40, Parts 1500–1508 of the *Code of Federal Regulations* [40 CFR Parts 1500–1508]), and applicable BLM and DOE authorities.

For the BLM, the Final Solar PEIS analyzes a no action alternative, under which solar energy development would continue on BLM-administered lands in accordance with the terms and conditions of the BLM's existing solar energy policies, and two action alternatives that involve implementing a new BLM Solar Energy Program that would allow the permitting of future solar energy development projects on public lands to proceed in a more efficient, standardized, and environmentally responsible manner. The proposed program would establish right-of-way authorization policies and design features applicable to all utility-scale solar energy development on BLM-administered lands. It would identify categories of lands to be excluded from utility-scale solar energy development and specific locations well suited for utility-scale production of solar energy where the BLM would prioritize development (i.e., solar energy zones or SEZs). The proposed action would also allow for responsible utility-scale solar development on lands outside of priority areas.

---

[1] Utility-scale facilities are defined as projects that generate electricity that is delivered into the electricity transmission grid, generally with capacities greater than 20 megawatts (MW).

For DOE, the Final PEIS analyzes a no action alternative, under which DOE would continue to address environmental concerns for DOE-supported solar projects on a case-by-case basis, and an action alternative, under which DOE would adopt programmatic environmental guidance for use in DOE-supported solar projects.

The BLM and DOE initiated the Solar PEIS process in May 2008. On December 17, 2010, the BLM and DOE published the Draft Solar PEIS. Subsequently, on October 28, 2011, the lead agencies published the Supplement to the Draft Solar PEIS, in which adjustments were made to elements of BLM's proposed Solar Energy Program to better meet BLM's solar energy objectives, and in which DOE's proposed programmatic environmental guidance was presented.

SOLAR PEIS CONTENTS

SOLAR PEIS CONTENTS (Cont.)

VOLUME 6

VOLUME 7

VOLUME 6, PART 2 CONTENTS

CONTENTS (Cont.)

CONTENTS (Cont.)

FIGURES

FIGURES (Cont.)

FIGURES (Cont.)

FIGURES (Cont.)

FIGURES (Cont.)

TABLES

TABLES (Cont.)

NOTATION

The following is a list of acronyms and abbreviations, chemical names, and units of measure used in this document. Some acronyms used only in tables may be defined only in those tables.

GENERAL ACRONYMS AND ABBREVIATIONS

AADT	annual average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
AC	alternating current
ACC	air-cooled condenser
ACEC	Area of Critical Environmental Concern
ADEQ	Arizona Department of Environmental Quality
ACHP	Advisory Council on Historic Preservation
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AERMOD	AMS/EPA Regulatory Model
AFC	Application for Certification
AGL	above ground level
AIM	Assessment, Inventory and Monitoring
AIRFA	American Indian Religious Freedom Act
AMA	active management area
AML	animal management level
ANHP	Arizona National Heritage Program
APE	area of potential effect
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
APS	Arizona Public Service
AQCR	Air Quality Control Region
AQRV	air quality–related value
ARB	Air Resources Board
ARRA	American Recovery and Reinvestment Act of 2009
ARRTIS	Arizona Renewable Resource and Transmission Identification Subcommittee
ARS	Agricultural Research Service
ARZC	Arizona and California
ATSDR	Agency for Toxic Substances and Disease Registry
AUM	animal unit month
AVSE	Arlington Valley Solar Energy
AVWS	Audio Visual Warning System
AWBA	Arizona Water Banking Authority
AWEA	American Wind Energy Association
AWRM	Active Water Resource Management
AZDA	Arizona Department of Agriculture
AZGFD	Arizona Game and Fish Department

AZGS	Arizona Geological Survey
BA	biological assessment
BAP	base annual production
BEA	Bureau of Economic Analysis
BISON-M	Biota Information System of New Mexico
BLM	Bureau of Land Management
BLM-CA	Bureau of Land Management, California
BMP	best management practice
BNSF	Burlington Northern Santa Fe
BO	biological opinion
BOR	U.S. Bureau of Reclamation
BPA	Bonneville Power Administration
BRAC	Blue Ribbon Advisory Council on Climate Change
BSE	Beacon Solar Energy
BSEP	Beacon Solar Energy Project
BTS	Bureau of Transportation Statistics
CAA	Clean Air Act
CAAQS	California Air Quality Standards
CAISO	California Independent System Operator
Caltrans	California Department of Transportation
C-AMA	California-Arizona Maneuver Area
CAP	Central Arizona Project
CARB	California Air Resources Board
CAReGAP	California Regional Gap Analysis Project
CASQA	California Stormwater Quality Association
CASTNET	Clean Air Status and Trends NETwork
CAWA	Colorado Agricultural Water Alliance
CCC	Civilian Conservation Corps
CDC	Centers for Disease Control and Prevention
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CDNCA	California Desert National Conservation Area
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife (now Colorado Parks and Wildlife)
CDPHE	Colorado Department of Public Health and Environment
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CES	constant elasticity of substitution
CESA	California Endangered Species Act
CESF	Carrizo Energy Solar Farm
CFR	*Code of Federal Regulations*
CGE	computable general equilibrium
CHAT	crucial habitat assessment tool

CIRA	Cooperative Institute for Research in the Atmosphere
CLFR	compact linear Fresnel reflector
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNHP	Colorado National Heritage Program
Colorado DWR	Colorado Division of Water Resources
CO_2e	carbon dioxide equivalent
CPC	Center for Plant Conservation
CPUC	California Public Utilities Commission
CPV	concentrating photovoltaic
CRBSCF	Colorado River Basin Salinity Control Forum
CREZ	competitive renewable energy zone
CRPC	Cultural Resources Preservation Council
CRSCP	Colorado River Salinity Control Program
CSA	Candidate Study Area
CSC	Coastal Services Center
CSFG	carbon-sequestration fossil generation
CSP	concentrating solar power
CSQA	California Stormwater Quality Association
CSRI	Cultural Systems Research, Incorporated
CTG	combustion turbine generator
CTPG	California Transmission Planning Group
CTSR	Cumbres & Toltec Scenic Railroad
CUP	Conditional Use Permit
CVP	Central Valley Project
CWA	Clean Water Act
CWCB	Colorado Water Conservation Board
CWHRS	California Wildlife Habitat Relationship System
DC	direct current
DEM	digital elevation model
DHS	U.S. Department of Homeland Security
DIMA	Database for Inventory, Monitoring and Assessment
DLT	dedicated-line transmission
DNA	Determination of NEPA Adequacy
DNI	direct normal insulation
DNL	day-night average sound level
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
DRECP	California Desert Renewable Energy Conservation Plan
DSM	demand-side management
DSRP	Decommissioning and Site Reclamation Plan
DTC/C-AMA	Desert Training Center/California–Arizona Maneuver Area

DWMA	Desert Wildlife Management Area
DWR	Division of Water Resources
EA	environmental assessment
EBID	Elephant Butte Irrigation District
ECAR	East Central Area Reliability Coordination Agreement
ECOS	Environmental Conservation Online System (USFWS)
EERE	Energy Efficiency and Renewable Energy (DOE)
Eg	band gap energy
EIA	Energy Information Administration (DOE)
EIS	environmental impact statement
EISA	Energy Independence and Security Act of 2007
EMF	electromagnetic field
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
EQIP	Environmental Quality Incentives Program
ERCOT	Electric Reliability Council of Texas
ERO	Electric Reliability Organization
ERS	Economic Research Service
ESA	Endangered Species Act of 1973
ESRI	Environmental Systems Research Institute
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRCC	Florida Reliability Coordinating Council
FSA	Final Staff Assessment
FTE	full-time equivalent
FY	fiscal year
G&TM	generation and transmission modeling
GCRP	U.S. Global Climate Research Program
GDA	generation development area
GHG	greenhouse gas
GIS	geographic information system
GMU	game management unit
GPS	global positioning system
GTM	Generation and Transmission Model

GUAC	Groundwater Users Advisory Council
GWP	global warming potential
HA	herd area
HAP	hazardous air pollutant
HAZCOM	hazard communication
HCE	heat collection element
HCP	Habitat Conservation Plan
HMA	herd management area
HMMH	Harris Miller Miller & Hanson, Inc.
HRSG	heat recovery steam generator
HSPD	Homeland Security Presidential Directive
HTF	heat transfer fluid
HUC	hydrologic unit code
HVAC	heating, ventilation, and air-conditioning
I	Interstate
IARC	International Agency for Research on Cancer
IBA	important bird area
ICE	internal combustion engine
ICPDS	Imperial County Planning & Development Services
ICWMA	Imperial County Weed Management Area
IDT	interdisplinary team
IEC	International Electrochemical Commission
IFR	instrument flight rule
IID	Imperial Irrigation District
IM	Instruction Memorandum
IMPS	Iron Mountain Pumping Station
IMS	interim mitigation strategy
INA	Irrigation Non-Expansion Area
IOP	Interagency Operating Procedure
IOU	investor-owned utility
IPCC	Intergovernmental Panel on Climate Change
ISA	Independent Science Advisor; Instant Study Area
ISB	Intermontane Seismic Belt
ISCC	integrated solar combined cycle
ISDRA	Imperial Sand Dunes Recreation Area
ISEGS	Ivanpah Solar Energy Generating System
ISO	independent system operator; iterative self-organizing
ITFR	Interim Temporary Final Rulemaking
ITP	incidental take permit
IUCNNR	International Union for Conservation of Nature and Natural Resources
IUCNP	International Union for Conservation of Nature Pakistan
KGA	known geothermal resources area
KML	keyhole markup language

KOP	key observation point
KSLA	known sodium leasing area
LCC	Landscape Conservation Cooperative
LCCRDA	Lincoln County Conservation, Recreation, and Development Act of 2004
LCOE	levelized cost of energy
L_{dn}	day-night average sound level
LDWMA	Low Desert Weed Management Area
L_{eq}	equivalent sound pressure level
LiDAR	light detection and ranging
LLA	limited land available
LLRW	low-level radioactive waste (waste classification)
LPN	listing priority number
LRG	Lower Rio Grande
LSA	lake and streambed alteration
LSE	load-serving entity
LTMP	long-term monitoring and adaptive management plan
LTVA	long-term visitor area
MAAC	Mid-Atlantic Area Council
MAIN	Mid-Atlantic Interconnected Network
MAPP	methyl acetylene propadiene stabilizer; Mid-Continent Area Power Pool
MCAS	Marine Corps Air Station
MCL	maximum contaminant level
MEB	Marine Expeditionary Brigade
MFP	Management Framework Plan
MIG	Minnesota IMPLAN Group
MLA	maximum land available
MOA	military operating area
MOU	Memorandum of Understanding
MPDS	maximum potential development scenario
MRA	Multiple Resource Area
MRI	Midwest Research Institute
MRO	Midwest Reliability Organization
MSDS	Material Safety Data Sheet
MSL	mean sea level
MTR	military training route
MVEDA	Mesilla Valley Economic Development Alliance
MWA	Mojave Water Agency
MWD	Metropolitan Water District
MWMA	Mojave Weed Management Area
NAAQS	National Ambient Air Quality Standard(s)
NADP	National Atmospheric Deposition Program
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission (California)
NAIC	North American Industrial Classification System

NASA	National Aeronautics and Space Administration
NCA	National Conservation Area
NCCAC	Nevada Climate Change Advisory Committee
NCDC	National Climatic Data Center
NCES	National Center for Education Statistics
NDAA	National Defense Authorization Act
NDCNR	Nevada Department of Conservation and Natural Resources
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWP	Nevada Division of Water Planning
NDWR	Nevada Division of Water Resources
NEAP	Natural Events Action Plan
NEC	National Electric Code
NED	National Elevation Database
NEP	Natural Events Policy
NEPA	National Environmental Policy Act of 1969
NERC	North American Electricity Reliability Corporation
NGO	non-governmental organization
NHA	National Heritage Area
NHD	National Hydrography Dataset
NHNM	National Heritage New Mexico
NHPA	National Historic Preservation Act of 1966
NID	National Inventory of Dams
NLCS	National Landscape Conservation System
NMAC	*New Mexico Administrative Code*
NMBGMR	New Mexico Bureau of Geology and Mineral Resources
NMDGF	New Mexico Department of Game and Fish
NM DOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NMED-AQB	New Mexico Environment Department-Air Quality Board
NMFS	National Marine Fisheries Service
NMOSE	New Mexico Office of the State Engineer
NMSU	New Mexico State University
NNHP	Nevada Natural Heritage Program
NNL	National Natural Landmark
NNSA	National Nuclear Security Administration
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NP	National Park
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPS	National Park Service
NPV	net present value
NRA	National Recreation Area

NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	*National Register of Historic Places*
NRS	*Nevada Revised Statutes*
NSC	National Safety Council
NSO	no surface occupancy
NSTC	National Science and Technology Council
NTHP	National Trust for Historic Preservation
NTS	Nevada Test Site
NTTR	Nevada Test and Training Range
NVCRS	Nevada Cultural Resources Inventory System
NV DOT	Nevada Department of Transportation
NWCC	National Wind Coordinating Committee
NWI	National Wetlands Inventory
NWIS	National Water Information System (USGS)
NWPP	Northwest Power Pool
NWR	National Wildlife Refuge
NWSRS	National Wild and Scenic River System
O&M	operation and maintenance
ODFW	Oregon Department of Fish and Wildlife
OHV	off-highway vehicle
ONA	Outstanding Natural Area
ORC	organic Rankine cycle
OSE/ISC	Office of the State Engineer/Interstate Stream Commission
OSHA	Occupational Safety and Health Administration
OTA	Office of Technology Assessment
PA	Programmatic Agreement
PAD	Preliminary Application Document
PAH	polycyclic aromatic hydrocarbon
PAT	peer analysis tool
PCB	polychlorinated biphenyl
PCM	purchase change material
PCS	power conditioning system
PCU	power converting unit
PEIS	programmatic environmental impact statement
PFYC	potential fossil yield classification
PGH	Preliminary General Habitat
PIER	Public Interest Energy Research
P.L.	Public Law
PLSS	Public Land Survey System
PM	particulate matter
$PM_{2.5}$	particulate matter with a diameter of 2.5 μm or less
PM_{10}	particulate matter with a diameter of 10 μm or less
PPA	Power Purchase Agreement

P-P-D	population-to-power density
PPH	Preliminary Priority Habitat
POD	plan of development
POU	publicly owned utility
PPA	Power Purchase Agreement
PPE	personal protective equipment
PSD	Prevention of Significant Deterioration
PURPA	Public Utility Regulatory Policy Act
PV	photovoltaic
PVID	Palo Verde Irrigation District
PWR	public water reserve
QRA	qualified resource area
R&I	relevance and importance
RAC	Resource Advisory Council
RCE	Reclamation Cost Estimate
RCI	residential, commercial, and industrial (sector)
RCRA	Resource Conservation and Recovery Act of 1976
RD&D	research, development, and demonstration; research, development, and deployment
RDBMS	Relational Database Management System
RDEP	Restoration Design Energy Project
REA	Rapid Ecoregional Assessment
REAT	Renewable Energy Action Team
REDA	Renewable Energy Development Area
REDI	Renewable Energy Development Infrastructure
REEA	Renewable Energy Evaluation Area
ReEDS	Regional Energy Deployment System
REPG	Renewable Energy Policy Group
RETA	Renewable Energy Transmission Authority
RETAAC	Renewable Energy Transmission Access Advisory Committee
RETI	Renewable Energy Transmission Initiative
REZ	renewable energy zone
RF	radio frequency
RFC	Reliability First Corporation
RFDS	reasonably foreseeable development scenario
RGP	Rio Grande Project
RGWCD	Rio Grande Water Conservation District
RMP	Resource Management Plan
RMPA	Rocky Mountain Power Area
RMZ	Resource Management Zone
ROD	Record of Decision
ROI	region of influence
ROS	recreation opportunity spectrum
ROW	right-of-way

RPG	renewable portfolio goal
RPS	Renewable Portfolio Standard
RRC	Regional Reliability Council
RSEP	Rice Solar Energy Project
RSI	Renewable Systems Interconnection
RTO	regional transmission organization
RTTF	Renewable Transmission Task Force
RV	recreational vehicle
SAAQS	State Ambient Air Quality Standard(s)
SAMHSA	Substance Abuse and Mental Health Services Administration
SCADA	supervisory control and data acquisition
SCE	Southern California Edison
SCRMA	Special Cultural Resource Management Area
SDRREG	San Diego Regional Renewable Energy Group
SDWA	Safe Drinking Water Act of 1974
SEGIS	Solar Energy Grid Integration System
SEGS	Solar Energy Generating System
SEI	Sustainable Energy Ireland
SEIA	Solar Energy Industrial Association
SES	Stirling Energy Systems
SETP	Solar Energy Technologies Program (DOE)
SEZ	solar energy zone
SHPO	State Historic Preservation Office(r)
SIP	State Implementation Plan
SLRG	San Luis & Rio Grande
SMA	Special Management Area
SMART	specific, measurable, achievable, relevant, and time sensitive
SMP	suggested management practice
SNWA	Southern Nevada Water Authority
SPP	Southwest Power Pool
SRMA	Special Recreation Management Area
SSA	Socorro Seismic Anomaly
SSI	self-supplied industry
ST	solar thermal
STG	steam turbine generator
SUA	special use airspace
SWAT	Southwest Area Transmission
SWIP	Southwest Intertie Project
SWPPP	Stormwater Pollution Prevention Plan
SWReGAP	Southwest Regional Gap Analysis Project
TAP	toxic air pollutant
TCC	Transmission Corridor Committee
TDS	total dissolved solids
TEPPC	Transmission Expansion Planning Policy Committee

TES	thermal energy storage
TRACE	Transmission Routing and Configuration Estimator
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act of 1976
TSDF	treatment, storage, and disposal facility
TSP	total suspended particulates
UACD	Utah Association of Conservation Districts
UBWR	Utah Board of Water Resources
UDA	Utah Department of Agriculture
UDEQ	Utah Department of Environmental Quality
UDNR	Utah Department of Natural Resources
UDOT	Utah Department of Transportation
UDWQ	Utah Division of Water Quality
UDWR	Utah Division of Wildlife Resources
UGS	Utah Geological Survey
UNEP	United Nations Environmental Programme
UNPS	Utah Native Plant Society
UP	Union Pacific
UREZ	Utah Renewable Energy Zone
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	*United States Code*
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Utah DWR	Utah Division of Water Rights
UTTR	Utah Test and Training Range
UWS	Underground Water Storage, Savings and Replenishment Act
VACAR	Virginia–Carolinas Subregion
VCRS	Visual Contrast Rating System
VFR	visual flight rule
VOC	volatile organic compound
VRHCRP	Virgin River Habitat Conservation & Recovery Program
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WA	Wilderness Area
WECC	Western Electricity Coordinating Council
WECC CAN	Western Electricity Coordinating Council–Canada
WEG	wind erodibility group
Western	Western Area Power Administration
WGA	Western Governors' Association
WGFD	Wyoming Game and Fish Department

WHA	wildlife habitat area
WHO	World Health Organization
WIA	Wyoming Infrastructure Authority
WRAP	Water Resources Allocation Program; Western Regional Air Partnership
WRCC	Western Regional Climate Center
WREZ	Western Renewable Energy Zones
WRRI	Water Resources Research Institute
WSA	Wilderness Study Area
WSC	wildlife species of special concern
WSMR	White Sands Missile Range
WSR	Wild and Scenic River
WSRA	Wild and Scenic Rivers Act of 1968
WWII	World War II
WWP	Western Watersheds Project
YPG	Yuma Proving Ground
ZITA	zone identification and technical analysis
ZLD	zero liquid discharge

CHEMICALS

CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
H_2S	hydrogen sulfide
Hg	mercury
N_2O	nitrous oxide
NH_3	ammonia
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O_3	ozone
Pb	lead
SF_6	sulfur hexafluoride
SO_2	sulfur dioxide
SO_x	sulfur oxides

UNITS OF MEASURE

ac-ft	acre-foot (feet)
bhp	brake horsepower
°C	degree(s) Celsius
cf	cubic foot (feet)
cfs	cubic foot (feet) per second
cm	centimeter(s)
dB	decibel(s)
dBA	A-weighted decibel(s)
°F	degree(s) Fahrenheit
ft	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
g	gram(s)
gal	gallon(s)

GJ	gigajoule(s)
gpcd	gallon per capita per day
gpd	gallon(s) per day
gpm	gallon(s) per minute
GW	gigawatt(s)
GWh	gigawatt hour(s)
GWh/yr	gigawatt hour(s) per year
h	hour(s)
ha	hectare(s)
Hz	hertz
in.	inch(es)
J	joule(s)
K	degree(s) Kelvin
kcal	kilocalorie(s)
kg	kilogram(s)
kHz	kilohertz
km	kilometer(s)
km^2	square kilometer(s)
kPa	kilopascal(s)
kV	kilovolt(s)
kVA	kilovolt-ampere(s)
kW	kilowatt(s)
kWh	kilowatt-hour(s)
kWp	kilowatt peak
L	liter(s)
lb	pound(s)
m	meter(s)
m^2	square meter(s)
m^3	cubic meter(s)
mg	milligram(s)
Mgal	million gallons
mi	mile(s)
mi^2	square mile(s)
min	minute(s)
mm	millimeter(s)
MMt	million metric ton(s)
MPa	megapascal(s)
mph	mile(s) per hour
MVA	megavolt-ampere(s)
MW	megawatt(s)
MWe	megawatt(s) electric
MWh	megawatt-hour(s)
ppm	part(s) per million
psi	pound(s) per square inch
psia	pound(s) per square inch absolute
rpm	rotation(s) per minute
s	second(s)
scf	standard cubic foot (feet)
TWh	terawatt hour(s)
VdB	vibration velocity decibel(s)
W	watt(s)
yd^2	square yard(s)
yd^3	cubic yard(s)
yr	year(s)
μg	microgram(s)
μm	micrometer(s)

ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS

The following table lists the appropriate equivalents for English and metric units.

Multiply	By	To Obtain
English/Metric Equivalents		
acres	0.004047	square kilometers (km^2)
acre-feet (ac-ft)	1,234	cubic meters (m^3)
cubic feet (ft^3)	0.02832	cubic meters (m^3)
cubic yards (yd^3)	0.7646	cubic meters (m^3)
degrees Fahrenheit (ºF) –32	0.5555	degrees Celsius (ºC)
feet (ft)	0.3048	meters (m)
gallons (gal)	3.785	liters (L)
gallons (gal)	0.003785	cubic meters (m^3)
inches (in.)	2.540	centimeters (cm)
miles (mi)	1.609	kilometers (km)
miles per hour (mph)	1.609	kilometers per hour (kph)
pounds (lb)	0.4536	kilograms (kg)
short tons (tons)	907.2	kilograms (kg)
short tons (tons)	0.9072	metric tons (t)
square feet (ft^2)	0.09290	square meters (m^2)
square yards (yd^2)	0.8361	square meters (m^2)
square miles (mi^2)	2.590	square kilometers (km^2)
yards (yd)	0.9144	meters (m)
Metric/English Equivalents		
centimeters (cm)	0.3937	inches (in.)
cubic meters (m^3)	0.00081	acre-feet (ac-ft)
cubic meters (m^3)	35.31	cubic feet (ft^3)
cubic meters (m^3)	1.308	cubic yards (yd^3)
cubic meters (m^3)	264.2	gallons (gal)
degrees Celsius (ºC) +17.78	1.8	degrees Fahrenheit (ºF)
hectares (ha)	2.471	acres
kilograms (kg)	2.205	pounds (lb)
kilograms (kg)	0.001102	short tons (tons)
kilometers (km)	0.6214	miles (mi)
kilometers per hour (kph)	0.6214	miles per hour (mph)
liters (L)	0.2642	gallons (gal)
meters (m)	3.281	feet (ft)
meters (m)	1.094	yards (yd)
metric tons (t)	1.102	short tons (tons)
square kilometers (km^2)	247.1	acres
square kilometers (km^2)	0.3861	square miles (mi^2)
square meters (m^2)	10.76	square feet (ft^2)
square meters (m^2)	1.196	square yards (yd^2)

APPENDIX J:

SPECIAL STATUS SPECIES ASSOCIATED WITH BLM'S ALTERNATIVES IN THE SIX-STATE STUDY AREA

This page intentionally left blank.

APPENDIX J:

SPECIAL STATUS SPECIES ASSOCIATED WITH BLM'S ALTERNATIVES IN THE SIX-STATE STUDY AREA

J.1 INTRODUCTION

This appendix provides supporting information for the special status species assessments presented in the Draft and Final *Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States* (Solar PEIS). The information from Appendix J of the Draft Solar PEIS has been completely revised and is presented here in full (i.e., this is not an update or summary). Included is information on (1) special status species categories (Section J.1); (2) summary information on the number of species in different categories that are found in different portions of the six-state study area (Sections J.2 to J.5); (3) information on habitats in which special status species are found (Section J.6); (4) life history characteristics of species that are listed, proposed for listing, candidates for listing, or under review for listing under the Endangered Species Act (ESA); U.S. Department of the Interior Bureau of Land Management (BLM)-designated sensitive species; and state-listed species; and (5) a determination of each species' potential for occurrence in alternative areas (i.e., no action, solar energy development program, and solar energy zone [SEZ] program alternatives; Section J.6). The methodology for assessing impacts on these species is presented in Appendix M of the PEIS.

As discussed in Appendix M, special status species considered in the analyses included the following groups of species[1]:

- Species listed as threatened or endangered under the ESA;
- Species that are proposed for listing, under review, or candidates for listing under the ESA;
- Species that are designated by the BLM as sensitive;
- Species that are listed as threatened or endangered by the state or states in the affected area[2]; and
- Species that are considered rare in the affected area. These include species that have been ranked by state natural heritage programs as S1 or S2, species listed by the state(s) as species of concern, or species listed by the U.S. Fish and Wildlife Service (USFWS) as species of concern. The inclusion of species

[1] Note that some of the categories of species included here do not fit BLM's definition of special status species as defined in BLM Manual 6840 (BLM 2008). These species are included here to ensure broad consideration of species that may be most vulnerable to impacts. Their inclusion is not intended to imply status by the BLM.

[2] State-listed species are considered to be those species that are protected by individual state regulatory statutes (e.g., California: California Endangered Species Act; Nevada: *Nevada Revised Statutes* [NRS] 501 or NRS 527).

with high state ranks also accounted for species with high global ranks (i.e., G1 or G2), because these species invariably have high state ranks as well.

The sources of species status and distribution data are presented in Table M.12-1 in Appendix M. This information includes data provided by state natural resource agencies, BLM field offices, and regionwide gap analysis programs, as well as information provided by NatureServe (2010) and the USFWS.

The approach used to compare the potential impacts of solar energy development on special status species within the areas available for development under each BLM alternative was based on the expected distribution or known occurrence of special status species within the area that would be available for leasing under the alternative. For the no action alternative, the analysis area consisted of approximately 98 million acres (396,600 km^2); for the solar energy development program alternative, it was approximately 19 million acres (76,890 km^2). For the SEZ program alternative evaluated in the Draft Solar PEIS, the analysis area consisted of approximately 285,000 acres (1,153 km^2).

This revised version of Appendix J evaluates the species that may potentially be present on lands available under the three alternatives, with emphasis placed on those species that could occur in the 17 SEZs being carried forward as described in the Supplement to the Draft Solar PEIS. A summary of the total number of special status species that may occur in the alternative areas analyzed is presented in Table J.1-1, based on recorded observations or the presence of potentially suitable habitat. In total, there are 1,153 special status species that could occur in at least one of the alternative areas. A total of 777 species could occur in the solar energy development program alternative area. Of these species that could occur in the solar energy development program alternative area, 358 could occur in the SEZ alternative area. There are 376 species that have the potential to occur only in the no action alternative area. Table J.1-2 lists the total number of special status species that could occur in the affected area of the proposed SEZs.

J.2 SPECIES LISTED, PROPOSED FOR LISTING, CANDIDATES FOR LISTING, OR UNDER REVIEW FOR LISTING UNDER THE ENDANGERED SPECIES ACT THAT MAY OCCUR IN ALTERNATIVE AREAS

In total, there are 244 species listed as threatened or endangered under the ESA (including experimental, nonessential populations) or that are candidates, proposed, or under review for listing under the ESA that may occur within the no action alternative area, 160 such species that may occur in the solar energy development program alternative area, and 54 such species that may occur in the SEZ alternative area (Table J.1-1). A summary of these species that may occur in the affected area of each proposed SEZ is shown in Table J.2-1. Note that some species with a known or pending status under the ESA may also be BLM-designated sensitive, state-listed, or rare.

TABLE J.1-1 Special Status Species That May Occur in the Alternative Areas Analyzed in This Final Solar PEIS

Status[a]	No Action Alternative Area	Solar Energy Program Alternative Area	SEZ Alternative Area[b]
ESA - Endangered	118	70	12
ESA - Threatened	58	35	8
ESA - Proposed	3	2	0
ESA - Candidate	29	20	7
ESA - Under Review	35	32	26
ESA - XN[c]	1	1	1
BLM - Sensitive	654	420	146
State - Listed	420	311	75
Rare	1,085	723	344
Total[d]	1,153	777	358

a Species status definitions are presented in the text.

b Species counts done for the SEZ alternative with seven SEZs eliminated per the Supplement to the Draft Solar PEIS.

c ESA - XN = experimental, nonessential populations as defined under Section 10(j) of the ESA.

d The total number of species within each alternative area does not equal the sum across status categories because many species have more than one status listing.

Consultation with the USFWS under Section 7 of the ESA is required for those species currently listed under the ESA; coordination with the USFWS should be conducted for those species that are candidates, proposed, or under review for listing under the ESA. Section 7 of the ESA requires all federal agencies to consult with the USFWS to ensure that agency actions are not likely to jeopardize the continued existence of listed species or result in destructive or adverse modification of critical habitat. The consultation process (also referred to as the Section 7 process) includes the development of a biological assessment (BA), which is a document prepared to determine whether the proposed federal action is likely to adversely affect listed species, proposed species, or designated critical habitat. As a result of the BA and the consultation process, the USFWS will form a biological opinion formally stating whether or not the federal action is likely to jeopardize the continued existence of listed or proposed species or result in the destruction of adverse modification of critical habitat. Often, at the request of the USFWS, species that are not listed but are candidates or under review for ESA listing may be included in the BA for review.

TABLE J.1-2 Total Number of Special Status Species That May Occur in the Affected Area of Each Proposed SEZ as Revised[a]

State	SEZ	Total Number of Special Status Species That May Occur in the Affected Area
Arizona	Brenda	20
Arizona	Gillespie	29
California	Imperial East	35
California	Riverside East	71
Colorado	Antonito Southeast	41
Colorado	De Tilla Gulch	35
Colorado	Fourmile East	60
Colorado	Los Mogotes East	54
Nevada	Amargosa Valley	66
Nevada	Dry Lake	73
Nevada	Dry Lake Valley North	33
Nevada	Gold Point	29
Nevada	Millers	28
New Mexico	Afton	35
Utah	Escalante Valley	19
Utah	Milford Flats South	20
Utah	Wah Wah Valley	22

[a] Species counts done for the SEZs per the Supplement to the Draft Solar PEIS and the Final Solar PEIS.

J.3 BLM-DESIGNATED SENSITIVE SPECIES

The BLM has established a policy, as specified in BLM Manual 6840, *Special Status Species Management* (BLM 2008), whose purpose is "to provide policy and guidance for the conservation of BLM special status species and the ecosystems upon which they depend on BLM-administered lands." Objectives of the BLM special status species policy are to (1) conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species, and (2) initiate proactive conservation measures that reduce or eliminate threats to BLM-designated sensitive species to minimize the likelihood of and need for listing of these species under the ESA.

BLM special status species are "(1) species listed or proposed for listing under the ESA, and (2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA, which are designated as sensitive by the BLM State Director(s). All federal candidate species, proposed species, and delisted species in the 5 years following delisting will be conserved as BLM-designated sensitive species." Each BLM state director maintains a list of sensitive species, and impacts on these species would have to be considered in project-specific assessments developed before approval

TABLE J.2-1 Number of Species Listed under the ESA or Species That Are Candidates, Proposed, or under Review for ESA Listing That May Occur in the Affected Area of the Proposed SEZs as Revised[a]

State	SEZ	Listed Threatened	Listed Endangered	XN[b]	Proposed for Listing	Candidate	Under Review	Total[c]
Arizona	Brenda	0	0	0	0	2	0	2
Arizona	Gillespie	0	2	0	0	4	0	6
California	Imperial East	0	1	0	0	0	0	1
California	Riverside East	1	1	0	0	0	0	2
Colorado	Antonito Southeast	0	1	0	0	1	1	3
Colorado	De Tilla Gulch	0	1	0	0	1	1	3
Colorado	Fourmile East	0	1	0	0	1	0	2
Colorado	Los Mogotes East	0	1	0	0	1	1	3
Nevada	Amargosa Valley	7	5	0	0	0	16	28
Nevada	Dry Lake	1	3	0	0	1	6	11
Nevada	Dry Lake Valley North	1	0	0	0	0	0	1
Nevada	Gold Point	0	0	0	0	1	0	1
Nevada	Millers	0	0	0	0	1	2	3
New Mexico	Afton	0	1	1	0	1	0	3
Utah	Escalante Valley	1	0	0	0	1	0	2
Utah	Milford Flats South	1	0	0	0	1	0	2
Utah	Wah Wah Valley	1	0	0	0	1	3	5

[a] Species counts done for the SEZs as revised per the Supplement to the Draft Solar PEIS and the Final Solar PEIS.

[b] XN = experimental, nonessential populations as defined under Section 10(j) of the ESA.

[c] The total number of species that are in the affected area of the SEZs is 54. The column does not sum to 54 because some species occur in the affected area of more than one SEZ.

of any activity that would affect listed or proposed species or critical habitat. In total, there are 653 BLM-designated sensitive species that may occur within the no action alternative area; 419 such species that may occur within the solar energy development program alternative area; and 145 such species that may occur in the SEZ alternative area (Table J.1-1). A summary of the BLM-designated sensitive species that may occur in the affected area of each proposed SEZ is presented in Table J.3-1.

J.4 STATE-LISTED SPECIES

For analyses presented in this PEIS, state-listed species were defined as those species considered to be protected by individual state regulatory statutes, as follows:

- Arizona: Plant species that are protected under the Arizona Native Plant Law (AZDA 2010) or wildlife that are species of special concern (WSC).

- California: Plant and animal species that are listed as threatened or endangered under the California Endangered Species Act (CESA).

- Colorado: Plant and animal species that are protected under *Colorado Revised Statute* (CRS) 33-2-101.

- Nevada: Species that are protected under NRS 501 (animals) or 527 (plants).

- New Mexico: Plants that are listed under the Endangered Plant Species Act (*New Mexico Statutes Annotated* [NMSA] 1978 § 75-6-1) or wildlife that are listed under the Wildlife Conservation Act (NMSA 1978 § 17-2-37)

- Utah: The State of Utah does not maintain a separate list of state-regulated species; however, the Utah Division of Wildlife Resources (UDWR) publishes a list of "wildlife species of concern" that conveys no regulatory status.

In total, there are 420 state-listed species that may occur within the no action alternative area; 311 such species that may occur within the solar energy development program alternative area; and 75 such species that may occur in the SEZ alternative area (Table J.1-1). A summary of the state-listed species that may occur in the affected area of each proposed SEZ is presented in Table J.4-1. Some state-listed species may also be federally listed under the ESA or as a BLM-designated sensitive species or considered to be a rare species.

J.5 RARE SPECIES

For analyses presented in this PEIS, raree species were defined as those species that may be locally or regionally rare but that do not possess any state or federal regulatory status. This includes species identified by state resource agencies as species of concern, USFWS species of concern, and species with a state rank of S1 or S2, where S1 refers to a species that is critically

TABLE J.3-1 Total Number of BLM-Designated Sensitive Species That May Occur in the Affected Area of Each Proposed SEZ as Revised[a]

State	SEZ	Total Number of BLM-Designated Species That May Occur in the Affected Area[b]
Arizona	Brenda	11
Arizona	Gillespie	15
California	Imperial East	15
California	Riverside East	29
Colorado	Antonito Southeast	19
Colorado	De Tilla Gulch	11
Colorado	Fourmile East	14
Colorado	Los Mogotes East	21
Nevada	Amargosa Valley	39
Nevada	Dry Lake	46
Nevada	Dry Lake Valley North	32
Nevada	Gold Point	29
Nevada	Millers	28
New Mexico	Afton	17
Utah	Escalante Valley	18
Utah	Milford Flats South	18
Utah	Wah Wah Valley	21

[a] Species counts done for the SEZs as revised per the Supplement to the Draft Solar PEIS and the Final Solar PEIS.

[b] The total number of BLM-sensitive species that are in the affected area of the SEZs is 146. The column does not sum to 146 because some species occur in the affected area of more than one SEZ.

imperiled in the state (e.g., fewer than 5 populations), and S2 refers to a species that is imperiled in the state (e.g., fewer than 20 populations). The inclusion of species with high state ranks also accounted for species with high global ranks (i.e., G1 or G2), because these species invariably have high state ranks as well.

In total, there are 1,084 rare species that may occur within the no action alternative area; 722 such species that may occur within the solar energy development program alternative area; and 344 that may occur in the SEZ alternative area (Table J.1-1). A summary of the rare species that may occur in the affected area of each proposed SEZ is presented in Table J.5-1. Many species that are considered rare are also listed or are being considered for listing under the ESA, are considered BLM-designated sensitive species, or are state-listed.

TABLE J.4-1 Total Number of State-Listed Species That May Occur in the Affected Area of Each Proposed SEZ as Revised[a]

State	SEZ	Total Number of State-Listed Species That May Occur in the Affected Area[b]
Arizona	Brenda	10
Arizona	Gillespie	18
California	Imperial East	7
California	Riverside East	6
Colorado	Antonito Southeast	4
Colorado	De Tilla Gulch	3
Colorado	Fourmile East	2
Colorado	Los Mogotes East	4
Nevada	Amargosa Valley	19
Nevada	Dry Lake	18
Nevada	Dry Lake Valley North	8
Nevada	Gold Point	8
Nevada	Millers	5
New Mexico	Afton	10
Utah	Escalante Valley[c]	0
Utah	Milford Flats South[b]	0
Utah	Wah Wah Valley[b]	0

[a] Species counts done for the SEZs as revised per the Supplement to the Draft Solar PEIS and the Final Solar PEIS.

[b] The total number of state-listed species that are in the affected area of the SEZs is 75. The column does not sum to 75 because some species occur in the affected area of more than one SEZ.

[c] The State of Utah does not maintain a separate list of state-regulated species.

J.6 SPECIAL STATUS SPECIES INFORMATION

This section presents information on all special status species that may occur in the alternative areas analyzed in this PEIS. Table J.6-1 lists each of these species, their current status, a brief habitat description, and their potential to occur within the areas available for development under the three BLM alternatives. (In Table J.6-1, species are listed in this order: plants, invertebrates, fish, amphibians, reptiles, birds, and mammals). Species accounts are presented for those species that may occur in the affected area of one or more of the proposed SEZs and that are (1) listed, proposed, candidate, or under review for listing under the ESA; (2) designated by the BLM as sensitive; or (3) listed or protected by the state in which the

TABLE J.5-1 Total Number of Rare Species That May Occur in the Affected Area of Each Proposed SEZ as Revised[a]

State	SEZ	Total Number of Rare Species That May Occur in the Affected Area[b]
Arizona	Brenda	18
Arizona	Gillespie	22
California	Imperial East	35
California	Riverside East	69
Colorado	Antonito Southeast	33
Colorado	De Tilla Gulch	30
Colorado	Fourmile East	58
Colorado	Los Mogotes East	48
Nevada	Amargosa Valley	49
Nevada	Dry Lake	60
Nevada	Dry Lake Valley North	20
Nevada	Gold Point	19
Nevada	Millers	17
New Mexico	Afton	30
Utah	Escalante Valley	16
Utah	Milford Flats South	18
Utah	Wah Wah Valley	20

[a] Species counts done for the SEZs as revised per the Supplement to the Draft Solar PEIS and the Final Solar PEIS.

[b] The total number of rare species that are in the affected area of the SEZs is 344. The column does not sum to 344 because some species occur in the affected area of more than one SEZ.

affected area is located. Species accounts for rare species that do not have at least one of these statuses are not presented. The species accounts include information on the species' life history, ecology, listing history, and threats to conservation. Species accounts are presented by taxonomic group (plants [Section J.6.1], invertebrates [Section J.6.2], fish [Section J.6.3], amphibians [Section J.6.4], reptiles [Section J.6.5], birds [Section J.6.6], and mammals [Section J.6.7]) and alphabetically, by common name, within each taxonomic group. The species accounts follow Table J.6-1.

TABLE J.6-1 Special Status Species Reviewed in this Final Solar PEIS and Their Potential Occurrence in the Alternative Analysis Areas

				Potential to Occur in the Alternative Areas[b]		
Common Name	Scientific Name	Status[a]	Habitat Description	No Action	Program	SEZ
Plants						
Abrams' spurge	*Chamaesyce abramsiana*	CA-S1	Restricted to deserts of southern California. Inhabits sandy substrates within creosotebush scrub communities in the Mojave and Sonoran Deserts at elevations below 3,000 ft.[c]	×	×	×
Ackerman milkvetch	*Astragalus ackermanii*	NV-S2	Endemic to the Sheep and Pintwater Ranges of southern Nevada. Occurs in crevices and ledges of carbonate cliffs in the mixed shrub, sagebrush, and juniper woodland habitat communities at elevations between 4,000 and 6,200 ft.	×	×	×
Acuna cactus	*Echinomastus erectocentrus* var. *acunensis*	ESA-C; AZ-HS; AZ-S1	Endemic to Arizona and nearby Sonora, Mexico. Occurs on well-drained knolls, gravel ridges, and desert flats between major washes at elevations between 1,200 and 2,790 ft. Known to occur in the paloverde saguaro association of southwestern Arizona.	×	×	
Alamo beardtongue	*Penstemon alamosensis*	FWS-SC; NM-SC	Known from the Sacramento and San Andres Mountains in Doña Ana and Otero Counties, New Mexico, as well as the Hueco Mountains in El Paso County, Texas. Occurs on sheltered rocky areas, canyon sides, and canyon bottoms on limestone substrate. Elevations range between 4,300 and 5,300 ft.	×	×	×
Algodones Dunes sunflower	*Helianthus niveus* ssp. *tephrodes*	BLM-S	Primarily restricted to the Algodones Dunes in Imperial County, California. Inhabits desert sand dune habitats at elevations below 328 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Alkali mariposa-lily	*Calochortus striatus*	BLM-S; FWS-SC; CA-S2; NV-S1	Restricted to wetlands in the western Mojave Desert. Inhabits alkaline seeps, springs, and meadows at elevations between 2,600 and 4,600 ft.	×	×	×
Alpine braya	*Braya humilis*	CO-S2	Occurs in slightly disturbed microsites that are within exposed slopes, solifluction lobes, and scree slopes that have calcareous soils of Leadville limestone or Manitou dolomite derivation. Elevation ranges between 11,400 and 12,800 ft.	×		
Altai chickweed	*Stellaria irrigua*	CO-S2	Occurs in mountain rills and scree above 8,200 ft. This species has a remarkably disjunct distribution where it is known only to occur in Colorado and Siberia.	×	×	×
Altered andesite buckwheat	*Eriogonum robustum*	BLM-S; NV-S2	Endemic to Nevada in Storey and Washoe Counties. Grows in dry, shallow, highly acidic soils on ridges, knolls, and steep slopes at elevations between 4,410 and 7,325 ft.	×		
Altered andesite popcornflower	*Plagiobothrys glomeratus*	BLM-S; NV-S2	Endemic to Nevada in Storey and Washoe Counties. Inhabits dry, shallow, acidic clay soils on ridges, knolls, and steep slopes in sagebrush, pinyon-juniper, and montane conifer zones at elevations between 4,850 and 6,650 ft.	×		
Amargosa beardtongue	*Penstemon fruticiformis* var. *amargosae*	BLM-S; CA-S2; FWS-SC	Primarily known from the Death Valley region of California and also adjacent western Nevada. Inhabits Mojave desertscrub communities at elevations between 2,600 and 4,600 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Amargosa niterwort	*Nitrophila mohavensis*	ESA-E; BLM-S; CA-E; NV-P; NV-S1	Endemic to the Amargosa Valley in Inyo County, California, and Nye County, Nevada, where there are less than five occurrences near Carson Slough in the Amargosa Desert. It inhabits playas and alkaline wetlands near the Ash Meadows region. Elevation ranges between 1,390 and 2,460 ft.	×	×	×
American yellow lady's-slipper	*Cypripedium calceolus* ssp. *parviflorum*	CO-S2	Occurs in aspen groves, ponderosa, and Douglas fir forests with rich humus and decaying leaf litter. Soil substrates are sandy to loam. Prefers rocky north or east facing hillsides at elevations between 7,400 and 8,500 ft.	×	×	×
Angel trumpets	*Acleisanthes longiflora*	CA-S1	Restricted to California from a single occurrence in the Maria Mountains. Rocky, gravelly, loamy, or sandy calcareous, gypsiferous, or igneous-derived soils in deserts, grasslands, shrublands, or woodlands at elevations between 295 and 310 ft.	×	×	
Annual rock-nettle	*Eucnide rupestris*	CA-S2	Inhabits San Diego and Imperial Counties of southern California. Occurs on rock or talus slopes within Sonoran desertscrub and creosotebush scrub communities at elevations between 1,650 and 1,970 ft.	×		
Antelope Canyon goldenbush	*Ericameria cervina*	NV-S1	Known from Arizona, Nevada, and Utah. Occurs in rock crevices and talus in shadscale and Douglas-fir-bristlecone pine communities often on calcareous substrates; less commonly on ash flow tuff. Elevation ranges between 3,100 and 8,800 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Aquarius milkvetch	*Astragalus newberryi* var. *aquarii*	BLM-S; AZ-S1	Endemic to Burro Creek in Mohave County, Arizona. Inhabits limey-clay soils in Sonoran desertscrub communities, primarily on BLM lands in the Clay Hills Area of Critical Environmental Concern (ACEC). Elevation ranges between 2,000 and 2,600 ft.	×	×	
Aravaipa sage	*Salvia amissa*	BLM-S; FWS-SC; AZ-S2	Range is south-central Arizona in shady canyons near streams in oak woodland or deciduous riparian woodland, at elevations between 1,500 and 5,000 ft.	×	×	
Aravaipa wood fern	*Thelypteris puberula* var. *sonorensis*	BLM-S; AZ-S2	Occurs in moist soils in shady canyon regions, riparian habitats such as riverbanks, seepage areas, and mesic meadow habitats. Elevation ranges between 2,220 and 4,500 ft.	×	×	
Arid tansy-aster	*Machaeranthera arida*	AZ-S1	Occurs in low sand dunes, alkaline flats, riverbanks, and sandy roadsides.	×	×	×
Arizona agave	*Agave arizonica*	AZ-HS	Range is central Arizona on open, rocky slopes and mesas in Sonoran desertscrub, chaparral, or juniper-grassland at elevations between 3,600 and 5,800 ft.	×	×	
Arizona cliffrose	*Purshia subintegra*	ESA-E; AZ-HS; AZ-S1	Endemic to central Arizona near Horseshoe Lake (Maricopa County), Cottonwood (Yavapai County), Burro Creek (Mohave County), and Bylas (Graham County) in rolling, rocky, limestone hills and slopes within the creosotebush-crucifixion thorn habitat. Elevation ranges between 2,100 and 4,000 ft.	×	×	
Arizona coralroot	*Hexalectris spicata*	BLM-S; NM-E; FWS-SC; NM-S2	Known from southern Arizona, New Mexico, Texas, and adjacent Mexico. Occurs in oak and pinyon-juniper woodland communities in areas of heavy leaf litter.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Arizona giant sedge	*Carex ultra*	BLM-S; AZ-S2	Occurs in shaded southeast-facing exposures of moist gravelly substrates near perennially wet springs and streams. Elevation ranges between 2,000 and 6,000 ft.	×	×	
Arizona hedgehog cactus	*Echinocereus triglochidiatus* var. *arizonicus*	ESA-E; AZ-HS; AZ-S2	Range is Pinal and Gila Counties in central Arizona. Inhabits areas with extensive rock cover, such as rugged, steep-walled canyons, boulder-pile ridges and slopes. Found among shrubby vegetation in Arizona desert grassland, and at elevations of 3,300 to 5,700 ft.	×	×	
Arizona phlox	*Phlox amabilis*	AZ-S2	Endemic to Arizona on open limestone-rocky slopes within pinyon-juniper woodlands and ponderosa pine-gambel oak communities. Elevation ranges between 3,500 and 7,800 ft.	×		
Arizona pholistoma	*Pholistoma auritum* var. *arizonicum*	CA-S1	Restricted to the Whipple Mountains in southeastern California. Inhabits creosotebush scrub and desertscrub communities at elevations between 900 and 2,700 ft.	×	×	
Arizona Sonoran rosewood	*Vauquelinia californica* ssp. *sonorensis*	BLM-S; AZ-S1	Known from the Ajo, Diablo, Mesquite, Sand Tank, and Santa Rosa Mountains in southwestern Arizona. Occurs on rocky slopes of hillsides and canyons on a variety of substrates. Associated with Sonoran Desert chaparral plant communities at elevations between 2,300 and 3,700 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Arizona willow	*Salix arizonica*	CO-S1; AZ-HS; AZ-S2	Occurs in subalpine wet meadows, low-gradient stream banks, wet drainage ways, and cienegas typically within coniferous forest matrix. Sites often occur as narrow, linear strips associated with perennial water and are unshaded to partly shaded. Slopes are generally flat to moderate (< 9%) at elevations between 7,500 and 11,700 ft.	×		
Arkansas Canyon stickleaf	*Nuttallia densa*	CO-S2	Occurs in washes, naturally disturbed sites, and steep rocky slopes having pinyon-juniper, sagebrush, or mountain mahogany. Substrates are composed of granodiorite, gneiss, gravel, and scree at elevations between 5,800 and 7,200 ft.	×		
Ash Meadows blazingstar	*Mentzelia leucophylla*	ESA-T; NV-P; NV-S1	Endemic to the Ash Meadows region in Nye County, Nevada, where it is narrowly confined to spring-fed desert wetlands.	×	×	×
Ash Meadows buckwheat	*Eriogonum contiguum*	CA-S2; NV-S1	Known from the Mojave Desert of Inyo County, California, and Clark and Nye Counties, Nevada. Occurs on sandy to gravelly flats and slopes in association with creosote scrub and mesquite communities at elevations below 3,280 ft.	×	×	×
Ash Meadows gumplant	*Grindelia fraxinopratensis*	ESA-T; NV-P; NV-S2	Endemic to the Ash Meadows region in Nye County, Nevada, where it is confined to saltgrass meadows along spring-fed desert wetlands.	×	×	×
Ash Meadows ivesia	*Ivesia kingii eremica*	ESA-T	Endemic to the Ash Meadows region in Nye County, Nevada, where it is confined to a single spring-fed wetland area with saline soils.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Ash Meadows sunray	*Enceliopsis nudicaulis corrugata*	ESA-T	Endemic to the Ash Meadows region in Nye County, Nevada, where it is confined to a single spring-fed wetland area with saline soils.	×	×	×
Ash-gray paintbrush	*Castilleja cinerea*	ESA-T	Endemic to the eastern end of the San Bernardino Mountains in southern California. Primarily found on pebble plains (dense clay soils, usually covered with a cobble pavement of quartzite). Also known from pine forests and dry sagebrush scrublands.	×	×	
Autumn buttercup	*Ranunculus aestivalis*	ESA-E; UT-S1	Endemic to Garfield County, Utah. Only two populations are known to occur in sedgegrass meadows associated with seeps and springs in the Sevier River Valley. Occurs at elevations near 6,500 ft.	×	×	
Autumn willow	*Salix serissima*	CO-S1	Occurs in marshes or fens associated with other Salix and Carex species. Elevation ranges between 7,800 and 9,300 ft.	×	×	×
Aztec gilia	*Gilia formosa*	NM-E; NM-S2	Restricted to San Juan County, New Mexico. Inhabits lower pinyon-juniper woodland-sagebrush rangeland or open arid Navajoan Desert between 5,800 and 6,200 ft in elevation.	×	×	
Aztec milkvetch	*Astragalus proximus*	CO-S2	Occurs in Rocky Mountain ponderosa pine woodland, Colorado Plateau pinyon-juniper woodland, intermountain-basins, semidesert shrub-steppe, and Rocky Mountain gambel oak-mixed montane shrublands at elevations between 5,400 and 7,300 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Baja California ipomopsis	*Ipomopsis effusa*	CA-S1	Endemic to southern California in the southeastern Peninsular Ranges. Inhabits alluvial fan and sandy substrates within chaparral, creosotebush scrub, and Sonoran desertscrub communities at elevations below 330 ft.	×		
Baja navarretia	*Navarretia peninsularis*	BLM-S; CA-S2	Inhabits meadows and seeps in lower montane coniferous forests and pinyon-juniper woodlands at elevations between 4,900 and 7,550 ft.	×		
Baldwin Lake linanthus	*Linanthus killipii*	BLM-S; CA-S2; FWS-SC	Restricted to the region of Baldwin Lakes, San Bernardino County, California. Inhabits dry open areas with pinyon-juniper and red fir forest communities, including dry slopes, alkaline meadows, and pebble plains. Elevation ranges between 5,000 and 7,900 ft.	×		
Bare-stem larkspur	*Delphinium scaposum*	CA-S1	Restricted to the Whipple Mountains of southern California. Inhabits rocky substrates of juniper woodlands and grasslands at elevations between 890 and 3,450 ft.	×		
Barstow woolly sunflower	*Eriophyllum mohavense*	BLM-S; CA-S2; FWS-SC	Known only from the area surrounding Barstow, California. Inhabits sandy or rocky substrates associated with creosotebush scrub, chenopod scrub, and playas. Elevation ranges between 2,000 and 3,000 ft.	×	×	
Barton Flats horkelia	*Horkelia wilderae*	BLM-S; CA-S1; FWS-SC	Known from fewer than 10 occurrences in the Barton Flats area in San Bernardino County, California. Inhabits lower and upper montane coniferous forests at elevations between 5,900 and 9,800 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Bartram stonecrop	*Graptopetalum bartramii*	BLM-S; AZ-SR; FWS-SC	Range is southern Arizona and Chihuahua, Mexico, at elevations of 3,650 to 6,700 ft. Inhabits cracks in rocky outcrops of canyons in shrub live oak-grassland communities along meandering arroyos.	×	×	
Bashful beardtongue	*Penstemon pudicus*	BLM-S; NV-S1	Endemic to Nevada in Nye County, at elevations between 7,500 and 9,000 ft. Grows in crevices, soil pockets, and rocky soils in volcanic outcrops, boulder piles, steep slopes, and drainage bottoms.	×		
Bear Lake buckwheat	*Eriogonum microthecum* var. *lacus-ursi*	BLM-S; CA-S1	Known from only one occurrence near Bear Lake in the San Bernardino Mountains. Inhabits Great Basin scrub communities and lower montane coniferous forests on rocky-clay outcrops. Elevation ranges between 6,550 and 6,900 ft.	×		
Bear Valley pyrrocoma	*Pyrrocoma uniflora* var. *gossypina*	BLM-S; CA-S2; FWS-SC	Known from fewer than 20 occurrences near Bear Valley, San Bernardino County, California. Inhabits moist meadows and seeps on pebble plain substrates at elevations between 5,250 and 7,500 ft.	×		
Bearded screwmoss	*Pseudocrossidium crinitum*	NV-S1	Known from only 12 occurrences in Nevada. Occurs on or near gypsiferous deposits and outcrops or limestone boulders, especially on east- to north-facing slopes of loose, uncompacted soil, often associated with other mosses and lichens at elevations between 1,300 and 2,300 ft.	×	×	×
Beautiful sedge	*Carex concinna*	BLM-S; CO-S1	Broadly distributed in boreal regions from Alaska to Colorado. In Colorado, the species is associated with cool, moist forests with mosses and well-drained soils at elevations between 8,000 and 10,500 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Beaver Dam breadroot	*Pediomelum castoreum*	FWS-SC	Known from Arizona, California, and Nevada. Occurs in dry, sandy desert communities.	×	×	×
Big Bear Valley milkvetch	*Astragalus lentiginosus* var. *sierrae*	BLM-S; CA-S1; FWS-SC	Endemic to San Bernardino County, California, from the Big Bear Valley and Baldwin Lake region. Inhabits scrub habitats, meadows, pinyon-juniper woodlands, and montane coniferous forests on gravelly or rocky substrates. Elevation ranges between 5,900 and 8,500 ft.	×		
Big Bear Valley phlox	*Phlox dolichantha*	BLM-S; CA-S2; FWS-SC	Known from the Big Bear Valley in San Bernardino County, California. Inhabits openings in montane coniferous forests on pebble plain substrates. Elevation ranges between 5,900 and 9,800 ft.	×		
Big Bear Valley sandwort	*Arenaria ursina*	ESA-T; BLM-S; CA-S2	Located in pebble plains, which are dense clay soils, usually covered with a cobble pavement of quartzite. Occurs in sparsely vegetated openings in forests at elevations between 5,900 and 7,500 ft.	×		
Big Bear Valley woollypod	*Astragalus leucolobus*	BLM-S; CA-S2; FWS-SC	Endemic to San Bernardino County, California, from the Big Bear Valley. Occurs in open habitats, including pebble plains in yellow pine forest and sagebrush scrub at elevations between 6,600 and 7,800 ft.	×		
Bigelow onion	*Allium bigelovii*	AZ-SR; AZ-S2	Inhabits gentle slopes on open, dry rocky soil in grassland, chaparral, and Sonoran–Mohave desertscrub communities. Elevation ranges between 2,000 and 5,000 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Bigelow's tansy-aster	*Machaeranthera bigelovii* var. *bigelovii*	AZ-S2	Regionally endemic, where it occurs at high elevations of the northeastern Sonoran Desert. Rangewide habitats include mountain brush, aspen, spruce-fir forest, montane grassland, and alpine meadow communities with dry granite gravel substrates. Known to occur at elevations between 7,000 and 8,528 ft.	×	×	
Birdbill day-flower	*Commelina dianthifolia*	CO-S1	Occurs in rocky soils at middle elevations in the shade of pines and junipers. Elevation ranges between 4,000 and 7,000 ft.	×		
Bitter hymenoxys	*Hymenoxys odorata*	CA-S2	Occurs in sandy substrates within riparian and Sonoran desertscrub communities. Also occurs within open flats, mesquite flats, ditches, and drainage areas and along roads and streams. Elevation ranges between 150 and 500 ft.	×	×	×
Black bog-rush	*Schoenus nigricans*	CA-S2	Endemic to California on alkaline or calcareous substrates within grasslands, marshes, springs, and swamps. Elevation ranges between 500 and 6,500 ft.	×	×	×
Black milkvetch	*Astragalus funereus*	BLM-S; FWS-SC; NV-S2	Known only from the Death Valley region of California and southern Nevada. There are only five occurrences of this species currently known. It inhabits gravelly-clay ridges and ledges on limestone or volcanic substrates at elevations between 4,200 and 6,900 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Blaine fishhook cactus	*Sclerocactus blaneii*	BLM-S; NV-P; FWS-SC; NV-S1	Endemic to southeastern Nevada and southwestern Utah, where it occurs on alkaline substrates and volcanic gravels in valley bottoms. Elevation ranges between 5,100 and 5,300 ft. There are only three occurrences of this species currently known.	×	×	×
Blue giant hyssop	*Agastache foeniculum*	CO-S1	Occurs in mixed grass and tallgrass prairies, as well as moist woodlands, mesic meadows, lakeshores, and wet ditches.	×		
Blue sand lily	*Triteleiopsis palmeri*	BLM-S; AZ-SR; AZ-S1	Known from few occurrences in Yuma County, Arizona. Inhabits Sonoran desertscrub communities and sand dunes at elevations between 250 and 1,660 ft. The species is not known to occur in the state of California.	×	×	
Blue-eyed grass	*Sisyrinchium demissum*	CO-S2	Occurs in moist areas, springs, stream banks, meadows, and forest seeps at elevations between 1,600 and 9,500 ft.	×	×	×
Blumer's dock	*Rumex orthoneurus*	AZ-HS; FWS-SC	Known in Arizona and New Mexico in wetlands with moist, organic soil adjacent to perennial springs or streams in canyons or meadows, and at elevations between 4,480 and 9,660 ft.	×	×	
Bodie Hills rockcress	*Boechera bodiensis*	BLM-S (CA, NV); NV-S2	Known only from higher elevations (6,725 to 11,600 ft) in a restricted geographical area within Nevada and California. Found on dry, open, rocky, slopes in Great Basin scrub, pinyon-juniper woodland, and subalpine lodgepole pine and whitebark pine forests.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Bodin milkvetch	*Astragalus bodinii*	CO-S2	Generally considered to occur in open forest clearings in association with aspen, pinyon-juniper, and ponderosa pine woodlands.	×	×	×
Booth's evening-primrose	*Camissonia boothii* ssp. *boothii*	CA-S2	Occurs in shrubby, open, or dry areas of Joshua and pinyon-juniper woodlands. Elevation ranges between 3,000 and 7,900 ft.	×	×	×
Brady pincushion cactus	*Pediocactus bradyi*	ESA-E; AZ-HS; AZ-S1	Known only in Marble Canyon in Coconino County, Arizona. Occurs in gravelly alluvium on gently sloping benches and terraces with specific soil characteristics, and with scattered low shrubs. Elevation is 3,400 to 5,200 ft.	×	×	
Brandegee's milkvetch	*Astragalus brandegeei*	BLM-S; CO-S1	Inhabits sandy or gravelly banks, flats, and stony meadows within pinyon-juniper woodlands. Substrates are usually sandstone with granite or occasional basalt. Elevation ranges between 5,400 and 8,800 ft.	×	×	×
Brandegee's wild buckwheat	*Eriogonum brandegeei*	BLM-S; CO-S1	Narrowly endemic to Chaffee and Fremont Counties in Colorado on the Dry Union and Morrison Formations. Occurs on outcrops with volcanic-derived (bentonite) soils. Often found on slopes as steep as 90%.	×	×	
Broadbeard beardtongue	*Penstemon angustifolius dulcis*	BLM-S; FWS-SC; UT-S2	Endemic to the Great Basin in Juab and Millard Counties, Utah. Occurs in saltbush, sagebrush, and juniper communities in sand dune habitats at elevations between 4,500 and 5,500 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Broadfruit burreed	*Sparganium eurycarpum*	CO-S2	Occurs in mud, sand, or gravel of lowland marshes, shores, and ditches with neutral to alkaline waters. Tolerant of some desiccation.	×	×	
Broadleaf lupine	*Lupinus latifolius* ssp. *leucanthus*	AZ-S1	Occurs along streams and moist soils of streambeds, oak-cottonwood communities, mixed shrub, and ponderosa pine forest communities. Elevation ranges between 4,800 and 7,000 ft.	×	×	
Broad-leaved twayblade	*Listera convallarioides*	CO-S2	Occurs in rich humus in open woods to boggy meadows with cool, circumneutral soils at elevations below 8,500 ft.	×	×	×
Brown turbans	*Malperia tenuis*	CA-S1	Known from the Colorado Desert in southeastern California. Inhabits rocky hillsides, alluvium washes, sandy flats, and lava flats within Sonoran desertscrub and creosotebush scrub communities. Elevation ranges between 50 and 1,100 ft.	×	×	×
Bullfrog Hills sweetpea	*Lathyrus hitchcockianus*	NV-S2	Occurs in open, dry to slightly moist gravels of rocky drainage bottoms in canyons and on upper alluvial slopes, often at bases of boulders or canyon walls and climbing up through shrubs, in areas of volcanic tuff or carbonate rocks in the mixed-shrub, sagebrush, and pinyon-juniper zones.	×	×	×
Burgess' scale broom	*Lepidospartum burgessii*	BLM-S; NM-E; FWS-SC; NM-S1	Known from southern Otero County, New Mexico, and adjacent Texas. Occurs on stabilized gypsum dunes in Chihuahuan desertscrub and grassland communities. Elevations range between 3,500 and 3,700 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Caespitose cat's-eye	*Oreocarya caespitosa*	BLM-S; CO-S2	Regionally endemic to Wyoming, Utah, Idaho, and Colorado. Restricted to rocky or chalky ridgetops in cushion plant communities at elevations between 6,400 and 10,000 ft.	×		
California barrel cactus	*Ferocactus cylindraceus* var. *cylindraceus*	AZ-SR	Inhabits gravelly or rocky hillsides, canyon walls, alluvial fans, and desert washes at elevations between 200 and 2,900 ft.	×	×	×
California dandelion (California taraxacum)	*Taraxacum californicum*	ESA-E; BLM-S; CA-S2	Endemic to the San Bernardino Mountains of southern California. Found along edges of moist meadows at elevations between 5,250 and 9,200 ft.	×	×	
California ditaxis	*Ditaxis serrata* var. *californica*	CA-S2	Sonoran desertscrub and creosotebush scrub communities at elevations between 100 and 3,300 ft.	×	×	×
California fan palm	*Washingtonia filifera*	AZ-SR; AZ-S1	Considered common in the state of California (not ranked); rare in Arizona where it is state-protected. Occurs in desert oases in isolated areas of the Sonoran and Mojave Deserts at elevations between 500 and 1,000 ft.	×	×	×
California jewel-flower	*Caulanthus californicus*	ESA-E; BLM-S; CA-E; CA-S1	Endemic to California. Occurs in sandy habitats of chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland at elevations lower than 3,280 ft.	×		
California satintail	*Imperata brevifolia*	CA-S2	Occurs in chaparral, coastal sage scrub, creosotebush, desertscrub, mesic riparian scrub, and alkaline meadow and seep communities. Elevation ranges between 0 and 1,650 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
California saw-grass	*Cladium californicum*	CA-S2	Occurs in alkaline, freshwater, and riparian habitats, including meadows, marshes, swamps, and seeps. Elevation ranges between 200 and 2,000 ft.	×	×	×
California snakewood	*Colubrina californica*	AZ-S2	Inhabits sandy desert washes, steep gullies, and rocky or gravelly slopes at elevations below 3,000 ft.	×	×	×
Canyonlands aletes	*Aletes latilobus*	BLM-S; CO-S1	Occurs in sandy soils in pinyon-juniper and desert shrub communities at elevations between 5,000 and 7,000 ft.	×		
Castetter's milkvetch	*Astragalus castetteri*	FWS-SC; NM-SC	Endemic to New Mexico from the Caballo and San Andres Mountains in Doña Ana and Sierra Counties. Occurs on dry, rocky slopes in montane scrub and open juniper woodland communities. Elevations range between 5,000 and 7,050 ft.	×	×	
Catalina beardtongue	*Penstemon discolor*	AZ-HS; AZ-S2	Endemic to southeastern Arizona. Inhabits bare rock in openings in pine forests, pine-oak woodlands, and oak woodlands at 4,400 to 7,200 ft in elevation.	×	×	
Cedar Breaks goldenbush	*Haplopappus zionis*	BLM-S; FWS-SC; UT-S2	Endemic to southwestern Utah in Garfield, Iron, and Kane Counties. Occurs in spruce-fir and ponderosa pine communities on limestone substrates at elevations between 8,000 and 10,000 ft. Known to occur only in Dixie National Forest, Cedar Breaks National Monument, and Bryce Canyon National Park.	×		
Chaparral sand-verbena	*Abronia villosa* var. *aurita*	BLM-S; CA-S2	Endemic to southern California. Inhabits chaparral desert sand dunes at elevations between 350 and 5,250 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Charleston goldenbush	*Ericameria compacta*	NV-S2	Endemic to the Spring and Sheep Ranges in southern Nevada, where the species is known from 10 occurrences. Occurs on forested carbonate slopes and adjacent ridges and low outcrops within the subalpine and montane conifer communities at elevations between 2,850 and 11,300 ft.	×	×	×
Charleston pinewood lousewort	*Pedicularis semibarbata* var. *charlestonensis*	FWS-SC	Endemic to Nevada. A high-elevation species that is locally abundant except on steep slopes. Associated with *Cercocarpus ledifolius*, *Pinus monophylla*, *P. ponderosa* var. *scopulorum*, and *Populus tremuloides* var. *aurea*. Elevation ranges between 7,200 and 9,000 ft.	×		
Churchill Narrows buckwheat	*Eriogonum diatomaceum*	ESA-C; BLM-S; NV-P; NV-S1	Known only in the Churchill Narrows in Lyon County, Nevada. Inhabits dry, barren, and undisturbed areas on knolls, ridges, and small drainages at elevations just over 4,000 ft.	×	×	
Cienega Seca oxytheca	*Acanthoscyphus parishii* var. *cienegensis*	BLM-S; CA-S1; FWS-SC	Endemic to San Bernardino County, California; known from approximately five locations. Inhabits pinyon-juniper woodlands and montane coniferous forests at elevations between 6,900 and 8,050 ft.	×		
Clarke phacelia	*Phacelia filiae*	BLM-S; NV-S2	Endemic to Nevada. Occurs on light-colored soils of calcareous sandstone, siltstone, tuffaceous claystone, and limestone substrates. Inhabits relatively flat areas or low knolls of valley floors, primarily above the playas and in the foothills of desert mountains within shadscale, blackbrush, and creosotebush scrub communities at elevations between 6,500 and 12,000 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Clay-loving wild buckwheat	*Eriogonum pelinophilum*	ESA-E; CO-S2	Known in Delta and Montrose Counties, Colorado, in alkaline clay soils in salt desert shrub communities at 5,200 to 6,400 ft in elevation.	×		
Cliff milkvetch	*Astragalus cremnophylax* var. *myriorrhaphis*	BLM-S; AZ-SR; FWS-SC; AZ-S1	Known from the Buckskin Mountains in Coconino County, Arizona, where it grows in crevices on shallow soil on Kaibab Limestone at elevations of 6,200 to 7,900 ft.	×	×	
Clokey buckwheat	*Eriogonum heermannii* var. *clokeyi*	BLM-S; NV-S2	Endemic to Nevada in Clark and Nye Counties. Inhabits carbonate outcrops, talus, scree, and gravelly washes and banks in creosotebush-bursage, shadscale, and blackbrush communities at elevations between 4,000 and 6,000 ft.	×		
Clokey eggvetch	*Astragalus oophorus* var. *clokeyanus*	FWS-SC; NV-S2	Endemic to the Spring Mountains of southern Nevada. Occurs in dry to slightly moist open slopes, flats; or in drainages on gravelly soil derived from limestone or rhyolitic volcanics; in openings or under shrubs in ponderosa pine forests, pinyon-juniper woodlands, and burned areas. Elevations range between 5,400 and 9,000 ft.	×		
Clokey milkvetch	*Astragalus aequalis*	BLM-S; NV-S2	Endemic to the Spring Mountains of southern Nevada. Occurs on calcareous gravelly flats, hillsides, and open ridges, often sheltering under sagebrush (*Artemisia* sp.), pine trees, or oak trees. Other common associates include Utah juniper (*Juniperus osteosperma*) and curl-leaf mountain mahogany (*Cercocarpus ledifolius* var. *intermontanus*). Elevation ranges between 6,000 and 8,400 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Clokey mountain sage	*Salvia dorrii* var. *clokeyi*	BLM-S; FWS-SC	Endemic to the Spring and Sheep Ranges in southern Nevada, where the species is known from 19 occurrences. Occurs on shallow, rocky to gravelly carbonate soils of ridges, slopes, and drainages in pinyon-juniper, montane conifer, mountain mahogany, and subalpine conifer communities. Elevation ranges between 7,000 and 9,800 ft.	×		
Clokey paintbrush	*Castilleja martinii* var. *clokeyi*	FWS-SC	Restricted to California and Nevada. Inhabits pinyon-juniper woodland communities at elevations between 6,500 and 9,500 ft.	×	×	×
Clokey's cryptantha	*Cryptantha clokeyi*	BLM-S; CA-S1	Restricted to a few locations near Barstow, California. Occurs on Mojave desertscrub on sandy or gravelly soils at elevations between 2,625 and 2,950 ft.	×	×	
Clover's fishhook cactus	*Sclerocactus cloveriae* ssp. *brackii*	NM-E; NM-S1	Restricted to areas in the San Juan River valley, San Juan County, New Mexico. Inhabits sandy clay strata in sparse shadscale scrub at elevations between 5,000 and 6,400 ft.	×	×	
Clustered barrel cactus	*Echinocactus polycephalus* var. *polycephalus*	AZ-SR; AZ-S2	Occurs in the driest parts of the Sonoran and Mohave Deserts in western Arizona on rocky and gravelly slopes. Often found with creosotebush scrub or the periphery of pinyon-juniper woodlands. Elevation ranges between 230 and 1,120 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Coachella Valley milkvetch	*Astragalus lentiginosus* var. *coachellae*	ESA-E; BLM-S; CA-S2	Endemic to Riverside County, California, where it is primarily known from the Coachella Valley. A disjunct population is also known from the Chuckwalla Valley. Occupies sandy areas in washes and sometimes on dunes in creosotebush scrub or in blown sand areas around valley margins. Elevation ranges between 160 and 2,130 ft.	×	×	×
Cochise pincushion cactus	*Coryphantha robbinsorum*	ESA-T; AZ-HS; AZ-S1	Rolling limestone slopes in transition zone between Chihuahuan desertscrub and semidesert grassland at elevations of 4,200 to 4,650 ft in Cochise County, Arizona. Also found in northern Sonora, Mexico.	×	×	
Colorado desert-parsley	*Lomatium concinnum*	BLM-S; CO-S2	Endemic to Delta, Montrose, and Ouray Counties in Colorado. Occurs in shrub communities dominated by sagebrush, shadscale, greasewood, or scrub oak at elevations between 5,500 and 7,000 ft.	×		
Colorado hookless cactus	*Sclerocactus glaucus*	ESA-T	Endemic to western Colorado in Delta, Garfield, Mesa, and Montrose Counties. Occurs on alluvial benches along the Colorado and Gunnison Rivers and their tributaries in saltbush or sagebrush flats, or on pinyon-juniper woodlands at elevations between 3,900 and 6,600 ft.	×		
Colorado larkspur	*Delphinium ramosum* var. *alpestre*	CO-S2; NM-S2	Inhabits meadows, aspen woodlands, and Artemisia scrub communities at elevations between 6,900 and 10,500 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	 Program	 SEZ
Plants (Cont.)						
Colorado tansy-aster	*Machaeranthera coloradoensis*	CO-S2	Restricted to the Rocky Mountains of south-central Wyoming and western Colorado. Occurs on gravelly substrates situated in mountain parks, slopes, and rock outcrops, reaching dry tundra. Elevation ranges between 8,500 and 12,500 ft.	×	×	
Colorado wild buckwheat	*Eriogonum coloradense*	BLM-S; CO-S2	Narrowly endemic to the mountains of central Colorado. Occurs on alpine talus slopes on gravelly or sandy soils at elevations between 8,500 and 12,500 ft.	×		
Compact cat's-eye	*Cryptantha compacta*	BLM-S; FWS-SC; NV-S1; UT-S2	Known from southwestern Millard County and northwestern Beaver County, Utah, and eastern Nevada. Occurs in salt desert shrub and mixed shrub communities at elevations between 5,000 and 8,400 ft.	×	×	×
Coulter's goldfields	*Lasthenia glabrata* ssp. *coulteri*	BLM-S; CA-S2	Endemic to California from salt marshes, swamps, playas, alkaline sinks, and vernal pools at elevations below 4,000 ft.	×	×	
Coves' cassia	*Senna covesii*	CA-S2	Inhabits Sonoran Desert dry washes and slopes with sandy substrates within desertscrub and creosotebush scrub communities. Elevation ranges between 1,000 and 3,500 ft.	×	×	×
Crandall's rockcress	*Arabis crandallii*	BLM-S; CO-S2	Endemic to west-central Colorado in the Upper Gunnison Basin. Inhabits rocky or gravelly areas, including cliffs, talus slopes, and ridges on granite or limestone substrate at elevations between 6,500 and 10,500 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Crandall's rockcress	*Boechera crandallii*	BLM-S; CO-S2	Regionally endemic to southwest Colorado and southwest Wyoming. Inhabits rocky or gravelly areas of cliffs, talus slopes, ridges, and ledges within cold desert, grassland, sagebrush, sagebrush-grassland, Utah juniper/mountain mahogany, pinyon-juniper woodland, and ponderosa pine forest communities.	×		
Creamy blazing star	*Mentzelia tridentata*	BLM-S; CA-S2	Inhabits Mojave Desert creosotebush scrub communities on rocky and sandy substrates at elevations below 3,900 ft.	×	×	×
Creeping milkvetch	*Astragalus troglodytus*	AZ-S2	Endemic to Coconino and Yavapai Counties in Arizona. Occurs in ponderosa pine forests, pinyon-juniper woodlands, chaparral communities, and grasslands. Elevation ranges between 4,260 and 8,100 ft.	×		
Currant milkvetch	*Astragalus uncialis*	BLM-S; FWS-SC; NV-S1; UT-S2	Regionally endemic to the Great Basin in Millard County, Utah, and Nye County, Nevada. Occurs in shadscale and bursage communities on alkaline limestone substrates at elevations between 4,500 and 6,000 ft.	×		
Cushenbury buckwheat	*Eriogonum ovalifolium* var. *vineum*	ESA-E; BLM-S; CA-S1	Restricted to a carbonate belt in the northeastern San Bernardino Mountains, San Bernardino County, California. Inhabits desert slopes, primarily in open areas on substrates derived from limestone or dolomite. Soils are typically powdery-fine, with little accumulation of organic matter and with numerous interspersed rocks. Elevation ranges between 4,600 and 7,875 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Cushenbury milkvetch	*Astragalus albens*	ESA-E; BLM-S; CA-S1	A limestone endemic in San Bernardino County, California, primarily found on soils derived directly from decomposing limestone bedrock. Occurs on open, very rocky slopes at elevations between 3,300 and 6,500 ft. Inhabits Joshua tree woodland, Mojavean desertscrub, and pinyon and juniper woodland.	×		
Cushenbury oxytheca	*Acanthoscyphus parishii* var. *goodmaniana*	ESA-E; BLM-S; CA-S1	Restricted to a carbonate belt in the northeastern San Bernardino Mountains, San Bernardino County, California, and known from fewer than 20 occurrences. Inhabits pinyon-juniper woodlands on talus slopes at elevations between 3,900 and 7,875 ft.	×		
Cushion bladderpod	*Physaria pulvinata*	BLM-S; CO-S1	Endemic to Colorado and confined to shale outcrops. Known in San Miguel and Dolores Counties.	×		
Dainty moonwort	*Botrychium crenulatum*	BLM-S; CA-S2; NV-S1	Widely distributed throughout western North America in high-elevation montane habitats (between 4,150 and 11,200 ft). Aquatic/wetland-dependent, occurring in wet, marshy, and riparian areas, including wet meadows, edges of marshes, saturated soils of seeps, bottoms and stabilized margins of small streams, and wet roadside swales and ditches. Sites tend to be partly to heavily shaded and usually have a dense, diverse cover of forbs and graminoids. Dominant plant species may include spruce, alders, and dogwood.	×		
Dalhouse spleenwort	*Asplenium dalhousiae*	BLM-S; AZ-S1	Found in scattered locations in the Mule, Huachuca, and Baboquivari Mountains in Arizona on shady, rocky ravines in Madrean oak woodland. Elevation ranges from 4,000 to 6,000 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Darwin rockcress	*Arabis pulchra* var. *munciensis*	CA-S1	Occurs on carbonate substrates along canyons, slopes, and washes. Elevation ranges between 3,600 and 6,800 ft.	×	×	×
Davidson sage	*Salvia davidsonii*	AZ-S2	Rocky substrates in canyons, and in moist soils on wooded slopes, often on bedrock. Elevation ranges between 1,600 and 9,500 ft.	×	×	×
Death Valley beardtongue	*Penstemon fruticiformis* ssp. *amargosae*	BLM-S; FWS-SC; NV-S2	Known only from the Death Valley region of California and southern Nevada. It inhabits Mojave desertscrub communities at elevations between 2,800 ft and 4,600 ft.	×	×	×
Death Valley mormon tea	*Ephedra funerea*	AZ-S1	Occurs on sandy, dry soils within upper, shrub-covered desert slopes and valley floors, fans, washes, rocky scrub areas, and sometimes on stabilized dunes in association with creosotebush scrub communities at elevations between 1,150 and 5,580 ft.	×	×	
DeBeque milkvetch	*Astragalus debequaeus*	BLM-S; CO-S2	Endemic to Colorado in Garfield and Mesa Counties. Found in pinyon-juniper woodlands and desert shrub on clay soils with sandstone.	×		
DeBeque phacelia	*Phacelia submutica*	ESA-C; BLM-S; CO-S2	Endemic to Colorado in Garfield and Mesa Counties. Inhabits barren, cracked clay soils, often on steep exposures.	×		
Debris milkvetch	*Astragalus detritalis*	BLM-S; CO-S2	Endemic to the Uinta Basin in Utah and Colorado. Found in rocky soils in pinyon-juniper and mixed desert shrub communities at elevations of 5,400 to 7,200 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Degener's beardtongue	*Penstemon degeneri*	BLM-S; CO-S2	Endemic to south-central Colorado along the Arkansas River corridor. Found in open pinyon-juniper woodlands and montane grasslands with rocky soils at elevations between 6,000 and 7,000 ft. Grows in cracks of large rock slabs around the canyon rims.	×	×	
Desert ageratina	*Ageratina herbacea*	CA-S2	Known from the eastern Mojave Desert Mountains on rocky substrates along streams, slopes, ridges, and washes within pine, pine-oak, and juniper, pinyon-juniper woodlands. Elevation ranges between 5,000 and 7,200 ft.	×	×	
Desert bedstraw	*Galium proliferum*	CA-S2	Endemic to southern California on carbonate (limestone) substrates of rocky banks and ledges. Occurs within Joshua tree woodlands, creosotebush scrub, Mojave desertscrub, and pinyon-juniper woodland habitats at elevations between 3,900 and 5,150 ft.	×	×	×
Desert cymopterus	*Cymopterus deserticola*	BLM-S	Restricted to western Mojave Desert habitats with deep, loose, well-drained, fine to coarse sandy soils of alluvial fan basins. Often occurs in low sand dunes and on sandy slopes. Elevation ranges between 2,060 and 3,060 ft.	×	×	
Desert germander	*Teucrium glandulosum*	CA-S1	Restricted to the Whipple Mountains of the Sonoran Desert in southern California. Occurs on rocky slopes and canyons within creosotebush scrub and Sonoran desertscrub communities. Elevation ranges between 1,300 and 2,600 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Desert night-blooming cereus	*Peniocereus greggii* var. *greggii*	BLM-S; NM-E; FWS-SC; NM-S1	Known from southern New Mexico and western Texas. Occurs in sandy to silty gravelly soils in desert grassland communities. Also found in gravelly flats and washes.	×	×	×
Desert pincushion	*Coryphantha chlorantha*	CA-S1	Occurs on gravelly bajadas, limestone or dolomite rocky slopes associated with desertscrub communities within pinyon-juniper woodlands and Joshua tree woodlands. Elevation ranges between 148 and 7,875 ft.	×	×	×
Desert spike-moss	*Selaginella eremophila*	CA-S2	Gravelly or rocky slopes within creosotebush scrub and Sonoran desertscrub communities. Elevation ranges between 650 and 2,950 ft.	×	×	×
Desert wild-buckwheat	*Eriogonum deserticola*	AZ-S1	Locally common in southeastern California and western Arizona on deep, moving sand dunes and sandy flats within desertscrub communities at elevations below 650 ft.	×		
Diamond Butte milkvetch	*Astragalus toanus* var. *scidulus*	BLM-S; AZ-S1	Known only at the bases of Diamond Butte and Twin Buttes, with mixed desertscrub and scattered juniper and pinyon, in Mohave County, Arizona. Elevation range is 4,900 to 5,400 ft.	×	×	
Dolores River skeletonplant	*Lygodesmia doloresensis*	BLM-S; CO-S1	Known in Mesa and San Miguel Counties, Colorado, and Grand County, Utah. Occurs in juniper-desert shrub or juniper-grassland communities at elevations of 4,400 to 4,700 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Duchesne buckwheat	*Eriogonum viridulum*	BLM-S; CO-S1	Occurs in Colorado and Utah in sandy or silty flats or clay slopes and hills in saltbush or sagebrush communities and pinyon-juniper woodlands at 4,600 to 6,600 ft in elevation.	×		
Duchesne milkvetch	*Astragalus duchesnensis*	BLM-S; CO-S1	Endemic to the Uinta Basin in Utah and Colorado. Inhabits sandy and gravelly pediments such as sandy mesas, or sandstone or shale outcrops of salt desert shrub and pinyon-juniper communities.	×		
Dudley Bluffs bladderpod	*Lesquerella congesta*	ESA-T; CO-S1	Endemic to the Piceance Basin in Rio Blanco County in Colorado. Occurs on barren white shale outcrops that have been exposed from downcutting of streams.	×		
Duncan's corycactus	*Escobaria dasyacantha* var. *duncanii*	NM-E; NM-S1	Inhabits limestone hills in desert at elevations between 3,300 and 5,400 ft.	×	×	
Dune sunflower	*Helianthus deserticola*	NV-S2	Known from Arizona, Nevada, and Utah. Dependent on sand dune communities where it occurs on dry, open, deep, loose sandy soils of aeolian deposits, vegetated dunes, and dune skirt areas, on flats and gentle slopes of all aspects, generally in alkaline areas. Elevation ranges between 1,325 and 4,900 ft.	×	×	×
Dwarf bear-poppy	*Arctomecon humilis*	ESA-E; UT-S1	Endemic to Washington County, Utah. Inhabits warm, open desert shrub communities on gypsiferous clay soils in the Moenkopi Formation. Occurs at elevations between 2,600 and 4,500 ft.	×	×	
Dwarf germander	*Teucrium cubense* ssp. *depressum*	CA-S2	Desert dunes, playas, riparian, creosotebush scrub, and desertscrub communities. Elevation ranges between 150 and 1,300 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Dwarf hawksbeard	*Askellia nana*	CO-S2	Occurs on steep alpine scree and talus slopes at elevations between 10,000 and 14,000 ft.	×	×	×
Dwarf milkweed	*Asclepias uncialis* ssp. *uncialis*	BLM-S; CO-S2	Grows in level to gently sloping terrain, often at the base of escarpments or mesas. Elevation is between 3,920 and 7,640 ft.	×		
Eastwood evening-primrose	*Camissonia eastwoodiae*	BLM-S; CO-S1	Endemic to the Colorado Plateau and found in Utah and Colorado in mat-sagebrush, shadscale, blackbrush, and juniper communities between 3,900 and 5,900 ft.	×		
Eastwood milkweed	*Asclepias eastwoodiana*	BLM-S; FWS-SC; NV-S2	Endemic to Nevada from public and private lands in Esmeralda, Lander, Lincoln, and Nye Counties. Occurs in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls; sand, carbonate, or basaltic gravels; or shale outcrops, generally barren and lacking competition. Frequently occurs in small washes or other moisture-accumulating microsites at elevations between 4,700 and 7,100 ft.	×	×	×
Eastwood monkey-flower	*Mimulus eastwoodiae*	BLM-S; CO-S1	Endemic to the canyonlands of Utah, Colorado, Arizona, and New Mexico. Grows in moist seeps and hanging garden communities in sandstone cliffs.	×		
El Dorado bedstraw	*Galium californicum* ssp. *sierrae*	ESA-E; BLM-S; CA-S1	Endemic to California with approximately 10 occurrences in El Dorado County. Inhabits chaparral, cismontane woodland, and lower montane coniferous forest at elevations between 320 and 1,920 ft.	×		

TABLE J.6-1 (Cont.)

				Potential to Occur in the Alternative Areas[b]		
Common Name	Scientific Name	Status[a]	Habitat Description	No Action	Program	SEZ
Plants (Cont.)						
Elko rockcress	*Boechera falcifructa*	BLM-S; NV-S1	Endemic to Nevada, in Elko County and in the Shoshone Mountains in Lander County. Inhabits sagebrush dominated, north-facing slopes.	×		
Emory's barrel-cactus	*Ferocactus emoryi*	AZ-SR; AZ-S1	Endemic to Arizona from the Sierra Estrella (Maricopa County) to the Organ Pipe Cactus National Monument and Papago Indian Reservation (Pima County). Occurs on rocky hills and sandy or rocky flats, including washes, alluvial fans, and mesas. Elevation ranges between 1,500 and 3,000 ft.	×	×	
Emory's crucifixion-thorn	*Castela emoryi*	CA-S2	Restricted to deserts of southern California and southwestern Arizona where it occurs at low densities. Inhabits slightly wet areas within Mojave desertscrub, nonsaline playas, creosotebush scrub, and Sonoran desertscrub communities. Preferred sites are described as being moist, having fine-textured alluvial bottomland soils, and associated with basalt flows. Elevation ranges between 295 and 2,200 ft.	×	×	×
Ephedra buckwheat	*Eriogonum ephedroides*	BLM-S; CO-S1	Known in Rio Blanco and Moffat Counties in Colorado, and Uintah County, Utah. Found in juniper and sagebrush-grass communities at 5,700 ft.	×		
Ewan's cinquefoil	*Potentilla glandulosa* ssp. *ewanii*	BLM-S; CA-S1	Known from only one occurrence in the San Bernardino Mountains in southern California. Inhabits montane coniferous forests near seeps and springs at elevations between 6,230 and 7,875 ft.	×		
Fendler's townsend-daisy	*Townsendia fendleri*	CO-S2	Inhabits sandy or rocky soils within desertscrub and pinyon-juniper woodlands. Elevation ranges between 3,900 and 7,900 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Ferron milkvetch	*Astragalus musiniensis*	BLM-S; CO-S1	Known in Colorado and Utah on gullied bluffs, knolls, benches, and open hillsides in pinyon-juniper woodlands or desert shrub communities. Elevation is between 4,700 and 7,000 ft.	×		
Few-flowered ragwort	*Packera pauciflora*	BLM-S; CO-S1	Extensive range in North America where it grows in subalpine to alpine damp woods and meadows.	×		
Fickeisen plains cactus	*Pediocactus peeblesianus* var. *fickeiseniae*	ESA-C; AZ-HS; AZ-S1	Range is northern Arizona in Coconino, Mohave, and Navajo Counties. Inhabits ridgetops and benches with slight to moderate slope in gravelly soils at 3,985 to 5,940 ft.	×	×	
Fish Creek fleabane	*Erigeron piscaticus*	BLM-S; AZ-SR; FWS-SC; AZ-S1	Known only in central Arizona, in Maricopa and Graham Counties, at elevations of 2,250 to 3,500 ft. Inhabits moist, sandy canyon bottoms associated with perennial streams.	×	×	
Fish Slough milkvetch	*Astragalus lentiginosus* var. *piscinensis*	ESA-T; BLM-S; CA-S1	Endemic to California. Known from less than five occurrences in Inyo and Mono Counties. Inhabits alkaline playas at elevations between 3,700 and 4,265 ft.	×		
Fisher Towers milkvetch	*Astragalus piscator*	BLM-S; CO-S1	Known in Utah and Colorado. Habitat in Colorado is alluvial terraces along the Dolores River, in open areas with sandy soil.	×		
Five-flower rockdaisy	*Perityle quinqueflora*	FWS-SC; NM-SC	Known from southern New Mexico and western Texas. Inhabits crevices of limestone bluffs in high canyons and caprock at elevations between 5,000 and 6,000 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Flagstaff beardtongue	*Penstemon nudiflorus*	AZ-S2	Endemic to Arizona. Occurs in dry ponderosa pine forests in mountainous regions south of the Grand Canyon. Elevation ranges between 5,000 and 7,375 ft.	×	×	
Flannel bush	*Fremontodendron californicum*	BLM-S; AZ-SR; AZ-S2	Known from Arizona and California. Occurs on well-drained rocky hillsides and ridges, in chaparral and pinyon-juniper and ponderosa pine woodlands. Occurs primarily on the dry, north slopes in canyons. Elevation ranges between 3,500 and 6,500 ft.	×	×	
Flat-seeded spurge	*Chamaesyce platysperma*	BLM-S; CA-S1	Recently observed from two separate occurrences in southern California and southwestern Arizona. Inhabits sandy substrates of desert dunes within Sonoran desertscrub communities at elevations below 650 ft.	×	×	×
Fragile rockbrake	*Cryptogramma stelleri*	BLM-S; CO-S2	Inhabits moist soils on shaded limestone cliffs at elevations greater than 7,000 ft and often in association with mosses.	×	×	×
Fremont's gentian	*Gentiana fremontii*	CA-S2	Restricted to disjunct locations in California and Colorado. Within California, the species inhabits wet meadows and seeps within red fir, lodgepole, and upper montane coniferous forests. Elevation ranges between 7,900 and 8,850 ft.	×		
Frisco buckwheat	*Eriogonum soredium*	ESA-UR; BLM-S; UT-S1	Endemic to the San Francisco Mountains in Beaver County, Utah. Occurs in sagebrush and pinyon-juniper communities on white limestone outcrops. Elevation ranges between 6,600 and 7,300 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Frisco clover	*Trifolium friscanum*	ESA-UR; BLM-S; UT-S1	Known from the San Francisco and Beaver Lake Mountains in Beaver County, Utah. Occurs on volcanic gravels and limestone substrates in association with pinyon-juniper woodlands at elevations between 6,900 and 7,300 ft.	×	×	×
Gentner's fritillary	*Fritillaria gentneri*	ESA-E; BLM-S; CA-S1	Occurs in chaparral and cismontane woodland at elevations between 3,300 and 3,700 ft.	×		
Gentry indigo bush	*Dalea tentaculoides*	BLM-S; AZ-HS; FWS-SC; AZ-S1	Known in Arizona in Santa Cruz County, Pajarito Mountains, Sycamore Canyon, and in one site in Mexico. Occurs in areas of disturbance and along canyon bottom on cobble terraces with occasional flooding. Elevation is 3,600 to 4,580 ft.	×	×	
Giant Spanish-needle	*Palafoxia arida* var. *gigantea*	BLM-S; CA-S1	Occurs on desert sand dune habitats at elevations below 330 ft.	×	×	×
Gibben's beardtongue	*Penstemon gibbensii*	BLM-S; CO-S1	Endemic to an area of Wyoming, Colorado, and Utah; restricted to a particular soil type of sparsely vegetated shale or sandy-clay at elevations between 5,500 and 7,700 ft.	×		
Gierisch globemallow	*Sphaeralcea gierischii*	ESA-C; AZ-S1	Endemic to Washington County, Utah, and Mohave County, Arizona. Inhabits warm desert shrub communities between 2,400 and 4,260 ft.	×	×	
Gilman milkvetch	*Astragalus gilmanii*	BLM-S; NV-S1	Known from California and Nevada. Occurs on light-colored volcanic slopes in pinyon-juniper woodland communities at elevations between 5,400 and 6,000 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Glandular ditaxis	*Ditaxis claryana*	CA-S1	Sandy substrates within desertscrub communities at elevations below 1,525 ft.	×	×	×
Glass Mountain coral-root	*Hexalectris nitida*	BLM-S; NM-E; FWS-SC; NM-S1	Known from southern New Mexico and western Texas. Inhabits deep canyons in litter and under oak trees at elevations near 4,300 ft.	×	×	×
Gold Butte moss	*Didymodon nevadensis*	BLM-S; NV-S1	Known from only Nevada and Texas. Occurs on or near gypsiferous deposits and outcrops or limestone boulders, especially on east- to north-facing slopes of loose, uncompacted soil. Typically associated with other mosses and lichens. Elevation ranges between 1,300 and 2,300 ft.	×	×	×
Golden barrel cactus	*Ferocactus cylindraceus* var. *eastwoodiae*	AZ-SR; AZ-S1	Endemic to central Arizona on gravelly or rocky hillsides, canyon walls, and wash margins. Elevation ranges between 1,200 and 4,000 ft.	×	×	
Golden bladderpod	*Lesquerella aurea*	FWS-SC; NM-SC; NM-S2	Restricted to the Jicarilla and Sacramento Mountains in south-central New Mexico. Occurs in open sites and bare areas of rocky limestone soil. Primarily known from montane coniferous forests at elevations between 6,500 and 9,000 ft.	×		
Golden blazing star	*Nuttallia chrysantha*	CO-S2	Barren slopes of limestone, shale, or clay at elevations between 5,120 and 5,700ft.	×		
Golden columbine	*Aquilegia chrysantha* var. *chaplinei*	FWS-SC; NM-SC; NM-S2	Known from southern New Mexico and western Texas. Inhabits limestone seeps and springs in montane scrub or riparian canyon bottoms at elevations between 4,700 and 5,500 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Golden columbine	*Aquilegia chrysantha* var. *rydbergii*	CO-S1	Occurs along montane streams or in rocky ravines at elevations between 5,500 and 6,000 ft.	×		
Goodding onion	*Allium gooddingii*	AZ-HS; FWS-SC; NM-E; NM-S1	Range is Arizona and New Mexico, where it grows on moist shaded canyon bottoms in climax mixed-conifer forests and spruce-fir zones at elevations of 7,000 to 11,300 ft.	×	×	
Good-neighbor bladderpod	*Lesquerella vicina*	BLM-S; CO-S2	Endemic to Montrose and Ouray Counties in Colorado. Grows in the ecotone between pinyon-juniper woodland and salt desertscrub at elevations between 6,000 and 7,200 ft. Often found in disturbed soils.	×		
Graham beardtongue	*Penstemon grahamii*	BLM-S; CO-S1	Occurs in a narrow range within Utah and Colorado on gravelly clay soils on semibarren knolls of white calcareous shale in pinyon-juniper woodland and desert shrubland.	×		
Grama grass cactus	*Sclerocactus papyracanthus*	BLM-S	Known from southern Arizona, New Mexico, and western Texas. Occurs in pinyon-juniper woodlands and desert grasslands on sandy soils at elevations between 4,900 and 7,200 ft.	×	×	×
Grand buckwheat	*Eriogonum contortum*	BLM-S; CO-S2	Occurs in Colorado and Utah in shadscale and saltbrush communities between 4,200 and 5,000 ft in elevation.	×		
Grand Canyon century plant	*Agave phillipsiana*	AZ-HS; AZ-S1	Found only in Arizona near pre-Columbian habitation sites.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Grand Canyon rose	*Rosa stellata* ssp. *abyssa*	BLM-S; AZ-SR; FWS-SC; AZ-S2	Occurs on or near canyon rims or cliff tops at 4,500 to 7,540 ft in elevation in Coconino and Mohave Counties, Arizona.	×	×	
Grand Junction milkvetch	*Astragalus linifolius*	BLM-S	Endemic to the east base of the Uncompahgre Plateau and the Dolores River. Inhabits canyon sides between 4,800 and 6,200 ft in elevation.	×		
Grassy slope sedge	*Carex oreocharis*	CO-S1	Regionally endemic to the southern Rocky Mountains. Occurs on granitic soils on dry slopes at elevations between 7,200 and 10,800 ft.	×	×	×
Gray's Peak whitlow-grass	*Draba grayana*	CO-S2	Regionally endemic within the state of Colorado. Inhabits gravelly alpine slopes and fellfields at elevations between 11,500 and 14,000 ft.	×	×	×
Great Plains ladies'-tresses	*Spiranthes magnicamporum*	NM-E	Habitat is variable, but associated with calcareous soils along riverbanks and floodplains.	×	×	
Green spleenwort	*Asplenium trichomanes-ramosum*	CO-S1	Occurs on limestone and other basic rocks at elevations between 9,850 and 13,100 ft.	×		
Greene's milkweed	*Asclepias uncialis* ssp. *uncialis*	BLM-S; CO-S2	Occurs in small colonies scattered along the eastern edge of the southern Rocky Mountains in eastern Colorado. Plants are often found at the base of escarpments at elevations between 4,000 and 7,600 ft.	×	×	
Gunnison's milkvetch	*Astragalus anisus*	BLM-S; CO-S2	Endemic to west-central Colorado in the Gunnison River Basin. Associated with sagebrush shrubland systems on flat to rolling hills with well-drained clay soils at elevations between 7,000 and 10,000 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Gypsum Valley cateye	*Cryptantha gypsophila*	BLM-S; CO-S1	Endemic to Colorado in Montrose and San Miguel Counties. Occurs in gypsum outcrops.	×		
Gypsum wild-buckwheat	*Eriogonum gypsophilum*	ESA-T; NM-E; NM-S1	Endemic to Eddy County, New Mexico, in three known locations. Habitat is restricted to almost pure gypsum at elevations between 3,280 and 3,600 ft.	×	×	
Hairy stickleaf	*Mentzelia hirsutissima*	CA-S2	Patchy distribution in southern California. Occurs on washes, fans, or slopes having rocky or sandy substrates within Sonoran desertscrub and creosotebush scrub communities at elevations below 2,300 ft.	×	×	×
Hairy townsend-daisy	*Townsendia strigosa*	BLM-S; CO-S1	In Colorado, currently known to occur only on alluvial gravel substrates of the Lookout Mountain ACEC. Inhabits open sites, sands, shales, and clays with desertscrub, junipers, and pinyons at elevations between 4,900 and 6,500 ft.	×	×	
Halfmoon milkvetch	*Astragalus allochrous* var. *playanus*	CO-S1; CA-S1	Occurs on gravelly washes and sandbars of summer-dry streams at elevations between 2,600 and 4,000 ft. In California, known from the eastern Mojave Desert within desertscrub communities.	×	×	×
Halfring milkvetch	*Astragalus mohavensis* var. *hemigyrus*	BLM-S; FWS-SC; NV-S2	Endemic to Nevada. Occurs on carbonate gravels and derivative soils on terraced hills and ledges, open slopes, and along washes within the creosotebush-bursage, blackbrush, and mixed-shrub habitat communities. Elevation ranges between 3,000 and 5,600 ft.	×	×	×
Hall fescue	*Festuca hallii*	CO-S1	Inhabits alpine tundra and dry subalpine grasslands at elevations between 11,000 and 12,000 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Harrington beardtongue	*Penstemon harringtonii*	BLM-S	Endemic to Colorado in Grand, Eagle, Routt, Garfield, Pitkin, and Summit Counties. Grows on rocky loam in sagebrush flats with pinyon-juniper.	×		
Hartweg's golden sunburst	*Pseudobahia bahiifolia*	ESA-E; BLM-S; CA-E; CA-S2	Endemic to California where it occurs in clay, often acidic, within cismontane woodland and valley and foothill grassland.	×		
Harwood's eriastrum	*Eriastrum harwoodii*	BLM-S; CA-S2	Known from fewer than 20 occurrences in southern California. Occurs on desert dunes and other sandy habitats at elevations between 650 and 3,000 ft.	×	×	×
Harwood's milkvetch	*Astragalus insularis* var. *harwoodii*	CA-S2	Occurs in the Sonoran Desert of Arizona and California on sandy or gravelly substrates of desert dunes within desertscrub communities. Elevation ranges between 0 and 2,325 ft.	×	×	×
Helleborine	*Epipactis gigantea*	CO-S2	Wet gravelly and sandy stream shores and bars, seeps on sandstone cliffs, and, to a lesser extent, chaparral, marshes, hot springs, or riparian willow, box elder, and river birch woodlands. Elevation ranges between 4,800 and 8,000 ft.	×	×	×
Hess' fleabane	*Erigeron hessii*	NM-E; NM-S1	Endemic to the Mogollon Mountains in southwestern New Mexico. Inhabits andesitic dikes in otherwise rhyolitic rock; growing from bedrock cracks in open areas in upper montane to subalpine conifer forest at elevations between 9,500 and 10,200 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Hitchcock bladderpod	*Physaria hitchcockii* var. *hitchcockii*	NV-S2	Restricted to the Sheep Range and Spring Mountains of southern Nevada and Table Cliff Plateau of Utah. Occurs on gravelly or rocky limestone substrates at elevations between 7,500 and 11,500 ft.	×		
Hohokam agave	*Agave murpheyi*	BLM-S; AZ-HS; FWS-SC; AZ-S2	Endemic to Arizona and Sonora, Mexico, on benches or alluvial terraces on gentle bajada slopes above major drainages in desertscrub communities. Elevation ranges between 1,300 and 3,200 ft.	×	×	×
Holmgren lupine	*Lupinus holmgrenianus*	BLM-S; NV-S2	Known only from the Death Valley region of California and southern Nevada. It inhabits dry desert slopes, washes, and valleys on volcanic substrates, sometimes in association with pinyon-juniper woodlands. Elevation ranges between 4,600 and 8,200 ft.	×	×	×
Holmgren milkvetch	*Astragalus holmgreniorum*	ESA-E; UT-S1	Endemic to Washington County, Utah, and Mohave County, Arizona. Inhabits warm desert shrub communities along Virgin River limestone cobble at elevations between 2,700 and 2,800 ft.	×	×	
Holy Ghost ipomopsis	*Ipomopsis sancti-spiritus*	ESA-E; NM-E; NM-S1	Endemic to one canyon in the upper Pecos River drainage of the southern Sangre de Cristo Mountains in San Miguel County, New Mexico. Inhabits dry, steep, west- to southwest-facing slopes in open ponderosa pine or mixed conifer forests at elevations of 7,730 to 8,220 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Horseshoe milkvetch	*Astragalus equisolensis*	BLM-S; CO-S1	One known population along the Green River in Uintah County in Utah and also reported in Mesa County, Colorado. Grows in cracks and crevices on river terraces in sandy-gravelly or sandy-silty soils at elevations between 4,600 and 5,200 ft.	×		
House Range primrose	*Primula cusickiana* var. *domensis*	BLM-S	Endemic to the Great Basin in Millard County, Utah. Occurs in limestone crevices in the House Range at elevations between 8,500 and 9,000 ft.	×		
House Rock fishhook cactus	*Sclerocactus sileri*	BLM-S; AZ-SR; AZ-S1	Inhabits pinyon-juniper mesa tops in sandstone to sandy soils at elevations between 4,200 and 7,040 ft.	×	×	
Huachuca golden aster	*Heterotheca rutteri*	BLM-S; FWS-SC; AZ-S2	Only 11 locations in the United States, including Cochise, Pima and Santa Cruz Counties in Arizona. Grows in disturbed areas and level, open grassland at elevations of 4,500 to 6,500 ft.	×	×	
Huachuca groundsel	*Senecio multidentatus* var. *huachucanus*	AZ-HS; AZ-S2	Occurs on steep, rocky, high elevation (7,000 to 9,500 ft) mountain slopes and in canyon bottoms within pine-oak or mixed conifer forests.	×	×	
Huachuca milkvetch	*Astragalus hypoxylus*	BLM-S; AZ-SR; FWS-SC; AZ-S1	Range is Huachuca and Patagonia Mountains in Arizona at elevations of 5,300 to 6,100 ft. Inhabits open, limestone rocky clearings in oak-juniper-pinyon woodland.	×	×	
Huachuca water-umbel	*Lilaeopsis schaffneriana* var. *recurva*	ESA-E; AZ-HS; AZ-S2	Range is New Mexico, Arizona, and Sonora, Mexico. Occurs in cienegas or marshy wetlands between 2,000 and 6,000 ft in elevation, in Sonoran desertscrub, grassland, or oak woodland, and conifer forest.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Jackass-clover	*Wislizenia refracta* ssp. *refracta*	CA-S1	Known from the Mojave and northern Sonoran Deserts. Inhabits dunes, sandy washes, roadsides, and playas within creosotebush scrub, alkali sink, or desertscrub communities. Elevation ranges between 2,000 and 2,600 ft.	×	×	×
Jaeger beardtongue	*Penstemon thompsoniae* ssp. *jaegeri*	NV-S2	Endemic to southern Nevada, where it is known from 24 occurrences. Occurs on limestone soils of knolls and slopes, in drainages, and under conifers within pinyon-juniper through the subalpine conifer zones. Elevation ranges between 5,600 and 11,000 ft.	×	×	×
James' cat's-eye	*Oreocarya cinerea* var. *pustulosa*	CO-S1	Occurs in gypsum and sandy substrates within sagebrush, pinyon-juniper, oak mountain brush, and ponderosa pine communities at elevations between 5,400 and 8,500 ft.	×	×	×
Johnston's buckwheat	*Eriogonum microthecum* var. *johnstonii*	BLM-S; CA-S1; FWS-SC	Known from fewer than 10 occurrences in San Bernardino County, California. Inhabits subalpine coniferous forests on rocky substrates at elevations between 6,050 and 9,850 ft.	×	×	
Jones' blue star	*Amsonia jonesii*	BLM-S; CO-S1	Inhabits dry, open areas with clay, sand, or gravelly soils in desert-steppe, rocky gorges, and canyons, at elevations of 4,500 to 5,000 ft.	×		
Jones' cycladenia	*Cycladenia humilis* var. *jonesii*	ESA-T; AZ-HS; AZ-S1	Known in southeastern Utah and northern Arizona, in gypsiferous, sandy silty soil on clay hills that form the steep side slopes and bases of mesas in canyons at elevations of 4,390 to 6,000 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Jones' globemallow	*Sphaeralcea caespitosa*	BLM-S; FWS-SC; NV-S2; UT-S2	Known from at least four occurrences in western Utah and six occurrences in eastern Nevada on federal and state lands. Occurs on Sevy dolomite calcareous soils in association with mixed shrub, pinyon-juniper, and grassland communities at elevations between 5,000 and 6,500 ft.	×	×	×
Kachina daisy	*Erigeron kachinensis*	BLM-S; CO-S1	Endemic to the Colorado Plateau and found in Utah and Colorado in low-elevation seeps and high-elevation sandstone outcrops in aspen and ponderosa pine communities. Elevation between 5,200 and 8,200 ft.	×		
Kaibab pincushion cactus	*Pediocactus paradinei*	BLM-S; AZ-HS; FWS-SC; AZ-S2	Known only on the Kaibab Plateau and House Rock Valley in Coconino County, Arizona. Occurs on level, gravelly soils of alluvial fans, valley bottoms, and ridgetops, at elevations between 5,000 and 7,200 ft.	×	×	
Kearney's blue-star	*Amsonia kearneyana*	ESA-E; AZ-HS; AZ-S1	Inhabits dry, open slopes at 4,000- to 6,000-ft elevation and dry washes at 3,600 to 3,800 ft within the South and Sycamore Canyons of the Baboquivari Mountains in Pima County, Arizona.	×	×	
Kearney's sumac	*Rhus kearneyi*	BLM-S; AZ-SR; AZ-S2	Range is Arizona and Baja California, Mexico, on arid slopes and along canyons and drainages at 1,000 to 2,000 ft in elevation.	×	×	
Keck's checkerbloom	*Sidalcea keckii*	ESA-E; BLM-S; CA-S1	Endemic to California where it occurs in cismontane woodland, and valley and foothill grassland. Elevation between 245 and 2,130 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Kern mallow	*Eremalche kernensis*	ESA-E; BLM-S; CA-S1	Endemic to California in Kern and Tulare Counties. Inhabits chenopod scrub and valley and foothill grassland at elevations between 230 and 3,280 ft.	×		
Keystone Canyon thistle	*Cirsium arizonicum* var. *tenuisectum*	NV-S1	Restricted to California and Nevada. Occurs on rocky slopes, drainages, roadsides, and disturbed areas within Joshua tree woodland, Mojave desertscrub, pine-oak-juniper woodland, montane coniferous forests, and pinyon-juniper woodland communities. Elevation ranges between 4,900 and 9,200 ft.	×		
King's campion	*Gastrolychnis kingii*	CO-S1	Regionally endemic to Colorado. Occurs in spruce-fir, sedge, and alpine tundra communities at elevations between 10,800 and 11,300 ft.	×	×	×
Knowlton's cactus	*Pediocactus knowltonii*	ESA-E; NM-E; NM-S1	Endemic to San Juan County, New Mexico, near the Los Pinos River. Inhabits rolling, gravelly hills in a pinyon-juniper-sagebrush community at an elevation of 6,200 to 6,300 ft.	×	×	
Kofa barberry	*Berberis harrisoniana*	BLM-S; AZ-S1; CA-S1	Known from disjunct locations in southwestern Arizona and southern California. Known from only one occurrence in California in the Whipple Mountains. Occurs in deeply shaded places, such as alcoves in narrow steep-walled canyons on andesite and rhyolite soils. Elevation ranges between 2,450 and 3,925 ft.	×	×	
Kremmling milkvetch	*Astragalus osterhoutii*	ESA-E; CO-S1	Endemic to Grand County, Colorado, near a single creek. Grows through sagebrush on moderate slopes at 7,300 to 7,900 ft in elevation.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Kuenzler's hedgehog cactus	*Echinocereus fendleri* var. *kuenzleri*	ESA-E; NM-E; NM-S1	Endemic to southern New Mexico from the Capitan, Guadalupe, and Sacramento Mountains. Occurs primarily on gentle, gravelly to rocky slopes and benches on limestone. Also occurs in Great Plains grasslands, oak woodlands, and pinyon-juniper woodlands. Elevation ranges between 5,200 and 6,600 ft.	×	×	×
Lace-leaf rockdaisy	*Perityle ambrosiifolia*	BLM-S; AZ-S1	Occurs in fissures and crevices on cliffs near seeps and waterfalls above Eagle Creek and the San Francisco River in Greenlee County, Arizona. Elevation is 1,800 to 4,900 ft.	×	×	
Lahontan beardtongue	*Penstemon palmeri* var. *macranthus*	BLM-S; NV-S2	Endemic to Nevada along washes, roadsides, and canyon floors where moisture is available in summer. At elevations between 3,420 to 4,550 ft.	×	×	
Lane Mountain milkvetch	*Astragalus jaegerianus*	ESA-E; BLM-S; CA-S1	Endemic to the Mojave Desert in San Bernardino County, California, where it is known from fewer than 10 locations. Occurs on Coolgardie Mesa desertscrub habitats on granitic-sandy soils. Elevation ranges between 3,000 and 3,800 ft	×		
Las Vegas bearpoppy	*Arctomecon californica*	NV-P; FWS-SC	Restricted to Arizona and Nevada. Occurs in open, dry, spongy or powdery, often dissected ("badland") or hummocked soils with high gypsum content, typically with well-developed soil crust, in areas of generally low relief on all aspects and slopes, with a sparse cover of other gypsum-tolerant species. Elevation ranges between 1,050 and 3,650 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Las Vegas buckwheat	*Eriogonum corymbosum* var. *nilesii*	ESA-C; BLM-S; NV-S1	Restricted to southern Nevada, where the species is known from 15 occurrences, encompassing an area of less than 1,500 acres. Occurs on or near gypsum soils, in washes, drainages, or in areas of generally low relief. Elevation ranges between 1,900 and 3,850 ft.	×	×	×
Latimer's woodland-gilia	*Saltugilia latimeri*	BLM-S; CA-S2	Mojave desertscrub communities, pinyon-juniper woodlands, and washes on rocky or sandy substrates at elevations between 1,300 and 6,500 ft.	×	×	×
Lavin eggvetch	*Astragalus oophorus* var. *lavinii*	BLM-S; NV-S2	Range includes Douglas, Lyon, and possibly Mineral Counties in Nevada; also in California. Grows in open, dry, gravelly clay slopes in pinyon-juniper or sagebrush at elevations between 5,700 and 7,500 ft.	×	×	
Layne's ragwort	*Packera layneae*	ESA-T; BLM-S; CA-S2	California endemic that occurs in rocky chaparral and cismontane woodland at elevations between 650 and 3,280 ft.	×		
Leadville milkvetch	*Astragalus molybdenus*	CO-S2	Occurs on rocky slopes and turf hillsides at elevations between 11,400 and 13,200 ft. Substrates are typically limestone.	×	×	
Least moonwort	*Botrychium simplex*	CO-S1	Inhabits open habitats, including pastures, meadows, orchards, prairies, wetlands, fens, sand dunes, and in lake and stream-edge vegetation.	×	×	×
Leathery grape fern	*Botrychium multifidum*	CO-S1	Inhabits wet meadows, forest edges, lakeshores, stony lake margins, and trail sides at elevations between 6,300 and 11,500 ft. Sites are usually flat and open and have acidic soils that are seasonally wet.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Lee pincushion cactus	*Escobaria sneedii* var. *leei*	ESA-T; NM-E; NM-S2	Endemic to Guadalupe Mountains in Eddy County, New Mexico. Inhabits cracks in limestone in areas of broken terrain and steep slopes of Chihuahuan desertscrub at elevations between 4,000 and 5,000 ft.	×	×	
Lemmon fleabane	*Erigeron lemmonii*	ESA-C; AZ-HS; AZ-S1	Endemic to southern Arizona and found in only one location in Scheelite Canyon, Huachuca Mountains, in Cochise County. Inhabits crevices and ledges of west-, south-, and north-facing cliffs and on large boulders at the canyon bottom. Elevation is 6,300 to 7,300 ft.	×	×	
Lemon lily	*Lilium parryi*	BLM-S; CA-S2; FWS-SC	Inhabits wet soils of mountainous terrain, generally in forested areas between 5,000 and 9,000 ft in elevation. Usually found growing along shaded edges of streams, seeps, and boggy meadows.	×		
Lesser bladderwort	*Utricularia minor*	CO-S2	Inhabits shallow wetlands, including poor to extremely rich fens, freshwater marshes, beaver ponds, and enriched seeps at higher elevations corresponding to the Rocky Mountain Subalpine-Montane Fen and North American Arid West Emergent Marsh ecological systems. Preferred sites are inundated mudflats or areas with emergent vegetation.	×		
Ligulate feverfew	*Bolophyta ligulata*	BLM-S; CO-S2	Occurs in Colorado, Nevada, and Utah in salt desert shrub, serviceberry, rabbitbrush, Indian rice-grass, greasebush, galleta, black sagebrush, pygmy sagebrush, and pinyon-juniper communities between 5,600 and 7,000 ft in elevation.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Lime-loving willow	*Salix lanata* ssp. *calcicola*	CO-S1	Occurs on calcareous lakeshores at elevations near 12,000 ft.	×	×	
Limestone beardtongue	*Penstemon calcareus*	BLM-S; CA-S2	Inhabits Mojave desertscrub communities, pinyon-juniper forests, and Joshua tree woodlands on rocky carbonate substrates. Elevation ranges between 3,280 and 6,550 ft.	×	×	
Little bulrush	*Trichophorum pumilum*	BLM-S; CO-S2	Occurs in scattered sites in North America on calcareous ledges, gravels, shores, seepage areas, mines, and bogs.	×		
Little purple monkeyflower	*Mimulus purpureus*	BLM-S; CA-S2; FWS-SC	Inhabits wet meadows and seeps in upper montane coniferous forests on pebble plain substrates. Elevation ranges between 6,225 and 7,550 ft.	×	×	
Little San Bernardino Mountains linanthus	*Linanthus maculatus*	BLM-S; CA-S1	Known from fewer than 20 occurrences in southern California near Joshua Tree National Park. Inhabits desert dunes and sandy flats with creosotebush scrub and Joshua tree woodland communities at elevations less than 6,900 ft.	×	×	×
Littlefield milkvetch	*Astragalus preussii* var. *laxiflorus*	NV-S1	Endemic to the Lake Mead region of Arizona and Nevada and disjunctly in California. Occurs on alkaline clay flats and gravelly washes within shadscale and chenopod scrub communities at elevations between 2,300 and 2,450 ft.	×	×	×
Livemore fiddleleaf	*Nama dichotomum*	CO-S1	Specific habitat requirements for this species are largely unknown. Generally known to occur in plains and prairies. Occurs within the analysis area at elevations between 7,000 and 10,200 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Lobed ground-cherry	*Physalis lobata*	CA-S1	Known from the northeastern Sonoran and southeastern Mojave Deserts. Inhabits decomposed granitic substrates within creosotebush scrub, alkali sink, desertscrub, and playas communities. Elevation ranges between 1,650 and 2,600 ft.	×	×	×
Lone Mesa snakeweed	*Gutierrezia elegans*	BLM-S; CO-S1	Endemic to Colorado on shale barrens in and around Lone Mesa State Park in Dolores County.	×		
Lone Mountain goldenhead	*Tonestus graniticus*	BLM-S; NV-S1	Endemic to Esmeralda County, Nevada. Occurs in crevices of granitic cliffs and outcrops on protected exposures (north to east aspects in deep canyons) in pinyon-juniper communities at elevations near 7,800 ft.	×		
Long-calyx milkvetch	*Astragalus oophorus* var. *lonchocalyx*	BLM-S; FWS-SC; NV-S2; UT-S1	Regionally endemic to the Great Basin in western Utah and eastern Nevada. Occurs in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft.	×	×	×
Longleaf sandpaper plant	*Petalonyx linearis*	AZ-S2	Known in southeastern California from the Mojave and Sonoran Deserts. Occurs on sandy or rocky canyons within creosotebush scrub communities at elevations below 3,300 ft.	×	×	
Long-stem evening-primrose	*Oenothera longissima*	CA-S1	Restricted to Inyo and San Bernardino Counties in California. Inhabits seasonally mesic desertscrub, creosotebush scrub, and pinyon-juniper woodland habitat. Elevation ranges between 3,300 and 5,500 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Low feverfew	*Parthenium ligulatum*	BLM-S; NV-S1	Known in Colorado, Utah, and Eureka County, Nevada. Inhabits barren or semibarren outcrops in salt desert shrub, serviceberry, rabbitbrush, Indian rice-grass, greasebush, galleta, black sagebrush, pygmy sagebrush, and pinyon-juniper communities between 5,590 and 7,000 ft.	×		
Madrean ladies'-tresses	*Spiranthes delitescens*	ESA-E; AZ-HS; AZ-S1	Known only from four cienegas in southern Arizona. Grows in very dense vegetation of grasses and sedges within marshy wetlands or cienegas.	×	×	
Male fern	*Dryopteris filix-mas*	CA-S1	Known from the San Bernardino, White, and Inyo Mountains of California. Occurs on rocky cliffs and talus of granitic or igneous derivation within pinyon-juniper woodland and upper montane coniferous forest habitat. Elevation ranges between 7,900 and 10,000 ft.	×	×	
Mancos milkvetch	*Astragalus humillimus*	ESA-E; NM-E; NM-S1; CO-S1	Known in San Juan County, New Mexico, and Montezuma County, Colorado. Inhabits sandstone ledges or mesa tops, often in cracks or shallow pockets of sandy soils at elevations between 5,000 and 6,000 ft.	×	×	
Many-flowered gilia	*Ipomopsis multiflora*	CO-S1	Occurs on open sites, desert shrublands, and woodlands.	×	×	×
Many-stemmed spider-flower	*Cleome multicaulis*	BLM-S; CO-S2; FWS-SC	Populations exist in the San Luis Valley on saturated soils created by waterfowl management regimes on public lands.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Marble Canyon milkvetch	*Astragalus cremnophylax* var. *hevronii*	BLM-S; AZ-S1	Known on the rim of Marble Canyon in Coconino County, Arizona. Grows at 5,200 to 5,400 ft in elevation in Great Basin desertscrub habitat, on rim-rock benches at the canyon edge in crevices with shallow soil on Kaibab Limestone.	×	×	
Marble Canyon rockcress	*Sibara grisea*	BLM-S; FWS-SC; NM-SC	Known from southern New Mexico and western Texas. Occurs in rock crevices and at the bases of limestone cliffs in chaparral and pinyon-juniper woodland communities at elevations between 4,500 and 6,000 ft.	×	×	×
Marsh cinquefoil	*Comarum palustre*	CO-S1	Occurs on lakeshores, bogs, swamps, and stream banks in mucky, peaty soil.	×	×	×
Marsh-meadow indian-paintbrush	*Castilleja lineata*	CO-S1	Montane woodlands and meadows at elevations between 8,500 and 12,000 ft.	×	×	×
Mcdonald's rockcress	*Arabis macdonaldiana*	ESA-E; CA-E; CA-S2	Inhabits upper and lower montane coniferous forest at lower than 6,000 ft in elevation.	×		
McKelvey's agave	*Agave mckelveyana*	AZ-SR	Endemic to Arizona in dry scrubland between 3,000 and 6,000 ft.	×	×	
Meadow Valley sandwort	*Eremogone stenomeres*	NV-S2	Endemic to Nevada, where it is restricted to Clark and Lincoln Counties. Occurs on limestone cliffs at elevations between 2,950 and 3,950 ft.	×	×	×
Mecca-aster	*Xylorhiza cognata*	BLM-S; CA-S2	Restricted to the Indio Hills and Mecca Hills in Riverside County, California. Inhabits desertscrub on steep canyon slopes, at the bases of canyons, and in canyon washes at elevations below 1,300 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Mesa Verde cactus	*Sclerocactus mesae-verdae*	ESA-T; NM-E; NM-S2; CO-S2	Known only from the Four Corners area of Colorado and New Mexico. Inhabits dry, low, exposed hills and mesas in the desert between 3,900 and 6,600 ft.	×	×	
Mescalero milkwort	*Polygala rimulicola* var. *mescalerorum*	BLM-S; NM-E; FWS-SC; NM-S1	Known only from the San Andres Mountains in Doña Ana County, New Mexico. Occurs in rock crevices in sandy limestone cliffs at elevations between 5,700 and 6,300 ft.	×		
Mingan's moonwort	*Botrychium minganense*	CO-S1	Inhabits dense forest to open meadow and from summer-dry meadows to permanently saturated fens and seeps, but most common in moist meadows and woodlands in association with riparian corridors. Recorded sites are often associated with old (>10 year) disturbances.	×	×	×
Mohave indigo bush	*Psorothamnus arborescens* var. *pubescens*	BLM-S; AZ-S2	Range is the Colorado River drainage of southern Utah and northern Arizona. Inhabits rocky clay knolls and talus under sandstone cliffs at 3,200 to 4,900 ft in elevation.	×	×	
Mohave thistle	*Cirsium mohavense*	AZ-S1	Restricted to wetland habitats in the Mojave Desert region; common at perennial springs. Found in moist canyons, stream banks, and poorly drained alkaline flats, seeps, and springs.	×	×	×
Mojave monkeyflower	*Mimulus mohavensis*	BLM-S; CA-S2; FWS-SC	Endemic to the western Mojave Desert in San Bernardino County, California. Inhabits gravelly banks of desert washes at elevations below 3,900 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]		
				No Action	Program	SEZ
Plants (Cont.)						
Mokiak milkvetch	*Astragalus mokiacensis*	BLM-S; NM-S1	Known only from the valleys and canyons of the Colorado and Virgin Rivers in northern Mohave County, Arizona, and eastern Clark County, Nevada. Occurs on sandy soils of bluffs, cliff terraces, gullied badlands, and disturbed areas along streams. Elevation ranges between 2,000 and 4,200 ft.	×		
Money wild buckwheat	*Eriogonum nummulare*	BLM-S; UT-S1	Occurs in western Utah and eastern Nevada on gravelly washes, flats, and slopes in saltbrush and sagebrush communities. Also known to occur in pinyon-juniper woodlands.	×	×	×
Mono County phacelia	*Phacelia monoensis*	BLM-S (CA, NV)	Range includes Esmeralda, Lyon, and Mineral Counties, Nevada, and California. Grows in alkaline, barren, or sparsely vegetated clay soils with low-intensity artificial or natural disturbances, such as road berms. Occurs in pinyon-juniper and mountain sagebrush zones at elevations between 5,920 and 9,055 ft.	×		
Mosquito plant	*Agastache cana*	FWS-SC; NM-SC	Known from southern New Mexico and western Texas. Occurs in rock crevices of granite cliffs or in canyon habitats at the lower edge of the pinyon-juniper zone. Elevations range between 4,600 and 5,900 ft.	×	×	×
Mottled milkvetch	*Astragalus lentiginosus* var. *stramineus*	NV-S1	Restricted to the lower Virgin River Valley in Mohave County, Arizona, and Clark County, Nevada. Inhabits sandy and gravelly flats and dunes at elevations between 2,000 and 3,000 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Mount Charleston sandwort	*Eremogone congesta* var. *charlestonensis*	NV-S2	Restricted to southeastern California and southern Nevada. Occurs on sandy ridges at elevations between 7,200 and 10,000 ft.	×	×	
Mountain ball cactus	*Pediocactus simpsonii* var. *minor*	NM-E	Inhabits rocky soils of high valleys and mountainsides in grasslands and at edges of forests near timberline.	×	×	
Mountain bladder fern	*Cystopteris montana*	CO-S1	Inhabits moist, rich soil in closed-canopied spruce-fir forests at elevations between 9,000 and 11,000 ft.	×	×	×
Mountain whitlow-grass	*Draba rectifructa*	CO-S2	Occurs in openings in sagebrush ponderosa pine, aspen, spruce-fir, lodgepole pine, and moderately moist alpine meadow communities at elevations between 6,400 and 9,600 ft.	×	×	×
Mt. Dellenbaugh sandwort	*Arenaria aberrans*	AZ-S2	Endemic to Arizona. Occurs in pinyon-juniper, oak, and pine forests at elevations between 5,500 and 9,000 ft.	×	×	
Mt. Trumbull beardtongue	*Penstemon distans*	BLM-S; AZ-SR; FWS-SC; AZ-S2	Restricted to Shivwits Plateau in Mohave County, Arizona. Occurs in gravelly Kaibab limestone on mesa tops in pinyon-juniper woodlands, and on canyon slopes of Mohave desertscrub in Whitmore, Parashant, and Andrus Canyons. Elevation is 3,900 to 5,200 ft.	×	×	
Mud nama	*Nama stenocarpum*	CA-S1	Known from margins of freshwater wetlands in southern California, including lakes, streams, rivers, marshes, and swamps. Elevation ranges between 0 and 1,640 ft.	×	×	×
Mud sedge	*Carex limosa*	CO-S2	Inhabits sphagnum bogs, wet meadows, and shores at elevations below 6,500 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Munz's cholla	*Opuntia munzii*	BLM-S; CA-S1; FWS-SC	Inhabits gravelly or sandy to rocky soils, often on lower bajadas, washes, and flats. Also occurs in hills and canyon sides. Occurs in Sonoran Desert creosotebush shrub communities at elevations below 3,280 ft.	×	×	×
Nachlinger catchfly	*Silene nachlingerae*	BLM-S; NV-S2	Endemic to Nevada in Elko, Nye, and White Pine Counties. Occurs in the subalpine conifer zone at elevations between 7,160 and 11,250 ft on dry, exposed crevices on steep slopes or cliffs.	×		
Narrow-leaf evening primrose	*Oenothera acutissima*	BLM-S; CO-S2	Endemic to the mountains of northeastern Utah and Colorado. Restricted to sandy and gravelly soils of arroyos, drainage channels, and depressions in meadows or rock crevices. Elevations ranges between 3,900 and 8,530 ft.	×		
Narrow-leaved cottonwood	*Populus angustifolia*	CA-S2	Occurs in upland riparian forest habitats at elevations between 3,900 and 5,900 ft.	×	×	×
Narrow-leaved psorothamnus	*Psorothamnus fremontii* var. *attenuates*	CA-S2	Occurs on volcanic substrates of slopes, flats, and canyons within Sonoran desertscrub communities at elevations between 1,100 and 3,000 ft.	×	×	×
Narrow-leaved yerba santa	*Eriodictyon angustifolium*	CA-S2	Restricted to the New York and Granite Mountains in California. Occurs in washes and slopes within pinyon-juniper woodland habitats at elevations between 4,900 and 6,200 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Narrow-stem gilia	*Gilia stenothyrsa*	BLM-S; CO-S1	Known in Mesa and Rio Blanco Counties in Colorado and also in Utah. Inhabits open areas of hills of pinyon-juniper, salt desert shrub, sagebrush, and mountain-mahogany communities from 5,000 to 9,300 ft in elevation.	×		
Naturita milkvetch	*Astragalus naturitensis*	BLM-S; CO-S2	Known in Colorado, New Mexico, and Utah. Inhabits cracks and ledges of sandstone cliffs within pinyon-juniper woodland at elevations between 1,650 and 2,050 ft.	×	×	
Navajo mountain phlox	*Phlox cluteana*	AZ-S2	Known from the mountains along the Arizona–Utah border and adjacent northwestern New Mexico. Occurs in open ponderosa pine forests on flat to gentle mountain slopes with light to heavy shade. Elevations range between 6,000 and 10,400 ft.	×		
Needle Mountains milkvetch	*Astragalus eurylobus*	BLM-S; FWS-SC; NV-S2	Occurs on gravel washes and sandy soils in alkaline desert and arid grasslands at elevations between 4,250 and 6,250 ft.	×	×	×
Nevada dune beardtongue	*Penstemon arenarius*	BLM-S; FWS-SC; NV-S2	Endemic to western Nevada. Dependent on sand dunes or deep sand occurring on deep, loose, sandy soils of valley bottoms, aeolian deposits, and dune skirts, often in alkaline areas, sometimes on road banks and other recovering disturbances crossing such soils, in shadscale communities.	×	×	×
Nevada oryctes	*Oryctes nevadensis*	BLM-S; NV-S2	Range is Nevada and California in sand dunes or deep sand of washes and valley flats. Elevation is between 3,900 and 5,960 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Nevada willowherb	*Epilobium nevadense*	BLM-S; FWS-SC; NV-S2; UT-S1	Known from eastern Nevada and western Utah. Occurs in pinyon-juniper woodlands and oak/mountain mahogany communities, on talus slopes and rocky limestone outcrops. Elevation ranges between 5,000 and 8,800 ft.	×	×	×
Nevin's barberry	*Berberis nevinii*	ESA-E; BLM-S; CA-E; CA-S2	Endemic to California in sandy or gravelly chaparral, cismontane woodland, coastal scrub, and riparian scrub. Occurs between 900 and 2,700 ft in elevation.	×		
New Mexico beardtongue	*Penstemon neomexicanus*	FWS-SC; NM-SC	Endemic to south-central New Mexico from the Capitan and Sacramento Mountains. Occurs on wooded slopes or open glades in ponderosa pine or other coniferous forests. Elevation ranges between 6,000 and 9,000 ft.	×	×	
New Mexico cliff fern	*Woodsia neomexicana*	CO-S2	Inhabits cliffs and rocky slopes usually on sandstone or igneous substrates. Elevations range between 7,875 and 11,500 ft.	×	×	×
New Mexico milkvetch	*Astragalus neomexicanus*	FWS-SC; NM-SC	Endemic to south-central New Mexico primarily from the Sacramento Mountains. Occurs on dry hillsides, pinyon-juniper woodlands, or ponderosa pine forests at elevations between 6,850 and 8,450 ft.	×	×	
New Mexico rock daisy	*Perityle staurophylla* var. *staurophylla*	BLM-S; FWS-SC; NM-SC	Endemic to south-central New Mexico. Occurs in crevices of limestone cliffs and boulders at elevations between 4,900 and 7,000 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
New York Mountains cats'-eye	*Cryptantha tumulosa*	NV-S2	Known from California and Nevada. Occurs on gravelly or clay, granitic or carbonate substrates within Mojave desertscrub, creosotebush scrub, and pinyon-juniper woodland communities. Elevation ranges between 4,500 and 9,900 ft.	×	×	×
Nichol turk's head cactus	*Echinocactus horizonthalonius* var. *nicholii*	ESA-E; AZ-HS; AZ-S2	Only three populations are known in Pima and Pinal Counties in Arizona, and one in Sonora, Mexico. In habitats with open vegetation, few trees, and scattered shrubs at elevations between 2,000 and 3,600 ft.	×	×	
Nodding rockdaisy	*Perityle cernua*	BLM-S; FWS-SC; NM-SC; NM-S2	Endemic to the Organ Mountains in Doña Ana County, New Mexico. Occurs on volcanic or igneous cliffs at elevations between 5,000 and 8,800 ft.	×	×	
North Park bugseed	*Corispermum navicula*	BLM-S; CO-S1	Endemic to the North Sand Dunes in Jackson County, Colorado.	×		
North Park phacelia	*Phacelia formosula*	ESA-E; CO-S1	Known in Jackson and Larimer Counties, Colorado. Grow on steep, sparsely vegetated, erodible slopes of ravines.	×		
Northern moonwort	*Botrychium pinnatum*	CO-S1	Inhabits grassy slopes, stream banks, and woodlands at elevations below 8,200 ft.	×	×	×
Northern twayblade	*Listera borealis*	CO-S2	In moist, rich humus of mossy spruce-dominant or mixed hardwood forests and swamps. Prefers banks of cold streams fed by melting snow with high acidic soils at elevations between 8,700 and 10,800 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
One-leaflet torrey milkvetch	*Astragalus calycosus* var. *monophyllidius*	NV-S2	Known from Nevada and Utah. Utilizes areas having dry, ashy-sand, tuffaceous sediments in drainage bottoms and lower to upper slope and crest positions. Typically occurs on southern and western exposures within open juniper, big sagebrush communities. Elevation ranges between 5,350 and 7,500 ft.	×	×	
Orcutt's linanthus	*Linanthus orcuttii*	BLM-S; CA-S2; FWS-SC	Inhabits chaparral and lower montane coniferous forests in gravelly clearings and disturbed open areas. Elevation ranges between 3,280 and 6,550 ft.	×		
Orcutt's pincushion cactus	*Escobaria orcuttii*	NM-E; NM-S2	Inhabits cracks in limestone or in rocky soils of broken mountainous terrain in Chihuahuan desertscrub, desert grassland, and oak woodlands at elevations between 5,200 and 6,000 ft.	×	×	
Orcutt's woody-aster	*Xylorhiza orcuttii*	BLM-S; CA-S2	Inhabits Sonoran desertscrub, often in washes of desert canyons on rocky substrates. Also occurs on slopes and bottoms of ravines. Elevation ranges between 875 and 1,200 ft (265 and 365 m). Known only to occur in Imperial and San Diego Counties, California.	×		
Organ Mountains evening-primrose	*Oenothera organensis*	BLM-S; FWS-SC; NM-SC; NM-S2	Endemic to the Organ Mountains in Doña Ana County, New Mexico. Inhabits seeps, springs, and colluvium substrates in the bottom of drainages in montane scrub and pinyon-juniper woodland communities. Elevation ranges between 5,700 and 7,600 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Organ Mountains giant-hyssop	*Agastache pringlei* var. *verticillata*	FWS-SC; NM-SC; NM-S2	Endemic to the Organ Mountains in southern New Mexico. Occurs on humus-covered volcanic talus and boulders at the bases of steep cliffs in coniferous woodlands. Elevation ranges between 5,900 and 7,500 ft.	×		
Organ Mountains paintbrush	*Castilleja organorum*	BLM-S; FWS-SC; NM-SC	Endemic to the Organ Mountains in Doña Ana County, New Mexico. Inhabits open to partly shaded montane slopes and rocky canyons in pinyon-juniper woodlands or montane coniferous forests at elevations between 7,000 and 8,000 ft.	×		
Organ Mountains pincushion cactus	*Escobaria organensis*	BLM-S; NM-E; FWS-SC; NM-S2	Endemic to the Franklin and Organ Mountains in Doña Ana County, New Mexico. Inhabits granite and limestone substrates in desertscrub and pinyon-juniper woodlands at elevations between 4,400 and 8,530 ft.	×		
Organ pipe cactus	*Stenocereus thurberi*	AZ-SR	Endemic to Arizona and northern Mexico. Widespread in the Sonoran Desert, occurring on hills and bajadas below 3,700 ft. Found on south- to southeast-facing slopes on the Organ Pipe Cactus National Monument and elsewhere throughout the Sonoran Desert. Associated with upland Sonoran desertscrub plant communities.	×	×	
Orocopia sage	*Salvia greatae*	BLM-S; CA-S2	Inhabits creosotebush scrub communities and dry washes at elevations less than 2,600 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Osterhout cat's-eye	*Oreocarya osterhoutii*	BLM-S; CO-S2	Endemic to the Navajo Basin and occurs in Colorado, Utah, and possibly Arizona. Occurs in dry barren areas with decomposed sandstone or in dry sandy soil in desert, blackbrush, mixed desert shrub, oak brush, salt bush, and pinyon-juniper communities at elevations between 4,500 and 6,600 ft.	×		
Ostler's ivesia	*Ivesia shockleyi ostleri*	BLM-S; FWS-SC; UT-S1	Endemic to the Wah Wah Mountains and Needle Range of western Beaver County, Utah. Occurs in pinyon-juniper and adjacent ponderosa pine woodland communities in crevices of quartzite outcrops at elevations between 6,500 and 8,000 ft.	×		
Ostler's pepper-grass	*Lepidium ostleri*	ESA-UR; BLM-S; UT-S1	Endemic to the San Francisco Mountains in Beaver County, Utah. Occurs in pinyon-juniper communities in crevices in limestone outcrops at elevations between 5,800 and 6,800 ft.	×		
Pagosa bladderpod	*Lesquerella pruinosa*	CO-S2	Primarily found in exposed gray clay barrens and Mancos slate or shale meadows with slopes of approximately 15% and a high level of disturbance at elevations between 6,890 and 8,800 ft.	×		
Pagosa skyrocket	*Ipomopsis polyantha*	ESA-C; BLM-S; CO-S1	Known from Archuleta County in Colorado, where it grows on rocky clay soils, typically where soil has been disturbed along roads, in the southern San Juan Mountains. Elevation is between 6,800 and 7,200 ft.	×		
Pahrump Valley buckwheat	*Eriogonum bifurcatum*	BLM-S (CA, NV); NV-S2	Range includes Clark and Nye Counties in Nevada; also in California. Inhabits barren, saline, or heavy clay soils on dry playa margins, shore terraces, and stabilized sand dunes at elevations of 2,300 to 2,800 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Pahute green gentian	*Frasera pahutensis*	FWS-SC	Endemic to Nye County, Nevada, in montane habitats (elevations between 7,000 and 8,400 ft). Occurs on flat to very gentle slopes in relatively deep, stable, sandy or sandy-rocky soils on or near protected (wooded or north-sloping) exposures or on more open, south-sloping exposures at higher elevations, mostly derived from rhyolitic, granitoid, or andesitic parent materials within pinyon-juniper and lower montane scrub communities.	×		
Pahute Mesa beardtongue	*Penstemon pahutensis*	BLM-S; FWS-SC	Restricted to southeastern California and Nye County, Nevada, where it is locally abundant. Occurs in loose soil and rock crevices among boulders in pinyon-juniper woodlands and sagebrush shrubland at elevations between 5,400 and 7,500 ft.	×		
Pale blue-eye-grass	*Sisyrinchium pallidum*	BLM-S; CO-S2	Endemic to central Colorado in the Pike and San Isabel National Forests. Occurs in wet, poorly drained meadows, stream banks, and roadside ditches where water is available through the early growing season.	×		
Pale moonwort	*Botrychium pallidum*	CO-S2	Inhabits open exposed hillsides, burned or cleared areas, or old mining situations at elevations between 9,800 and 10,600 ft.	×	×	×
Palmer's mariposa-lily	*Calochortus palmeri* var. *palmeri*	BLM-S; CA-S2; FWS-SC	Occurs in moist to wet meadows or on moist grassy knolls. Also found along creeks or swales and within chaparral, pinyon woodlands, and pine forest communities. Elevation ranges between 3,280 and 7,850 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Panamint Mountains bedstraw	*Galium hilendiae* ssp. *carneum*	NV-S1	Restricted to southeastern California and western Nevada. Occurs on rocky or gravelly substrates of rocky slopes or open flats within Mojave desertscrub and pinyon-juniper woodlands at elevations between 4,000 and 11,200 ft.	×	×	×
Parachute penstemon	*Penstemon debilis*	ESA-C; BLM-S; CO-S1	Endemic to Garfield County, Colorado, where it grows on oil shale outcrops at elevations between 7,800 and 9,200 ft.	×		
Paradox breadroot	*Pediomelum aromaticum*	BLM-S; CO-S2	Known in Arizona, Colorado, and Utah where it grows in adobe hills.	×		
Parish's alkali grass	*Puccinellia parishii*	BLM-S; CA-S1; AZ-HS; FWS-SC; AZ-S2; NM-E; NM-S1	Known in five sites in California, Nevada, Arizona, and New Mexico. Inhabits meadows, seeps, and moist areas near springs on alkaline soils at elevations between 2,300 and 7,350 ft.	×	×	
Parish's alumroot	*Heuchera parishii*	BLM-S; CA-S2	Inhabits alpine and lower montane coniferous forests on rocky carbonate substrates. Elevation ranges between 5,900 and 12,450 ft.	×		
Parish's brittlescale	*Atriplex parishii*	BLM-S; CA-S1; FWS-SC	Restricted to chenopod scrub, playas, and vernal pools in southern California. Occurs at elevations between 100 and 6,200 ft.	×	×	
Parish's checkerbloom	*Sidalcea hickmanii* ssp. *parishii*	BLM-S; CA-S1	Inhabits chaparral communities and montane coniferous forests at elevations between 3,280 and 8,200 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Parish's club-cholla	*Grusonia parishii*	CA-S2	Inhabits silty, sandy, or gravelly flats, dunelets, and hills within Joshua tree woodlands, creosotebush scrub, and desertscrub communities. Elevation ranges between 100 and 5,000 ft.	×	×	×
Parish's daisy	*Erigeron parishii*	ESA-T; BLM-S; CA-S2	Endemic to California in Riverside and San Bernardino Counties. Restricted to carbonate substrates in the San Bernardino Mountains in southern California. Occurs on dry rocky slopes and outwash plains. Sometimes found on sites underlain by granite, usually with an overlying wash of limestone materials. Elevation ranges between 3,280 and 6,560 ft.	×		
Parish's desert-thorn	*Lycium parishii*	CA-S2	Regionally endemic in southeastern California, occurring on coastal sage scrub, creosotebush scrub, and Sonoran desertscrub communities. Elevation ranges between 1,000 and 3,300 ft.	×		
Parish's onion	*Allium parishii*	BLM-S; AZ-SR; AZ-S1	Known from western Arizona and southeastern California. Inhabits open rocky and sandy slopes in the Mohave Desert. Primarily known from the Kofa Mountains in Yuma County, Arizona. Elevation ranges between 2,720 and 2,900 ft.	×		
Parish's phacelia	*Phacelia parishii*	BLM-S; CA-S1; NV-S2; FWS-SC	Known from Arizona, California, and Nevada. An aquatic/wetland dependent species, occurring in moist to superficially dry, open, flat, mostly barren, salt-crusted silty-clay soils. Generally known to occur on valley bottoms, lake deposits, and playa edges. Often in close proximity to seepage areas surrounded by saltbush scrub vegetation. Elevation ranges between 2,200 and 5,950 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Parish's popcorn-flower	*Plagiobothrys parishii*	BLM-S; CA-S1	Known from Rabbit Springs in San Bernardino County, California. Inhabits Joshua tree woodlands on alkaline mesic soils at elevations between 2,600 and 4,900 ft.	×		
Parish's rockcress	*Arabis parishii*	BLM-S; CA-S2; FWS-SC	Endemic to the San Bernardino Mountains in southern California. Inhabits pinyon-juniper forests and montane coniferous forests on mostly pebble-clay substrates. Elevation ranges between 5,800 and 9,800 ft.	×		
Parish's yampah	*Perideridia parishii* ssp. *parishii*	CA-S2	Inhabits meadows, seeps, lodgepole forest, red fir forest, yellow pine forest, as well as upper and lower montane coniferous forests. Elevation ranges between 4,800 and 9,800 ft.	×		
Parry's crazy-weed	*Oxytropis parryi*	CO-S1	Inhabits gravelly, calcareous soil on exposed ridgetops in the alpine zone. Occurs within the analysis area at elevations between 8,200 and 10,200 ft.	×	×	×
Parry's spurge	*Chamaesyce parryi*	CA-S1	Restricted to the vicinity of Kelso, California. Inhabits desert dunes, creosotebush scrub, and Mojave desertscrub at elevations between 1,300 and 2,400 ft.	×		
Payson lupine	*Lupinus crassus*	BLM-S; CO-S2	Endemic to Montrose and Gunnison Counties in Colorado. Occurs in pinyon-juniper woodland on sparsely vegetated soil at elevations between 5,000 and 5,800 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Peck sedge	*Carex peckii*	CO-S1	Inhabits calcareous soils on dry to mesic slopes in partial shade within rich, deciduous, or mixed deciduous-coniferous woodlands; open woods; bases of slopes; or full sun on exposed outcrops. Occurs at elevations below 6,600 ft.	×	×	×
Pecos sunflower	*Helianthus paradoxus*	ESA-T; NM-E; NM-S2	Inhabits saturated saline soils of desert wetlands at elevations between 3,300 and 6,600 ft.	×	×	
Pedate checker-mallow (bird-foot checkerbloom)	*Sidalcea pedata*	ESA-E; BLM-S; CA-E; CA-S1	Endemic to California in San Bernardino County. Known from fewer than 20 occurrences in the San Bernardino Mountains in southern California. Inhabits moist meadows and seeps on mesic soils and pebble plains at elevations between 5,900 and 8,200 ft.	×		
Peebles Navajo cactus	*Pediocactus peeblesianus* var. *peeblesianus*	ESA-E; AZ-HS; AZ-S1	Endemic to Arizona in the Little Colorado River watershed at 5,100 to 5,600 ft in elevation. Inhabits gravelly alluvium on gently sloping hills to flat hilltops, in desertscrub and grassland.	×	×	
Peirson's milkvetch	*Astragalus magdalenae* var. *peirsonii*	ESA-T; BLM-S; CA-E; CA-S2	Currently known to occur along the north and west flanks of the Algodones Dunes in California. Found on the slopes of mobile sand dunes in the Sonoran desertscrub plant community. It most often grows in conically shaped hollows on the leeward side of the dunes. Elevation ranges between 164 and 820 ft.	×	×	
Peirson's pincushion	*Chaenactis carphoclinia* var. *peirsonii*	BLM-S; CA-S1	Known only from the eastern Santa Rosa Mountains. Inhabits Sonoran desertscrub communities at elevations below 2,000 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Penland beardtongue	*Penstemon penlandii*	ESA-E; CO-S1	Endemic to Grand County, Colorado, where it grows in alkaline clays containing selenium. Preferred habitat is runoff channels.	×		
Philadelphia fleabane	*Erigeron philadelphicus*	CO-S1	Inhabits disturbed sites, low prairies, and stream banks with open and moist conditions.	×	×	×
Piceance bladderpod	*Lesquerella parviflora*	BLM-S; CO-S2	Endemic to shale barrens in Rio Blanco, Garfield, and Mesa Counties, Colorado. Inhabits ledges and slopes of canyons in open areas of pinyon-juniper communities.	×		
Piceance twinpod	*Physaria obcordata*	ESA-T; CO-S1	Endemic to the Piceance Basin, Rio Blanco County, Colorado. Found in white oil-shale.	×		
Pima indian mallow	*Abutilon parishii*	BLM-S; AZ-SR; FWS-SC; AZ-S2	Mesic and riparian areas on hillsides, cliff bases, canyon bottoms, rocks and boulders, and washes. Elevation ranges between 1,720 and 4,900 ft.	×	×	
Pima pineapple cactus	*Coryphantha scheeri* var. *robustispina*	ESA-E; AZ-HS; AZ-S2	Inhabits ridges in semidesert grassland and alluvial fans in Sonoran desertscrub at elevations of 2,300 to 5,000 ft. Range is south-central Arizona and north-central Sonora, Mexico.	×	×	
Pine Hill ceanothus	*Ceanothus roderickii*	ESA-E; BLM-S; CA-S2	Endemic to California in El Dorado County. Occurs in chaparral and cismontane woodland at elevations between 800 and 2,070 ft.	×		
Pine Hill flannelbush	*Fremontodendron decumbens*	ESA-E; BLM-S; CA-S1	California endemic occurring in rocky areas of chaparral and cismontane woodland. Elevation ranges between 1,390 and 2,490 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Pine Nut Mountains mousetails	*Ivesia pityocharis*	BLM-S; NV-S2	Endemic to the Pine Nut Mountains, Douglas County, Nevada. Associated with springs, moist drainages, or ephemeral ponds at elevations from 6,990 to 8,550 ft.	×		
Pine Valley goldenbush	*Haplopappus crispus*	BLM-S; FWS-SC; UT-S2	Known only from the Pine Valley Mountains in Washington County, Utah. Occurs in ponderosa pine, spruce-fir, and aspen communities at elevations between 8,000 and 10,000 ft.	×		
Pink fairy-duster	*Calliandra eriophylla*	CA-S2	Occurs on sandy or rocky substrates in creosote and desertscrub communities. Elevation ranges between 390 and 4,900 ft.	×	×	×
Pinyon rockcress	*Arabis dispar*	CA-S2	Restricted to the southern High Sierra Nevada and northern San Bernardino Mountains east of the Sierra Nevada. Occurs on granitic and gravelly substrates on loose slopes or compact talus. Elevation ranges between 3,900 and 8,300 ft.	×		
Pioche blazingstar	*Mentzelia argillicola*	BLM-S; NV-S1	Endemic to Nevada. Occurs on dry, soft, silty clay soils on knolls and slopes with sparse vegetation consisting mainly of *Artemisia pygmaea*, *Eriogonum nummulare*, *Gutierrezia sarothrae*, and *Salvia dorrii* var. *dorrii*.	×	×	×
Plain thistle	*Cirsium inornatum*	FWS-SC; NM-SC	Known only from the Sacramento Mountains in southern New Mexico. Inhabits mountain meadows and roadsides at elevations above 7,500 ft.	×		
Plank's catchfly	*Silene plankii*	BLM-S; FWS-SC; NM-SC; NM-S2	Known from New Mexico and western Texas. Inhabits volcanic cliffs and rocky outcrops at elevations between 5,000 and 9,200 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Plummer's mariposa-lily	*Calochortus plummerae*	BLM-S; FWS-SC	Endemic to southern California. Inhabits chaparral, cismontane woodlands, coastal scrub, and montane coniferous forests on rocky substrates. Elevation ranges between 330 and 5,550 ft.	×		
Porsild's whitlow-grass	*Draba porsildii*	CO-S1	Moist to sometimes drier sites with rocky or gravelly substrates in limestone or shale talus, scree, and grassy meadows; along ridges and slopes; and in summits within the alpine zone at elevations between 9,600 and 13,000 ft.	×	×	×
Prairie violet	*Viola pedatifida*	CO-S2	Occurs in rocky sites within prairies, open woodlands, and forest openings at elevations between 5,800 and 8,800 ft.	×	×	×
Prairie wedge grass	*Sphenopholis obtusata*	CA-S2	Inhabits cismontane woodland, foothill woodland, stream banks, ponds, and mesic meadows and seeps. Elevation ranges between 990 and 6,500 ft.	×	×	×
Providence Mountains lotus	*Lotus argyraeus* var. *notitius*	BLM-S; CA-S1	Restricted to the Providence Mountains in San Bernardino County, California. Occurs in pinyon-juniper woodlands at elevations between 3,900 and 6,550 ft.	×		
Pueblo goldenweed	*Oonopsis puebloensis*	CO-S2	Occurs on barren shale outcrops in sparse shrublands or pinyon-juniper woodlands at elevations between 4,800 and 5,500 ft. Substrates are derived from the Smoky Hill Member of the Niobrara Formation.	×		
Purple-nerve cymopterus	*Cymopterus multinervatus*	CA-S2	Occurs on sandy or gravelly slopes within desertscrub, Joshua tree woodland, and pinyon-juniper woodland communities. Elevation ranges between 2,600 and 5,900 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Pygmy pussypaws	*Calyptridium pygmaeum*	BLM-S; CA-S2	Endemic to the High Sierra Nevada and the San Bernardino Mountains. Inhabits dry sandy or gravelly soils in upper montane and subalpine coniferous forests. Elevation ranges between 6,230 and 11,475 ft.	×		
Railroad Valley globemallow	*Sphaeralcea caespitosa* var. *williamsiae*	BLM-S; NV-S2	Range is Nye County, Nevada.	×	×	
Red Hills vervain	*Verbena californica*	ESA-T; BLM-S; CA-T; CA-S2	Endemic to California. Known from 11 occurrences in the Red Hills in Tuolumne County. Inhabits mesic, usually serpentinite seeps or creeks within cismontane woodland and valley and foothill grassland at elevations between 850 and 1,310 ft.	×		
Red Mountain stonecrop	*Sedum eastwoodiae*	ESA-C; BLM-S; CA-S1	California endemic with four occurrences on Red Mountain in Mendocino County, at elevations near 2,000 to 4,000 ft. Inhabits lower montane coniferous forest.	×		
Remote rabbitbrush	*Chrysothamnus eremobius*	BLM-S; NV-S1	Endemic to Clark and Lincoln Counties, Nevada. Known from the Sheep and Pintwater Ranges on crevices or rubble of north-facing carbonate cliffs at elevations between 4,850 and 6,400 ft.	×		
Retrorse sedge	*Carex retrorsa*	CO-S1	Occurs in perennially wet areas, with a strong preference for banks along small channels, small to mid-size depressional wetlands, open mudflats at pond margins, and surface drying mud. Occurs at elevations between 5,000 and 10,000 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Rhizome fleabane	*Erigeron rhizomatus*	ESA-T; NM-E; NM-S2	Inhabits nearly barren detrital clay hillsides with soils derived from shales of Chinle or Baca formations. Occurs most often on north- or east-facing slopes in open pinyon-juniper woodlands at elevations between 7,300 and 8,000 ft.	×	×	
Ripley biscuitroot	*Cymopterus ripleyi* var. *ripleyi*	FWS-SC; NV-S2	Restricted to southeastern California and western Nevada. A sand-dune-dependent species occurring on deep loose, sandy soils of stabilized dunes, dune skirt areas, aeolian deposits, and alluvial drainage areas at elevations between 4,400 and 6,000 ft.	×	×	×
Ripley’s milkvetch	*Astragalus ripleyi*	BLM-S; CO-S2	Endemic to Conejos County, Colorado, and Taos and Rio Arriba Counties in New Mexico. In Colorado, the habitat is ponderosa pine, pinyon-juniper woodlands, and mixed conifer forest at elevations above 8,000 ft.	×	×	×
Roan Cliffs blazing star	*Mentzelia rhizomata*	BLM-S; CO-S2	Endemic to Garfield County, Colorado. Known from steep, shaley talus slopes of the Roan Plateau.	×		
Robison’s monardella	*Monardella robisonii*	BLM-S; CA-S2	Known from fewer than 20 occurrences in Riverside and San Bernardino Counties, California. Inhabits pinyon-juniper woodlands at elevations below 4,900 ft.	×		
Rock phacelia	*Phacelia petrosa*	BLM-S; NV-S2	Known from Arizona, Nevada, and Utah. Occurs on dry limestone and volcanic talus slopes of foothills, washes, and gravelly canyon bottoms on substrates derived from calcareous material. Inhabits mixed desertscrub, creosotebush, and blackbrush communities at elevations between 2,500 and 5,800 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Rock purpusia	*Ivesia arizonica* var. *saxosa*	BLM-S; NV-S1	Endemic to southern Nevada. It inhabits crevices of cliffs and boulders on volcanic substrates in pinyon-juniper communities at elevations between 4,900 and 6,900 ft.	×	×	×
Rock purslane	*Calandrinia ambigua*	AZ-S2	Limited distribution in California. Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grasslands, and margins of vernal pools. Elevation ranges from 0 to 1,425 ft. Populations in California have no federal or state status or rank.	×		
Rock sandwort	*Minuartia stricta*	CO-S1	Inhabits moist, granitic gravels, sedge meadows, heath, alpine, or arctic tundra. Elevation ranges from 300 to 12,500 ft.	×	×	×
Rockcress draba	*Draba globosa*	CO-S1	Occurs in Alpine meadows, granitic talus slopes, and rock crevices at elevations between 11,500 and 12,500 ft.	×		
Rock-loving aletes	*Neoparrya lithophila*	BLM-S; CO-S2	Endemic to south-central Colorado on igneous rock outcrops on north-facing cliffs and ledges. Found on north-facing cliffs and ledges within pinyon-juniper woodlands at elevations greater than 7,000 ft.	×	×	×
Rock-tansy	*Sphaeromeria capitata*	BLM-S; CO-S1	Occurs in Wyoming, Colorado, Montana, and Utah in dry, rocky hills at elevations between 4,900 and 7,800 ft.	×		
Rocky Mountain bladderpod	*Lesquerella calcicola*	CO-S2	Inhabits shale bluffs, limy hillsides, gypseous knolls and ravines, and various calcareous substrates at elevations between 5,000 and 7,500 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Rocky Mountain blazing-star	*Liatris ligulistylis*	CO-S1	Occurs on dry, rocky slopes, rocky woodlands, gravelly ground in valleys, streamsides, prairies, and open moist sites.	×	×	×
Rollins' cat's-eye	*Oreocarya rollinsii*	BLM-S; CO-S2	Occurs in Colorado, Wyoming, and Utah on white shale slopes in pinyon-juniper woodlands and cold desert shrubland communities at 5,300 to 5,800 ft in elevation.	×		
Rollins' twinpod	*Physaria rollinsii*	CO-S2	Regionally endemic to approximately 1,439 mi^2 [e] in southwestern Colorado. Occurs on granitic talus, open knolls, limestone chiprock, steep slopes, clay banks, and sagebrush, and in close proximity to granite boulders.	×		
Rosy two-tone beardtongue	*Penstemon bicolor* ssp. *roseus*	BLM-S; FWS-SC	Known from Arizona, California, and Nevada. Occurs on calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving enhanced runoff, within creosotebush-bursage, blackbrush, and mixed-shrub communities. Elevation ranges between 1,800 and 4,850 ft.	×	×	×
Rough angelica	*Angelica scabrida*	BLM-S; NV-S2	Endemic to the Spring Mountains in southern Nevada. An aquatic/wetland-dependent species occurring in moist, rocky calcareous drainages, canyon bottoms, or seepy or north-facing slopes over carbonate or sandstone rock in interior chaparral, mountain brush, and montane coniferous forest communities. Elevation ranges between 4,000 and 9,350 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Rough dwarf greasebush	*Glossopetalon pungens* var. *pungens*	BLM-S; NV-S2	Endemic to the Spring and Sheep Ranges in southern Nevada, where the species is known from seven occurrences. Inhabits crevices of carbonate cliffs and outcrops, generally avoiding southerly exposures, within pinyon-juniper, mountain mahogany, and montane conifer communities. Elevation ranges between 4,400 and 7,800 ft.	×	×	×
Rough fringemoss	*Crossidium seriatum*	NV-S2	Known from only eight occurrences in Nevada. Occurs in sandstone and gypsiferous bluffs, outcrops, rock piles, and soils, often protected on the north or east sides of rocks or shrubs, or at bases of bluffs, in the creosotebush-bursage zone at elevations between 1,300 and 2,450 ft.	×	×	×
Roundleaf errazurizia	*Errazurizia rotundata*	BLM-S; AZ-SR; AZ-S2	Endemic to the Little Colorado River drainage in Coconino and Navajo Counties in Arizona. Also found in Maricopa County. Found on rocky hilltops and ledges with sandy or gravelly soils in the Great Basin desertscrub plant community. Elevation is 4,620 to 5,200 ft.	×	×	
Round-leaf four-o'clock	*Oxybaphus rotundifolius*	CO-S2	Restricted to barren shale outcrops in sparse shrublands or pinyon-juniper woodlands at elevations between 4,800 and 5,600 ft. Substrate derived from the Smoky Hill Member of the Niobrara Formation.	×	×	
Round-leaved filaree	*California macrophylla*	BLM-S	Found on clay substrates of valleys and foothill grasslands within montane woodland communities at elevations ranging between 50 and 3,950 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Royal Gorge stickleaf	*Mentzelia densa*	BLM-S	Narrowly endemic to central Colorado in Chaffee and Fremont Counties. Occurs in dry open sites, such as washes, roadside ditches, and steep rocky slopes. Found on gravelly substrates at elevations between 6,000 and 7,200 ft.	×		
Sacramento groundsel	*Senecio sacramentanus*	FWS-SC; NM-SC	Known only from the Sacramento and White Mountains in southern New Mexico. Inhabits mountain meadows and aspen glades in lower and upper montane coniferous forests. Elevation ranges between 8,000 and 11,000 ft.	×	×	
Sacramento Mountain fleabane	*Erigeron rybius*	FWS-SC; NM-SC	Known only from the Sacramento and White Mountains in southern New Mexico. Inhabits mountain meadows and forest openings in lower and upper montane coniferous forests. Elevation ranges between 7,000 and 9,200 ft.	×	×	
Sacramento prickly-poppy	*Argemone pleiacantha* ssp. *pinnatisecta*	ESA-E; NM-E; NM-S2	Endemic to the Sacramento Mountains in Otero County, New Mexico. Inhabits loose, gravelly soils of open disturbed sites in canyon bottoms, on slopes, and along roadsides. Elevation ranges between 4,200 and 7,100 ft.	×	×	
Sacramento Mountains thistle	*Cirsium vinaceum*	ESA-T; NM-E; NM-S2	Endemic to the Sacramento Mountains in Otero County, New Mexico. Inhabits wet soils at springs, seeps, and along streams in meadows or forest margins at elevations between 7,500 and 9,500 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	No Action	Program	SEZ
				Potential to Occur in the Alternative Areas[b]		
Plants (Cont.)						
Saguaro cactus	*Carnegiea gigantea*	CA-S1	Regionally endemic, found only in the Sonoran Desert. Occurs in low numbers along the Colorado River from the Whipple Mountains to Laguna Dam. Inhabits rocky substrates within Sonoran desertscrub and creosotebush scrub communities at elevations between 160 and 4,900 ft.	×	×	×
Saiya	*Amoreuxia gonzalezii*	AZ-HS; FWS-SC; AZ-S1	Found in the Santa Rita Mountains in Pima and Santa Cruz Counties in Arizona, where it grows on rocky limestone hillsides at elevations of 4,200 to 4,600 ft.	×	×	
Salt Spring checkerbloom	*Sidalcea neomexicana*	CA-S2	Occurs on alkaline or mesic substrates within riparian wetlands, marshes, springs, chaparral, coastal scrub, coniferous forest, desertscrub, and playas habitats. Elevation ranges between 50 and 5,000 ft.	×	×	×
San Benito evening-primrose	*Camissonia benitensis*	ESA-T; BLM-S; CA-S1	Endemic to California. Known only from the New Idria area in Fresno and San Benito Counties. Inhabits clay or gravelly chaparral, cismontane woodland, and valley and foothill grassland at elevations between 1,970 and 4,200 ft.	×		
San Bernardino aster	*Symphyotrichum defoliatum*	BLM-S	Known primarily from the San Bernardino Mountains in southern California. Inhabits montane coniferous forests, moist meadows and seeps, marshes and swamps, and valley foothill habitats at elevations below 6,500 ft.	×		
San Bernardino blue grass	*Poa atropurpurea*	ESA-E; BLM-S; CA-S2	Inhabits edges of moist meadows and seeps in the San Bernardino, Palomar, and Laguna Mountains of southern California. Elevation ranges between 4,600 and 8,200 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
San Bernardino gilia	*Gilia leptantha* ssp. *leptantha*	BLM-S; CA-S2	Known only from the San Bernardino Mountains in southern California. Inhabits lower montane coniferous forests on sandy or gravelly substrates at elevations between 4,900 and 8,500 ft.	×		
San Bernardino Mountains bladderpod	*Lesquerella kingii* ssp. *bernardina*	ESA-E; BLM-S; CA-S1	Occurs on dolomite substrates, typically on open, gentle to moderate slopes within pine-juniper woodlands and fir forests at elevations between 6,900 and 8,850 ft. Soils typically have little accumulation of organic material.	×		
San Bernardino Mountains dudleya	*Dudleya abramsii* ssp. *affinis*	BLM-S; CA-S2; FWS-SC	Restricted to the San Bernardino Mountains in southern California. Inhabits upper montane coniferous forests and pinyon-juniper woodlands on granitic, quartzite, or carbonate soils. Elevation ranges between 4,100 and 8,500 ft.	×		
San Bernardino Mountains monkeyflower	*Mimulus exiguous*	BLM-S; CA-S2; FWS-SC	Known only from the San Bernardino Mountains in southern California. Inhabits upper montane coniferous forests, seeps, and wet meadows on mesic clay substrates. Elevation ranges between 5,900 and 7,700 ft.	×		
San Bernardino Mountains owl's-clover	*Castilleja lasiorhyncha*	BLM-S; CA-S2; FWS-SC	Known primarily from the San Bernardino Mountains of southern California. Inhabits meadows, pebble plains, and upper montane coniferous forests at elevations between 4,275 and 7,875 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
San Bernardino ragwort	*Packera bernardina*	BLM-S; CA-S2	Known from fewer than 20 occurrences in the San Bernardino Mountains of southern California. Inhabits open areas with coniferous forests, including wet meadows, dry rocky slopes, and pebble plains habitats. Elevation ranges between 5,900 and 7,550 ft.	×		
San Bernardino rockcress	*Arabis breweri* var. *pecuniaria*	BLM-S; CA-S1; FWS-SC	Known from only two extant locations in San Bernardino County, California. Inhabits rocky substrates in subalpine coniferous forests at elevations between 8,900 and 10,500 ft.	×		
San Diego ambrosia	*Ambrosia pumila*	ESA-E; BLM-S; CA-S1	Inhabits sandy loam or clay, often in disturbed areas in chaparral, coastal scrub, valley and foothill grassland, and vernal pools at elevations lower than 1,400 ft.	×		
San Joaquin Valley orcuttgrass	*Orcuttia inaequalis*	ESA-T; BLM-S; CA-E; CA-S2	Endemic to California. Inhabits vernal pools at elevations lower than 2,475 ft.	×		
San Joaquin woolly threads	*Monolopia congdonii*	ESA-E; BLM-S	California endemic that occurs in chenopod scrub, and sandy valley and foothill grassland at elevations lower than 2,600 ft.	×		
San Pedro River wild buckwheat	*Eriogonum terrenatum*	BLM-S; AZ-S1	Endemic to Arizona, where it is known in only two locations at elevations of 3,520 to 3,914 ft. In Pima County, it is restricted to clayey outcrops and in Cochise County, it occurs on eroded, clay slopes and flats.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
San Rafael milkvetch	*Astragalus rafaelensis*	BLM-S; CO-S1	Endemic to the Navajo Basin. Inhabits banks of sandy, clay gulches, in pockets at the base of sandstone outcrops, or among boulders in dry watercourses. Elevation between 4,500 and 5,300 ft.	×		
Sand evening-primrose	*Camissonia arenaria*	CA-S2	Occurs on sandy washes and rocky slopes within Sonoran desertscrub communities at elevations below 3,000 ft.	×	×	×
Sand flat milkvetch	*Astragalus insularis*	AZ-S2	Known from Arizona and California. Inhabits desert dunes and sandy washes at elevations below 1,000 ft.	×		
Sand food	*Pholisma sonorae*	BLM-S; AZ-HS; AZ-S1; CA-S2; FWS-SC	Inhabits Sonoran sand dune habitats at elevations below 650 ft.	×	×	×
Sand prickly-pear cactus	*Opuntia arenaria*	NM-E; FWS-SC; NM-S2	Known from southern New Mexico, western Texas, and northern Mexico. Inhabits sandy areas, particularly semistabilized sand dunes among open Chihuahuan desertscrub. Often associated with sparse cover of grasses. Elevation ranges between 3,800 and 4,300 ft.	×	×	×
Sandberg pincushion cactus	*Escobaria sandbergii*	FWS-SC; NM-SC; NM-S2	Known from the San Andres and Fra Cristobal Mountains in Doña Ana and Sierra Counties, New Mexico. Occurs on rocky limestone soils in Chihuahuan desertscrub and open oak and pinyon-juniper woodlands at elevations between 4,200 and 7,400 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Sandhill goosefoot	*Chenopodium cycloides*	BLM-S; NM-S2	Known from south-central New Mexico as well as southern Colorado and western Texas. Inhabits open sandy areas, frequently along the edges of sand dunes.	×	×	×
Sandstone milkvetch	*Astragalus sesquiflorus*	BLM-S; CO-S1	Occurs in Colorado, Utah, and Arizona. Inhabits slickrock formations in mixed desert shrub, pinyon-juniper, and ponderosa pine or aspen communities at elevations between 4,800 and 10,000 ft.	×		
Sanicle biscuitroot	*Cymopterus ripleyi* var. *saniculoides*	BLM-S; FWS-SC	Endemic to Nevada. Occurs on loose, sandy to gravelly, often somewhat alkaline soils on volcanic tuff deposits and mixed valley alluvium within blackbrush, mixed-shrub, sagebrush, and lower pinyon-juniper communities. Elevation ranges between 3,150 and 6,700 ft.	×	×	×
Santa Cruz beehive cactus	*Coryphantha recurvata*	AZ-HS	Inhabits alluvial soils of valleys and foothills in desert grassland and oak woodland at elevations of 3,680 to 6,000 ft in southern Arizona and northern Sonora, Mexico.	×	×	
Santa Cruz striped agave	*Agave parviflora* ssp. *parviflora*	AZ-HS; FWS-SC	Range is northern Sonora, Mexico, and southern Arizona in Pima and Santa Cruz Counties. Occurs at middle elevations of mountains at 3,560 to 5,200 ft on open rocky or gravelly slopes and ridges, in desert grassland and oak woodland.	×	×	
Santa Fe cholla	*Opuntia viridiflora*	NM-E; NM-S1	Endemic to Santa Fe County, New Mexico. Inhabits gravelly rolling hills in pinyon-juniper woodlands at elevations between 5,800 and 7,200 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Santa Rosa Mountains leptosiphon	*Leptosiphon floribundus* ssp. *hallii*	BLM-S; CA-S1	Endemic to the Santa Rosa Mountains of southern California. Inhabits Sonoran desertscrub and pinyon and juniper woodland communities at elevations between 3,280 and 6,560 ft.	×		
Scaly sandplant	*Pholisma arenarium*	BLM-S; AZ-HS; AZ-S2	Occupies a variety of habitats, including coastal and inland sand dunes, chaparral, and Sonoran and Mohave Desert habitats at elevations below 900 ft.	×	×	
Scheer cory cactus	*Coryphantha scheeri* var. *uncinata*	NM-E; NM-S1	Inhabits rocky hillsides in the Chihuahuan Desert at 4,000-ft elevation.	×	×	
Scheer's pincushion cactus	*Coryphantha scheeri* var. *valida*	NM-E; FWS-SC; NM-S2	Known from southern New Mexico in desert grassland and Chihuahuan desertscrub communities, occasionally on rocky benches, washes, or bajadas. Elevation ranges between 3,300 and 3,600 ft.	×	×	
Schlesser pincushion cactus	*Sclerocactus schlesseri*	BLM-S; NV-P; FWS-SC; NV-S1	Endemic to Lincoln County, Nevada, where it is known to occur within a 134-acre area within the Meadow Valley. Occurs in open, stable, gravelly, or silty soils derived from gypsiferous sediments on mesic microsites on north to east aspects. Elevation ranges between 4,760 and 5,150 ft.	×		
Schott wire lettuce	*Stephanomeria schottii*	BLM-S; AZ-S2	Endemic to sand dunes of the Gran Desierto region. Occurs on semistabilized sand dunes with creosote, white bursage, and big galleta grass. Elevation ranges between 350 and 800 ft.	×	×	
Selkirk violet	*Viola selkirkii*	CO-S1	Generally known to occur in moist woods and alder thickets. Within the SEZ analysis area, the species is known to occur at elevations between 7,875 and 8,850 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Sentry milkvetch	*Astragalus cremnophylax* var. *cremnophylax*	ESA-E; AZ-HS; AZ-S1	Grows in the uppermost layer of Kaibab limestone at 7,000 to 7,960 ft in elevation. Two known populations on the South Rim of the Grand Canyon.	×	×	
September 11 stickleaf	*Mentzelia memorabalis*	BLM-S; AZ-S1	Endemic to Arizona in northern Mohave County, in the Clayhole Wash drainage. Occurs on dry gypsum-clay outcrops with scattered shrubs at 4,689- to 5,197-ft elevation.	×	×	
Sheep fleabane	*Erigeron ovinus*	BLM-S; FWS-SC; NV-S2	Endemic to Mount Irish and the Sheep and Groom Ranges in southern Nevada, where the species is known from fewer than 15 occurrences. Inhabits crevices of carbonate cliffs and ridgeline outcrops within pinyon-juniper and montane conifer communities. Elevation ranges between 3,600 and 8,400 ft.	×	×	×
Sheep Mountain milkvetch	*Astragalus amphioxys* var. *musimonum*	BLM-S; FWS-SC; NV-S2	Restricted to the foothills of the Sheep Mountains in southern Nevada (historically occurred in Arizona). Occurs on carbonate alluvial gravels, particularly along drainages, roadsides, and in other microsites with enhanced runoff, at elevations between 4,400 and 6,000 ft.	×	×	×
Shivwit's milkvetch	*Astragalus ampullarioides*	ESA-E; UT-S1	Endemic to Washington County, Utah. Inhabits warm desert shrub, creosotebush, and juniper communities on gypsiferous soils on the Chinle Formation. Occurs at elevations between 3,400 and 4,000 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Shockley's rockcress	*Arabis shockleyi*	CA-S2	Restricted to the San Bernardino Mountains and Mojave Desert in southern California. Occurs on rocky or gravelly ridges of carbonate or quartzite derivations within Pinyon-juniper woodlands. Elevation ranges between 2,900 and 7,500 ft.	×		
Sierra Blanca kittentails	*Besseya oblongifolia*	FWS-SC; NM-SC; NM-S2	Endemic to the Sacramento Mountains in Lincoln and Otero Counties, New Mexico. Occurs in alpine meadows at elevations between 11,000 and 12,000 ft.	×		
Siler pincushion cactus	*Pediocactus sileri*	ESA-T; BLM-S; AZ-HS	Limited to southwestern Utah and northwestern Arizona at elevations of 2,800 to 5,800 ft. Restricted to a specific gypsum and salt-rich soil.	×	×	
Silver-cup mock-orange	*Philadelphus argyrocalyx*	FWS-SC; NM-SC	Known from the Capitan, Sacramento, and White Mountains in southern New Mexico. Inhabits rocky slopes in montane regions in association with pinyon-juniper and coniferous woodlands. Elevation ranges between 6,900 and 8,500 ft.	×		
Silver-haired ivesia	*Ivesia argyrocoma*	BLM-S; CA-S2; FWS-SC	Known from an extremely narrow range in the San Bernardino Mountains. Inhabits dry alkaline meadows, decomposed granite soils, and pebble plains habitats. Associated with yellow pine forests, red fir forests, and montane coniferous forest communities at elevations between 5,900 and 9,500 ft.	×		
Silverleaf sunray	*Enceliopsis argophylla*	BLM-S; NV-S1	Nearly entirely confined to Clark County, Nevada, the species is also known to occur in Arizona and Utah. Inhabits dry, open, relatively barren areas on gypsum badlands, volcanic gravels, or loose sands, within creosotebush-bursage communities. Elevation ranges between 1,200 and 2,400 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Single-stemmed wild buckwheat	*Eriogonum acaule*	BLM-S; CO-S1	Occurs in Colorado and Wyoming on ridgetops, chalky or ashy barrens, and clay flats.	×		
Skiff milkvetch	*Astragalus microcymbus*	BLM-S; CO-S1	Endemic to Colorado in Gunnison and Saguache Counties. Inhabits open sagebrush or juniper-sagebrush communities on moderately steep to steep slopes. Found in rocky areas at elevations between 7,800 and 8,500 ft.	×		
Slender cottongrass	*Eriophorum gracile*	CO-S2	Found in fens and subalpine wetlands at elevations between 7,100 and 12,000 ft that are supported by groundwater discharge or snowmelt. Soils tend to be peaty and highly saturated.	×	×	×
Slender cottonheads	*Nemacaulis denudata* var. *gracilis*	CA-S2	Occurs in southern California within the Mojave and Sonoran Deserts. Inhabits sandy soils within coastal dunes, desert dunes, creosotebush scrub, and desertscrub communities at elevations below 1,300 ft.	×	×	×
Slender orcutt grass	*Orcuttia tenuis*	ESA-T; BLM-S; CA-E	Endemic to California. Occurs in vernal pools at elevations between 115 and 5,775 ft.	×		
Slender sedge	*Carex lasiocarpa*	CO-S1	Inhabits very wet sites, including sedge meadows, fens, bogs, lakeshores, and stream banks. A dominant species of boreal wetlands, where it often forms large, floating mats.	×	×	×
Slender-horned spineflower	*Dodecahema leptoceras*	ESA-E; CA-E; CA-S1	Endemic to California in Los Angeles, Riverside, and San Bernardino Counties. Inhabits sandy areas of chaparral, cismontane woodland, and coastal scrub (alluvial fan) at elevations lower than 2,490 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Slender-petaled mustard	*Thelypodium stenopetalum*	ESA-E; BLM-S; CA-E; CA-S1	Restricted to the Big Bear Basin in San Bernardino County, California. It is protected in part at Baldwin Lake Ecological Reserve. Occurs in meadows and seeps at elevations between 5,250 and 8,200 ft.	×		
Slender-spined all-thorn	*Koeberlinia spinosa* ssp. *tenuispina*	CA-S2	Known from the Chocolate Mountains of the Sonoran Desert in southeastern California. Occurs in riparian woodland, creosotebush scrub, and Sonoran desertscrub communities. Elevation ranges between 500 and 1,675 ft.	×	×	
Slender-stem bean	*Phaseolus filiformis*	CA-S1	Restricted to a single occurrence in the Coachella Valley of southern California. Occupies washes within Sonoran desertscrub and creosotebush scrub communities at elevations near 400 ft.	×		
Small-flowered androstephium	*Androstephium breviflorum*	CA-S1	Occurs on dry sandy to rocky soil substrates. Occurs on desert dunes within creosotebush scrub and Mojave desertscrub at elevations between 720 and 2,100 ft.	×	×	×
Small-flowered sand-verbena	*Tripterocalyx micranthus*	CA-S1	Restricted to the vicinity of Kelso, California. Occurs on sandy substrates within desert dunes, desert grasslands, creosotebush scrub, and desertscrub. Elevation ranges between 1,800 and 2,800 ft.	×		
Small-winged sedge	*Carex stenoptila*	CO-S2	Inhabits open, rocky sites within coniferous woodlands at elevations between 7,900 and 9,500 ft.	×	×	×
Smith whitlow-grass	*Draba smithii*	CO-S2	Endemic to the mountains of southern Colorado. Occurs on talus slopes providing shaded and protected crevices at elevations between 8,000 and 11,000 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Smooth dwarf greasebush	*Glossopetalon pungens* var. *glabrum*	BLM-S; FWS-SC; NV-S1	Endemic to the Spring and Sheep Ranges in southern Nevada, where the species is known from three occurrences. Inhabits crevices of carbonate cliffs and outcrops, generally avoiding southerly exposures, within pinyon-juniper, mountain mahogany, and montane conifer communities. Elevation ranges between 6,000 and 7,800 ft.	×		
Smooth figwort	*Scrophularia laevis*	BLM-S; FWS-SC; NM-SC; NM-S2	Known from the Organ Mountains in Doña Ana County, New Mexico. Inhabits moist canyons on quartz monzonite substrates in pinyon-juniper woodlands and coniferous forests at elevations between 6,900 and 8,500 ft.	×		
Sneed's pincushion cactus	*Escobaria sneedii* var. *sneedii*	ESA-E; NM-E; NM-S2	Known from southern New Mexico and western Texas. Found primarily in limestone cracks of broken terrain on steep slopes. Also found on limestone edges and rocky slopes in mountainous regions. Elevation ranges between 4,000 and 6,000 ft.	×	×	×
Snow gooseberry	*Ribes niveum*	CO-S1	Once considered to be extirpated in Colorado, occurs in thickets along streams or open hillsides at elevations between 1,300 and 7,900 ft.	×		
Sodaville milkvetch	*Astragalus lentiginosus* var. *sesquimetralis*	NV-P; NV-S1	Aquatic or wetland dependent in Nevada, where it occurs in Mineral and Nye Counties. Also in California. Inhabits moist, open, alkaline hummocks and drainages near cool springs at elevations just over 4,000 ft.	×	×	
Southern jewel-flower	*Streptanthus campestris*	BLM-S; CA-S2	Inhabits chaparral, pinyon-juniper, and montane coniferous habitats on rocky substrates at elevations between 3,280 and 7,875 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Southern mountain buckwheat	*Eriogonum kennedyi* var. *austromontanum*	ESA-T; BLM-S; CA-S2	Restricted to pebble plains—dense clay soils, usually covered with a cobble pavement of quartzite. These areas usually occur as sparsely vegetated openings in forested habitats. Elevation ranges between 5,900 and 7,900 ft.	×		
Southern skullcap	*Scutellaria bolanderi* ssp. *austromontana*	BLM-S; CA-S2	Inhabits chaparral communities and montane coniferous forests on mesic soils at elevations between 1,650 and 6,500 ft.	×		
Southern Rocky Mountain cinquefoil	*Potentilla ambigens*	CO-S1	Scattered distribution in Colorado. Occurs on gravelly soils within dry, open shrublands and grasslands at middle elevations.	×	×	×
Spear-leaf matelea	*Matelea parvifolia*	CA-S2	Regionally endemic to southeastern California. Occurs on rocky substrates within creosotebush and desertscrub communities at elevations between 1,450 and 3,600 ft.	×	×	×
Spiny cliff-brake	*Pellaea truncata*	CA-S2	Occurs on rocky slopes and cliffs of volcanic or granitic derivation within pinyon-juniper woodlands. Elevation ranges between 4,000 and 7,000 ft.	×	×	×
Spiny-spored quillwort	*Isoetes setacea* ssp. *muricata*	CO-S2	Occurs in sandy sediment of shallow water and shores of lakes as well as sluggish, acidic streams.	×		
Spreading sandwort	*Arenaria lanuginosa* ssp. *saxosa*	CA-S1	Restricted to the San Bernardino Mountains and Peninsular Ranges of southern California. Inhabits mesic and sandy substrates along streams within red fir, lodgepole, subalpine coniferous, and upper montane coniferous forests. Elevation ranges between 5,900 and 8,500 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Spring-loving centaury	*Centaurium namophilum*	ESA-T; NV-P; NV-S2	Endemic to the Ash Meadows region in Nye County, Nevada, where it is restricted to moist clay soils along the banks of seeps and streams.	×	×	×
Springville clarkia	*Clarkia springvillensis*	ESA-T; BLM-S; CA-E; CA-S1	Endemic to California in Tulare County. Inhabits chaparral, cismontane woodland, and valley and foothill grassland. Elevation ranges between 800 and 4,000 ft.	×		
Squalid milkvetch	*Astragalus serenoi* var. *sordescens*	NV-S2	Endemic to Nevada. Occurs on dry, open, gravelly or sandy soils along gentle slopes of alluvial fans or light-colored clay hills, within mixed-shrub, sagebrush, and lower pinyon-juniper communities at elevations between 5,000 and 6,800 ft.	×	×	×
St. George blue-eyed grass	*Sisyrinchium radicatum*	NV-S1	Restricted to southern Nevada and southwestern Utah, where it is primarily known from the Las Vegas–St. George region. Occurs in moist, sometimes alkaline, meadows, stream banks, and spring borders at elevations between 2,000 and 4,300 ft.	×	×	×
Standley's whitlow-grass	*Draba standleyi*	BLM-S; FWS-SC; NM-SC; NM-S2	Known from southern Arizona, New Mexico, and western Texas. Inhabits sandy areas, particularly semistabilized sand dunes among open Chihuahuan desertscrub. Often associated with a sparse cover of grasses. Elevation ranges between 5,500 and 9,400 ft.	×	×	
Stebbins' morning-glory	*Calystegia stebbinsii*	ESA-E; BLM-S; CA-E; CA-S1	Endemic in El Dorado and Nevada Counties in California. Preferred habitat is openings in chaparral and cismontane woodland at elevations below 3,600 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Stephens' beardtongue	*Penstemon stephensii*	BLM-S; CA-S2; FWS-SC	Restricted to Inyo and San Bernardino Counties, California. Occurs on rocky (usually carbonate) substrates, including rock crevices, cliffs, rocky slopes, and washes associated with pinyon-juniper and creosotebush scrub communities. Elevation ranges between 3,900 and 6,550 ft.	×	×	
Sticky buckwheat	*Eriogonum viscidulum*	NV-P; FWS-SC; NV-S2	Known only from Clark County, Nevada, and Mohave County, Arizona. Dependent on sand dune communities, where it occurs on deep, loose, sandy soils in washes, flats, roadsides, steep aeolian slopes, and stabilized dune areas. Elevation ranges between 1,200 and 2,200 ft.	×	×	×
Sticky ringstem	*Anulocaulis leisolenus*	BLM-S; NV-S2	Known from southern Nevada, northern Arizona, and New Mexico, Texas, and Mexico. Occupies loose soils of calcareous shales and clay, loose talus, and gypsum at elevations between 1,700 and 4,000 ft.	×	×	×
Straw-top cholla	*Opuntia echinocarpa*	AZ-SR	Inhabits sandy or gravelly soil of benches, slopes, mesas, flats, and washes at elevations between 1,000 and 6,700 ft.	×	×	×
Succulent owl's-clover	*Castilleja campestris* ssp. *succulenta*	ESA-T; BLM-S; CA-E; CA-S2	Endemic to California. Inhabits vernal pools that are often acidic at elevations lower than 2,460 ft.	×		
Sun-loving meadowrue	*Thalictrum heliophilum*	BLM-S; CO-S2	Limited to a range within the Colorado River drainage in Garfield, Rio Blanco, and Mesa Counties, Colorado. Found in open areas of sparsely vegetated, dry shale slopes.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Sunnyside green gentian	*Frasera gypsicola*	NV-P; NV-S1	Range is Nye and White Pine Counties in Nevada and possibly in Utah. Inhabits open, dry, alkaline silty-clay soils on calcareous flats and barrens with sagebrush, greasewood, barberry, and swamp cedar. Found at elevations just over 5,000 ft.	×	×	
Sweet moustache moss	*Trichostomum sweetii*	NV-S1	Known from only two occurrences in Nevada. Occurs on sandstone bluffs and sandstone-derived soil, often shaded by rocks at elevations between 2,000 and 2,230 ft.	×	×	×
Tecopa birdbeak	*Cordylanthus tecopensis*	BLM-S; FWS-SC; NV-S2	Known from Esmeralda and Nye Counties, Nevada, as well as Inyo County, California. Inhabits open, moist alkali-crusted clay soils of deep springs, seeps, and outflow drainages at elevations between 2,100 and 4,900 ft.	×	×	×
Texas purple spike	*Hexalectris warnockii*	BLM-S; AZ-HS; FWS-SC; AZ-S1	Range includes Texas, New Mexico, Arizona, and Baja California in Mexico. Inhabits humus beneath rocks and fallen oaks along streambeds in mixed oak woodlands at elevations of 5,000 to 7,000 ft.	×	×	
Tharp's blue-star	*Amsonia tharpii*	NM-E; NM-S1	Only three populations are known to occur in New Mexico. Inhabits limestone and gypsum hills in Chihuahuan desertscrub communities at elevations between 3,100 and 3,500 ft.	×	×	
Thorny milkwort	*Polygala acanthoclada*	CA-S2	Occupies loose, sandy or gravelly slopes within shadscale scrub, chenopod scrub, Joshua tree woodland, and pinyon-juniper woodland communities at elevations between 2,500 and 7,500 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Three-awned grama	*Bouteloua trifida*	CA-S2	Occurs in eastern Mojave Desert mountains on dry, rocky, often calcareous slopes within desertscrub communities. Elevation ranges between 2,300 and 6,500 ft.	×	×	×
Threecorner milkvetch	*Astragalus geyeri* var. *triquetrus*	NV-P; FWS-SC; NV-S2	Known only from Clark County, Nevada, and Mohave County, Arizona. Dependent on open, deep, sandy soils, desert washes, or dunes, generally stabilized by vegetation and/or a gravel veneer. Elevations range between 1,500 and 2,500 ft.	×	×	×
Thurber pilostyles	*Pilostyles thurberi*	AZ-S2	Known from the Sonoran Desert in southern Arizona and southern California. Occurs in Sonoran desertscrub communities at elevations below 1,200 ft.	×		
Tidestrom's milkvetch	*Astragalus tidestromii*	CA-S2	Known from fewer than 15 occurrences in the east-central Mojave Desert mountains. Occurs on sandy or gravelly substrates of carbonate (limestone) derivation within creosotebush and desertscrub communities. Elevation ranges between 1,950 and 5,200 ft.	×	×	×
Tiehm blazingstar	*Mentzelia tiehmii*	BLM-S; NV-S1	Endemic to Nevada. Occurs on hilltops of white soil, sparsely vegetated white calcareous knolls, and bluffs with scattered perennials.	×	×	×
Tiehm buckwheat	*Eriogonum tiehmii*	BLM-S; NV-P; NV-S1	Endemic to the Silver Peak Range in Esmeralda County, Nevada. Occurs on dry, open, relatively barren, light-colored rocky clay soils derived from a formation of interbedded claystones, shales, tuffaceous sandstones, and limestones.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Tiehm peppercress	*Stroganowia tiehmii*	BLM-S; NV-S2	Endemic to Virginia Range and Table Mountain of the Pine Nut Range in Lyon County, Nevada. Inhabits dry, open, rocky clay soils in sagebrush, shadscale, and juniper woodland zones at elevations between 4,820 and 6,170 ft.	×		
Timberland blue-eyed grass	*Sisyrinchium longipes*	CA-S1	Restricted to San Bernardino County, California. Inhabits mesic meadows, stream banks, moist mixed conifer forest openings, and seeps at elevations near 6,750 ft.	×		
Todsen's pennyroyal	*Hedeoma todsenii*	ESA-E; NM-E; NM-S2	Endemic to the Sacramento and San Andres Mountains in southern New Mexico. Inhabits loose, gypseous limestone soils on steep north- or east-facing slopes in pinyon-juniper woodlands. Elevations range between 6,200 and 7,400 ft.	×	×	
Tonopah milkvetch	*Astragalus pseudiodanthus*	NV-S2	Restricted to southeastern California and western Nevada. A sand-dune-dependent species that occurs in deep, loose, sandy soils of stabilized and active dune margins, old beaches, valley floors, or drainages at elevations between 4,500 and 6,000 ft.	×	×	×
Tonopah pincushion	*Sclerocactus nyensis*	BLM-S; NV-P; NV-S1	Endemic to Esmeralda and Nye Counties, Nevada. Occurs on dry rocky soils and low outcrops of rhyolite, tuff, and possibly other rock types, on gentle slopes in open areas or under shrubs in the upper salt desert and lower sagebrush zones. Elevation ranges between 5,700 and 5,800 ft	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Tonto Basin agave	*Agave delamateri*	AZ-HS; FWS-SC; AZ-S2	Inhabits central Arizona in Gila, Maricopa, and Yavapai Counties atop benches, at slope edges, and on open hilly slopes in desertscrub at elevations of 2,350 to 5,100 ft.	×	×	
Toquima milkvetch	*Astragalus toquimanus*	BLM-S; NV-S2	Endemic to Nevada. Occurs on dry, stiff, sandy to gravelly, basic or calcareous soils along gentle slopes or flats at elevations between 6,500 and 7,500 ft.	×	×	×
Trelease agave	*Agave schottii* var. *treleasei*	AZ-HS; FWS-SC; AZ-S1	Range is Santa Catalina Mountains in Pima County, Arizona, on gravelly to rocky places in desertscrub, grasslands, juniper, and oak woodlands at elevations of 3,600 to 6,557 ft.	×	×	
Triple-ribbed milkvetch	*Astragalus tricarinatus*	ESA-E; BLM-S; CA-S1	Narrowly endemic to a small area extending from Morongo Wash to the hills northeast of Mecca in Riverside and San Bernardino Counties, California. Exists in sandy and gravelly soils of dry washes or on decomposed granite or gravelly soils at the base of canyons. Elevation ranges between 1,475 and 3,900 ft.	×		
Tufted green gentian	*Frasera paniculata*	BLM-S; CO-S1	Grows in dry, often sandy habitats in desert shrub and pinyon-juniper communities at elevations between 4,000 and 6,500 ft.	×		
Tumamoc globeberry	*Tumamoca macdougalii*	BLM-S; AZ-SR	Endemic to southern Arizona and northern Mexico in xeric situations, in shady areas of nurse plants along gullies and sandy washes at elevations below 3,000 ft.	×	×	×
Tundra saxifrage	*Muscaria monticola*	CO-S1	Occurs on rock outcrops, crevices, talus, scree slopes, rocky tundra, fellfields, nunataks, and stream banks at elevations below 14,700 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Tunnel Springs beardtongue	*Penstemon concinnus*	BLM-S; NV-S2	Range is Lincoln and White Pine Counties in Nevada; also in Utah. At elevations of 6,200 to 6,600 ft.	×		
Tusayan flame flower	*Talinum validulum*	AZ-SR; FWS-SC	Endemic to Arizona from Coconino and Yavapai Counties. In open mountain meadows, ponderosa pine forests, and pinyon-juniper woodlands and along canyon rims. Elevation ranges between 5,590 and 7,700 ft.	×	×	
Twinevine	*Sarcostemma crispum*	CO-S1	Occurs in rocky soils on hills, open-wooded slopes, arid slopes, and canyons at elevations between 5,250 and 6,500 ft.	×		
Uinta Basin spring-parsley	*Cymopterus duchesnensis*	BLM-S; CO-S1	Known only in northeastern Utah and Moffat and Rio Blanco Counties in Colorado. Inhabits cold desert shrub, sagebrush, and juniper communities between 4,700 to 6,800 ft.	×		
Upright burrhead	*Echinodorus berteroi*	AZ-S1	Inhabits clay soils of wet ditches, streams, and shallow ponds at elevations below 2,600 ft. Populations in California are not listed or ranked.	×		
Upswept moonwort	*Botrychium ascendens*	NV-S1	Widely scattered and rare throughout western North America in high-elevation montane habitats (elevations between 8,000 and 11,200 ft). Occurs in mesic habitats in coniferous forests.	×	×	
Utah gentian	*Gentianella tortuosa*	BLM-S; CO-S1	Range is Colorado, Utah, and Nevada. Grows on shale outcrops in sagebrush and spruce-fir forests at 8,500 to 10,800 ft in elevation.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Utah glasswort	*Sarcocornia utahensis*	CA-S1	Known from only two occurrences in California. Occurs on alkaline substrates within chenopod scrub and playa habitats at elevations near 1,050 ft.	×	×	×
Utah swallowwort	*Cynanchum utahense*	AZ-S2	Occurs on sandy or gravelly substrates within Sonoran and Mojave desertscrub communities. Elevation ranges between 160 and 4,700 ft.	×	×	×
Varied fishhook cactus	*Mammillaria viridiflora*	AZ-SR	Known throughout Arizona and western New Mexico. Occurs in sandy granitic soils of high hills and mountain sides in oak woodlands and at the edge of forest at elevations between 5,000 and 6,888 ft.	×	×	
Vasey's bitter-weed	*Hymenoxys vaseyi*	FWS-SC; NM-SC; NM-S2	Known from the Organ and San Andres Mountains in Doña Ana County, New Mexico. Occurs in dry sites with coarse soils in montane pinyon-juniper woodland communities. Elevation ranges between 6,900 and 8,200 ft.	×		
Veyo milkvetch	*Astragalus ensiformis* var. *gracilior*	NV-S1	Restricted to Lincoln County, Nevada, and Washington County, Utah. Occurs on stiff clay soil of open washes, valley floors, and hillsides under sagebrush within pinyon-juniper communities. Elevation ranges between 4,200 and 5,000 ft.	×	×	×
Villard pincushion cactus	*Escobaria villardii*	BLM-S; NM-E; FWS-SC; NM-S2	Known from the Franklin and Sacramento Mountains in Otero and Doña Ana Counties, New Mexico. Occurs on loamy soils of desert grassland on broad limestone benches at elevations between 4,500 and 6,500 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Violet twining snapdragon	*Maurandya antirrhiniflora* ssp. *antirrhiniflora*	CA-S1	Within California, known from fewer than 10 locations in the Providence Mountains in eastern San Bernardino County. Occurs on carbonate substrates within creosotebush scrub, Joshua tree woodland, and desertscrub habitats. Elevation ranges between 2,500 and 5,000 ft.	×		
Virgin River thistle	*Cirsium virginense*	NV-S1	Known from only a few wet saline areas in Washington County, Utah; Mohave County, Arizona; and Clark County, Nevada. Occurs in open, moist, alkaline clay soils of seep and spring areas or gypsum knolls at elevations between 1,950 and 6,550 ft.	×	×	×
Wahatoya Creek larkspur	*Delphinium robustum*	CO-S2	Occurs in broad canyon bottoms, aspen groves, subalpine meadows, riparian woodlands, and lower and upper montane coniferous forest at elevations between 7,200 and 11,200 ft.	×	×	×
Wand-like fleabane daisy	*Erigeron oxyphyllus*	CA-S1	Restricted to the Whipple Mountains in southern California. Inhabits rocky slopes and washes around seeps or springs, canyons, and cliff bases within desertscrub communities at elevations between 2,100 and 2,600 ft.	×		
Waxflower	*Jamesia tetrapetala*	BLM-S; FWS-SC; NV-S2	Restricted to southern Nevada and southwestern Utah. Occurs in crevices on limestone cliffs, alpine boulder fields, and rock fields having granitic or carbonate substrates at elevations between 7,000 and 10,500 ft.	×		
Weasel phacelia	*Phacelia mustelina*	NV-S2	Occurs in Mojave desertscrub and pinyon-juniper woodlands on volcanic or gravelly substrates at elevations between 5,000 and 5,500 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Webber's ivesia	*Ivesia webberi*	ESA-C; BLM-S; CA-S2; NV-P; NV-S1	Inhabits sandy or gravelly lower montane coniferous forest and pinyon and juniper woodland, or volcanic Great Basin scrub communities at elevations between 3,280 and 6,800 ft.	×		
Welsh's milkweed	*Asclepias welshii*	ESA-T; AZ-HS; AZ-S1	Found on open, sparsely vegetated coral pink sand dunes in sagebrush, juniper, pine and oak communities of the Great Basin desertscrub at elevations between 4,700 and 6,250 ft in Arizona and Utah.	×	×	
Western moonwort	*Botrychium hesperium*	CO-S2	Found on early successional habitats with coarse gravelly soil that undergoes periodic disturbance. These include grassy mountain slopes, snowfields, road ditches, and gneiss outcrops and cliffs, as well as old fields at elevations between 650 and 11,300 ft.	×	×	×
Western sedge	*Carex occidentalis*	CA-S2	Restricted to the San Bernardino, San Jacinto, Inyo, and White Mountains in southern California. Inhabits dry grasslands, meadows, and seeps within yellow pine and lower montane coniferous forests at elevations between 5,400 and 10,282 ft.	×		
Whisk fern	*Psilotum nudum*	AZ-HS; AZ-S1	Indigenous to the Hawaiian Islands but occurs in southern states in rock crevices, on trees, and on the ground up to 4,000 ft in elevation.	×	×	
White bearpoppy	*Arctomecon merriamii*	BLM-S	Endemic to the Death Valley region of California and Nevada. It inhabits barren, gravelly areas, rocky slopes, and limestone outcrops at elevations between 2,000 and 5,900 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
White bog adder's-mouth	*Malaxis monophyllos* ssp. *brachypoda*	CA-S1	Restricted to disjunct locations in California and Colorado. Within California, the species inhabits bogs, fens, meadows, and seeps in mesic red fir, yellow pine, and upper montane coniferous forests. Elevation ranges between 7,200 and 9,000 ft.	×		
White Mountain alum-root	*Heuchera wootonii*	FWS-SC; NM-SC	Known from the Datil, Sacramento, and White Mountains in Catron, Lincoln, and Otero Counties, New Mexico. Occurs on mountain slopes in oak thickets, pinyon-juniper woodlands, and montane coniferous forests at elevations between 7,000 and 12,000 ft.	×		
White Mountain false-penny-royal	*Hedeoma pulcherrima*	FWS-SC; NM-SC; NM-S2	Known from the Capitan, Sacramento, and White Mountains in southern New Mexico. Inhabits steep rocky hillsides and slopes in disturbed areas along roadsides, montane coniferous forests, and pinyon-juniper woodlands. Elevation ranges between 5,000 and 9,000 ft.	×		
White Mountain larkspur	*Delphinium novomexicanum*	FWS-SC; NM-SC; NM-S2	Occurs in canyon bottoms, forest meadows, and road banks in lower and upper montane coniferous forest at elevations between 7,200 and 11,200 ft.	×		
White Mountain lupine	*Lupinus sierrae-blancae*	FWS-SC; NM-SC	Inhabits meadows and roadsides in pine and fir forest at elevations between 5,900 and 10,000 ft.	×		
White River cat's-eye	*Cryptantha welshii*	BLM-S; FWS-SC	Endemic to southern Nevada on dry, open, sparsely vegetated outcrops. Known to occur on carbonate substrates at elevations between 4,500 and 6,600 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
White River penstemon	*Penstemon scariosus* var. *albifluvis*	ESA-C; BLM-S; CO-S1	Endemic to Raven Ridge in Rio Blanco County, Colorado, and Uintah County, Utah. Grows in fine textured soils and shale fragments in pinyon-juniper-desert shrub or desert shrub communities at elevations between 5,120 and 6,680 ft.	×		
White-bracted spineflower	*Chorizanthe xanti* var. *leucotheca*	BLM-S; CA-S2	Inhabits Mojave desertscrub communities and pinyon-juniper woodlands on sandy or gravelly soils. Occurs at elevations below 3,925 ft.	×	×	
White-margined beardtongue	*Penstemon albomarginatus*	BLM-S; FWS-SC; CA-S1; NV-S2	Inhabits desert sand dune habitats and Mojave desertscrub communities at elevations below 3,600 ft.	×	×	×
White-margined everlasting	*Antennaria marginata*	CA-S1	Restricted to San Gorgonio Mountain and the South Fork Santa Ana River area in southwestern San Bernardino County, California. Inhabits moist slopes, ridge tops, and forest openings within lodgepole, red fir, and yellow pine, as well as the lower and upper montane coniferous forests. Elevation ranges between 6,950 and 11,000 ft.	×		
Wiggins' cholla	*Opuntia wigginsii*	CA-S1	Occurs on sandy substrates of small washes and flats within creosotebush scrub and Sonoran desertscrub communities. Elevation ranges between 100 and 2,900 ft.	×	×	×
Wiggins' croton	*Croton wigginsii*	CA-S1	Known only from Imperial County, California; Yuma County, Arizona; and northern Mexico. Restricted to desert dunes of the Sonoran Desert. Elevation ranges between 164 and 330 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Plants (Cont.)						
Wilcox fishhook cactus	*Mammillaria wrightii* var. *wilcoxii*	NM-E; NM-S2	Occurs among grasses on low hills mostly in grasslands or along the edges of woodlands.	×	×	
Williams combleaf	*Polyctenium williamsiae*	NV-P; NV-S2	Range is Nevada, California, and Oregon. Nevada habitat is relatively barren sandy to sandy-clay or mud margins and bottoms of seasonal lakes over volcanic bedrock. Elevation ranges between 5,670 and 8,930 ft.	×	×	
Windloving buckwheat	*Eriogonum anemophilum*	BLM-S; NV-S2	Endemic to Nevada in Churchill, Humboldt, Lander, Pershing, and Washoe Counties. Occurs at elevations of 4,750 to 9,840 ft on dry, exposed, undisturbed gravelly, limestone, or volcanic ridges and knolls.	×	×	
Winged milkvetch	*Astragalus altus*	FWS-SC; NM-SC; NM-S2	Endemic to the Sacramento Mountains of southern New Mexico. Occurs on limestone soils on steep slopes and road cuts in lower montane coniferous forest. Elevation ranges between 7,000 and 8,500 ft.	×		
Wood lily	*Lilium philadelphicum*	NM-E	Inhabits high meadows of the mountain west.	×	×	
Woods draba	*Draba oligosperma*	CO-S2	Considered relatively common throughout Colorado. Occurs on gravel terraces, sandy and shaley bluffs, and alpine fell fields on gravel or sand substrates at elevations between 6,500 and 14,200 ft.	×		
Woodside buckwheat	*Eriogonum tumulosum*	BLM-S; CO-S2	Known from Moffat County in Colorado and also from Utah. Inhabits gravelly to clayey flats and slopes of saltbush and sagebrush communities, pinyon and/or juniper woodlands between 4,900 and 7,545 ft.	×		
Woolly heads	*Nemacaulis denudata*	AZ-S2	Known from southwestern California on well-developed coastal habitats and sand dunes at elevations below 330 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Wooton's wild buckwheat	*Eriogonum jamesii* var. *wootonii*	FWS-SC; NM-SC; NM-S2	Endemic to the Sacramento, White, and Gallinas Mountains of south-central New Mexico. Occurs on mountain slopes and small openings in lower and upper montane coniferous forests. Elevation ranges between 7,000 and 11,500 ft.	×		
Wright's cliff-brake	*Pellaea wrightiana*	CO-S2	Occurs on a variety of acidic to mildly basic substrates on exposed or partially shaded cliffs and rocky slopes. Elevation ranges between 5,200 and 9,500 ft.	×	×	×
Wright's marsh thistle	*Cirsium wrightii*	BLM-S; NM-E; FWS-SC; NM-S2	Known from south-central New Mexico, western Texas, and Chihuahua, Mexico. Inhabits wet, alkaline soils in springs, seeps, and marshy areas of streams and ponds. Elevation ranges between 3,450 and 8,500 ft.	×	×	
Yellow flame flower	*Talinum angustissimum*	AZ-S2	Found on mountainous habitats, including meadows, ponderosa pine forests, pinyon-juniper woodlands, and along canyon rims at elevations between 5,000 and 8,000 ft.	×		
Yellow lady's-slipper	*Cypripedium parviflorum* var. *pubescens*	AZ-HS; AZ-S1; NM-E; NM-S2	Extensive range, including Europe. Occurs in Apache, Graham, and Greenlee Counties in Arizona. Grows in boggy and swampy areas, damp woods, near rivers or canal banks, and in wet meadows, at elevations between 6,000 and 9,560 ft. Also associated with rocky wooded hillsides on north- or east-facing slopes, and wooded loess river bluffs.	×	×	
Yellow stargrass	*Hypoxis hirsuta*	CO-S1	Inhabits wet to dry woodlands and prairies at elevations below 5,500 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Plants (Cont.)						
Yellow two-tone beardtongue	*Penstemon bicolor* ssp. *bicolor*	BLM-S; FWS-SC; NV-S2	Endemic to Clark County, Nevada, on mostly BLM lands in the vicinity of Las Vegas. Occurs on calcareous or carbonate soils in washes, roadsides, rock crevices, or outcrops at elevations between 2,500 and 5,500 ft.	×	×	×
Invertebrates						
Aegialian scarab beetle	*Aegialia knighti*	BLM-S; NV-S1	Endemic to Clark County, Nevada, where it is known from one location encompassing an area less than 3,000 acres. Confined to the low, red sand hills and sand blowouts in the Meadow Valley Wash–Weiser Wash–Muddy River drainage system.	×		
Alamosa springsnail	*Pseudotryonia alamosae*	ESA-E; NM-E; NM-S1	Endemic to a single stream system in western New Mexico. Occurs on cobble, gravel, and sand substrate with algal film in thermal spring pools and runs.	×	×	
Algodones sand jewel beetle	*Lepismadora algodones*	CA-S1	Endemic to a narrow north–south corridor along the western edge of the Algodones Dunes in southern California. Habitat is active or partially stabilized desert sand dunes with widely scattered perennial vegetation cover.	×		
Amargosa naucorid	*Pelocoris shoshone amargosa*	ESA-UR; NV-S1	Endemic to the Amargosa Valley in Inyo County, California, and Nye County, Nevada. Inhabits spring-fed aquatic habitats, where it prefers quiet waters among vegetation.	×	×	×
Amargosa tryonia	*Tryonia variegata*	ESA-UR; BLM-S; NV-S2	Endemic to the Amargosa Valley in Nye County, Nevada. Inhabits spring-fed aquatic habitats where there is an abundance of detritus or aquatic macrophytes.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Invertebrates (Cont.)						
Andrew's dune scarab beetle	*Pseudocotalpa andrewsi*	CA-S2	Known from a single metapopulation in southern California. Restricted to a region of inland desert sand dunes. Preferred habitat described as troughs of loose, drifting, desert sand dunes.	×		
Andrew's marble butterfly	*Euchloe hyantis andrewsi*	CA-S1; FWS-SC	Narrowly endemic to the Baldwin Lake area in southwestern San Bernardino County, California. Utilizes hills and washes having the host plants *Streptanthus bernardinus*, *Arabis holboellii*, and *Thelypodium stenopetalum*.	×		
Animas minute moss beetle	*Limnebius aridus*	BLM-S	Occurs along edges of clear mountain streams on sand or vegetation.	×	×	
Anthony blister beetle	*Lytta mirifica*	BLM-S; FWS-SC; NM-SC	Occurs terrestrially on flowering plants. Often found in agricultural areas where the species may be a pest to certain crops.	×	×	×
Ash Meadows naucorid	*Ambrysus amargosus*	ESA-T; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is restricted to Point of Rocks and Kings Springs.	×	×	×
Ash Meadows pebblesnail	*Pyrgulopsis erythropoma*	ESA-UR; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known from six spring systems.	×	×	×
Ash Springs riffle beetle	*Stenelmis lariversi*	NV-S1	Endemic to Ash Springs in Lincoln County, Nevada. An arthropod that inhabits warm springs.	×	×	×
Baker's desertsnail	*Eremarionta rowelli bakerensis*	CA-S1	A terrestrial gastropod narrowly endemic to a region less than 39 mi^2 in size near Soda Lake in San Bernardino County, California. Primarily occurs among rocks on talus slopes.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Baking powder flat blue	*Euphilotes bernardino minuta*	BLM-S; NV-S1	Occurs only in the vicinity of Baking Powder Flat in White Pine County, Nevada.	×	×	
Bifid duct pyrg	*Pyrgulopsis peculiaris*	BLM-S; NV-S1	Known from six sites in Millard County, Utah, and two sites in White Pine County, Nevada. In Nevada, occurs in an unnamed spring at Big Springs Creek in Snake Valley and at Turnley Spring in Spring Valley.	×		
Big Dune miloderes weevil	*Miloderes* sp. 1	BLM-S; NV-S1	Endemic to the Big Dune area of Nye County, Nevada, where the species is known to be dependent on deep sand habitats.	×	×	×
Big Smoky wood nymph	*Cercyonis oetus alkalorum*	BLM-S; NV-S1	Known only in Big Smoky Valley in Lander County, Nevada. Preferred habitat is grassy alkaline flats.	×	×	
Bishop Cap tubesnail	*Coelostemma pyrgonasta*	NM-S1	Endemic to the Bishops Cap Mountain in Doña Ana County, New Mexico. Occurs terrestrially under limestone blocks below cliffs.	×		
Blunt ambersnail	*Oxyloma retusum*	NM-S1	Widely distributed across North America. Known to occur in marshy riparian habitats in association with wetland plants.	×	×	×
Boisduval's blue butterfly	*Icaricia icarioides*	FWS-SC	Known from western North America, from British Columbia, Canada, south to Arizona and New Mexico. Occurs in a variety of habitats, including desert sand dunes, mountain meadows, riparian areas, open woodlands, and sagebrush-dominated landscapes.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Borrego parnopes cuckoo wasp	*Parnopes borregoensis*	CA-S1	Endemic to California, where it is known from the Sonoran and Mojave Deserts. General habitat preferences are poorly understood. May occur in desertscrub, creosotebush scrub, yucca and cholla cactus, saltbush, and desert dune communities.	×	×	×
Bradley's cuckoo wasp	*Ceratochrysis bradleyi*	CA-S1	Endemic to California, where it is known only from eastern Riverside County. May occur in Sonoran desertscrub, creosotebush scrub, yucca and cholla cactus, saltbush, and desert dune communities.	×	×	×
Brian Head mountainsnail	*Oreohelix parawanensis*	FWS-SC; UT-SC; UT-S1	Known only from the southwestern slope of Brian Head Peak in southeastern Iron County, Utah. Inhabits alpine rocky scree habitats. Occurs among dense clumps of currants on limestone and basaltic substrates at elevations between 10,600 and 11,000 ft.	×		
Brown springsnail	*Pyrgulopsis sola*	BLM-S; FWS-SC; AZ-S1	Endemic to Brown Spring in Yavapai County in Arizona.	×	×	
Brown tassel trigonoscuta weevil	*Trigonoscuta brunnotesselata*	CA-S1	Endemic to the Mojave Desert of California, this species is known only from the Kelso Dunes in San Bernardino County.	×		
Bylas springsnail	*Pyrgulopsis arizonae*	BLM-S; FWS-SC; AZ-S1	Occurs only in three thermal springs on dead wood, gravel, and pebbles on the north bank of the Gila River in Graham County, Arizona.	×	×	
California floater	*Anodonta californiensis*	BLM-S; UT-SC; NV-S1; UT-S1	Locally abundant in streams and creeks of the western United States. Occurs in pools of lower-elevation creeks along sandy or muddy substrates.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
California McCoy snail	*Eremarionta rowelli mccoiana*	CA-S1	Known only from Riverside County, California, within an area less than 40 mi^2 near the southern Palen-McCoy Wilderness. Lives terrestrially among rocks on talus slopes.	×	×	×
Carlson's dune beetle	*Anomala carlsoni*	CA-S2	Endemic to the Algodones Dunes in southern California. Occurs in desert dune habitats associated with creosote scrub communities.	×	×	
Carson wandering skipper	*Pseudocopaeodes eunus obscurus*	ESA-E; CA-S1; NV-S1	Known in California and Nevada. Preferred habitat is alkaline desert seeps dominated by saltgrass, with a nearby freshwater source, such as hot springs.	×		
Chalcedon checkerspot	*Euphydryas chalcedona cloudcrofti*	ESA-PE	Endemic to the Sacramento Mountains near Cloudcroft in Otero County, New Mexico.	×		
Cheeseweed owlfly (cheeseweed moth lacewing)	*Oliarces clara*	CA-S1	Occurs within the Colorado River drainage of southwestern Arizona and southern California. Known to occur within creosotebush scrub communities on or near bajadas at elevations below 330 ft.	×	×	×
Chupadera springsnail	*Pyrgulopsis chupaderae*	NM-E; NM-S1	Endemic to the south end of the Chupadera Mountains in Socorro County, New Mexico, in the Rio Grande drainage. Preferred habitat is springs emerging as free-flowing streams.	×		
Circus beetle	*Eleodes hirtipennis*	CO-S1	Endemic to Colorado, restricted to great Sand Dunes and Indian Springs Natural Area. Inhabits sparsely vegetated, windblown sand dunes and flats.	×		
Cockerell's striate disc snail	*Discus shimeki cockerelli*	BLM-S	Associated with woody debris of spruce, fir, and/or aspen at elevations between 7,000 and 12,000 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Colorado blue	*Euphilotes rita coloradensis*	CO-S2	Regionally endemic, naturally rare, and susceptible to disturbance. Small isolated populations persist on transition zone prairies. Sites are undisturbed with the occurrence of host plant *Erigonum effusum* at elevations between 5,000 and 7,000 ft.	×		
Cook's Peak woodlandsnail	*Ashmunella macromphala*	BLM-S; NM-T; NM-S1	Known only from two rock slides on Cooke's Peak, Luna County, New Mexico. Occurs on a north-facing slope at 6,900 ft under rocks and debris that are bordered by oaks.	×		
Crescent Dunes aegialian scarab	*Aegialia crescenta*	ESA-UR; BLM-S; NV-S1	Endemic to Nevada, where it is restricted to the Crescent Dunes and possibly also the San Antonio and Game Range Dunes. This species is a sand dune obligate species.	×	×	×
Crescent Dunes serican scarab	*Serica ammomenisco*	ESA-UR; BLM-S; NV-S1	Endemic to Nevada, where it is restricted to the Crescent Dunes. This species is a sand dune obligate species.	×	×	×
Crystal springsnail	*Pyrgulopsis crystalis*	ESA-UR; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known only from Crystal Spring.	×	×	×
Cuckoo bee	*Paranomada californica*	CA-S1	Restricted to two locations in southern San Bernardino County in California. The ecology of this species is poorly understood. It is generally known to occur in desertscrub habitats and in association with the host *Exomalopsis verbesinae*.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Desert monkey grasshopper	*Psychomastax deserticola*	CA-S1	Historically known from shrubland and chaparral habitats in California and Nevada. The species is presumably extirpated from Nevada and is currently known from only two locations in southwestern San Bernardino County.	×		
Desert springsnail	*Pyrgulopsis deserta*	BLM-S; AZ-S1	Occurs in springs along the Virgin River in southwestern Utah and northwestern Arizona, at elevations of 1,870 to 1,900 ft.	×	×	
Distal gland springsnail	*Pyrgulopsis nanus*	ESA-UR; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known from only four spring systems.	×	×	×
Distorted metastoma	*Metastoma roemeri*	NM-SC; NM-S2	Known to occur in southern New Mexico from the Guadalupe, San Andres, Franklin, and Sacramento Mountains. This species is an obligate calciphile, not found in areas of volcanic rock. Occurs terrestrially along canyon walls under stones and dead plant material and in accumulations of limestone talus. Known to occur on the White Sands Missile Range.	×		
Doña Ana talussnail	*Sonorella todseni*	BLM-S; NM-T; FWS-SC; NM-S1	Endemic to the Doña Ana Mountains in Doña Ana County, New Mexico. Occurs terrestrially in a small, arid range of volcanic rock. Found in volcanic rock talus under sparse growth of oak and xeric-adapted shrubs.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Dusted skipper	*Atrytonopsis hianna*	CO-S2	Widespread but discontinuous geographic range. Occurs in dry open fields, open woodlands, barren areas, mid grass and tall grass prairies, foothills, prairie gulches, outcrops, and glades. The key habitat feature is the dominance of the food plants *Andotpogo gerardii* and *Schizachyrium scoparius*, with intermixed patches of bare sand or rock. Prefers relatively undisturbed canyons and open pine woods at elevations between 5,300 and 7,200 ft.	×		
Early blue	*Euphilotes enoptes primavera*	BLM-S; NV-S1	Known only in the lower mountain canyons of Mineral and Esmeralda Counties, Nevada.	×		
Elongate gland springsnail	*Pyrgulopsis isolata*	ESA-UR; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known only from the spring at Clay Pits.	×	×	×
Endemic ant	*Neivamyrmex nyensis*	NV-S1	Known from only one colony in very rocky terrain in Clark County, Nevada, south of Beatty.	×	×	×
Fairbanks springsnail	*Pyrgulopsis fairbanksensis*	ESA-UR; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known only from Fairbanks Spring.	×	×	×
Flag springsnail	*Pyrgulopsis breviloba*	ESA-UR; NV-S1	Endemic to Nevada, where it is known from only two spring systems in Lincoln and Nye Counties. Occurs in rheocrene or limnocrene springs. Associated vegetation includes rush (*Juncus* spp.), bulrush (*Schoenoplectus* and *Scirpus* spp.), spikerush (*Eleocharis* spp.), and water cress (*Rorripa* spp.).	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Invertebrates (Cont.)						
Franklin Mountain talussnail	*Sonorella metcalfi*	NM-SC; NM-S1	Known from the Organ Mountains in Doña Ana County, New Mexico. Occurs terrestrially, where it is restricted to mounds of rhyolitic talus in the upper Sonoran Life Zone (6,000 ft). Often occurs in association with pinyon-juniper woodlands.	×	×	
Franklin Mountain woodlandsnail	*Ashmunella pasonis pasonis*	NM-S1	Known from the San Andres Mountains in southern New Mexico. Occurs terrestrially in accumulations of limestone talus at elevations between 3,300 and 10,600 ft. Known to occur on the White Sands Missile Range.	×	×	
Giant Sand treader cricket	*Daihinibaenetes giganteus*	CO-S1	Endemic to Colorado on sand dunes and sandy washes.	×	×	
Gila springsnail	*Pyrgulopsis gilae*	NM-T; NM-S2	Current populations are only known in New Mexico. Occurs in mud, debris, and vegetation in cool to warm waters.	×		
Gila tryonia	*Tryonia gilae*	BLM-S; FWS-SC; AZ-S1	Occurs in a thermal spring in Graham County, Arizona. Found on dead wood, leaves, or stones.	×	×	
Giuliani's dune scarab beetle	*Pseudocotalpa giulianii*	ESA-UR; BLM-S; NV-S1	Endemic to the Big Dune and Lava Dune regions of Nye County, Nevada, where the species is known to be dependent on deep sand habitats.	×	×	×
Grand Wash springsnail	*Pyrgulopsis bacchus*	BLM-S; FWS-SC; AZ-S1	Occurs in springs within the Grand Wash trough in Mohave County in northwestern Arizona, with cattails, sedges, cottonwood, willow, ash, and mesquite. Elevation is 1,570 to 1,720 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Invertebrates (Cont.)						
Grated tryonia	*Tryonia clathrata*	ESA-UR; BLM-S; NV-S2	Endemic to the Muddy River spring system in southeastern Nevada. Occurs on algae and detritus substrates of slow-moving freshwater spring systems.	×	×	×
Great Basin silverspot butterfly	*Speyeria nokomis nokomis*	BLM-S; CO-S1; NM-S1	Occurs in isolated populations in streamside meadows and open seepage areas associated with violets.	×	×	×
Great Sand Dunes anthicid beetle	*Amblyderus werneri*	CO-S1	Endemic to Colorado, restricted to active dunes, sandy blowouts, or shifting sands with vegetative cover of less than 15%. Known global range is within an area of 112 mi^2 of the Great Sand Dunes.	×	×	
Hacheta Grande woodlandsnail	*Ashmunella hebardi*	BLM-S; NM-T; NM-S1	Restricted to the Hachita Grande area of the Big Hatchet Mountains in Hidalgo County, New Mexico. Occurs at the base of limestone outcrops where litter-soil mold collects at elevations between 6,200 and 7,500 ft.	×	×	
Hamlin Valley pyrg	*Pyrgulopsis hamlinensis*	ESA-UR; BLM-S; UT-SC; UT-S1	Known from only one complex of springs in the Hamlin–Snake Valleys watershed in Beaver County, Utah. Occurs in high-elevation springs (7,160 ft) with rocky substrates.	×	×	
Hardy’s dune beetle	*Anomala hardyorum*	CA-S2	Endemic to the Algodones Dunes in southern California. Known to occur on active north- or east-facing dunes.	×	×	
Hardy’s aegialian scarab	*Aegialia hardyi*	BLM-S; NV-S1	Occurs in Nevada.	×		
Hebard’s blue-winged desert grasshopper	*Anconia hebardi*	NM-SC	Occurs in open sand dune habitats.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Invertebrates (Cont.)						
Hoary skimmer	*Libellula nodisticta*	CO-S1	Inhabits wetlands with emergent vegetation, including marshes, shallow pools, and slow springs.	×	×	×
Hot Springs physa	*Physa acuta*	CO-S2	Occurs in drainage ditches, ponds, swamps, and streams at elevations below 10,500 ft.	×	×	
Hubbs pyrg	*Pyrgulopsis hubbsi*	ESA-UR; NV-S1	Endemic to Nevada, where it is restricted to Hiko and Crystal Springs. Occurs in rheocrene and limnocrene springs in association with vegetation that includes saltgrass (*Distichlis spicata*).	×	×	
Kanab ambersnail	*Oxyloma haydeni kanabensis*	ESA-E; BLM-S; AZ-S1	Known in Kanab, Utah, and Grand Canyon, Arizona. Occurs in perennially wet soil surface or shallow standing water, as found in marshes watered by springs and seeps at the base of cliffs.	×	×	
Kelso Dunes scarab glaresis beetle	*Glaresis arenata*	CA-S1; FWS-SC	Endemic to California from the Kelso Dunes in San Bernardino County.	×	×	
Kelso giant sand treader cricket	*Macrobaenetes kelsoensis*	CA-S1; FWS-SC	Endemic to California from the Kelso Dunes in San Bernardino County.	×	×	
Kelso Jerusalem cricket	*Ammopelmatus kelsoensis*	CA-S1; FWS-SC	Endemic to California from the Kelso Dunes in San Bernardino County.	×	×	
Kingman springsnail	*Pyrgulopsis conica*	BLM-S; FWS-SC; AZ-S1	Occurs in Burns, Dripping, and Cool Springs in the Black Mountains in Mohave County, Arizona.	×	×	
Large aegialian scarab beetle	*Aegialia magnifica*	ESA-UR; BLM-S; NV-S1	Endemic to the Big Dune and Lava Dune regions of Nye County, Nevada, where the species is known to be dependent on deep sand habitats.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Longitudinal gland pyrg	*Pyrgulopsis anguina*	ESA-UR; UT-SC; NV-S1; UT-S1	Known from only two springs in Snake Valley on the Utah–Nevada border. The one spring in Utah in which it occurs is Clay Spring in northwestern Millard County.	×	×	
MacNeill sooty wing skipper	*Hesperopsis gracielae*	BLM-S; FWS-SC; NV-S1	Endemic to a section of the Colorado River from the Arizona–Nevada–Utah border south into California and adjacent Baja California, Mexico. Occurs along desert alkali flats adjacent to river sources within desert washes and in arid canyons.	×	×	
Maricopa tiger beetle	*Cicindela oregona maricopa*	FWS-SC	Known primarily from Maricopa County, Arizona, in sandy riparian areas, such as stream banks and sand bars.	×	×	×
Median gland springsnail	*Pyrgulopsis pisteri*	ESA-UR; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known from only three spring-fed habitats.	×	×	×
Mineral Creek mountainsnail	*Oreohelix pilsbryi*	NM-T; NM-S1	Endemic to the Black Range in southwestern New Mexico along Mineral Creek. Occurs in moist limestone crevices in soil and leaf litter beneath limestone rocks.	×		
Minute tryonia	*Tryonia ericae*	ESA-UR; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known from fewer than four spring-fed habitats.	×	×	×
Moapa pebblesnail	*Pyrgulopsis avernalis*	ESA-UR; NV-S1	Endemic to Moapa Springs in Clark County, Nevada. A benthic species of freshwater springs and brooks.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Invertebrates (Cont.)						
Moapa Valley pebblesnail	*Pyrgulopsis carinifera*	ESA-UR; NV-S1	Endemic to the Moapa Valley in Clark County, Nevada, where it occurs in freshwater spring-fed habitats.	×	×	×
Moapa Warm Spring riffle beetle	*Stenelmis moapa*	ESA-UR; BLM-S; NV-S1	Endemic to the Warm Springs Area of Clark County, Nevada. A warm springs obligate species occurring in swift, shallow waters of freshwater outlet springs on gravel substrates. Often found near vegetation and bare tree roots.	×	×	×
Mojave gypsum bee	*Andrena balsamorhizae*	BLM-S; NV-S2	Endemic to Nevada, where the species is restricted to gypsum soils associated with habitats of its single larval host plant, *Enceliopsis argophylla*. Such habitats include warm desert shrub communities on dry slopes and sandy washes.	×	×	×
Mojave poppy bee	*Perdita meconis*	BLM-S; NV-S2	Known only from Clark County, Nevada, where the species is dependent on poppy plants (genus *Arctomecon*). Such habitats include roadsides, washes, and barren desert areas on gypsum soils.	×	×	×
Neararctic riffle beetle	*Stenelmis occidentalis*	NV-S1	Widespread distribution in western North America. Occurs in high-gradient creeks as well as low- to mid-gradient rivers, springs, and brooks. Preferred sites are characterized as having woody debris, rocks, and exposed, submerged, or overhanging vegetation.	×	×	×
Nelson's miloderes weevil	*Miloderes nelsoni*	CA-S1; FWS-SC	Endemic to sand dune habitats in the Eureka–Salin Valley and Mojave regions of California. Currently restricted to two locations from Inyo and San Bernardino Counties.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Invertebrates (Cont.)						
Nevada admiral	*Limenitis weidemeyerii nevadae*	NV-S2	Endemic to southern Nevada, where it is restricted to the Spring Mountains and Sheep Range. Occurs in riparian areas associated with its host plants *Populus*, *Salix*, and *Amelanchier* at elevations above 6,500 ft.	×	×	
New Mexico hot springsnail	*Pyrgulopsis thermalis*	NM-T; NM-S1	Endemic to New Mexico; its range is restricted to two thermal springs in the Gila Wilderness. Occurs in cooler portions of minor hot springs flows on algae-covered stones and rock faces.	×		
Niobrara ambersnail	*Oxyloma haydeni haydeni*	BLM-S; AZ-S1	Range is Arizona, with two populations, and Utah, at elevations between 3,120 and 3,780 ft. Occurs in permanently wet areas, or areas with damp or saturated cattail litter, or seep- or spring-fed wetlands.	×	×	
Oasis Valley springsnail	*Pyrgulopsis micrococcus*	ESA-UR; BLM-S; NV-S2	Endemic to the Amargosa River drainage and the Death, Panamint, and Saline Valleys in Inyo County, California, and Nye County, Nevada. Inhabits small springs and stream outflows on stone, travertine, and detritus.	×	×	×
Obese thorn snail	*Carychium exiguum*	NM-S2	Occurs in damp habitats, such as marshy riparian areas, floodplains, and ponds.	×	×	×
Organ Mountain talussnail	*Sonorella orientis*	NM-SC	Known from the Organ and San Andres Mountains in southern New Mexico. Occurs terrestrially in limestone talus in montane pinyon-juniper woodlands. Elevations range between 4,900 and 7,900 ft. Known to occur on the White Sands Missile Range.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Organ Mountain woodlandsnail	*Ashmunella organensis*	NM-S2	Endemic to the Organ Mountains in Doña Ana County, New Mexico. Occurs terrestrially in volcanic rock talus in montane ponderosa pine and gambel oak woodlands. Elevation ranges between 5,000 and 8,000 ft.	×		
Ovate vertigo	*Vertigo ovata*	NM-T; NM-S1	Occurs in graminoid litter and cattail leaves in swamps, sedge meadows, wet and mesic prairie, low calcareous meadows, river banks, lakeshores, roadside ditches, and wooded wetlands. Also found on bedrock outcrops, upland forest, and upland grassland habitats.	×		
Pahranagat naucorid	*Pelocoris shoshone shoshone*	BLM-S; NV-S1	Known only to occur in the Muddy and White River Basins in southern Nevada. Inhabits quiet waters of warm, spring-fed habitats.	×	×	×
Pahranagat pebblesnail	*Pyrgulopsis merriami*	ESA-UR; NV-S1	Endemic to spring-fed systems in southern Nevada. Occurs on rocks and submergent vegetation near the outflow of freshwater springs.	×	×	×
Pallid wood nymph	*Cercyonis oetus pallescens*	BLM-S; NV-S1	Known only in alkaline flats within the Reese River Valley in Lander County, Nevada.	×		
Paper pondshell	*Utterbackia imbecillis*	NM-E; NM-S2	Occurs in muddy sand in moderate current and muddy sand and substrates of reservoirs. Commonly found in artificial waters.	×		
Pecos assiminea	*Assiminea pecos*	ESA-E; NM-E; NM-S1	Occurs at Bitter Creek and the Diamond Y Spring system in Texas, and Bitter Lake National Wildlife Refuge, Chaves County, New Mexico. Preferred habitat is a humid microhabitat created by wet mud or beneath vegetation mats, typically within a few centimeters of running water.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Pecos springsnail	*Pyrgulopsis pecosensis*	BLM-S; NM-T; NM-S1	Restricted to less than 3 mi[f] of a single spring run and associated marsh in Eddy County, New Mexico. Occurs on pebbles, gypsum silt, mud, and submerged vegetation in gypsum rich water.	×		
Point of Rocks tryonia	*Tryonia elata*	ESA-UR; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known only from Point of Rocks Springs.	×	×	×
Quino checkerspot butterfly	*Euphydryas editha quino*	ESA-E; CA-S1	Inhabits chaparral and coastal sage scrub with Plantago species as host plants.	×		
Railroad Valley skipper	*Hesperia uncas fulvapalla*	BLM-S; NV-S1	Found in moist areas within Nye County, Nevada.	×	×	
Red-tailed blazing star bee	*Megandrena mentzeliae*	NV-S2	Endemic to southern Nevada, where it is known only from Clark County. The species is primarily associated with the host plant, *Mentzelia tricuspis*. Such habitats include open, dry, barren areas with gypsum to gravelly soils.	×	×	×
Riverside cuckoo wasp	*Hedychridium argenteum*	CA-S1	Endemic to California, where it is known only from eastern Riverside County. May occur in Sonoran desertscrub, creosotebush scrub, yucca and cholla cactus, saltbush, and desert dune communities.	×	×	×
Roberts' rhopalolemma bee	*Rhopalolemma robertsi*	CA-S1	Endemic to southern California from desert wash habitats in southern San Bernardino County.	×	×	×
Sacramento Mountains checkerspot butterfly	*Euphydryas anicia cloudcrofti*	FWS-SC	Restricted to meadows in mixed-conifer forests of the Sacramento Mountains in southern New Mexico. Elevation ranges between 8,000 and 9,000 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Samalayuca Dune grasshopper	*Cibolacris samalayucae*	NM-SC	Occurs terrestrially in open sand dune habitats.	×	×	×
San Emigdio blue butterfly	*Plebulina emigdionis*	CA-S2; FWS-SC	Endemic to California, where populations are extremely localized within the southern San Joaquin Valley, Mojave Desert, and Victorville area. The entire range is limited to 97 to 193 mi^2. Utilizes dry river courses and intermittent streamsides as well as adjacent flats. The host plant is *Atriplex canescens*.	×		
San Luis Dunes tiger beetle	*Cicindela theatina*	CO-S1	Endemic to Colorado, where it is restricted to active dunes, sandy blowouts, or shifting sands with vegetative cover of less than 15%. Known global range is within a 112-mi^2 area of the Great Sand Dunes. Adults prefer sandy slopes with sparse bunches of vegetation but are not found on open sand. Larvae are restricted to burrowing to leeward slopes of dunes, with particular preference for northeast aspects. Burrows are typically established on northern aspects of the crests of dune blowouts with more apparent vegetation.	×	×	
Sand Mountain blue	*Euphilotes pallescens arenamontana*	BLM-S; NV-S1	Dependent on Kearney buckwheat shrub habitat at Sand Mountain in Nevada.	×		
Sand Mountain serican scarab	*Serica psammobunus*	BLM-S; NV-S1	Endemic to Nevada and known to occur at Sand Mountain and Blow Sand Mountain.	×		
Sangre de Cristo peaclam	*Pisidium sanguinichristi*	BLM-S; NM-T; NM-S1	Known in a single cirque lake, Middle Fork Lake, in Taos County, New Mexico. Inhabits mud along emergent grasses in sheltered embayments and in rocky substrate.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Shasta crayfish	*Pacifastacus fortis*	ESA-E; CA-E; CA-S1	Known only from tributaries of the Pit River in Shasta County, California. Prefers rocky, gravelly bottoms, usually volcanic rubble, in cool, clear, spring-fed lakes, rivers, and streams.	×		
Shortneck snaggletooth	*Gastrocopta dalliana dalliana*	NM-T; NM-S1	Occurs in an array of habitats ranging from Sonoran Desert shrublands to montane forest. Known in Indian Creek Canyon at 5,900-ft elevation in Hidalgo County, New Mexico.	×		
Shotwell's range grasshopper	*Shotwellia isleta*	NM-SC	Known from southern New Mexico and adjacent Mexico. Occurs in nonsaline playas that are composed of clay soils.	×	×	×
Simple hydroporus diving beetle	*Hydroporus simplex*	CA-S1; FWS-SC	Endemic to California, where it is currently known only from the vicinity of Big Bear Lake in southwestern San Bernardino County. Inhabits shallow edge areas of creeks, lakes, or ponds.	×		
Slate millipede	*Comanchelus chihuanus*	BLM-S	Occurs along volcanic outcrops at the base of south-facing slopes.	×		
Sphinx moth	*Sphinx dollii*	CO-S2	Madrean oak woodland, arid brushlands, and desert foothills with woody broad-leafed shrubs.	×	×	×
Sporting goods tryronia	*Tryonia angulata*	ESA-UR; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known from only three spring systems.	×	×	×
Spring Mountains springsnail	*Pyrgulopsis deaconi*	BLM-S; NV-S1	Endemic to freshwater springs in two valleys of the Spring Mountains in southern Nevada.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Squaw Park talussnail	*Sonorella allynsmithi*	FWS-SC; AZ-S1	Endemic to Squaw Peak Park and Mummy Mountain, Maricopa County, Arizona. Suitable habitat is restricted to steep, north-facing, talus slopes where limestone talus breaks off and forms piles or slides.	×	×	
Swamp fingernailclam	*Musculium partumeium*	NM-T; NM-S1	Occurs in the mud bottoms of streams, swamps, ponds, and lake margins where current velocity is slow.	×	×	
Terrestrial snail	*Oreohelix florida*	NM-E	Endemic to the Florida Mountains of southwestern New Mexico.	×	×	
Texas hornshell	*Popenaias popeii*	NM-E; NM-S1	Confined to the lower portions of the Pecos River and Rio Grande drainages. In New Mexico, this species appears to be confined to the Pecos River near Carlsbad. Occurs in shallow, narrow run habitat over travertine bedrock where small-grained substrata collect.	×		
Uncompahgre fritillary butterfly	*Boloria improba crocnema*	ESA-E; CO-S1	Endemic to the San Juan Mountains of southwestern Colorado. Habitat is moist alpine slopes above 12,000 ft with extensive snow willow patches. Primarily known from Mt. Uncompahgre and Redcloud Peak, more than 75 mi west of the SEZ.	×		
Utah physa	*Physella utahensis*	BLM-S; FWS-SC; UT-SC; UT-S1	Current populations are known only from Utah. Primarily known from tributaries of Utah Lake, this species also occurs in shallow, spring-fed pools with muddy or sandy substrates.	×	×	
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	ESA-T; CA-S2	Associated with elderberry trees in Central Valley, California.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Vernal pool fairy shrimp	*Branchinecta lynchi*	ESA-T; CA-S2	Endemic to the Central Valley, Central Coast Mountains, and South Coast Mountains of California. Inhabits vernal pools and ephemeral wetlands, typically grassed or mud bottomed.	×		
Vernal pool tadpole shrimp	*Lepidurus packardi*	ESA-E; CA-S2	Endemic to Central Valley and Sacramento River Delta in California. Found in natural and artificial habitats, including vernal pools, swales, ephemeral drainages, stock ponds, reservoirs, ditches, backhoe pits, and tire ruts.	×		
Victorville shoulderband	*Helminthoglypta mohaveana*	CA-S1	Endemic to California in the vicinity of Victorville in southwestern San Bernardino County. Primarily known from shrub-scrub habitats along the Mojave River.	×		
Warm Springs naucorid	*Limnocoris moapensis*	NV-S1	Endemic to southern Nevada, where it is restricted to the Warm Springs Area. Occurs among the pebble beds of quiet waters or stream outlets.	×	×	×
White desertsnail	*Eremarionta immaculata*	CA-S1; FWS-SC	Endemic to the Riverside Mountains of eastern Riverside County, California, where its current known range is less than 100 mi^2. Lives terrestrially among rocks on talus slopes.	×		
White River wood nymph	*Cercyonis pegala pluvialis*	BLM-S; NV-S2	Occurs in White Pine County, Nevada, in a narrow marshy area in a channel of the White River.	×	×	
Wong's pyrg	*Pyrgulopsis wongi*	BLM-S; NV-S1	Known from Mineral County, Nevada, and Inyo County, California. Occurs in aquatic habitats in the Owens River drainage and the Deep Springs, Fish Lake, and Huntoon Valleys.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Invertebrates (Cont.)						
Woodlandsnail	*Ashmunella amblya cornudasensis*	BLM-S (NM)	Endemic to the Cornudas Mountain complex in Otero County, New Mexico. It is restricted to accumulations of igneous-rock talus with low junipers and live oaks.	×		
Fish						
Arkansas darter	*Etheostoma cragini*	CO-S2	Occurs in the Upper Arkansas, Fountain Creek, Horse Creek, Upper Arkansas at John Martin, Big Sandy Creek, Rush Creek, Black Squirrel Creek, and Chico Creek drainages. Preferred habitat includes spring-fed creeks with cool, clear water and herbaceous aquatic vegetation and pools with sand, fine gravel, or organic detritus substrate.	×		
Arkansas River shiner	*Notropis girardi*	ESA-T; NM-E; NM-S1	Inhabits turbid water of broad, shallow, unshaded channels of creeks and rivers, with silt and sand bottom. Introduced populations occur in the Pecos River, New Mexico.	×		
Arroyo chub	*Gila orcuttii*	CA-S2	Endemic to the southern coastal drainages of California where populations are restricted to a small range. A benthic species that uses small to moderate-sized streams, with the majority of habitat being runs and pools. Occurs in headwaters, creeks, and small to medium-sized rivers; often, intermittent streams are also used.	×	×	×
Ash Meadows Amargosa pupfish	*Cyprinodon nevadensis mionectes*	ESA-E; NV-P; NV-S2	Endemic to the Ash Meadows National Wildlife Refuge, where it is known to be in the outflows of spring-fed systems.	×	×	×
Ash Meadows speckled dace	*Rhinichthys osculus nevadensis*	ESA-E; NV-P; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known to be in the outflows of spring-fed systems.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Fish (Cont.)						
Big Smoky Valley tui chub	*Gila bicolor* ssp. 8	BLM-S; NV-P; NV-S1	Occurs in Nye County, Nevada. Preferred habitat is springs/springbrooks, lakes, and reservoirs.	×	×	
Big Spring spinedace	*Lepidomeda mollispinis pratensis*	ESA-T; NV-P; NV-S1	Endemic to Lincoln County, Nevada, where it is restricted to stream habitats of Meadow Valley Wash. Restricted to a 5-mi section of stream in Condor Canyon, which flows through private and publicly owned lands. Inhabits clean, flowing, spring-fed stream habitats with deep pool areas and shallow marshy areas near the shore.	×		
Bigscale logperch	*Percina macrolepida*	NM-T; NM-S2	Inhabits gravel, sand runs, and pools of small to medium-sized rivers. In New Mexico, this species is known from the upper Pecos River drainage.	×		
Blue sucker	*Cycleptus elongatus*	BLM-S; NM-E; NM-S1	Occurs in the largest rivers and lower parts of major tributaries, typically in channels and flowing pools with moderate current. In New Mexico, this species is known from the Pecos River system in Eddy County.	×		
Bluehead sucker	*Catostomus discobolus*	BLM-S	Known from the Virgin River basin in the project area. Occurs in the mainstem and large tributaries of the Virgin River. Adults prefer fast-flowing water over rubble substrates; young prefer quiet, shallow margins.	×	×	
Bonneville cutthroat trout	*Oncorhynchus clarkii utah*	BLM-S; NV-P; NV-S1	Inhabits high-elevation streams with coniferous and deciduous trees, and low-elevation streams in sage-steppe grasslands. Elevation ranges between 3,280 and 11,500 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Fish (Cont.)						
Bonytail chub	*Gila elegans*	ESA-E; AZ-WSC; AZ-S1; NV-P; NV-S1	Historically widespread in larger Colorado River basin streams; currently known from a few scattered occurrences. Inhabits mainstem portions of larger rivers, usually over mud or rocks. Occupies a variety of habitats in reservoirs but appears to prefer open water areas.	×		
Coho salmon (Central California coast evolutionarily significant unit [ESU])	*Oncorhynchus kisutch*	ESA-E; CA-E; CA-S2	Spawns in streams in areas dominated by redwood forest.	×		
Colorado pikeminnow	*Ptychocheilus lucius*	ESA-E; CA-E; CA-SX	Formerly widespread in the Colorado River basin; currently considered extirpated in California. Young prefer small, quiet backwaters. Adults use various habitats, including deep, turbid, strongly flowing water, eddies, runs, flooded bottoms, or backwaters.	×	×	
Colorado River cutthroat trout	*Oncorhynchus clarkii pleuriticus*	BLM-S; CO-SC	Found in the Colorado River drainage where it is limited to a few, small headwater streams and lakes in northwest Colorado.	×		
Desert pupfish	*Cyprinodon macularius*	ESA-E; AZ-WSC; CA-E; AZ-S1; CA-S1	Known from the Colorado and Gila River drainages in desert springs and outflow marshes, river-edge marshes, backwaters, saline pools, and streams. Prefers areas with sand/silt substrates and aquatic plant life, limited surface flow, and water less than 3 ft deep.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Fish (Cont.)						
Desert sucker	*Catostomus clarkii*	BLM-S; FWS-SC; UT-SC; NV-S2; UT-S2	Known from the lower Colorado, Gila, and Virgin River Basins. Found in rapids and flowing pools of streams and rivers. Adults primarily live in pools; young inhabit riffles.	×	×	
Devils Hole pupfish	*Cyprinodon diabolis*	ESA-E; NV-P; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known only from Devils Hole.	×	×	×
Fish Creek Springs tui chub	*Gila bicolor euchila*	BLM-S; NV-P; NV-S1	Occurs in Fish Creek Springs, Fish Creek Valley, in southwestern Eureka County, Nevada.	×	×	
Flannelmouth sucker	*Catostomus latipinnis*	BLM-S; FWS-SC; AZ-S2; CA-S1; NV-S1; UT-S2	Found throughout the Colorado River Basin, from Wyoming to southern Arizona and California. Considered rare in the lower Colorado River Basin; populations have been introduced in areas of the Colorado River below Lake Mead.	×	×	
Flathead chub	*Platygobio gracilis*	BLM-S	Occurs in shallow to fairly deep turbid flowing waters in main channels of small to large rivers with mud, rock, or sand bottoms.	×	×	
Gila chub	*Gila intermedia*	ESA-E; AZ-WSC; AZ-S1; BLM-S; NM-E; NM-S1	Found in smaller headwater streams, cienegas, and springs or marshes of the Gila River basin. Preferred habitat is quiet, deeper waters, or remaining near cover of terrestrial vegetation, boulders, and fallen logs.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Fish (Cont.)						
Gila longfin dace	*Agosia chrysogaster chrysogaster*	BLM-S; FWS-SC	Native to the Gila and Bill Williams drainages in Arizona. Habitat ranges from intermittent, hot, low-desert streams to cool brooks at higher elevations. Occupies relatively small or medium-sized streams with sandy or gravelly bottoms, eddies, and pools near overhanging banks or other cover.	×	×	
Gila topminnow	*Poeciliopsis occidentalis occidentalis*	ESA-E; AZ-WSC; NM-T; AZ-S1	Gila River system, currently only at a few localities in the Gila River drainage and one locality in the Bill Williams drainage. Inhabits headwater springs and vegetated margins and backwater areas of intermittent and perennial streams and rivers.	×	×	
Gray redhorse	*Scartomyzon congestus*	NM-E; NM-S1	Occurs in warm, clear to moderately turbid, sluggish, and low-gradient small to medium-sized rivers.	×		
Greenback cutthroat trout	*Oncorhynchus clarkii stomias*	ESA-T; CO-S2	Found only in cold, clear, oxygenated headwater streams in the Arkansas and South Platte River drainages in eastern Colorado. Occurs in streams along the eastern escarpment of the Sangre de Cristo Mountains.	×	×	
Greenthroat darter	*Etheostoma lepidum*	NM-T; NM-S2	In New Mexico, primarily known from the lower Pecos River drainage. Occurs in swift-flowing springs, headwaters, creeks, and small rivers. Most common in riffle areas with rocky, plant-covered surfaces.	×	×	
Headwater catfish	*Ictalurus lupus*	BLM-S; NM-S1	Known to occur throughout the Pecos River. Inhabits clear, temperate waters of creeks and small rivers, with sandy and rocky riffles, runs, and pools.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Fish (Cont.)						
Hiko White River springfish	*Crenichthys baileyi grandis*	ESA-E; NV-P; NV-S1	Endemic to Lincoln and Mineral Counties, Nevada, where it is restricted to the remaining waters of the White River and the stream and outflow habitats of Hiko and Crystal Springs. The species has also been introduced into Blue Link Spring.	×	×	
Hot Creek Valley tui chub	*Gila bicolor* ssp. 5	BLM-S; NV-P; NV-S1	Occurs in Nye County, Nevada.	×	×	
Humpback chub	*Gila cypha*	ESA-E; AZ-WSC; AZ-S1; CO-E; CO-S1	Restricted to six population centers of turbulent, high-gradient, canyon-bound reaches of large rivers within the Colorado River Basin in Arizona, Colorado, and Utah. Found in areas of slower eddies and pools of the Yampa, Gunnison, Green, and Colorado Rivers in Colorado.	×	×	
Least chub	*Iotichthys phlegethontis*	ESA-UR; BLM-S; UT-S1	Endemic to the Bonneville Basin in western Utah. Historically occurred in alkaline marshes, slow rivers and creeks, and spring-fed habitats. Currently known to occur only in alkaline spring habitats.	×	×	
Little Colorado spinedace	*Lepidomeda vittata*	ESA-T; AZ-WSC; AZ-S1	Endemic to the Little Colorado River and its north-flowing tributaries. Four populations exist in creeks in Arizona, with a preference for slow to moderate currents over fine gravel bottoms.	×	×	
Little Colorado sucker	*Catostomus* ssp. 3	BLM-S; AZ-WSC; FWS-SC; AZ-S2	Endemic to the upper portion of the Little Colorado River and several of its north-flowing tributaries in Coconino, Navajo, and Apache Counties. Inhabits creeks, small to medium-sized rivers, pools, and riffles.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Fish (Cont.)						
Loach minnow	*Tiaroga cobitis*	ESA-T; AZ-WSC; NM-T; AZ-S1; NM-S2	Limited to a bottom-dwelling habitat of turbulent, rocky riffles of mainstream rivers and tributaries within Arizona and New Mexico.	×	×	
Longfin dace	*Agosia chrysogaster*	BLM-S	Occurs in streams from deserts to lower mountains at elevations ranging from 4,900 to 6,500 ft. Inhabits shallow water with sand substrate and moderate current.	×	×	
Meadow Valley speckled dace	*Rhinichthys osculus* ssp. 11	ESA-UR; BLM-S; NV-S2	Endemic to Meadow Valley Wash and Clover Creek in Lincoln County, Nevada. Inhabits cool to warm freshwater streams with gravel or rock substrates.	×		
Meadow Valley Wash desert sucker	*Catostomus clarkii* ssp. 2	BLM-S; NV-P; NV-S2	Endemic to the Meadow Valley Wash system in Lincoln County, Nevada. Preferred habitat includes rapids and flowing pools of small to medium-sized streams and rivers primarily over bottoms of gravel-rubble with sandy silt in the interstices. Adults live in pools, moving at night to swift riffles and runs, while juveniles inhabit riffles.	×		
Mexican tetra	*Astyanax mexicanus*	NM-T; NM-S1	Historically occurred in the Rio Grande and Pecos River drainages in New Mexico and Texas. Currently considered extirpated from the SEZ region. Inhabits springs and streams in pools and below swift areas in eddies.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Fish (Cont.)						
Moapa dace	*Moapa coriacea*	ESA-E; NV-P; NV-S1	Endemic to Clark County, Nevada, where the species is restricted to 6 mi of aquatic habitat in the warm spring area at the headwaters of the Muddy River. Preferred habitat includes spring pools, outflows, and the mainstem of the Muddy River, where the water is clear and warm. Habitat use varies with age; juveniles tend to occur in spring pools and outflows where water velocities are slower and temperatures are warmer, while adults tend to occur in outflows and in the Muddy River where water velocities are faster and temperatures are slightly cooler.	×	×	×
Moapa speckled dace	*Rhinichthys osculus moapae*	ESA-UR; BLM-S; NV-P; NV-S1	Endemic to Clark County, Nevada, where it is restricted to the Muddy River. Uses stream bottoms in shallow cobble riffles. Occurs in low-velocity areas behind rocks. Spawning habitat consists of small patches of bare rocks and pebbles.	×	×	×
Moapa White River springfish	*Crenichthys baileyi moapae*	ESA-UR; NV-P; NV-S2	Endemic to southern Nevada, where it is restricted to five warmwater springs in the upper Muddy River. Preferred habitat includes spring pools and backwaters in spring outflows. More abundant in and near the springs than in the river.	×	×	×
Mohave tui chub	*Gila bicolor mohavensis*	ESA-E; CA-E; CA-S2	Currently restricted to a few known locations in San Bernardino County, California. Inhabits deep pools or shallow portions of mineralized, alkaline waters. Formerly in the mainstream Mohave River; now in lakes and mineral spring pools.	×	×	
Monitor Valley speckled dace	*Rhinichthys osculus* ssp. 5	BLM-S; NV-P; NV-S1	Occurs in Nye County, Nevada, in springs/ springbrooks.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]		
				No Action	Program	SEZ
Fish (Cont.)						
Newark Valley tui chub	*Gila bicolor newarkensis*	BLM-S; NV-P; NV-S1	Found in a spring in the western part of Newark Valley near Diamond Peak, White Pine County, Nevada. Tolerant of habitat alterations.	×		
Oasis Valley speckled dace	*Rhinichthys osculus* ssp. 6	BLM-S; NV-P; FWS-SC; NV-S1	Endemic to the Oasis Valley in Nye County, Nevada, where it is restricted to spring-fed habitats.	×	×	×
Owens pupfish	*Cyprinodon radiosus*	ESA-E; CA-E; CA-S1	Found in a limited number of refuges with clear, shallow water, and few predators.	×		
Owens tui chub	*Gila bicolor snyderi*	ESA-E; CA-E; CA-S1	Restricted to a few sites in Owens Valley, California. Found in shallow water with aquatic vegetations or in sluggish rivers.	×		
Pahranagat roundtail chub	*Gila robusta jordani*	ESA-E; NV-P; NV-S1	Endemic to Nevada, where it is restricted to the White River system. A benthic species that uses small freshwater streams.	×	×	
Pahranagat speckled dace	*Rhinichthys osculus velifer*	ESA-UR; BLM-S; NV-P; NV-S1	Endemic to Nevada, where it is restricted to the White River Valley system. Inhabits rivers, streams, tributaries, springs, brooks, marshes, lakes, and reservoirs.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Fish (Cont.)						
Pahrump poolfish	*Empetrichthys latos latos*	ESA-E; NV-P; NV-S1	Endemic to the Pahrump Valley in southern Nye County, Nevada. It is currently extirpated from its native range. Introduced populations are currently known to occur in three spring-fed habitats in Clark and White Pine Counties, Nevada: Corn Creek Springs (Desert National Wildlife Range), Shoshone Springs, and an irrigation reservoir fed by Sandstone Spring (Spring Mountain State Park).	×	×	×
Pecos bluntnose shiner	*Notropis simus pecosensis*	ESA-T; NM-E; NM-S2	Known from the upper Pecos River system in New Mexico. Inhabits main river channels over a substrate of sand, gravel, and silt.	×	×	
Pecos gambusia	*Gambusia nobilis*	ESA-E; NM-E; NM-S1	Known from the lower Pecos River system. Occurs in shallow margins of clear vegetated spring waters high in calcium carbonate as well as gypsum sinkhole habitats.	×	×	
Pecos pupfish	*Cyprinodon pecosensis*	NM-T; NM-S1	Native to the Pecos River system and nearby lakes, sinkholes, and saline springs from Texas to New Mexico. Inhabits saline springs, gypsum sinkholes, and desert streams.	×	×	
Plains minnow	*Hybognathus placitus*	BLM-S	Occurs in silt-laden rivers, slower water and side pools of silty streams. Inhabits clear to highly turbid rivers and creeks with sandy bottoms, high levels of dissolved solids, and slight to moderate erratic flows.	×	×	
Railroad Valley springfish	*Crenichthys nevadae*	ESA-T; NV-P; NV-S2	Endemic to the Railroad Valley in eastern Nye County, Nevada. It is extirpated from much of its historic natural habitat and has been introduced elsewhere. Inhabits warm spring pools, outflows, streams, and adjacent marsh habitats.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Fish (Cont.)						
Railroad Valley tui chub	*Gila bicolor* ssp. 7	BLM-S; NV-P; NV-S1	Occurs in Nye and White Pine Counties, Nevada. Preferred habitat is rivers, streams, tributaries, springs/springbrooks, marshes, lakes, and reservoirs.	×	×	
Razorback sucker	*Xyrauchen texanus*	ESA-E; AZ-WSC; CA-E; NV-P; AZ-S1; CA-S1; NV-S1	Historically widespread in larger Colorado River basin streams; currently known from a few scattered occurrences. Inhabits slow areas, backwaters, and eddies of medium to large rivers and their impoundments. The largest extant populations occur in Lake Mohave, Lake Mead, and Lake Havasu.	×	×	
Relict dace	*Relictus solitarius*	BLM-S; NV-P; NV-S2	Native to basin-bottom springs and pluvial drainages of lakes in valleys of eastern Nevada. Inhabits springs, spring-fed streams, ponds, intermittent lakes, and marshes, with mud or stone bottoms.	×	×	
Rio Grande chub	*Gila pandora*	BLM-S; CO-S1; CO-SC; NM-SC; NM-S2	Known from larger tributaries in the Colorado Basin, from Wyoming south to Arizona and New Mexico. Occupies cool to warm water streams and rivers consisting of pools adjacent to riffles and runs. Suitable habitats include boulders, tree roots, submerged trees and branches, and undercut cliff walls.	×	×	×
Rio Grande cutthroat trout	*Oncorhynchus clarkii virginalis*	ESA-C; BLM-S; CO-S1	Historically inhabited tributary streams of the Rio Grande, Pecos, and Canadian River Basins. The current distribution is confined to streams of the Rio Grande Basin.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Fish (Cont.)						
Rio Grande shiner	*Notropis jemezanus*	BLM-S; FWS-SC; NM-SC; NM-S2	Historically occurred in the Rio Grande and Pecos River drainages in New Mexico and Texas. Inhabits large, open rivers and large streams with sand, gravel, or rubble substrates.	×	×	
Rio Grande silvery minnow	*Hybognathus amarus*	ESA-E; NM-E; NM-S1	Historically known from the Rio Grande drainage in Mexico, New Mexico, and Texas. Currently confined to perennial reaches of the Rio Grande. Inhabits low-gradient, large streams with shifting sand or silty bottoms.	×	×	
Rio Grande sucker	*Catostomus plebeius*	CO-E; CO-S1; NM-S2	Restricted to streams of the Rio Grande Basin. It is found in channels and backwaters near rapidly flowing waters.	×	×	×
Roundtail chub	*Gila robusta*	BLM-S; AZ-WSC; FWS-SC; AZ-S2; NV-S1; UT-S2	Occurs in larger tributaries in the Colorado Basin, from Wyoming south to Arizona and New Mexico; cool to warm water streams and rivers consisting of pools adjacent to riffles and runs and with boulders, tree roots, submerged trees and branches, and undercut cliff walls.	×	×	×
Saratoga Springs pupfish	*Cyprinodon nevadensis nevadensis*	CA-S1	Endemic to California, where populations are primarily known from Saratoga Springs (Death Valley National Park); also known to co-occur with the Mojave tui chub in Lake Tuendae near the Soda Lake playa in the Mojave National Preserve. Utilizes shallow areas of herbaceous lakes, marshes, springs, and brooks.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Fish (Cont.)						
Smallmouth buffalo	*Ictiobus bubalus*	NM-S2	Native to the Rio Grande and Pecos River. Inhabits larger pools of higher-order rivers with low-velocity currents and abundant aquatic vegetation. Prefers clean to moderately turbid, deep, warm waters.	×	×	×
Sonora sucker	*Catostomus insignis*	BLM-S; FWS-SC	Known from the Gila and Bill Williams drainages in Arizona and New Mexico. Found in a variety of habitats from warm water rivers to cooler higher-elevation streams. Adults tend to remain near cover in daylight and move to runs and riffles at night; young live in runs and quiet eddies.	×	×	
Southern leatherside chub	*Lepidomeda aliciae*	UT-SC; UT-S1	Utah Lake and Sevier River drainages, Utah; apparently extirpated from the Provo River at Utah Lake and from the Beaver River.	×	×	
Speckled dace	*Rhinichthys osculus*	BLM-S; FWS-SC	Known to occur in most major watersheds in the western United States. Found in rocky riffles, runs, and pools of headwaters, streams, rivers, and occasionally in lakes. Often congregates below riffles and eddies.	×	×	
Spikedace	*Meda fulgida*	ESA-T; AZ-WSC; AZ-S1; NM-E; NM-S1	Formerly widespread in the Gila Rivers system of southwestern New Mexico, Arizona, and Sonora, Mexico. Currently persists only in the Verde River in Arizona and portions of the Gila River in New Mexico. Preferred habitat is permanent, flowing, unpolluted water of low-gradient streams with pool, riffle, run, and backwater areas. Substrates are sand, gravel, and cobble.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Fish (Cont.)						
Spring-run chinook salmon	*Oncorhynchus tshawytscha spring-run*	ESA-T; CA-T; CA-S1	In summer months, inhabits deep, riverine pools with cover from rocky ledges or shade. Winters in the ocean.	×		
Suckermouth minnow	*Phenacobius mirabilis*	CO-E; CO-S2; NM-T; NM-S2	Inhabits runs and riffles of creeks and small to medium-sized rivers with substrates ranging from sand and gravel to large boulders, and with low to moderate currents.	×		
Unarmored threespine stickleback	*Gasterosteus aculeatus williamsoni*	ESA-E; CA-E; CA-S1	Inhabits clear, slow-flowing streams with sand or mud substrate, water temperature of less than 75°F[g], and abundant aquatic vegetation.	×	×	
Virgin River chub	*Gila seminuda*	ESA-E; NV-P; NV-S1; UT-S1	Endemic to the Virgin River system, occurring in slower-flowing mainstem pools in areas with vegetation and boulders.	×	×	
Virgin River spinedace	*Lepidomeda mollispinis mollispinis*	BLM-S; NV-P; NV-S1; UT-S1	Endemic to the Virgin River system, occurring in mainstem and tributary reaches, particularly areas with swift runs interspersed with shaded pools.	×		
Warm Springs Amargosa pupfish	*Cyprinodon nevadensis pectoralis*	ESA-E; NV-P; NV-S1	Endemic to the Ash Meadows National Wildlife Refuge, where it is known to be in the outflows of spring-fed systems.	×	×	×
White River spinedace	*Lepidomeda albivallis*	ESA-E; NV-P; NV-S1	Endemic to east-central Nevada in cool, clear, spring-fed habitats. Historical habitat included spring-fed habitats in the White River system in Nye County, Nevada, north to the mouth of Ellison Creek and south to 10 mi south of Flag Springs. Currently restricted to Flag Springs.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Fish (Cont.)						
White River springfish	*Crenichthys baileyi baileyi*	ESA-E; NV-P; NV-S1	Currently restricted to the Ash Spring system in southeastern Nevada. Occurs in warm springs and their outflows and marshes. Tolerates extreme temperature and dissolved oxygen conditions.	×	×	×
White Sands pupfish	*Cyprinodon tularosa*	NM-T; FWS-SC; NM-S1	Endemic to the Tularosa Basin in southern New Mexico. Restricted to Malpais Spring and Lost River in Otero County, Salt Creek in Sierra County, and Mound Springs in Lincoln County. Occupies shallow pools and calm spring runs over mud-silt and sand-gravel substrates.	×	×	
Woundfin	*Plagopterus argentissimus*	ESA-E; NV-P; NV-S1; UT-S1	Restricted to the Virgin River system, occurring in seasonally warm and turbid runs and riffles. Juveniles typically prefer slower and deeper habitats than adults.	×	×	
Yaqui chub	*Gila purpurea*	ESA-E; AZ-WSC; AZ-S1	Limited to the San Bernardino and Leslie Canyon National Wildlife Refuges in Cochise County, Arizona, in deeper pools of small streams with dense aquatic vegetation.	×	×	
Yaqui topminnow	*Poeciliopsis occidentalis sonorensis*	ESA-E; AZ-WSC; AZ-S1	Limited to the Rio Yaqui basin of the San Bernardino Wildlife Refuge in Arizona, living near the surface of shallow water in vegetated springs, brooks, and margins.	×	×	
Zuni bluehead sucker	*Catostomus discobolus yarrowi*	ESA-C; BLM-S; AZ-WSC; NM-E; NM-S1	Historically inhabited headwater streams of the Little Colorado River. Currently limited to the Zuni River drainage of eastern Arizona and west-central New Mexico at elevations of 2,000 to 6,760 ft. Habitat is low-velocity pools and pool-runs.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Amphibians						
Amargosa toad	*Bufo nelsoni*	ESA-UR; BLM-S; NV-P; NV-S2	Endemic to the Amargosa Valley in Nye County, Nevada, where it is confined to isolated riparian and spring-fed habitats along the Amargosa River. Usually observed near water at the outflow of warm springs.	×	×	×
Arroyo toad	*Anaxyrus californicus*	ESA-E; CA-S2	Occurs in washes, streams, arroyos, and adjacent uplands and along rivers that have shallow, gravelly pools adjacent to sandy terraces.	×	×	
Boreal (western) toad	*Bufo boreas*	FWS-SC; CO-E; CO-S1; UT-SC; UT-S2	In close proximity to ponds, marshes, lakes, reservoirs, rivers, and streams within grassland and mountain meadow habitats at elevations between 7,000 and 11,860 ft, with highest densities occurring between 9,500 and 11,000 ft. Associated plant communities include lodgepole pine forests, spruce-fir forests, and alpine meadows characterized by *Salix* spp., *Betula glandulosa*, and *Potentilla fruticosa*.	×	×	
Boreal toad (southern Rocky Mountain population)	*Bufo boreas* pop. 1	CO-E; CO-S1	Occurs in southern Rocky Mountains in Colorado, Wyoming, and New Mexico at elevations between 7,800 and 12,000 ft. Inhabits subalpine lakes, reservoirs, ponds, creek pools, marshy areas, wet meadows, and adjacent terrestrial habitats.	×	×	
California red-legged frog	*Rana draytonii*	ESA-T; CA-S2	In or near the quiet, permanent water of streams, marshes, or ponds; also damp woods and meadows some distance from water. Breeding occurs in permanent or seasonal ponds, marshes, or quiet stream pools; eggs are often attached to emergent vegetation and float near the surface.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Amphibians (Cont.)						
Chiricahua leopard frog	*Rana chiricahuensis*	ESA-T; AZ-WSC; AZ-S2; NM-S1	Habitat generalists in the mountain regions of central and southeastern Arizona and into Mexico. Inhabits natural and man-made systems with primary habitat being oak, mixed oak, and pine woodlands with permanent water ponds of moderate depth, and also montane streams. Elevations between 3,280 and 8,890 ft.	×	×	
Colorado River toad	*Bufo alvarius*	NM-T; NM-S2	Occurs from sea level to 5,000 ft in elevation, from arid mesquite/creosotebush lowlands and grasslands to oak/sycamore/walnut groves in mountain canyons.	×	×	
Columbia spotted frog	*Rana luteiventris*	BLM-S; UT-S1	Occurs at grass/sedge margins of streams, lakes, ponds, springs, and marshes. Found near permanent, quiet water at elevations ranging from sea level to 10,000 ft.	×	×	
Columbia spotted frog	*Rana luteiventris* pop. 3	ESA-C; NV-P; NV-S2	Range includes Idaho, Oregon, and Nevada, where it is found in Nye, Elko, and Eureka Counties at elevations of 5,600 to 8,700 ft.	×	×	
Couch's spadefoot	*Scaphiopus couchii*	BLM-S; CA-S2	Known to occur in scattered populations east of the Algodones Mountains and north along the Colorado River. Wetland habitats include temporary pools, ponds, and puddles. Often occurs in arid and semiarid shrublands, shortgrass plains, mesquite savanna, creosotebush desert, thorn forest, and cultivated areas. Elevation ranges between 690 and 1,120 ft.	×	×	×
Great Basin spadefoot	*Spea intermontana*	BLM-S	Ranges from canyon bottoms to dry basins to stream floodplains in pinyon-juniper woodlands, sagebrush, and semidesert shrublands.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Amphibians (Cont.)						
Great Plains narrowmouth toad	*Gastrophryne olivacea*	BLM-S; AZ-WSC; NM-E; NM-S1	Mesquite semidesert grasslands and oak woodlands near streams, springs, and pools. Found in deep, moist burrows, often with rodents, and under large flat rocks, dead wood, or other debris near water.	×	×	
Great Plains toad	*Bufo cognatus*	BLM-S; UT-SC	Inhabits deserts, grasslands, semidesert shrublands, open floodplains, and agricultural areas at elevations from sea level to 6,000 ft. Typically in stream valleys.	×	×	
Inyo Mountains slender salamander	*Batrachoseps campi*	BLM-S; CA-S2	Endemic to 16 canyons and springs along a 25-mi section of the Inyo Mountains in Inyo County, California. Found in the vicinity of springs, seeps, and their associated riparian growth.	×		
Jemez Mountains salamander	*Plethodon neomexicanus*	BLM-S; NM-E; NM-S2	Restricted to Jemez Mountains in Sandoval, Los Alamos, and Rio Arriba Counties, New Mexico, at elevations of 7,185 to 11,256 ft. Occurs in mixed conifer habitat with rotted logs and rocks.	×	×	
Kern Canyon slender salamander	*Batrachoseps simatus*	CA-T; CA-S2	Endemic to the lower Kern River Canyon, California. Occurs in north-facing riparian areas in narrow canyons shaded with willows and cottonwoods. Habitats include creek margins, seeps, talus, and exposed chaparral.	×		
Limestone salamander	*Hydromantes brunus*	BLM-S; CA-T; CA-S1	Endemic to the Merced River in California. Inhabits mossy limestone crevices in talus of the lower Merced River Canyon.	×		
Lowland burrowing treefrog	*Smilisca fodiens*	BLM-S; AZ-WSC; AZ-S2	Occurs in Arizona in low, open mesquite grasslands associated with major washes and arroyos, and in Mexico in tropical scrub forests.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Amphibians (Cont.)						
Lowland leopard frog	*Rana yavapaiensis*	BLM-S; AZ-WSC; CA-SC; FWS-SC	Known from central and southern Arizona, northern Mexico, and extreme southeastern California. Inhabits aquatic systems in desert grasslands and pinyon-juniper woodlands. A habitat generalist that will breed in a variety of natural and man-made habitats, including rivers, streams, ponds, cattle tanks, canals, and ditches.	×	×	×
Mountain yellow-legged frog	*Rana muscosa*	ESA-E; CA-S1	Inhabits sunny riverbanks, meadow streams, isolated pools, and lake borders in the southern Sierra Nevada and the mountains of southern California. Prefers sloping banks with rocks or vegetation to the water's edge.	×		
Northern cricket frog	*Acris crepitans*	BLM-S; CO-SC	Extensive range; in Colorado, preferred habitat is sunny, muddy, or marshy gently sloped edges of ponds, reservoirs, and streams.	×		
Northern leopard frog	*Rana pipiens*	ESA-UR; BLM-S; BLM-S; AZ-WSC; AZ-S2; CA-S2; CO-SC; NM-S2; NV-S2	Inhabits a variety of habitats at elevations from 2,640 to 9,155 ft. Wetland community types, including low-gradient creeks, moderate-gradient rivers, pools, springs, canals, floodplains, reservoirs, and shallow lakes. Permanent water with rooted aquatic vegetation is the preferred wetland habitat. Terrestrial habitats include wet meadows and fields.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Amphibians (Cont.)						
Plains leopard frog	*Rana blairi*	BLM-S; CO-SC; AZ-WSC; AZ-S1	Range is western Indiana, through the plains to eastern Colorado and New Mexico and Texas. Population in Arizona is isolated to the western side of the Chiricahua Mountains and Sulphur Springs Valley. Found near streams, ponds, marshes, or ditches in prairie and desert grasslands, sandhills, canyon bottoms, and also oak and oak-pine woodlands, and farmland.	×	×	
Relict leopard frog	*Rana onca*	ESA-C; NV-P; NV-S1	Current range is restricted to a few small areas in Arizona and Nevada within the Lake Mead National Recreation Area. Occupies a variety of habitats, including springs, streams, outlet creeks, and wetlands characterized by clean, clear water, in both deep and shallow water. The five recently extant populations inhabit spring systems with largely unaltered hydrology and no introduced American bullfrogs or game fishes. Breeding habitat includes pools or slow-moving side areas of streams.	×	×	
Sacramento Mountain salamander	*Aneides hardii*	BLM-S; NM-T; FWS-SC	Endemic to southern New Mexico from the Sacramento and Capitan Mountains. Known to occur in moist coniferous forests at elevations above 7,875 ft. Found under litter, logs, bark, rocks, and woody debris.	×		
Santa Cruz long-toed salamander	*Ambystoma macrodactylum croceum*	ESA-E; CA-E; CA-S1	Occurs in coastal woodland and chaparral near ponds and marshes for breeding. Requires shade and abundant soil humus.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Amphibians (Cont.)						
Shasta salamander	*Hydromantes shastae*	BLM-S; CA-T; CA-S1	Endemic to a small area near Shasta Lake, Shasta County, California. Found around cliff faces, vertical cavern walls, and level ground in mixed forests of Douglas fir, pines, and oaks. Lives in moist caves and rock crevices.	×		
Southwestern toad	*Bufo microscaphus*	BLM-S; FWS-SC; NV-S2; UT-SC; UT-S2	Inhabits woodlands and low-elevation riparian habitats in association with permanent or semipermanent water bodies. Occurs in and along streams, ditches, flooded fields, irrigated croplands, and permanent reservoirs.	×	×	×
Tehachapi slender salamander	*Batrachoseps stebbinsi*	BLM-S; CA-T; CA-S2	Endemic to California in the Caliente Creek drainage at the juncture of the Sierra Nevada and the Tehachapi Mountains. Inhabits north-facing moist canyons and ravines in oak and mixed woodlands in arid to semiarid locations. Found under rocks, logs, and other debris in moist areas.	×		
Western spadefoot	*Spea hammondii*	BLM-S	Endemic to California and Baja California, Mexico. Prefers open areas with sandy or gravelly soils, in a variety of habitats, including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, floodplains, playas, and mountains.	×		
Yellow-blotched salamander	*Ensatina eschscholtzii croceator*	BLM-S; CA-S2	Endemic to the lower Kern River Canyon in California. Found in evergreen and deciduous forests, under logs, rocks, and other surface debris.	×		
Yosemite toad	*Anaxyrus canorus*	ESA-C; CA-S2	Inhabits montane wet meadows and also seasonal ponds associated with pine and subalpine conifer forests at elevations between 6,400 and 11,320 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Reptiles						
Alameda whipsnake	*Masticophis lateralis euryxanthus*	ESA-T; CA-T; CA-S2	Occurs in chaparral foothills, shrublands with grassy patches, rocky canyons, and watercourses.	×	×	
Arizona mud turtle	*Kinosternon arizonense*	AZ-S2	Known only from Arizona and Mexico. In Arizona, distribution is limited to southern Maricopa and Pima Counties. Inhabits various quiet or slow-flowing bodies of water, usually with soft mud or sand bottom.	×		
Arizona night lizard	*Xantusia arizonae*	AZ-S1	Endemic to Arizona from Mohave, Pinal, and Yavapai Counties in arid and semiarid granite outcroppings and rocky areas, among fallen leaves, trunks of agave, or other vegetative debris. Associated with pinyon-juniper and chaparral-oak plant communities.	×	×	×
Arizona skink	*Eumeces gilberti arizonensis*	AZ-WSC; FWS-SC; AZ-S1	Known only from west-central Arizona. Among rocks, logs, and leaf litter areas near permanent or semipermanent streams; riparian drainages up through oak-pine woodlands.	×	×	
Barefoot banded gecko	*Coleonyx switaki*	CA-T; CA-S1	Known from southern California from Borrego Springs south to Baja California. Found in arid, rocky areas on flatlands and canyons where there are large boulders and rock outcrops with sparse vegetation. Elevation ranges from sea level to 2,000 ft.	×		
Blunt-nosed leopard lizard	*Gambelia sila*	ESA-E; CA-E; CA-S1	Inhabits semiarid grasslands, alkali flats, low foothills, canyon floors, large washes, and arroyos. Prefers sandy soils.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Reptiles (Cont.)						
Brown vinesnake	*Oxybelis aeneus*	AZ-WSC; AZ-S1	Range is Arizona through Mexico into South America. Arizona habitat is brush-covered hillsides, canyons, and stream bottoms with sycamore, oak, walnut, and wild grape, at elevations between 3,000 and 5,800 ft.	×		
California mountain kingsnake (San Diego population)	*Lampropeltis zonata (pulchra)*	BLM-S; CA-S1	A subspecies of California kingsnake, found in three areas of southern California in San Diego County. Found in diverse habitats, including coniferous forests, oak-pine woodlands, chaparral, and scrub areas.	×	×	
California mountain kingsnake (San Bernardino population)	*Lampropeltis zonata (parvirubra)*	CA-S1; FWS-SC	Inhabits valley-foothill hardwood, hardwood-conifer, and coniferous forests as well as mixed and montane chaparral, valley-foothill, and wet meadow habitats. Uses sites having dense shrub, rock, or boulder cover in close proximity to stream or lakeshores.	×	×	
Canyon spotted whiptail	*Aspidoscelis burti*	BLM-S; NM-T; NM-S2	Distribution extends from southern Arizona, southwestern New Mexico, through Sonora into northern Sinaloa, Mexico. Only found in Guadalupe Canyon in Hidalgo County, New Mexico, at elevations of 4,333 to 4,550 ft in riparian zones with sycamore, cottonwood, ash, or bunch grasses.	×	×	
Chuckwalla	*Sauromalus ater*	BLM-S; FWS-SC; UT-SC; UT-S2	Widely distributed throughout the Mojave and Sonoran Deserts in California and Arizona. Considered a BLM-designated sensitive species in the state of Arizona. Inhabits rocky flats and hillsides, lava flows, and large outcrops associated with desert creosotebush communities at elevations below 6,000 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Reptiles (Cont.)						
Coachella Valley fringe-toed lizard	*Uma inornata*	ESA-T; CA-T; CA-S1	Endemic to the Coachella Valley of Riverside County, California. Inhabits sparsely vegetated, windblown sand dunes and sandy flats with fine, loose sand for burrowing at elevations below 1,600 ft.	×		
Colorado Desert fringe-toed lizard	*Uma notata*	BLM-S; CA-S2; CA-SC	Known from the Sonoran Desert in California from the Salton Sea east to the Colorado River and south to Baja California. Inhabits sparsely vegetated, arid areas with windblown sand, including dunes, flats, and washes, at elevations below 1,600 ft.	×	×	×
Common kingsnake	*Lampropeltis getula*	BLM-S; CO-SC; CO-S1	Extensive range. In Colorado, found in areas dominated by shortgrass prairie, including floodplains, rural residential areas, and near streams.	×	×	
Coronado skink	*Eumeces skiltonianus interparietalis*	BLM-S; CA-S1	Range encompasses the coastal range of southern California through the north Pacific coast region of Baja California, Mexico. Inhabits grasslands, woodlands, and chaparral communities, especially in open sunny areas. Often found near the edges of creeks and rivers.	×	×	
Desert iguana	*Dipsosaurus dorsalis*	BLM-S; UT-SC	Range is southwestern United States and parts of Mexico from below sea level in desert sinks to 5,000 ft in elevation. Occurs in Utah along the Virgin River in the vicinity of Beaver Dam Wash. Its range in the United States is closely associated with that of creosotebush.	×	×	
Desert massasauga	*Sistrurus catenatus edwardsii*	AZ-WSC; AZ-S1	Wide range in North America, but only two isolated populations in Arizona, where it is found in tobosa grassland along sloping bajadas with surface rocks.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Reptiles (Cont.)						
Desert night lizard	*Xantusia vigilis*	UT-SC; UT-S2	Arid and semiarid habitats among fallen leaves and trunks of yuccas, agaves, cacti, and other large plants; also in crevices of rock outcroppings and under logs and bark of foothill pines; ranges locally into pinyon-juniper, sagebrush-blackbrush, and chaparral-oak.	×	×	
Desert rosy boa	*Charina trivirgata gracia*	BLM-S; FWS-SC	Known from southeastern California and western Arizona. Arid scrublands, rocky deserts, and canyons with permanent or intermittent streams.	×	×	×
Desert spiny lizard	*Sceloporus magister*	BLM-S; CO-S2	Found in southwestern states and Mexico. Colorado habitat includes shrub-covered banks and rocky areas near streams or arroyos.	×	×	
Desert tortoise	*Gopherus agassizii*	ESA-T; ESA-C; BLM-S; CA-T; AZ-WSC; NV-P; NV-S2; UT-S1	Occurs in the Mojave and Sonoran Deserts in desert creosotebush communities on firm soils for digging burrows, along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Mojave populations north and west of the Colorado River are listed as threatened under the ESA; Sonoran populations south and east of the Colorado River are candidates for listing under the ESA.	×	×	×
Flat-tailed horned lizard	*Phrynosoma mcallii*	BLM-S; AZ-WSC; AZ-S2; CA-S2	Known primarily from the Imperial Valley in California. Inhabits sandy desert hardpan or gravel flats with sparse vegetation and low species diversity at elevations below 850 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Reptiles (Cont.)						
Gila monster	*Heloderma suspectum*	BLM-S; NV-P; FWS-SC; CA-S1; NV-S2; UT-S1	Scattered distribution in the Mojave and Sonoran Deserts. Occurs in rocky, deeply incised topography and riparian habitat, desertscrub, thorn scrub, xero-riparian, oak woodland, and semidesert grassland. On lower mountain slopes, rocky bajadas, canyon bottoms, and arroyos at elevations below 3,950 ft.	×	×	×
Gray-banded kingsnake	*Lampropeltis alterna*	NM-E; NM-S1	Inhabits dry, rocky desert terrain, including desert flats, rocky hillsides, canyons, escarpments, limestone ledges, roadcuts, and mountain gaps.	×	×	
Green rat snake	*Senticolis triaspis*	NM-T; NM-S1	Range extends from southeastern Arizona and southwestern New Mexico, into Mexico and Costa Rica. In the United States, habitat includes woodlands and chaparral of rocky mountain canyons near streams.	×	×	
Longnose leopard lizard	*Gambelia wislizenii*	BLM-S; CO-SC; CO-S1	Range is western United States and Mexico. In Colorado, found in greasewood and sagebrush on broad outwash plains at elevations below 5,200 ft.	×	×	
Massasauga	*Sistrurus catenatus*	ESA-C; BLM-S; CO-SC; CO-S2	Range from Ontario to Mexico; in Colorado, inhabits dry plains grassland and sandhill areas.	×		
Mexican garter snake	*Thamnophis eques*	BLM-S; NM-E; NM-S1	Inhabits permanent water with vegetation, including stock tanks, ponds, cienegas, cienega streams, and riparian woods. Also, in or near water in highland canyons with pine-oak forest and pinyon-juniper woodland, and will enter mesquite grassland and desert areas along valleys and stream courses.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Reptiles (Cont.)						
Mexican rosy boa	*Charina trivirgata trivirgata*	BLM-S; FWS-SC; AZ-S1	Sonoran Desert near rocky hillsides and rock outcroppings.	×	×	×
Midget faded rattlesnake	*Crotalus oreganus concolor*	BLM-S; CO-SC	Endemic to an area of Wyoming, Colorado, and Utah.	×		
Milk snake	*Lampropeltis triangulum*	BLM-S	Occurs throughout much of southern Colorado and northern New Mexico at elevations below 8,000 ft. Inhabits shortgrass prairie, sandhills, shrubby hillsides, pinyon-juniper woodlands, and arid river valleys.	×	×	×
Mojave fringe-toed lizard	*Uma scoparia*	BLM-S; AZ-WSC; AZ-S1; CA-SC	Known from sandy habitats in the Mojave Desert from Death Valley south to the Colorado River near Blythe, California, and extreme western Arizona. Inhabits sparsely vegetated desert areas with fine windblown sand, including dunes, flats, and washes at elevations below 3,000 ft.	×	×	×
Mojave rattlesnake	*Crotalus scutulatus*	BLM-S; FWS-SC; UT-SC; UT-S1	In Utah, this species is known only from the extreme southwestern corner of the state where it can be found in barren desert and desertscrub habitats.	×	×	
Mojave shovel-nosed snake	*Chionactis occipitalis occipitalis*	AZ-S1	Known only from Arizona in sparsely vegetated desert areas on rocky slopes, dunes, washes, and sandy flats.	×	×	×
Mottled rock rattlesnake	*Crotalus lepidus lepidus*	NM-T; NM-S2	Known to occur in the Guadalupe Mountains in southern New Mexico. Inhabits mountain areas of boulders and rocks, including talus slopes and pinyon-juniper woodlands.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Reptiles (Cont.)						
Mountain skink	*Eumeces callicephalus*	NM-T; NM-S1	Occurs in rocky pine and oak habitats in the mountains, particularly in canyon riparian and hillside situations.	×	×	
Narrow-headed gartersnake	*Thamnophis rufipunctatus*	BLM-S; AZ-WSC; FWS-SC; AZ-S1; BLM-S; NM-T; NM-S2	Occurs in Arizona, New Mexico, and Mexico along rocky streams with abundant riparian vegetation, in areas of pinyon-juniper, oak-pine, or ponderosa pine. Bank vegetation is Arizona alder, velvet ash, willows, and canyon grape.	×		
New Mexico ridge-nosed rattlesnake	*Crotalus willardi obscurus*	ESA-T; AZ-S1; NM-E; NM-S1	Known only in the Animas, Peloncillo, and Sierra de San Luis Mountains of New Mexico, Arizona, and Mexico. Inhabits Madrean evergreen woodland and Petran montane forest communities above 5,000 ft. Also found in foothill canyons in pinyon-juniper woodland, and canyon bottoms with alder, box elder, and maple.	×		
Northern Mexican gartersnake	*Thamnophis eques megalops*	ESA-C; AZ-WSC; AZ-S1	Occurs in New Mexico, Mexico, and Arizona, where its habitat is densely vegetated habitat surrounding cienegas, cienega-streams, and stock tanks in generally open areas.	×	×	
Northern red-diamond rattlesnake	*Crotalus ruber ruber*	CA-S2	Endemic to California from rocky areas of bare rock-talus-scree, chaparral shrubland, desertscrub, thorn scrub, open chaparral, mesquite/cactus, and pine-oak woodland communities. Occurs at elevations below 2,950 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Reptiles (Cont.)						
Northern sagebrush lizard	*Sceloporus graciosus graciosus*	BLM-S	Inhabits sagebrush and other types of shrublands. Also occurs in pinyon-juniper woodland and openly wooded areas of ponderosa pine or Douglas-fir. Regularly perches on rocks, logs, or snags.	×		
Plainbelly water snake	*Nerodia erythrogaster*	NM-E; NM-S1	Occurs in aquatic and wetland habitats, with permanent or semipermanent water, including forested and shrubby swamps, marshes, pond and lake edges, ditches, and slow streams.	×		
Redback whiptail	*Aspidoscelis xanthonota*	FWS-SC; AZ-S2	Known from Arizona and adjacent Mexico. In canyons and hills in juniper-oak woodlands, in Sonoran Desert upland habitats, among dense shrubby vegetation, and along streams and arroyos.	×	×	
Ridgenose rattlesnake	*Crotalus willardi*	NM-E; NM-S1	Inhabits montane areas of pine-oak, oak scrub, oak-juniper, and pine-fir woodland, foothill canyons in pinyon-juniper woodland, and canyon bottoms with sycamore, alder, box elder, and maple, along stream courses, rock outcrops, or downed logs.	×	×	
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	ESA-E; CA-E; CA-S2	Occurs near freshwater marshes, ponds, and slow-moving streams. Seeks cover in bankside vegetation.	×	×	
Sand dune lizard	*Sceloporus arenicolus*	ESA-P; BLM-S; NM-E; NM-S1	Occurs in the vicinity of active and semistabilized sand dunes, primarily on the Mescalero Sands in southeastern New Mexico and Monahan Sandhills in Texas, at elevations of 2,550 to 4,595 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Reptiles (Cont.)						
Sidewinder	*Crotalus cerastes*	BLM-S; UT-SC; UT-S2	Occurs nearly exclusively in open sandy habitat in creosote and sand sage communities. During periods of inactivity, populations occupy underground burrows of rodents or tortoises.	×	×	
Sierra alligator lizard	*Elgaria coerulea palmeri*	BLM-S; NV-P; NV-S2	Inhabits woodlands, forests, and grasslands in the Sierra Nevada Mountains. Commonly found under rocks or other cover.	×	×	
Southern rubber boa	*Charina umbratica*	CA-T; CA-S2; FWS-SC	Found only in a few disjunct areas in montane southern California. Inhabits mixed-coniferous montane forests at elevations between 5,000 and 9,000 ft, often under rocks or logs.	×	×	
Southwestern pond turtle	*Actinemys marmorata pallida*	CA-S2	Uses ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches within woodland, forest, and grassland habitats. Prefers slow-moving, shallow waters with abundant vegetation, and either rocky or muddy bottoms. Logs, rocks, cattail mats, and exposed banks are critical habitat components for thermoregulatory behavior.	×	×	×
Speckled rattlesnake	*Crotalus mitchellii*	BLM-S; UT-S1; UT-SC	Native to the southwestern United States and parts of Mexico. Found only in the Mojave Desert in Utah.	×	×	
Texas horned lizard	*Phrynosoma cornutum*	BLM-S	Flat, open, generally dry country with little plant cover, except for desertscrub, bunchgrass, and cactus. Occurs in areas of loose soil that is sandy, loamy, or rocky.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Reptiles (Cont.)						
Triploid Colorado checkered whiptail	*Aspidoscelis neotesselata*	CO-S2	Endemic to Colorado in the Arkansas River Valley. Occurs on valleys, arroyos, canyons, and on hillsides within herbaceous grassland, shrublands, chaparral, and coniferous woodlands. Utilizes sites characterized by plains, grasslands, or juniper woodlands at elevations below 7,000 ft.	×	×	
Tucson shovel-nosed snake	*Chionactis occipitalis klauberi*	ESA-C; BLM-S; AZ-S1	Endemic to Arizona from Pima, Pinal, and Maricopa Counties in creosote-mesquite floodplain habitats with soft, sandy, loam soils and sparse gravel.	×	×	×
Two-striped garter snake	*Thamnophis hammondii*	BLM-S; CA-S2	Range is along coastal southern California. Generally found around pools, creeks, cattle tanks, and other water sources.	×		
Western banded gecko	*Coleonyx variegatus*	BLM-S; UT-SC; UT-S2	Inhabits desertscrub habitat along rocky hillsides and sandy flats and washes of canyon lands.	×	×	
Western blind snake	*Leptotyphlops humilis*	BLM-S; UT-SC; UT-S1	Range is the southwestern United States and into Mexico at elevations below sea level in desert sinks to 5,000 ft. Fossorial, generally occurring in sandy areas, alluvial deposits, and other areas with loose soils. May sometimes be found under rocks or wood debris, among plant roots, or in crevices.	×	×	
Yuma Desert fringe-toed lizard	*Uma rufopunctata*	BLM-S; AZ-WSC; FWS-SC; AZ-S2	Restricted to extreme southwestern Arizona and adjacent Mexico. Known from the Mohawk and Yuma dune systems in Yuma County, Arizona, as well as the Pinta Sands in Pima County, Arizona. Restricted to sparsely vegetated, fine, windblown sand dunes, flats, riverbanks, and washes of very arid desert.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Reptiles (Cont.)						
Zebra-tailed lizard	*Callisaurus draconoides*	BLM-S; UT-SC; UT-S2	Occurs on open desert habitat, often in wash bottoms or other areas sparsely vegetated with creosote.	×	×	
Birds						
Abert's towhee	*Pipilo aberti*	NM-T; NM-S1	Inhabits woodlands and thickets along rivers and streams.	×	×	
American peregrine falcon	*Falco peregrinus anatum*	BLM-S; AZ-WSC; NM-T; CO-SC; CO-S2; NM-S2; FWS-SC	Delisted from the ESA in 1999, populations have reoccupied much of the historic habitat in California and Arizona. Nests along cliffs and bluffs, as well as in urban areas on buildings. Prefers open areas to hunt for other bird species and small mammals.	×	×	×
American redstart	*Setophaga ruticilla*	AZ-WSC; AZ-S1	Breeding habitat is composed of mature and second-growth wooded habitats. Deciduous and mixed deciduous-coniferous forest; old-growth forests with regenerating trees, thickets, small groves, and swamps.	×		
American three-toed woodpecker	*Picoides dorsalis*	UT-SC; NV-S2; UT-S2	Year-round resident of montane coniferous forests in Utah. Nests in loose colonies in spruce, tamarack, pine, cedar, and aspen trees. Forages for insects on scaly-barked trees, such as spruce, hemlock, lodgepole pine, and tamarack.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
American white pelican	*Pelecanus erythrorhynchos*	BLM-S; FWS-SC; CO-S1; UT-SC; NV-S2; UT-S1	May occur as a summer resident in large reservoirs within the project area. Suitable habitat does not occur on any of the proposed SEZs in Utah; however, flocks may be observed migrating through each SEZ.	×	×	×
Arizona bell’s vireo	*Vireo bellii arizonae*	BLM-S; CA-E; CA-S1	A summer resident of willow and mesquite riparian habitat of the lower Colorado River Valley. Historically occurred throughout the lower Colorado River, currently known in the solar analysis area from Yuma, Arizona.	×	×	
Arizona grasshopper sparrow	*Ammodramus savannarum ammolegus*	NM-E; NM-S1	Restricted to grasslands in southeast Arizona, southwest New Mexico, northern Sonora, and Chihuahua. Within New Mexico, limited to well-developed grasslands in the southern Animas and western Playas valleys.	×	×	
Baird’s sparrow	*Ammodramus bairdii*	BLM-S; NM-T; FWS-SC; NM-S1	A winter nonbreeding resident in the southwestern United States and northern Mexico. Nonbreeding habitat includes open grasslands and overgrown fields.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Bald eagle	*Haliaeetus leucocephalus*	BLM-S; CA-E; CA-S2; CO-T; NV-P; AZ-WSC; NM-T; FWS-SC; CO-S1; NM-S1; NV-S1; UT-SC; UT-S1	Found near large bodies of water or free-flowing rivers with abundant fish and waterfowl prey. Nesting occurs in tall trees near bodies of water; winters near open water. Occasionally forages in arid shrubland habitats.	×	×	×
Bank swallow	*Riparia riparia*	BLM-S; CA-T; CA-S2	Widespread summer breeding range in North America; winters in Central and South America. Habitat includes open and partly open situations, frequently near flowing water. Nests in deep sand, dirt, or gravel banks. Feeds primarily on flying insects.	×		
Barrow's goldeneye	*Bucephala islandica*	BLM-S; CO-S2; NM-S2	A winter resident in southern Colorado. Occurs on larger lakes and rivers.	×	×	×
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*	CA-E	Year-round resident in southern California coastal marshes from San Diego County to Santa Barbara County. Also known from Baja California, Mexico. Occurs in salt marshes. Nests on the ground in natural depressions or scrapes.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Bell's vireo	*Vireo bellii*	NM-T; FWS-SC; NM-S2	Inhabits dense shrublands or woodlands along lower-elevation riparian areas among willows, scrub oak, and mesquite. May nest in any successional stage with dense understory vegetation.	×	×	×
Belted kingfisher	*Megaceryle alcyon*	AZ-WSC; AZ-S2	Inhabits rivers, brooks, ponds, lakes, coasts, streams, creeks, mangroves, swamps, and estuaries.	×	×	
Bendire's thrasher	*Toxostoma bendirei*	BLM-S	A summer resident in localized areas throughout the SEZ region. Uses a variety of desert habitats with fairly large shrubs or cacti and open ground, or with open woodland with scattered shrubs and trees, between 0 and 1,800 ft in elevation.	×	×	×
Black skimmer	*Rynchops niger*	CA-S1	Known in California from coastal, estuarine, marsh, and wetland habitats, including the Salton Sea in Imperial and Riverside Counties. Breeding habitats are usually small islands or impounded levees along aquatic habitats; nests are constructed on bare ground. Winter habitat includes mud flats in estuaries as well as urban beaches associated with estuaries or protected harbors and near river mouths.	×		
Black swift	*Cypseloides niger*	FWS-SC; UT-SC; UT-S1	Aerial; forages over forests and in open areas. Nests behind or next to waterfalls and wet cliffs.	×	×	
Black tern	*Chlidonias niger*	BLM-S; FWS-SC	A migratory transient in the southwestern United States. Inhabits wet grasslands, marshes, and flooded agricultural fields. Also occurs along playa margins and open water habitats in desert lowland areas.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Black-and-white warbler	*Mniotilta varia*	AZ-S1	Considered a migratory transient in the western United States. Nonbreeding habitat varies from early successional disturbed areas to mature forests.	×		
Black-bellied whistling-duck	*Dendrocygna autumnalis*	AZ-WSC	Inhabits estuaries, rivers, ponds, stock tanks, marshes, and swamps. Often found in riparian areas or thickets. Uses natural cavities in live or dead trees for nesting.	×	×	
Black-necked stilt	*Himantopus mexicanus*	AZ-S2	Patchily distributed in central and southern California; rarely occurs in Arizona. Populations in California have no federal or state status or rank. Populations in Arizona, however, are imperiled in the state (S2). Populations occur in the Central Valley of California, from San Francisco south along the Pacific Coast and east to the Colorado River. Inhabits barren, estuarine, and fresh emergent wetlands; irrigated grain crops; irrigated hayfields; lacustrine, riverine, and saline emergent wetlands; and wet meadows.	×	×	
Bobolink	*Dolichonyx oryzivorus*	BLM-S; AZ-WSC; AZ-S1; UT-S2; UT-SC	A long-distance migrant with preferred habitat of herbaceous wetland, cropland-hedgerow, and grassland-herbaceous. Isolated breeding populations in northern Utah, where preferred habitat is wet meadow, wet grassland, and irrigated agricultural areas.	×	×	
Boreal owl	*Aegolius funereus*	CO-S2; NM-S2	Prefers mature, structurally complex spruce-fir forest close to open grassy locations. Also associated with habitats composed of dense coniferous forest, mixed forest, or alder, aspen, or stunted spruce thickets.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Broad-billed hummingbird	*Cynanthus latirostris*	NM-T; NM-S2	Riparian woodlands at low to moderate elevations (2,800 to 5,500 ft), characterized by cottonwood or sycamore trees. Nests in a variety of trees, shrubs, and forbs. Also occurs in Chihuahuan desertscrub in open stands of creosotebush and large succulents.	×		
Brown-crested flycatcher	*Myiarchus tyrannulus*	CA-S2	Occurs in riparian woodlands or forests dominated by cottonwoods and willows in southern California. The presence of woodpeckers or other cavity-excavating species is important.	×	×	
Buff-collared nightjar	*Caprimulgus ridgwayi*	NM-E	Occurs in summer in southeastern Arizona and extreme southwestern New Mexico. Inhabits open woodland, including scrub, deciduous forest, and hillsides with scattered trees, most frequently in arid situations.	×	×	
Cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	BLM-S; AZ-WSC; FWS-SC; AZ-S1	Occurs in Arizona, Texas, and Mexico. Habitat in Arizona is streamside cottonwoods, willows, and mesquite bosques, with saguaros.	×	×	
California black rail	*Laterallus jamaicensis coturniculus*	BLM-S; AZ-WSC; CA-FP; CA-T; AZ-S1; CA-S1; FWS-SC	Within the analysis area, this species is known year-round from the Imperial Valley and lower Colorado River in Arizona and California. May be locally common in marshes along the Colorado River or canal systems.	×	×	×

TABLE J.6-1 (Cont.)

				Potential to Occur in the Alternative Areas[b]		
Common Name	Scientific Name	Status[a]	Habitat Description	No Action	Program	SEZ
Birds (Cont.)						
California brown pelican	*Pelecanus occidentalis californicus*	CA-S1	Generally restricted to California coastal areas, including those near shores, bays, sounds, lagoons, river mouths, scrub-shrub wetlands, bare rock/talus/scree, cliffs, and sand dunes, with nesting occurring on islands.	×	×	
California condor	*Gymnogyps californianus*	ESA-E; CA-E; CA-S1	A permanent resident of the semiarid, rugged mountain ranges surrounding the San Joaquin Valley and northern Arizona. Occurs at elevations between sea level and 9,000 ft.	×		
California gull	*Larus californicus*	CA-S2	Inhabits seacoasts, bays, estuaries, mudflats, marshes, irrigated fields, lakes, ponds, agricultural lands, and urban areas. Islands, lakeshores, and pond shores having open sandy or gravelly areas serve as nesting habitat.	×	×	
California spotted owl	*Strix occidentalis occidentalis*	BLM-S	Range encompasses part of California and northern Baja California, Mexico. Typical habitat is dense, multilayered evergreen forest that includes a variety of tree species, large trees, and open areas under the canopy.	×		
Cattle egret	*Bubulcus ibis*	AZ-S1	Known from southern California and southwestern Arizona. Primary habitat communities include herbaceous, scrub-shrub, forested, and riparian wetlands as well as croplands and herbaceous grasslands. Within those communities, wet pasture land, marshes, fresh and brackish locations, dry fields, agricultural areas, and garbage dumps are utilized.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
Clark's grebe	*Aechmophorus clarkii*	BLM-S; AZ-WSC	A year-round resident in the lower Colorado River Valley. Considered common in California (not ranked); less common in Arizona (S3), where it is state-protected and listed as a BLM-designated sensitive species. Primarily associated with permanent open water areas, including marshes, lakes, bays, and rivers.	×	×	
Coastal California gnatcatcher	*Polioptila californica californica*	ESA-T; CA-S2	Inhabits dry coastal slopes, washes, and mesas within distinctive subassociations of the coastal sage scrub plant community.	×		
Columbian sharp-tailed Grouse	*Tympanuchus phasianellus columbianus*	BLM-S; CO-SC; CO-S2	Native range includes the western United States and British Columbia. Inhabits native bunchgrass and shrub-steppe communities.	×		
Common black-hawk	*Buteogallus anthracinus*	BLM-S; AZ-WSC; NM-S2; FWS-SC	An obligate riparian nester, dependent on mature riparian habitats supported by permanent flowing streams. Nests in groves of trees in riparian areas. Also known to occur in mixed savannah, dunes, and grasslands where a water source is nearby.	×	×	×
Common ground-dove	*Columbina passerina*	NM-E; NM-S1	Previously most common in open country with trees and bushes and in open, sandy areas in forest and savannah, but now, over much of its range, it is found primarily on cultivated land, in villages, and in towns at elevations below 5,400 ft. Nests in shrubs or low trees.	×		
Costa's hummingbird	*Calypte costae*	NM-T; NM-S2	Inhabits desert and semidesert, arid brushy foothills, chaparral; during migration and in winter, also found in adjacent mountains and open meadows and gardens. Nests in trees, shrubs, vines, or cacti.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Crested caracara	*Caracara cheriway*	AZ-WSC; AZ-S1	Inhabits paloverde-saguaro desert, and open country, pastureland, cultivated areas, and semidesert in both arid and moist habitats. Prefers low ground vegetation with scattered tall vegetation for nesting.	×	×	
Crissal thrasher	*Toxostoma crissale*	CA-SC; FWS-SC	A year-round resident in the deserts of southeastern California and southwestern Arizona. Occupies dense thickets of scrub or low trees in desert riparian and desert wash habitats. Also occurs in washes within pinyon-juniper habitats.	×	×	×
Dickcissel	*Spiza americana*	NM-S1	Occurs in grassland, meadows, savanna, cultivated lands, brushy fields. Nests on the ground in grass, tall weeds, or low shrubs or trees. Prefers habitat with dense, moderate to tall vegetation and moderately deep litter. Suitable habitats are found in old fields, hayfields, fence rows, hedge rows, road rights-of-way, planted cover, and moderately grazed prairie.	×	×	×
Eastern bluebird	*Sialia sialis*	NM-S1	Occurs in forest edges, open woodlands, and partly open locations with scattered trees, from coniferous or deciduous forest to riparian woodland. Also occurs in pine woodlands or savannas. Nests are in natural cavities, old woodpecker holes, bird boxes, or similar sites.	×	×	×
Elegant trogon	*Trogon elegans*	NM-E; NM-S1	Inhabits open woodland, pine-oak association, scrubby woodland and second-growth, primarily in arid or semiarid situations, less frequently in humid woodland.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
Elf owl	*Micrathene whitneyi*	CA-E; CA-S1	A rare spring and summer resident of the lower Colorado River Valley. Nests in desert riparian habitat dominated by saltcedar. Also utilizes tall trees and snags, such as cottonwood, sycamore, willow, mesquite, and saguaro cactus.	×	×	
Ferruginous hawk	*Buteo regalis*	BLM-S; AZ-WSC; FWS-SC; AZ-S2; CO-SC; NM-S2; NV-S2; UT-S2	Occurs in grasslands, sagebrush and saltbrush habitats, and the periphery of pinyon-juniper woodlands. Nests in tall trees or on rock outcrops along cliff faces. May forage in various desert shrubland habitats.	×	×	×
Forster's tern	*Sterna forsteri*	CO-S2	Inhabits large freshwater marshes and lakes with deep water and extensive reed beds or muskrat burrows.	×	×	
Gila woodpecker	*Melanerpes uropygialis*	CA-E; CA-S1	A fairly uncommon year-round resident in southern California and southwestern Arizona along the Colorado River. Occurs primarily in desert riparian and desert wash habitats, but also found in orchard-vineyard and urban habitats.	×	×	×
Gilded flicker	*Colaptes chrysoides*	CA-E; CA-S1	Occurs in stands of saguaro cactus, Joshua tree, and cottonwood or ironwood forests in southern Arizona and southern California along the Colorado River.	×	×	
Golden eagle	*Aquila chrysaetos*	BLM-S; CA-FP	A year-round resident in North America. Occurs primarily in open country, in prairies, open woodlands, barren areas, deserts, and in hilly or mountainous regions. Nests on rock ledges or in large trees.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Grasshopper sparrow	*Ammodramus savannarum*	BLM-S; UT-S1; UT-SC	Breeds in northern Utah where preferred habitat is grasslands of intermediate height, moderately deep litter, and sparse woody vegetation.	×	×	
Gray catbird	*Dumetella carolinensis*	AZ-WSC; AZ-S1	Breeds in Canada through the United States. In Arizona, habitat is forest edge and riparian areas. Nests in scrub willow and alder.	×	×	
Gray hawk	*Buteo nitidus*	BLM-S	Resident of southern portions of Arizona, New Mexico, Texas, and south to South America. Inhabits open woodland, pasturelands, and open country with scattered trees in arid situations. Also found in riparian woodlands near open areas.	×	×	
Gray vireo	*Vireo vicinior*	BLM-S; NM-T; CA-S2; CO-S2; NM-S2; FWS-SC	An uncommon summer resident in arid pinyon-juniper and chaparral habitats of southern California. Elevation ranges between 2,000 and 6,500 ft.	×	×	×
Gray-headed junco	*Junco hyemalis caniceps*	CA-S1	Occupies coniferous, mixed, and deciduous forests, forest edges and clearings, bogs, open woodlands, brushy areas adjacent to forest, and burned-over lands.	×		
Great egret	*Ardea alba*	BLM-S; AZ-WSC; AZ-S1	A year-round resident in the lower Colorado River Valley. Primarily associated with areas of open water, such as marshes, estuaries, lagoons, lakes, ponds, rivers, and flooded fields.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
Greater sage-grouse	*Centrocercus urophasianus*	ESA-C; BLM-S; UT-SC; UT-S2	Occurs in plains, foothills, and mountain valleys dominated by sagebrush (*Artemisia* spp.). Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Some populations may travel up to 60 mi between summer and winter habitats.	×	×	×
Greater sandhill crane	*Grus canadensis tabida*	CO-S2	Inhabits open, shallow, freshwater wetlands adjacent to grassland or short-vegetation uplands dominated by *Artemisia* spp., *Potentilla* spp., and *Populus* ssp. Breeding habitat includes marshes, swamps, and bulrush and sedge meadows generally larger than 2.5 acres in size. Nesting wetlands are secluded and free from disturbance.	×	×	
Green kingfisher	*Chloroceryle americana*	AZ-S2	A summer breeder in southwestern North America from Arizona, New Mexico, and Texas. Populations are not known to occur in California. Inhabits arroyos and riparian, flooded forest, coastal lagoon, mangrove, marsh, and forested wetland habitats. Nests in horizontal burrows dug in the banks of streams. Elevations range between 450 ft and 4,600 ft.	×	×	
Gull-billed tern	*Gelochelidon nilotica*	CA-S1	Breeds along the Salton Sea and in the San Diego Bay in southern California. Occupies primarily coastlines, salt marshes, estuaries, lagoons, plowed fields, and, less frequently, rivers, lakes, and freshwater marshes. Requires isolated nesting habitat composed of small, bare islets of fine clay.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
Gunnison sage-grouse	*Centrocercus minimus*	ESA-UR; BLM-S; CO-SC; CO-S1	A year-round resident in the Gunnison Basin in south-central Colorado. Inhabits large expanses of sagebrush with mixed grasses and forbs.	×	×	×
Harlequin duck	*Histrionicus histrionicus*	BLM-S	Occurs in river, riparian woodland, and subalpine marsh, at elevations where stream conditions provide enough moisture for emergent plants, or for deciduous trees and shrubs.	×	×	
Hepatic tanager	*Piranga flava*	CA-S1	A summer resident in the SEZ region in southern California and southwestern Arizona. Inhabits open coniferous forests, montane pine-oak forests, riparian woodlands, and pine savanna. Nests high in coniferous or deciduous trees.	×	×	×
Interior least tern	*Sterna antillarum athalassos*	ESA-E; CO-E; NM-E; CO-S1; NM-S1	A migratory transient in the southwestern United States. Inhabits beaches and sandbars of large rivers and lakes. May occasionally be observed at open water habitats and playas in the southwestern United States.	×	×	×
Inyo California towhee	*Pipilo crissalis eremophilus*	ESA-T; CA-E; CA-S1	The known population is centered on Benko Canyon in California. Inhabits desert riparian areas and dense thickets around desert springs and streams.	×	×	
Least Bell's vireo	*Vireo bellii pusillus*	ESA-E; CA-E; CA-S2	Small summer range in southern California and Baja California. Inhabits dense brush, willow-cottonwood forest, streamside thickets, and scrub oak in arid regions near water. Nests in low trees in riparian habitats. Will also inhabit cultivated areas.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Least bittern (western)	*Ixobrychus exilis (hesperis)*	BLM-S; AZ-WSC; NV-P; FWS-SC; CA-S1; CA-SC; NV-S2	A year-round resident in the lower Colorado River Valley. Breeding habitat includes freshwater and brackish marshes with dense, tall growths of aquatic or semiaquatic vegetation. Winter habitat is primarily composed of brackish and saline swamps and marshes.	×	×	×
Least tern	*Sterna antillarum*	ESA-E; CO-E; CO-S1	Spring and fall migrant and summer visitor to Colorado. Inhabits bare sandy shorelines along reservoirs, lakes, and rivers.	×	×	
LeConte's thrasher	*Toxostoma lecontei*	BLM-S; NV-P; FWS-SC; NV-S2	Known from Arizona, southern California, and southern Nevada, where it is uncommon throughout its range. Inhabits saltbush-cholla scrub communities in desert flats, dunes, or alluvial fans.	×	×	×
Lesser prairie-chicken	*Tympanuchus pallidicinctus*	ESA-C; CO-T; CO-S2; BLM-S; NM-S2	Common resident in southeastern Baca County, and Kiowa and Prowers Counties, Colorado. Inhabits mixed grass-dwarf shrub communities that occur on sandy soils, and agricultural areas.	×	×	
Lewis's woodpecker	*Melanerpes lewis*	UT-SC; UT-S2	A year-round resident in the southwestern United States. Inhabits open ponderosa pine, Douglas-fir, pinyon-juniper, mixed conifer, and oak forests. Prefers areas with understory grasses and shrubs to support insect prey populations. Nests in cavities of dead or dying trees and stumps.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
Loggerhead shrike	*Lanius ludovicianus*	BLM-S; CA-SC; FWS-SC	Known to breed in southern California in the solar analysis area. Breeding habitat includes open woodlands with moderate grass cover interspersed with areas of bare ground.	×	×	×
Long-billed curlew	*Numenius americanus*	BLM-S; CO-S2; UT-SC; NV-S2; UT-S2	May occur as a summer resident throughout the project area. Inhabits short-grass grasslands near standing water. Suitable habitat for this species does not occur on any of the proposed SEZs in Utah; however, flocks may be observed migrating through each SEZ.	×	×	×
Long-eared owl	*Asio otus*	FWS-SC; AZ-S2	Inhabits deciduous and evergreen forests, orchards, wooded parks, farm woodlots, riparian areas, and desert oases. Nests in trees in old nests of other birds or squirrels; sometimes nests in tree cavities.	×	×	×
Lucifer hummingbird	*Calothorax lucifer*	NM-T; NM-S1	Breeds in southern Arizona, southwestern New Mexico (Peloncillo Mountains), southwestern Texas, and into Mexico. In the United States, inhabits talus slopes, rocky hillsides, dry washes, and other arid habitats in mountain foothills and canyons.	×	×	
Lucy's warbler	*Vermivora luciae*	BLM-S; CA-S2; CA-SC	Restricted to very limited areas in the Mojave and Colorado Deserts. Occurs in riparian, chaparral, and hardwood woodlands having standing snags or hollow trees. Utilizes almost exclusively mesquite thickets within riparian woodlands. Nonbreeding habitat includes dry washes and riparian forests.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
Masked bobwhite	*Colinus virginianus ridgwayi*	ESA-E; AZ-WSC; AZ-S1	Re-introduced at the Buenos Aires National Wildlife Refuge in Arizona, where the preferred habitat is desert grassland with some brush and tree cover.	×	×	
Mexican spotted owl	*Strix occidentalis lucida*	ESA-T; AZ-WSC; CO-T; CO-S1; NM-SC; NM-S2; UT-S2	Inhabits deep, sheer-walled canyons in old-age, mixed coniferous forests.	×	×	
Mississippi kite	*Ictinia mississippiensis*	BLM-S; AZ-WSC	Range is North and South America. In Arizona, breeding habitat is riparian deciduous forests that border desertscrub upland habitats. Also inhabits pecan orchards.	×	×	
Mountain plover	*Charadrius montanus*	BLM-S; CA-S2; CA-SC; UT-SC; UT-S1	Inhabits prairie grasslands and arid plains and fields. Nests in shortgrass prairies associated with prairie dogs, bison, and cattle. More than 50% of the global population nests in the states of Colorado and New Mexico. May be a winter resident in southern California.	×	×	×
Mountain quail	*Oreortyx pictus*	BLM-S; NV-P	Scattered occurrences in western North America, from southwestern British Columbia south and east to Idaho, Washington, Oregon, Nevada, California, and Baja California. Uses high-altitude areas on steep slopes with tall, dense shrubs, close to water within brushy mountain sides, coniferous forest, and mixed forests. Elevations typically range from 4,000 to 10,000 ft.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Neotropic cormorant	*Phalacrocorax brasilianus*	NM-T; NM-S2	Inhabits rivers, lakes, marshes, and seacoasts.	×		
Northern aplomado falcon	*Falco femoralis septentrionalis*	ESA-E; NM-E; NM-S1	Inhabits open rangeland and savanna, semiarid grasslands with scattered trees, mesquite, and yucca. Nests in old stick nests of other raptor species. Nests are located in trees or shrubs in areas of desert grassland.	×	×	×
Northern beardless-tyrannulet	*Camptostoma imberbe*	NM-E; NM-S1	Breeds in southeastern Arizona, southwestern New Mexico (Guadalup Canyon), southern Texas, and into Mexico and Central America. Inhabits arid scrub, thickets, mesquite, forest edge, and open riparian woodland. Nests in trees, often near water.	×	×	
Northern buff-breasted flycatcher	*Empidonax fulvifrons pygmaeus*	AZ-WSC; FWS-SC; AZ-S1	A summer resident of Arizona where it breeds in the Huachuca, Santa Catalina, and Chiricahua Mountains. Habitat is open stands of pine or sycamore.	×		
Northern cardinal	*Cardinalis cardinalis superba*	CA-S1	Widely distributed throughout eastern and central North America. Rarely occurs in California at the western periphery of its range. The species is a rare inhabitant of riparian areas along the lower Colorado River in California.	×	×	
Northern goshawk	*Accipiter gentilis*	BLM-S; AZ-WSC; NV-P; FWS-SC; NM-SC; NM-S2; NV-S2	Occurs in mature mountain forest and riparian zone habitats. Nests in trees in mature deciduous, coniferous, and mixed forests. Forages in both heavily forested and relatively open shrubland habitats.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
Northern gray hawk	*Buteo nitidus maxima*	BLM-S; AZ-WSC; FWS-SC	A migratory bird that arrives in Arizona in mid-March and flies south for winter. Arizona habitat is Sonoran riparian deciduous forest and woodlands, and Madrean evergreen woodland.	×	×	
Osprey	*Pandion haliaetus*	NM-SC; NM-S2	Occurs primarily along rivers, lakes, reservoirs, and seacoasts. Typically builds large stick nests on living or dead trees and also uses numerous man-made structures, such as utility poles, wharf pilings, windmills, microwave towers, chimneys, and channel markers. Nests are usually near or above water.	×	×	×
Ovenbird	*Seiurus aurocapillus*	CO-S2	Uses mid to late successional, closed-canopied deciduous or deciduous-coniferous forests having deep leaf litter and limited understory for breeding season. Forest types include oak-hickory, oak-pine, maple-basswood, maple-birch, maple-birch-beech, hemlock-oak, trembling aspen, and spruce.	×	×	
Peregrine falcon	*Falco peregrinus*	BLM-S; NV-P; FWS-SC; NV-S2	Occurs in open habitats, including deserts, shrublands, and woodlands that are associated with high, nearly vertical cliffs and bluffs above 200 ft. When not breeding, its activity is concentrated in areas with ample prey, such as farmlands, marshes, lakes, rivers, and urban areas.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Phainopepla	*Phainopepla nitens*	BLM-S; NV-P; FWS-SC; NV-S2	Known from the southwestern United States and Mexico, where it breeds from central California east to southern Nevada and south to western Texas, including the southern half of Arizona and southern New Mexico. Inhabits desertscrub, mesquite, and pinyon-juniper woodland communities. Also occurs in desert riparian areas and orchards. Nests in trees or shrubs that are 3 to 45 ft above the ground.	×	×	×
Piping plover	*Charadrius melodus*	ESA-T; CO-E; CO-S1; NM-T	Widespread distribution, but breeds in North America. Known in New Mexico and Colorado as a rare spring and fall migrant. Occurs on sandflats or along bare shorelines of rivers, lakes, reservoirs, or coasts.	×	×	
Plains sharp-tailed grouse	*Tympanuchus phasianellus jamesi*	CO-E; CO-S1	Resident of Douglas County. Inhabits Gambel oak and other shrublands lacking in conifers. Also occurs in croplands and riparian areas.	×		
Prairie falcon	*Falco mexicanus*	BLM-S	A year-round resident in the Nevada SEZ region, primarily in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Typically nests in well-sheltered ledges of rocky cliffs and outcrops.	×	×	×
Sharp-tailed grouse	*Tympanuchus phasianellus*	BLM-S; UT-S1; UT-SC	Widespread range in North America. A resident in Utah, where it requires dense grass and shrubs for nesting, and riparian areas during winter.	×	×	
Short-eared owl	*Asio flammeus*	BLM-S; CO-S2; NM-S2; UT-SC; UT-S2	Known to occur throughout the project area. Inhabits grasslands, shrublands, and other open habitats. It is nomadic, often selecting unique breeding sites each year, depending on local rodent densities. Nests on the ground near shrubs.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
Snowy egret	*Egretta thula*	BLM-S; AZ-WSC; AZ-S1; CO-S2	Primarily associated with open water areas, such as marshes, estuaries, lagoons, lakes, ponds, rivers and flooded fields. A year-round resident in the lower Colorado River Valley.	×	×	×
Sonoran yellow warbler	*Dendroica petechia sonorana*	CA-S1; CA-SC	Restricted to the lower Colorado River Valley. Occupies riparian vegetation close to water along streams and wet meadows. Associated with *Salix* ssp. and *Populus* ssp. Also uses xeric montane shrub fields, chaparral shrub fields, and mixed-conifer forests having shrubby understories.	×	×	
Southwestern willow flycatcher	*Empidonax traillii extimus*	ESA-E; AZ-WSC; CA-E; CO-E; NV-P; NM-E; AZ-S1; CA-S1; NM-S2; NV-S1; UT-S1	Occupies riparian shrublands and woodlands. Nests in thickets, scrubby and brushy areas, open second-growth, swamps, and open woodlands.	×	×	×
Sprague's pipit	*Anthus spragueii*	ESA-C; AZ-WSC; AZ-S2	Winters in southern states, including grasslands with mid-height vegetation in Arizona. Habitat has moderate litter cover with little to no woody vegetation.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Summer tanager	*Piranga rubra*	CA-S2; CA-SC; FWS-SC	An uncommon summer resident and breeder in desert riparian habitat along the lower Colorado River. Occurs very locally elsewhere in southwestern Arizona and southern California. Inhabits dense stands of cottonwood and willow in riparian areas for feeding and breeding.	×	×	
Swainson's hawk	*Buteo swainsoni*	BLM-S; NV-P; FWS-SC; CA-S2; NV-S2	Occurs in savanna, open pine-oak woodlands, grasslands, and cultivated lands. Nests in solitary trees, bushes, or small groves.	×	×	×
Swainson's thrush	*Catharus ustulatus*	AZ-S1	Widely distributed throughout North America. Inhabits dense coniferous forests, aspen forests, and willow or alder thickets. Prefers damp forests or forests adjacent to water at elevations between 7,300 and 9,200 ft. Populations in California are apparently secure (S4) and have no federal or state status or rank.	×	×	
Thick-billed kingbird	*Tyrannus crassirostris*	BLM-S; AZ-WSC; AZ-S2; NM-E; NM-S1	Occurs in Arizona, New Mexico, through Mexico to Guatemala. Breeds in sycamore riparian habitats in Arizona and common in cottonwood-willow forests on the San Pedro River. Inhabits arid scrub, savanna, riparian woodland, clearings in deciduous forest, and open situations with scattered trees.	×	×	
Tricolored blackbird	*Agelaius tricolor*	BLM-S; CA-S2	Year-round resident from central Oregon south to southern California and northern Baja California, Mexico. Breeds in freshwater marshes among thick vegetation. During migration and winter periods, occurs in open cultivated lands and pastures.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
Tropical kingbird	*Tyrannus melancholicus*	AZ-WSC	Breeds May to June in Arizona, nesting in cottonwoods. Preferred habitat is areas with scattered trees such as savanna, open woodland, forest edge, plantations, residential areas, and agricultural lands.	×		
Trumpeter swan	*Cygnus buccinator*	NV-P; NV-S1	Inhabits ponds, lakes, and marshes. Breeds in emergent vegetation such as reeds and sedges. Primarily on freshwater.	×	×	
Varied bunting	*Passerina versicolor*	NM-T; NM-S2	Summer breeding resident in southern Arizona, southern New Mexico, and southern Texas. In New Mexico, this species is known to summer in Carlsbad Caverns National Park and Guadalupe Canyon. Inhabits shrublands, second-growth, and similar habitats consisting of mesquite (*Prosopis* spp.). Also found along canyon bottoms.	×	×	
Veery	*Catharus fuscescens*	AZ-WSC; AZ-S1	Range is North and South America. In Arizona, irregularly breeds in riparian habitats at elevations that provide permanent moisture for emergent plants.	×	×	
Vermilion flycatcher	*Pyrocephalus rubinus*	CA-S2	Breeding and summer habitat occurs in southeastern California and southwestern Arizona along the Colorado River, as well as in southern California near the Salton Sea. Breeding habitat consists of arid scrub, farmlands, savanna, agricultural areas, and riparian woodlands. Used sites are associated with surface water as well as *Populus* ssp. and *Salix* ssp.	×	×	
Violet-crowned hummingbird	*Amazilia violiceps*	AZ-WSC; NM-T; NM-S1	Resident of northern Sonora, southern Arizona, and southwestern New Mexico. Inhabits scrub, open woodland, forest edge, riparian groves and plantations in arid or semiarid regions.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Western burrowing owl	*Athene cunicularia hypugaea*	BLM-S; FWS-SC; CO-T; AZ-S2; AZ-SC; CA-S2; CA-SC; NM-SC; UT-SC	A year-round resident within the solar analysis area. Occurs locally in open areas with short, sparse vegetation, including grasslands, agricultural fields, and disturbed areas. Nests in burrows created by mammals or tortoises. Local abundance is determined by small mammal prey abundance.	×	×	×
Western snowy plover	*Charadrius alexandrinus nivosus*	BLM-S; AZ-WSC; NV-P; AZ-S1; CO-S1; CO-SC	Breeds on alkali flats around reservoirs and sandy shorelines. A known summer breeder and winter resident in portions of the six-state study area.	×	×	×
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	ESA-C; AZ-WSC; CA-E; CA-S1; NV-P; CA-S1; NM-SC; NV-S1; UT-S1	Breeds in scattered areas along the lower Colorado River and larger bodies of water in the southwestern United States. Primarily associated with riparian cottonwood and willow forests with dense understory foliage. Nonbreeding habitat includes woodlands and scrub vegetation.	×	×	×
Whiskered screech-owl	*Megascops trichopsis*	NM-T; NM-S1	A resident from the mountains of southeastern Arizona to Nicaragua, with preferred habitat of pine-oak woodlands.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Birds (Cont.)						
White-faced ibis	*Plegadis chihi*	BLM-S; AZ-S2; CA-S1; CO-S2; NM-SC; NM-S2; FWS-SC	Forages in fresh emergent wetlands, shallow lacustrine waters, muddy ground of wet meadows, and irrigated or flooded pastures and croplands. Dense, fresh emergent wetlands serve as nesting habitat. Roosts amidst dense, freshwater emergent vegetation, such as bulrushes, cattails, reeds, or low shrubs over water.	×	×	×
White-tailed kite	*Elanus leucurus*	AZ-S2	Inhabits savanna, open woodlands, marshes, cleared areas, and cultivated fields.	×	×	
Willet	*Catoptrophorus semipalmatus*	CO-S1	Occurs in large expanses of short, sparse grasslands for nesting and wetland complexes for foraging. Habitat types include marshes, lake margins, and river mouths.	×	×	
Wood duck	*Aix sponsa*	AZ-S2	Wooded freshwater habitats with an abundance of cover. Inhabits riparian areas, wooded swamps, and freshwater marshes. Areas of shallow, flooded timber and emergent vegetation are preferred.	×	×	
Yellow warbler	*Dendroica petechia brewsteri*	CA-S2; CA-SC	Inhabits the San Joaquin and Colorado River Valleys. Occupies riparian vegetation close to water along streams and wet meadows. Associated with *Salix* ssp. and *Populus* ssp. Also uses xeric montane shrub fields, chaparral shrub fields, and mixed-conifer forests having shrubby understories.	×	×	
Yellow-eyed junco	*Junco phaeonotus*	NM-T; NM-S2	A resident in southern Arizona, extreme southwestern New Mexico, and into Mexico. Inhabits open coniferous forest;, pine-oak association; and adjacent scrub, brush, pastures, and fields.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Birds (Cont.)						
Yuma clapper rail	*Rallus longirostris yumanensis*	ESA-E; AZ-WSC; CA-FP; CA-T; NV-P; CA-S1; NV-S1	Inhabits freshwater marshes containing dense stands of cattails. Nests on dry hummocks or in small shrubs among dense cattails or bulrushes along the edges of shallow ponds in freshwater marshes with stable water levels.	×	×	×
Mammals						
Allen's big-eared bat	*Idionycteris phyllotis*	BLM-S; NV-P; FWS-SC; NV-S1; UT-S2	Known to occur in isolated locations throughout the southwestern United States. Habitat is primarily mountainous, wooded areas composed of ponderosa pine, pinyon-juniper, Mexican woodland and oak brush as well as cottonwood riparian woodland. Occurs within the range of Mohave desertscrub of low-desert ranges to white fir forest zones, with summer ranges occurring at higher elevations. Roosts in caverns, rock fissures, and mines.	×	×	
Amargosa vole	*Microtus californicus scirpensis*	ESA-E; CA-E; CA-S1	Range is along the Amargosa River in Inyo County, California. Inhabits wetland pockets of bulrush, cattails, salt grass, and willows.	×	×	
American badger	*Taxidea taxus*	CA-SC	Prefers open areas and may frequent brushlands with little ground cover. Occupies underground burrows during periods of inactivity.	×	×	
American marten	*Martes americana*	NM-T; NM-S2	Found in dense, deciduous, mixed, or coniferous upland and lowland forest. May use rocky alpine areas.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
American mink	*Mustela vison*	NM-S1	Once considered to be extirpated from New Mexico; now considered extremely rare. Associated with montane riparian areas.	×		
American pika	*Ochotona princeps*	NV-P; NV-S2	Restricted to rocky, talus slopes. Occurs above the treeline up to the vegetation limit, and at lower elevations in forests or near lakes.	×	×	
American water shrew	*Sorex palustris*	AZ-WSC; AZ-S1	Common in boreal and montane riparian habitats, where it is found in shallow tunnels through grasses, sedges, reeds, willow, and alder thickets along ponds, marshes, and streams.	×	×	
Arizona montane vole	*Microtus montanus arizonensis*	NM-E; NM-S1	Occurs in wet sedge and grass meadows that border marshes and open water at elevations around 6,900 ft.	×	×	
Arizona myotis	*Myotis occultus*	BLM-S; CA-S2; NM-SC; FWS-SC	Known from extreme southeastern California and southern Arizona, occurring only along the Colorado River lowlands and in adjacent desert mountain ranges. Inhabits ponderosa pine and oak-pine woodlands close to water; also occurs in riparian forests within desert areas along the Colorado River.	×	×	×
Big brown bat	*Eptesicus fuscus*	BLM-S	Inhabits wooded and semi-open habitats. More abundant in areas dominated by deciduous forest than coniferous forest. Roosts in buildings, hollow trees, rock crevices, tunnels, and cliff swallow nests.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
Big free-tailed bat	*Nyctinomops macrotis*	BLM-S; FWS-SC; CA-S2; CA-SC; NM-S2; NV-S1; UT-S2	Associated with bare rock/talus/scree, cliff, shrub desert, hardwood woodland, and riparian communities. Roosts in rock crevices on cliff faces or in buildings. Forages primarily in coniferous forests and arid shrublands to feed on moths.	×	×	×
Black-footed ferret	*Mustela nigripes*	ESA-E, ESA-XN; CO-E; CO-S1	Believed to be extirpated from the state of Colorado since the 1950s. Experimental populations were re-introduced to the northwestern portion of Colorado beginning in 2001. Historically, it inhabited prairies and semiarid shrublands, where it preyed on prairie dogs.	×	×	
Black-tailed prairie dog	*Cynomys ludovicianus*	FWS-SC; NM-SC; NM-S2	A species of the Great Plains, occurring from southern Saskatchewan, Canada, south to the desert grasslands of western Texas and southern New Mexico. Inhabits dry, flat or gently sloping, open grasslands with relatively sparse vegetation. May inhabit some areas grazed by cattle or vacant lots in residential areas.	×	×	×
Botta's pocket gopher	*Thomomys bottae rubidus*	CO-SC; CO-S1	Inhabits agricultural fields, grasslands, roadsides, parks, pinyon-juniper woodlands, open montane forest, montane shrublands, and semidesert shrublands at an elevation ranging from 4,000 to 8,500 ft.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
Brazilian free-tailed bat	*Tadarida brasiliensis*	BLM-S; NV-P	Found primarily throughout the southern half of North America, the species may occur in isolated locations throughout the southwestern United States. Forages in desert grassland, old field, savanna, shrubland, and woodland habitats as well as urban areas. Roosts in old buildings, caves, mines, and hollow trees.	×	×	×
Buena Vista Lake shrew	*Sorex ornatus relictus*	ESA-E; CA-S1	Has occupied marshes on lake margins and may occur in dense vegetation along streams, sloughs, and tule marshes in the Tulare Basin.	×		
California leaf-nosed bat	*Macrotus californicus*	BLM-S; AZ-WSC; CA-S2; CA-SC; FWS-SC	A year-round resident in southern California and southwestern Arizona. May be locally common in some areas. Occurs in desert riparian, desert wash, desertscrub, and palm oasis habitats at elevations below 2,000 ft. Roosts in mines, caves, and buildings.	×	×	×
Canada lynx	*Lynx canadensis*	ESA-T; CO-E; CO-S1	Occurs on montane conifer and conifer-hardwood habitats; a dense understory that supports snowshoe hare populations. Within the solar analysis region, this species is currently restricted to extremely isolated areas of the mountains in the central portion of Colorado.	×	×	
Cave myotis	*Myotis velifer*	BLM-S; FWS-SC; CA-S1	Found in the lower Colorado River Basin in desertscrub, shrublands, washes, and riparian habitats. Roosts in colonies in caves.	×	×	×
Cebolleta pocket gopher	*Thomomys bottae paguatae*	BLM-S; NM-S2	Found in Valencia County, New Mexico, and inhabits areas where suitable soil conditions for digging exist.	×	×	

TABLE J.6-1 (Cont.)

				Potential to Occur in the Alternative Areas[b]		
Common Name	Scientific Name	Status[a]	Habitat Description	No Action	Program	SEZ
Mammals (Cont.)						
Colorado River cotton rat	*Sigmodon arizonae plenus*	AZ-S2; CA-SC	Restricted to the lower Colorado River floodplain in Arizona and California. Confined to isolated mesic habitats, such as desert riparian, grassland, and freshwater wetlands and flooded agricultural areas.	×	×	
Colorado Valley woodrat	*Neotoma albigula venusta*	CA-S1	Known from extreme southeastern California. Inhabits low-lying desert, creosote-mesquite, and pinyon-juniper habitats. Distribution is strongly influenced by the availability of den-building materials—including litter of opunita, cholla, prickly pear, mesquite, and catclaw—as well as its low tolerance for cold temperatures.	×	×	×
Common hog-nosed skunk	*Conepatus leuconotus*	CO-S1	Inhabits woodlands, grasslands, deserts, brushy areas, and rocky canyons in mountainous regions. Utilized sites are characterized as scrub oak, pinyon scrub, and pinyon-juniper woodlands with sandy soils, grassy understories, and rocks at elevations below 9,000 ft.	×	×	×
Dark kangaroo mouse	*Microdiposops megacephalus*	BLM-S; UT-SC; UT-S2	Occurs in the Great Basin region within the project area in sagebrush-dominated areas with sandy soils. Nocturnally active during warm weather, the species remains in underground burrows during the day and cold winter months.	×	×	×
Desert bighorn sheep	*Ovis canadensis mexicana*	NM-E; NM-SC; NM-S1	Occurs on visually open, steep rocky terrain in mountainous habitats in desert regions. Rarely uses desert lowlands, but may use them as corridors for travel between mountain ranges.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Mammals (Cont.)						
Desert pocket gopher	*Geomys arenarius*	FWS-SC	Scattered distribution in southern New Mexico, western Texas, and northern Mexico. Inhabits loose soils of disturbed areas or sandy areas near open water. Often occurs along rivers, ponds, or canals.	×	×	×
Desert Valley kangaroo mouse	*Microdipodops megacephalus albiventer*	BLM-S; NV-P; FWS-SC; NV-S2	Endemic to central Nevada. Inhabits desert areas at playa margins and dune habitats.	×	×	×
Dwarf shrew	*Sorex nanus*	CO-S2	Utilizes rocky sites within alpine, bare rock/talus/scree, coniferous forests, herbaceous grasslands, shrubland/chaparral, and woodland-conifer forests. Other habitats include sedge marsh, subalpine meadow, dry brushy slopes, arid shortgrass prairie, dry stubble fields, and pinyon-juniper woodlands.	×	×	×
Fish Spring pocket gopher	*Thomomys bottae abstrusus*	BLM-S	Endemic to Nye County, Nevada.	×	×	
Fletcher dark kangaroo mouse	*Microdipodops megacephalus nasutus*	BLM-S; NV-P; NV-S2	Occurs in Mineral County, Nevada, and in California.	×	×	
Fringed myotis	*Myotis thysanodes*	BLM-S; NV-P; FWS-SC; NV-S2; UT-SC	Occurs in a wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roost sites have been reported in buildings and caves. May be a summer or year-round resident throughout the six-state study area.	×	×	×
Giant kangaroo rat	*Dipodomys ingens*	ESA-E; CA-E; CA-S2	Found on fine sandy loam soils with sparse annual grass/forb vegetation along the western side of the San Joaquin Valley.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
Goat Peak pika	*Ochotona princeps nigrescens*	BLM-S; NM-S1	Found in the Jemez Mountains in the Sante Fe National Forest, where they live in lava rocks at an elevation of 9,000 ft.	×	×	
Gray-footed chipmunk	*Neotamias canipes*	BLM-S	Known from New Mexico and western Texas. Occurs in montane woodlands where dense stands of mixed timber are present. Also occurs on brushy hillsides with rock crevices.	×		
Guadalupe pocket gopher	*Thomomys bottae guadalupensis*	BLM-S; NM-S1	Confined to the Guadalupe Mountains, primarily in the montane and valley areas.	×	×	
Gunnison's prairie dog	*Cynomys gunnisoni*	ESA-C; NM-S2	Known from the Gunnison Basin in central and south-central Colorado. Inhabits mountain valleys, plateaus, and open brush habitats in the project area at elevations between 6,000 and 12,000 ft.	×	×	×
Hoary bat	*Lasiurus cinereus*	BLM-S	Prefers deciduous and coniferous forests and woodlands. Roosts in tree foliage at the edge of clearings; rarely uses caves.	×	×	
Houserock Valley chisel-toothed kangaroo rat	*Dipodomys microps leucotis*	BLM-S; AZ-WSC; FWS-SC; AZ-S2	Endemic to Arizona, where it is found only in Houserock Valley in Coconino County. Requires good shrub cover of Great Basin desertscrub communities.	×	×	
Hualapai Mexican vole	*Microtus mexicanus hualpaiensis*	ESA-E; AZ-WSC; AZ-S1	Endemic to western and central Arizona. Primarily associated with dry grass/forb habitats on steep slopes in ponderosa pine woodlands. Currently only known from moist, grass/sedge habitats along permanent and semipermanent water sources at elevations between 3,000 and 8,400 ft.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Mammals (Cont.)						
Jaguar	*Panthera onca*	ESA-E; AZ-WSC; AZ-S1; NM-S1	Range is Mexico to Brazil to northern Patagonia; very rare in Arizona, New Mexico, and Texas. Preferred habitat is lowland wet areas; primarily associated with rivers and cienegas in Arizona.	×	×	
Kit fox	*Vulpes macrotis*	BLM-S; UT-SC	Occurs in open prairie, plains, and desert habitats, where it inhabits burrows and preys on rodents, rabbits, hares, and small birds.	×	×	×
Least shrew	*Cryptotis parva*	NM-T; NM-S2	Occurs in open country with dense herbaceous vegetation. Also inhabits brushy areas, forest edges, salt and freshwater marshes. Nests underground or under logs, stumps, or rocks.	×	×	
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	ESA-E; AZ-WSC; AZ-S1	Range is central California, southern Arizona, New Mexico, south to Honduras, and El Salvador. Does not hibernate, and there are seasonal differences in habitat. Inhabits desert grassland and shrubland up to the oak transition, and roosts in caves and mine tunnels.	×	×	
Lodgepole chipmunk	*Neotamias speciosus speciosus*	CA-S2	Occurs in isolated populations in mountains of California. Occurs within open-canopy forests of mixed conifer, Jeffrey pine, lodgepole, and limber pine, as well as chaparral. Elevation ranges between 6,400 and 10,800 ft.	×	×	
Long-eared myotis	*Myotis evotis*	BLM-S; FWS-SC	A year-round resident in California, primarily occurring in coastal habitats. Rarely occurs in arid desert habitats but may forage along riparian areas and coniferous forests. Roosts in buildings, crevices, and snags.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Mammals (Cont.)						
Long-legged myotis	*Myotis volans*	BLM-S	Occurs primarily in montane coniferous forests, also in riparian and desert habitats. May change habitats seasonally. Uses caves and mines as hibernacula, but winter habits are poorly known. Roosts in abandoned buildings, rock crevices, and under the bark of trees.	×	×	×
Mearns' pocket gopher	*Thomomys bottae mearnsi*	BLM-S; NM-S2	Found in moist soil along edges of a large marsh at the bottom of Animas Valley.	×	×	
Mexican long-nosed bat	*Leptonycteris nivalis*	ESA-E; NM-E; NM-S1	Inhabits generally arid areas of desertscrub, open conifer-oak woodlands, and pine forests in the Upper Sonoran and Transition Life Zones. Colonies roost in caves, culverts, hollows trees or vacant buildings.	×	×	
Mexican long-tongued bat	*Choeronycteris mexicana*	BLM-S; AZ-WSC; FWS-SC; BLM-S; NM-S2	Range includes southwestern states and Mexico. Inhabits mesic areas in canyons of mixed oak-conifer forests in mountains rising from the desert. Roosts in places that are not very dark, such as caves, rock fissures, and old mines.	×	×	
Mohave ground squirrel	*Spermophilus mohavensis*	CA-T; CA-S2	Known from the Mojave Desert in San Bernardino County, California. Inhabits open desertscrub, grasslands, and Joshua tree woodlands at elevations between 1,800 and 5,000 ft. Utilizes burrows at the base of shrubs.	×	×	
Mohave river vole	*Microtus californicus mohavensis*	CA-S1; FWS-SC	Endemic to California, where it is restricted to two localities along the Mojave River. Occupies moist habitats, including meadows, freshwater and tidal marshes, irrigated pastures, and oak woodlands.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
Morro Bay kangaroo rat	*Dipodomys heermanni morroensis*	ESA-E; CA-E; CA-S1	Range is a small area near Morro Bay, San Luis Obispo County, California. Prefers southern coastal scrub, coastal sage scrub, or coastal sand plains and stabilized dunes.	×		
Nelson's antelope squirrel	*Ammospermophilus nelsoni*	BLM-S; CA-T; CA-S2	Found on dry, flat, or rolling terrain on alluvial and loamy soils. Inhabits grassy or sparsely shrubby areas.	×		
Nelson's bighorn sheep	*Ovis canadensis nelsoni*	BLM-S; FWS-SC	Visually open, steep, rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Rarely uses desert lowlands, but may use them as corridors for travel between mountain ranges.	×	×	×
New Mexican jumping mouse	*Zapus hudsonius luteus*	ESA-C; BLM-S; NM-E; NM-S2	Inhabits herbaceous riparian areas along permanent streams, including wet meadows within river floodplains. Also known along irrigation ditches. In many areas, moist riparian zones with tall, dense sedges provide suitable habitat.	×	×	
Occult little brown myotis	*Myotis lucifugus occultus*	BLM-S	Known in low-elevation riparian areas in the Rio Grande Valley and montane highlands; associated with large bodies of water without respect to associated vegetation type.	×	×	
Organ Mountains chipmunk	*Neotamias quadrivittatus australis*	BLM-S; NM-T; FWS-SC; NM-S1	Endemic to New Mexico in the Organ Mountains. Most common around Aguirre Springs at elevations between 6,050 and 7,300 ft. Inhabits north-facing slopes in association with ponderosa pine, oak, and pinyon-juniper woodlands.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Mammals (Cont.)						
Owens Valley vole	*Microtus californicus vallicola*	BLM-S; CA-S1	Inhabits fresh and brackish marshes, valley grasslands, meadows, and dry grassy hillsides. Occupies underground burrows and surface runways through grass.	×	×	
Pacific fisher	*Martes pennanti pacifica* DPS	ESA-C; BLM-S; CA-T; CA-S2	Prefers upland and lowland forests, including coniferous, mixed, and deciduous forests. Inhabits hardwood stands in summer, and coniferous or mixed forests in winter.	×	×	
Pacific pocket mouse	*Perognathus longimembris pacificus*	ESA-E; CA-S1	Occurs in shrublands with firm, sandy soil in the immediate vicinity of the ocean.	×	×	
Pahranagat Valley montane vole	*Microtus montanus fucosus*	BLM-S; NV-P; FWS-SC; NV-S2	Endemic to Lincoln County, Nevada, where it is restricted to springs in the Pahranagat Valley. Within that area, isolated populations use mesic montane and desert riparian patches.	×	×	×
Pale kangaroo mouse	*Microdipodops pallidus*	NV-P; NV-S2	Known from southwestern Nevada and southeastern California. Inhabits fine sands in alkali sink and desertscrub dominated by shadscale or big sagebrush. Often burrows in areas of soft, windblown sand piled at the bases of shrubs.	×	×	×
Pallid bat	*Antrozous pallidus*	BLM-S; NV-P; CA-SC; FWS-SC	Inhabits low-elevation desert communities, including grasslands, shrublands, and woodlands. During the day, roosts in caves, crevices, and mines. May be a summer or year-round resident throughout the six-state study area.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Mammals (Cont.)						
Palm Springs pocket mouse	*Perognathus longimembris bangsi*	BLM-S; CA-S2	Known from the Coachella Valley in Riverside County California, south to the Salton Sea. Active above ground in warmer months, foraging on seeds in creosote scrub, desertscrub, and grasslands on loose or sandy soils.	×	×	×
Palm Springs round-tailed ground squirrel	*Spermophilus tereticaudus chlorus*	ESA-C; BLM-S; CA-S1	Prefers sandy areas where the sand accumulates under large shrubs to provide adequate cover. Includes areas of coarse sand associated with washes, and the transition area between dunes and creosotebush scrub.	×	×	
Palmer's chipmunk	*Neotamias palmeri*	NV-P; NV-S2	Endemic to Nevada, where it is restricted to Mount Cheston in the Spring Mountains. Inhabits coniferous forests, from the yellow pine belt to the timber line, where it rarely ventures far from shelter among large rocks, logs, or cliff crevices.	×	×	
Pecos River muskrat	*Ondatra zibethicus ripensis*	BLM-S	Found in areas within New Mexico and Texas; common in the refuge wetlands and water conveyance systems in the Bosque del Apache National Wildlife Refuge.	×	×	
Penasco least chipmunk	*Neotamias minimus atristriatus*	NM-E; FWS-SC; NM-S1	Known only from the Sacramento Mountains in Otero County, New Mexico. Inhabits mesic meadows, riparian areas, agricultural fields, and pinyon-juniper woodlands.	×	×	
Peninsular bighorn sheep	*Ovis canadensis nelsoni* DPS	ESA-E; CA-E; CA-S1	A DPS of Nelson's bighorn sheep, restricted to the Peninsular Ranges of the San Jacinto Mountains in southern California. Inhabits visually open, steep, rocky terrain in mountainous habitats of the western Sonoran Desert. Rarely uses desert lowlands, but may use them as corridors for travel between ranges.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
Plains pocket mouse	*Perognathus flavescens relictus*	CO-S2	Confined to areas of sandy or sandy-loam soils at elevations between 3,000 and 7,500 ft. Inhabits xeric grassland communities, including tallgrass prairie, midgrass prairie, shortgrass prairie, and foothill/mountain grassland, as well as shrublands, pinyon-juniper forests, and sand dune habitats.	×	×	
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	CA-S2; FWS-SC	Confined to a few localities within southern California and southwestern Arizona. Uses almost exclusively arid lowland areas, including creosotebush and chaparral habitats, in association with very large boulders, high cliffs, rugged rock outcroppings, and rocky canyons.	×	×	×
Point Arena mountain beaver	*Aplodontia rufa nigra*	ESA-E; CA-S1	Range is coastal Mendocino County, California. Inhabits gulches and north-facing slopes within narrow coastal valleys.	×	×	
Preble's shrew	*Sorex preblei*	BLM-S; UT-S1; UT-SC	Range is the western United States and British Columbia. Known in Utah at Timpie Spring Waterfowl Management Area, where the preferred habitat is alkaline shrubland.	×	×	
Pygmy rabbit	*Brachylagus idahoensis*	BLM-S; NV-P; UT-S2; UT-SC	Inhabits sagebrush-shrubland habitats throughout the SEZ region. Prefers loose soils to dig burrows.	×	×	×
Salinas pocket mouse	*Perognathus inornatus psammophilus*	BLM-S; CA-S2	Inhabits dry, open, grassy ground, including arid grasslands, desertscrub, and oak savannas.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
San Bernardino flying squirrel	*Glaucomys sabrinus californicus*	CA-S2; FWS-SC	Endemic to California, with three isolated populations occurring within the forests of the San Gabriel, San Bernardino, and San Jacinto Mountains. Occupies coniferous and deciduous forests, including riparian forest and mixed coniferous forest composed of Jeffrey pine, white fir, and black oak.	×		
San Bernardino kangaroo rat	*Dipodomys merriami parvus*	ESA-E; CA-S1	Inhabits sage scrub on alluvial fans, floodplains, washes, upland areas, and in areas with historic braided stream channels. Soils are sand, loam, sandy loam, or gravelly.	×	×	
San Joaquin kit fox	*Vulpes macrotis mutica*	ESA-E; CA-T; CA-S2	Range is San Joaquin Valley in California. Inhabits alkali sink, valley grassland, and foothill woodland. Prefers low, sparse vegetation for hunting.	×	×	
Short-nosed kangaroo rat	*Dipodomys nitratoides brevinasus*	BLM-S; CA-S1	Endemic to California. Habitat includes friable sandy or silty soils in areas with no to moderate shrub cover and scattered herbaceous plants.	×		
Sierra Nevada bighorn sheep	*Ovis canadensis sierrae*	ESA-E; CA-E; CA-S1	Inhabits portions of the southern Sierra Nevada at elevations between 4,790 and above 14,000 ft.	×	×	
Sierra Nevada red fox	*Vulpes vulpes necator*	CA-T; CA-S1	Known from the Sierra Nevada region of northern and central California and western and central Nevada. Occurs in various habitats in alpine and subalpine zones. Preferred habitat is red fir and lodgepole pine forests.	×		

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
Silky pocket mouse	*Perognathus flavus*	BLM-S; UT-S1; UT-SC	Native to the southwestern and west-central United States and portions of Mexico. In Utah, occurs in the southeastern corner in San Juan County. Inhabits sandy soils in arid grassland, woodland, and sagebrush areas.	×	×	
Silver-haired bat	*Lasionycteris noctivagans*	BLM-S; FWS-SC	Primarily confined to high-elevation forested areas (1,600 to 8,500 ft) composed of aspen, cottonwood, white fir, pinyon-juniper, subalpine fir, willow, and spruce communities. Roost and nursery sites occur in tree foliage, cavities, or under loose bark. Rarely hibernates in caves.	×	×	×
Sonoran pronghorn	*Antilocapra americana sonoriensis*	ESA-E; AZ-WSC; AZ-S1	Endemic to southern and western Arizona and northern Mexico. Inhabits areas of the Lower Sonoran Desert Life Zone in broad alluvial valleys separated by mountains, where substrates consist of clay, silt, and alluvium deposited from wind and ephemeral streams. Mean elevation of the valleys ranges between 400 and 1,600 ft.	×	×	
Southern long-nosed bat	*Leptonycteris curasoae*	ESA-E; NM-T; NM-S2	Occurs in desert grassland and shrubland, chaparral, and lower elevational oak woodland and associated habitats.	×	×	
Southern pocket gopher	*Thomomys umbrinus*	NM-T; NM-S1	Found only in the Animas Mountains in Hidalgo County, New Mexico, at elevations of 4,900 to 7,200 ft. Inhabits the shallow rocky soils of the pine forest.	×	×	

TABLE J.6-1 (Cont.)

				Potential to Occur in the Alternative Areas[b]		
Common Name	Scientific Name	Status[a]	Habitat Description	No Action	Program	SEZ
Mammals (Cont.)						
Southwestern river otter	*Lontra canadensis sonora*	BLM-S	Habitat ranges from semidesert shrubland to subalpine forest that contains required permanent flowing water or ponds, overhanging bank vegetation, and sites for entering and leaving water.	×	×	
Spotted bat	*Euderma maculatum*	BLM-S; AZ-WSC; NV-P; NM-T; FWS-SC; CA-S2; CA-SC; CO-S2; NM-S2; NV-S2; UT-S2; UT-SC	Near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. May be a summer or year-round resident throughout the six-state study area.	×	×	×
Stephens' kangaroo rat	*Dipodomys stephensi*	ESA-E; CA-T; CA-S2	Occurs in annual and perennial grassland habitats, but also coastal scrub or sagebrush with sparse canopy cover, or in disturbed areas.	×		
Tipton kangaroo rat	*Dipodomys nitratoides nitratoides*	ESA-E; CA-E; CA-S1	Small range in southern California. Preferred habitat is sandy or silty soils with none to moderate shrub cover and scattered herbaceous plants.	×		
Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	BLM-S; CO-SC; CO-S2; FWS-SC	A subspecies of Townsend's big-eared bat, known primarily within the six-state study area from the state of Colorado. Inhabits semiarid shrublands, pinyon-juniper woodlands, and montane forests below elevations of 9,500 ft. Roosts in caves, mines, or rock crevices, under bridges, or within buildings.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM-S; BLM-S; NV-P; FWS-SC; CA-S2; NM-SC; NV-S2; UT-SC	Near forests and shrubland habitats below 9,000 ft in elevation throughout the SEZ region. The species may use caves, mines, and buildings for day roosting and winter hibernation. May be a summer or year-round resident throughout the six-state study area.	×	×	×
Tulare grasshopper mouse	*Onychomys torridus tularensis*	BLM-S; CA-S1	Known from Tulare County, California. Inhabits areas of sparse and scattered vegetation such as mesquite and short grasses.	×	×	
Utah prairie dog	*Cynomys parvidens*	ESA-T; UT-S1	Endemic to southwestern Utah. Inhabits grasslands in level mountain valleys and areas with deep, well-drained soils. Populations exist as colonies residing in underground burrow systems, which are dynamic in size and location.	×	×	×
Western mastiff bat	*Eumops perotis californicus*	BLM-S; NV-P; FWS-SC; NV-S1	An uncommon year-round resident in Arizona, California, and Nevada. Occurs in many open semiarid habitats, including conifer and deciduous woodlands, shrublands, grasslands, chaparral, and urban areas. Day roosts in crevices in cliff faces, buildings, and tall trees.	×	×	×
Western pipistrelle	*Pipistrellus hesperus*	BLM-S	Inhabits deserts and lowlands, desert mountain ranges, desertscrub flats, and rocky canyons. Roosts in rock crevices, burrows, and mines.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
Western red bat	*Lasiurus blossevillii*	BLM-S; AZ-WSC; NV-P; FWS-SC; NM-S2 NV-S1; UT-S1	Forages in riparian and other wooded areas. Roosts primarily in cottonwood trees along riparian areas and in fruit orchards.	×	×	×
Western small-footed myotis	*Myotis ciliolabrum*	BLM-S; FWS-SC; CA-S2	Occurs in a variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. May be a summer or year-round resident throughout the six-state study area.	×	×	×
Western yellow bat	*Lasiurus xanthinus*	BLM-S; AZ-WSC; AZ-S2; CA-SC	An uncommon year-round resident in the foothills and desert regions of southern California and southwestern Arizona. Inhabits desert riparian, desert wash, and palm oasis habitats at elevations below 2,000 ft. Roosts in trees.	×	×	×
White sands woodrat	*Neotoma micropus leucophaea*	FWS-SC	Known only from the White Sands region in Otero County, New Mexico. Occurs in desert grasslands, shrublands, and riparian areas.	×	×	×
White-sided jackrabbit	*Lepus callotis*	BLM-S; NM-T; NM-S1	Range is from southern Hidalgo County in New Mexico to northern Oaxaca, Mexico, where its habitat is primarily grasslands.	×	×	
White-tailed prairie-dog	*Cynomys leucurus*	BLM-S; UT-S2; UT-SC	Occurs in northeastern Utah, and Colorado, Wyoming, and Montana. Inhabits open shrublands, semidesert grasslands, and open valleys.	×	×	

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b] No Action	Program	SEZ
Mammals (Cont.)						
Wolverine	*Gulo gulo*	CA-T; CA-S2; CO-S1	Occurs in high-elevation habitats, including aspen, spruce-fir, Douglas fir, lodgepole pine, limber pine, ponderosa pine/lodgepole, white fir, juniper, pinyon juniper, Rocky Mountain bristlecone pine, and mixed conifer forests as well as tundra, subalpine meadow, and xeric shrublands at elevations between 6,000 and 14,500 ft.	×		
Yellow-faced pocket gopher	*Cratogeomys castanops*	NM-S2	Inhabits deep sandy or silty soils that are relatively free of rocks. Prefers deep, firm soils; rich soils of river valleys and streams; agricultural land (orchards, gardens, potato fields, and other croplands); and meadows. Also in mesquite-creosotebush habitat. Constructs shallow foraging burrows and deeper ones between nest and food cache.	×	×	×
Yellow-nosed cotton rat	*Sigmodon ochrognathus*	BLM-S; NM-S2	Inhabits dry rocky slopes in oak-pinyon-juniper habitat, montane meadows in ponderosa pine and Douglas-fir forests, rocky slopes of desert mountains, and grassy montane flats.	×	×	
Yuma hispid cotton rat	*Sigmodon hispidus eremicus*	AZ-S2; CA-S2; CA-SC; FWS-SC	Known from the southern Colorado River Valley in southwest Arizona and southwestern California. Occurs in dense stands of vegetation near wetlands, herbaceous grasslands, and hardwood woodland communities. Preferred sites are described as being dense, grassy areas, such as fields, marshes, and roadside edges; brushy areas along streams or ponds; irrigated fields; and desertscrub.	×	×	×

TABLE J.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat Description	Potential to Occur in the Alternative Areas[b]: No Action	Program	SEZ
Mammals (Cont.)						
Yuma mountain lion	*Puma concolor browni*	CA-S1	Small range, mostly confined to the Colorado River Valley of southern California and southwestern Arizona. Establishes large home ranges composed of riparian bottomlands, cottonwood-willow forests, mesquite bosques, adjacent desert foothills, low and rocky mountains, and canyons within desert, chaparral shrubland, and mixed woodland communities.	×	×	×
Yuma myotis	*Myotis yumanensis*	BLM-S; FWS-SC	A widespread year-round resident throughout much of the southwestern United States. It is uncommon in the Mojave and Sonoran Desert regions, except for mountain ranges bordering the Colorado River and the San Bernardino Mountains. Prefers montane forest habitats at elevations between 2,000 and 8,000 ft. Roosts in buildings, mines, caves, and crevices.	×	×	×

[a] AZ-HS = highly safeguarded plant species in Arizona; AZ-S1 = ranked as S1 in Arizona; AZ-S2 = ranked as S2 in Arizona; AZ-SR = salvage-restricted plant species in Arizona; AZ-WSC = wildlife species of concern in Arizona (formerly regarded as state-threatened); BLM-S = designated as a sensitive species by the BLM; CA-E = listed as endangered by the State of California; CA-FP = California fully-protected species; CA-S1 = ranked as S1 in California; CA-S2 = ranked as S2 in California; CA-SC = a California species of concern; CA-SX = extirpated from California; CA-T = listed as threatened by the State of California; DPS = Distinct Population Segment; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA; ESA-P = proposed for listing under the ESA; ESA-T = listed as threatened under the ESA; ESA-UR = under review for ESA listing; ESA-XN = experimental, non-essential populations under the ESA; FWS-SC = FWS species of concern; CO-E = listed as endangered by the State of Colorado; CO-S1 = ranked as S1 in Colorado; CO-S2 = ranked as S2 in Colorado; CO-SC = Colorado species of concern; CO-T = listed as threatened by the State of Colorado; NM-E = listed as endangered by the State of New Mexico; NM-S1 = ranked as S1 in New Mexico; NM-S2 = ranked as S2 in New Mexico; NM-SC = New Mexico species of concern; NM-T = listed as threatened by the State of New Mexico; NV-P = protected in Nevada; NV-S1 = ranked as S1 in Nevada; NV-S2 = ranked as S2 in Nevada; UT-S1 = ranked as S1 in Utah; UT-S2 = ranked as S2 in Utah; UT-SC = Utah species of concern.

[b] The potential of any species to occur in any of the alternative analysis areas and their affected areas is based on the presence of known occurrences or potentially suitable habitat. Potentially suitable habitat was determined from CAReGAP (USGS 2010) and SWReGAP (USGS 2005a,b) habitat suitability and land cover models.

[c] To convert ft to m, multiply 0.3048.

[d] To convert acres to km^2, multiply by 0.004047.

[e] To convert mi^2 to km^2, multiply by 2.590.

[f] To convert mi to km, multiply by 1.609.

[g] To convert °F to °C, multiply by 0.5555.

J.6.1 Plants

Alkali Mariposa-Lily (*Calochortus striatus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State Rank S2

The Alkali mariposa-lily is an herbaceous perennial monocot in the Liliaceae (lily) family that is native to California but also occurs in Nevada. The plant grows from an underground bulb and has an erect stem that is usually 4 to 8 in. (10 to 20 cm) tall but may be much taller. The stem may branch toward the end and is subtended by a long, linear basal leaf that usually withers by the time the plant blooms. The Alkali mariposa-lily blooms from April to June, with white to lavender, bell-shaped flowers at the end of the stem. The flower petals are striped with purple veins, and each has a nectary at its base that is surrounded by hairs. The fruit is an erect, linear, angled capsule containing flat, yellowish or tan seeds (eFloras.org 2010; Jepson 2010; NatureServe 2012).

The Alkali mariposa-lily grows in wetlands, alkaline seeps, springs, meadows, and springy places in creosotebush scrub (*Larrea tridentata*) of the western Mojave Desert of southern California at elevations between 2,600 and 4,600 ft (800 and 1,400 m) (eFloras.org 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The alkali mariposa-lily may occur in the affected area of the proposed Riverside East SEZ.

Amargosa Niterwort (*Nitrophila mohavensis*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Endangered in California; Protected in Nevada
Rarity: Nevada State Rank S1

The Amargosa niterwort is confined to a few small depressions, or sinks, of the Carson Slough in Nevada and California (from the Ash Meadows National Wildlife Refuge [NWR] in Nevada, downstream to the Franklin Playa, California) and to at least one locale on the eastern shore of the Amargosa River at Grimshaw Basin, California. This habitat is composed of highly saline and alkaline soils that are hydrated to varying degrees and are formed by seepage from freshwater springs that lie many miles to the north and east in Ash Meadows, Nevada (NatureServe 2012).

The Amargosa niterwort grows on open, highly alkaline mudflats and low sand deposits in sinks, around alkali sink vegetation. All populations are known from wet alkaline flats that lack appreciable standing water and support very little vegetation, with extensive salt crust development. The species occurs in the open and is generally not found with, or under, any type of cover. It is found at elevations between approximately 1,970 and 2,460 ft (600 and 750 m). Associated plants include shadscale saltbush (*Atriplex confertifolia*), Parry's saltbush (*Atriplex parryi*), iva (*Iva* spp.), Tecopa bird's-beak (*Cordylanthus tecopensis*), short-pedicelled cleomella (*Cleomella brevipes*), pickleweed (*Salicornia virginica*), and saltgrass (*Distichlis spicata*). Natural and unaltered hydrology within the Lower Carson Slough appears critical for the survival of the Amargosa niterwort.

The Amargosa niterwort is a small erect perennial from an extensive heavy underground rootstock. The largest population of the species is thought to consist of several thousand individuals, many of which are interconnected via underground rootstocks. Plants can overwinter as underground rootstocks, with new plants starting their growth in March. Flowering is from late April to October.

On June 19, 1985 (USFWS 1985), the Amargosa niterwort was federally listed as an endangered species, with designated critical habitat.

The restricted range of this species makes it susceptible to natural catastrophic events such as flooding and drought, as well as to the genetic and demographic consequences of small populations. The majority of all suitable habitat in California for this species is on public lands.

Potential threats to the species include local groundwater depletion; streambed alteration; highway maintenance; mining, including exploratory drilling and claim marker placement; off-highway vehicle (OHV) travel; and trampling by wild horses. An additional threat is the potential introduction and spread of the exotic plant saltcedar (*Tamarisk* spp.). Saltcedar has not been observed near Franklin Playa to date, although it does occur downstream on the Amargosa River in the vicinity of Grimshaw Basin (USFWS 1985; NatureServe 2012).

The Amargosa niterwort may occur in the affected area of the proposed Amargosa Valley SEZ.

Arizona Coralroot (*Hexalectris spicata* var. *arizonica*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (New Mexico)
State Listing Status: Endangered in New Mexico
Rarity: New Mexico State Rank S2; USFWS Species of Concern

The Arizona coralroot is a subspecies of crested coralroot that occurs throughout southern Arizona, New Mexico, Texas, and adjacent Mexico. Within New Mexico, populations exist in Doña Ana, Hidalgo, Otero, and Sierra Counties. The Arizona coralroot grows under heavy leaf litter in oak, mixed oak and conifer, and pinyon-juniper woodland communities, on the wooded sides of canyons, and on canyon bottoms from 3,480 to 6,950 ft (1,061 to 2,118 m) in Arizona and New Mexico. Substrate is limestone to calcareous sandy or organic soils. Associated orchids include spiny coralroot (*Corallorhiza wisteriana*), purple-spike coralroot (*H. warnockii*), Chisos coralroot (*H. revoluta*), and Huachuca Mountain adder's-mouth (*Malaxis corymbosa*) (NMRPTC 2010).

Emerging above ground only to flower from May to July in New Mexico, the Arizona coralroot rarely flowers in consecutive years. It has a symbiotic relationship with mycorrhizal fungi until the plant is mature for flowering. Within New Mexico, this species grows as widely scattered individuals, with some small colonies developing up to six plants (AZGFD 2010; NMRPTC 2010).

The Arizona coralroot is listed as endangered by the State of New Mexico, designated as sensitive by the BLM (New Mexico), ranked S2 by the State of New Mexico, and is a USFWS species of concern.

Threats include mining, land use conversion, habitat fragmentation, soil disturbance and compaction, and forest management practices.

The Arizona coralroot may occur in the affected area of the proposed Afton SEZ.

Ash Meadows Blazingstar (*Mentzelia leucophylla*)

ESA Listing Status: Threatened
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1

The Ash Meadows blazingstar is endemic to the Ash Meadows area of Nye County, Nevada. It occurs in open areas, on dry, hard, salt-crusted alkaline clay or sandy-clay soils. Plants grow on low bluffs, swales, flats, and drainages, in shadscale vegetation that surrounds spring and seep areas in warm desertscrub communities. Associated species include shadscale saltbush, alkali goldenbush (*Isocoma acradenia*), Ash Meadows sunray (*Enceliopsis nudicaulis* var. *corrugata*), and Ash Meadows milkvetch (*Astragalus phoenix*). The Ash Meadows blazingstar is found at elevations between 2,240 and 2,300 ft (683 and 700 m). There are eight occurrences of this species over a range of approximately 6 mi (10 km), on land administered by the USFWS and the BLM as well as on privately owned land.

The Ash Meadows blazingstar is a biennial herb with bright yellow flowers that bloom from late May into September. Flowers open only for brief periods in the late afternoon. Observations made in early spring indicate that individuals of this species do not overwinter;

there was no new growth from previous years. Sufficient rain is probably necessary to allow flowering. Since populations of mature plants vary greatly from year to year, it is likely that the total number of seeds produced varies also. The dispersal of this species' seeds is restricted to the sides of gullies and on raised knolls of the flats and lower foothills in the area of the existing populations. The Ash Meadows blazingstar is apparently sensitive to disturbance or habitat alteration, as it is not found on any disturbed sites either as seedlings or as established plants.

The Ash Meadows blazingstar was federally listed as threatened on May 20, 1985 (USFWS 1985). Critical habitat has been designated in the Ash Meadows area of Nye County, Nevada.

The Ash Meadows blazingstar could occur in the affected area of the proposed Amargosa Valley SEZ.

Ash Meadows Gumplant (*Grindelia fraxinopratensis*)

ESA Listing Status: Threatened
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2

The Ash Meadows gumplant is an erect, biennial or, more often, perennial herb of the sunflower (Asteraceae) family. It is known only from moist, meadow habitats along Carson Slough in Nevada and California, from the Ash Meadows NWR in Nevada, and Franklin Playa, California; it has also been reported along the Amargosa River from near Tecopa, California.

The populations of the Ash Meadows gumplant follow drainage patterns from spring sources in the Ash Meadows region into Carson Slough, the major drainage system of Ash Meadows. The current population status of the Ash Meadows gumplant is unknown, and population trends are difficult to determine because long-term data are unavailable. The Ash Meadows gumplant primarily occurs in saltgrass meadows along streams and surrounding pools in the vicinity of ash-screwbean-mesquite woodlands and desert shadscale scrub vegetation. It occasionally occurs sparsely on open alkali clay soils in drier shadscale habitats or in the unique clay barrens where groundwater is at or near the surface and where other Ash Meadow endemics are supported. The species is quite robust in marshy areas along some dirt roads where runoff accumulates.

The dominant plant species occurring with the gumplant is saltgrass. Other common associates within the saltgrass meadow type community include spring-loving centaury (*Centaurium namophilum*), seep willow (*Baccharis salicipholia*), yerba mansa (*Anemopsis californica*), western niterwort (*Nitrophila occidentalis*), loosestrife (*Lysimachia* spp.), and iva (*Iva* spp.). In wooded areas and on drier sites, common associates include velvet ash (*Fraxinus velutina*), screwbean mesquite (*Prosopis pubescens*), shadscale (*Atriplex confertifolia*), alkali sacaton (*Sporobolus airoides*), alkali goldenbush, rabbitbush (*Ericameria bloomeri*), seepweed (*Suaeda* spp.), and other saltbush species (*Atriplex* spp.).

The Ash Meadows gumplant was federally listed as threatened with designated critical habitat on May 20, 1985 (USFWS 1985).

Threats to the Ash Meadows gumplant include the reduction of spring outflow caused by adjacent land development and/or water diversion; the destruction and/or modification of the limited habitat available to this species from camping, staging area, road maintenance, and/or mining activities; and the degradation of habitat resulting from wild horse grazing and trampling and OHV use impacts.

The Ash Meadows gumplant could occur in the affected area of the proposed Amargosa Valley SEZ.

Ash Meadows Ivesia (*Ivesia kingii* var. *eremica*)

ESA Listing Status: Threatened
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2

The Ash Meadows ivesia is a perennial herb that is endemic to the Ash Meadows area of Nevada. The species occurs in open areas, on moist to saturated, heavy to chalky alkaline soils. Plants grow in meadows on flats, drainages, and bluffs near springs and seeps. They are commonly associated with highly alkaline, clay lowlands or depressions where soil moisture remains high from perched groundwater maintained by springs and seeps. The species is typically found in saltgrass meadow, shadscale, and ash-mesquite, associated with the following species: shadscale saltbush, saltgrass, Baltic rush (*Juncus balticus*), mesquite (*Prosopis* spp.), Mojave thistle (*Cirsium mohavense*), spring-loving centaury (*Centaurium namophilum*), velvet ash (*Fraxinus velutina*), yerba mansa, and iva.

The Ash Meadows ivesia is a matted perennial herb/shrub that bears white flowers from August to October. The Ash Meadows ivesia is aquatic or wetland-dependent and occurs at elevations ranging from 2,200 to 2,300 ft (670 to 700 m). There are nine occurrences of the species that cover a combined total area of approximately 9 acres (0.04 km^2), on land administered by the USFWS and the BLM, and on privately owned land.

The Ash Meadows ivesia was federally listed as threatened on May 20, 1985 (USFWS 1985). Critical habitat has been designated in the Ash Meadows area of Nye County, Nevada.

Potential threats to the species include development, trampling and grazing, and the associated large-scale drawdown of water resources.

The Ash Meadows ivesia could occur in the affected area of the proposed Amargosa Valley SEZ.

Ash Meadows Sunray (*Enceliopsis nudicaulis* var. *corrugate*)

ESA Listing Status: Threatened
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2

The Ash Meadows sunray is endemic to the Ash Meadows area, occurring in both Nevada and adjacent California. The species occurs on dry to somewhat moist, hard, strongly alkaline silty to clay soils, in open areas, often on or near low calcareous outcrops. Plants are found in spring and seep areas, at elevations from 2,200 to 2,360 ft (670 to 720 m), in creosotebush-bursage and shadscale zones. Common associated plant species include shadscale saltbush, alkali goldenbush, saltgrass, broom snakeweed (*Gutierrezia sarothrae*), ratany (*Krameria* spp.), basin yellow cryptantha (*Cryptantha confertiflora*), desert bearpoppy (*Arctomecon merriamii* Coville), Ash Meadows blazingstar (*Mentzelia leucophylla*), and Ash Meadows milkvetch (*Astragalus phoenix*). This species is known from 11 sites that together total an area of 27 acres (0.1 km^2).

The Ash Meadows sunray is a perennial shrub that flowers in April and May. Flowers are borne singly on leafless flower stalks. Little is known about the reproductive biology and life history of this species.

The Ash Meadows sunray was federally listed as threatened on May 20, 1985 (USFWS 1985). Critical habitat has been designated in the Ash Meadows area of Nye County, Nevada.

This subspecies is threatened by groundwater pumping and other agricultural development activities, road construction, and OHV traffic.

The Ash Meadows sunray could occur in the affected area of the proposed Amargosa Valley SEZ.

Black Milkvetch (*Astragalus funereus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Status: Not Listed in Any State
Rarity: Nevada State Rank S2; USFWS Species of Concern

The black milkvetch is a small, tufted, herbaceous perennial dicot in the Fabaceae (bean) family that is native to Nevada but also occurs in California. This species is probably endemic to the Death Valley region in southern Nevada and California. The plant consists of a taproot with a woody crown that gives rise to several prostrate or trailing stems that are woody below, and 0.8 to 3 in. (2 to 8 cm) long. All of the herbage is covered with stiff hairs. The stems bear alternate, crowded, pinnately compound leaves. The black milkvetch blooms during April to

May, with ascending clusters of pea-like flowers on stalks arising from the leaf bases. The flowers are pinkish purple with darker red veins, and each flower base (the calyx) is covered with black hairs. The fruits are large, oblong, pointed, hairy pods with a curved tip that are attached to the plant by ascending short stalks. The leathery pods contain numerous smooth, heart-shaped seeds that are olive, brown, or black. *Astragalus purshii* is a synonym for *Astragalus funereus* (Jepson 2010; NatureServe 2012).

The black milkvetch grows on gravelly clay ridges and ledges on limestone or volcanic substrates at elevations between 4,200 and 6,900 ft (1,277 and 2,098 m) (Jepson 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The black milkvetch could occur in the affected area of the proposed Amargosa Valley SEZ.

Blaine Fishhook Cactus (*Sclerocactus blainei*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1; USFWS Species of Concern

The Blaine fishhook cactus is a small perennial dicot cactus in the family Cactaceae that is native and endemic to southeastern Nevada and southwestern Utah. The plant is an erect, spiny cactus with an unbranched, unsegmented succulent stem that is pineapple-shaped and is 1.2 to 6 in. (3 to 15 cm) tall and 0.8 to 3 in. (2 to 8 cm) in diameter. The stem has 6 to 12 prominent ribs that are armed with clusters of stiff spines arising from wart-like tubercles (areoles). Each areole has 11 to 22 erect and spreading spines; some may be hooked, and others may be flat and ribbon-like. Young spines may be covered with very fine, soft hairs. The Blaine fishhook cactus blooms from April to May, with a cluster of funnel-shaped, pink-purplish flowers that are crowded among the dense spines at the top of the stem. The fruit is a barrel-shaped green to red berry that is persistent on the parent plant. When dry and mature, the fruit splits open to release large black seeds with small warts that are transported by winds and rain. The taxonomy of *Sclerocactus blainei* is not completely understood, and there are many questionable synonyms (eFloras.org 2010; NatureServe 2012).

The Blaine fishhook cactus grows in greasewood, galleta grass, shadscale, and sagebrush communities on alkaline substrates and volcanic gravels with a clay matrix in valley bottoms at elevations between 5,100 and 5,300 ft (1,550 and 1,611 m) (eFloras.org 2010; NatureServe 2012). Only three occurrences of this species are currently known.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The Blaine fishhook cactus could occur in the affected area of the proposed Dry Lake Valley North SEZ.

Brandegee's Milkvetch (*Astragalus brandegeei*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Colorado)
State Listing Status: Not Listed
Rarity: Colorado State Rank S1

The Brandegee's milkvetch is an herbaceous perennial dicot in the Fabaceae (bean) family that is native to Colorado but is also found in other western states. The plant is less than 39 in. (100 cm) tall and has arching stems that may become prostrate or mat-forming. The stems may be smooth or hairy. The plant has alternate, pinnately compound leaves that are hairy on one or both surfaces. Clusters of pea-like flowers are produced from April to September on stalks arising from the leaf bases. The flowers are white or bicolored or with red, purple, or yellow streaks or spots. The fruits are oblong, pointed legumes (pods) that may be hairy or smooth and that contain numerous smooth seeds that are olive, brown, or black (CNHP 2010; NatureServe 2012).

The Brandegee's milkvetch grows in a variety of habitats, including sandy or gravelly banks, flats, and stony meadows within pinyon-juniper woodlands. Substrates are usually sandstone with granite or occasional basalt. Its elevation ranges between 5,400 and 8,800 ft (1,600 and 2,700 m) (CNHP 2010).

Major threats are associated with habitat disturbance or destruction, recreation, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Brandegee's milkvetch could occur in the affected areas of the proposed Antonito Southeast, Fourmile East, and Los Mogotes East SEZs.

California Barrel Cactus (*Ferocactus cylindraceus* var. *cylindraceus*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Arizona Salvage Restricted (SR)
Rarity: None

The California barrel cactus is a large perennial dicot cactus in the family Cactaceae that is native to Arizona but also occurs in California. The plant is a large, erect, spiny cactus with an unbranched, unsegmented, succulent stem in the form of a cylinder that may be 6.5 ft (2 m) tall or higher and 1.3 ft (0.4 m) in diameter. The stem has 21 to 31 prominent ribs that are armed with clusters of stiff spines arising from wart-like tubercles (areoles). Each areole has 12 to 32 erect and spreading spines, the longest of which are 3 to 7 in. (7.5 to 17 cm), and may be whitish, yellow, pink, dull red, or brown. The California barrel cactus blooms from April to May, with a crown of flowers that are crowded among the dense spines at the top of the columnar stem. The individual flowers are maroon on the outside and yellow on the inside. The fruit is a yellow, ovoid, leathery or fleshy, smooth berry that is spineless and contains black seeds. The dried flower parts are persistent on the top of the mature fruit (eFloras.org 2010; Jepson 2010; NatureServe 2012).

The California barrel cactus grows on gravelly or rocky hillsides, canyon walls, alluvial fans, and desert washes in Mojave and Sonoran desertscrub at elevations between 200 and 2,900 ft (61 and 882 m) (eFloras.org 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The California barrel cactus could occur in the affected area of the proposed Gillespie SEZ.

California Fan Palm (*Washingtonia filifera*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Arizona Salvage Restricted (SR)
Rarity: Arizona State Rank S1

The California fan palm is a large perennial monocot palm tree in the Arecaceae family that is native to Arizona and California but also occurs in Nevada and Florida, probably as an exotic. The plant consists of an erect, columnar, unbranched trunk that is 20 to 75 ft (6 to 23 m) tall and 1 to 3 ft (0.3 to 1 m) in diameter, often clothed with a thick, skirt-like thatch of dead, persistent leaves that sometimes reaches all the way to the ground. The alternate leaves are fan-shaped and 3 to 6 ft (1 to 1.8 m) long with 40 to 60 folds, torn nearly to the base. The margins of the leaf divisions have numerous white, thread-like fibers. The very stout leaf stalks (petioles) are 2 to 5 ft (0.6 to 1.5 m) long and have large hooked teeth on the edges. These large leaves form a loose and open crown at the top of the trunk. California fan palm blooms from February to June, with a large, branched, spike-like inflorescence that hangs down among the leaves and bears numerous white flowers. The fruit is a small, ovoid, black, fleshy, one-seeded drupe (Jepson 2010; NatureServe 2012).

The California fan palm grows in desert washes, seeps, and springs where underground water is continuously available and in desert oases in isolated areas of the Sonoran and Mojave Deserts at elevations between 500 and 1,000 ft (150 and 300 m) (eFloras.org 2010; Jepson 2010).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The California fan palm could occur in the affected area of the proposed Brenda SEZ.

Chaparral Sand-Verbena (*Abronia villosa* var. *aurita*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State Rank S2

The Chaparral sand-verbena is an herbaceous annual dicot in the Nyctaginaceae family that is native to California and endemic to southern California. The plant consists of a loose mat of branched stems that are prostrate to ascending, widely spreading, and up to 30 in. (80 cm) long. The stems usually have a reddish tinge and are glandular-hairy. The stems bear opposite, oval, fleshy leaves that are grayish and glandular and may be hairy. Chaparral sand-verbena blooms from January to September, with dense roundish clusters of magenta flowers on stalks that arise from leaf bases at the ends of the branches. The fruit is a winged achene (eFloras.org 2010; Jepson 2010; NatureServe 2012).

The Chaparral sand-verbena grows on sandy sites in chaparral desert sand dunes, coastal scrub habitats, and sage-scrub at elevations between 350 and 5,250 ft (100 and 1,600 m) (eFloras.org 2010; NatureServe 2012). Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Chaparral sand-verbena could occur in the affected areas of the proposed Imperial East and Riverside East SEZs.

Compact Cat's-Eye (*Cryptantha compacta*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S1; Utah State Rank S2

The Compact cat's-eye is an herbaceous perennial dicot in the Boraginaceae family that is native to Utah but also occurs in Nevada. The plant is 1 to 4 in. (3 to 10 cm) tall and consists of numerous erect bristly stems, each with a rosette of basal leaves, arising from a woody base. The crowded, alternate, oval leaves on the stems are also bristly. The Compact cat's-eye blooms from May to June, with clusters of blossoms with white petals and yellow throats, at the ends of the branches. The oval base of each flower (the calyx) is covered with long, bristly hairs. The fruit is a small, smooth, brown nutlet, four of which are produced by each flower (NatureServe 2012; Utah Native Plant Society 2010).

The Compact cat's-eye grows in a variety of habitats, including salt desert shrub and mixed desert shrub communities, on gravelly loam and on open slopes and ridges at elevations of 6,200 to 7,400 ft (1,885 to 2,250 m) (Utah Native Plant Society 2010).

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Compact cat's-eye could occur in the affected areas of the proposed Escalante Valley, Milford Flats South, and Wah Wah Valley SEZs.

Creamy Blazing Star (*Mentzelia tridentata*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State rank S2

The creamy blazing star is an annual herbaceous dicot in the Loasaceae family that is native and endemic to California. The plant consists of a branching, erect, hairy stem that is 2 to 10 in. (5 to 25 cm) tall. The stem bears widely separated, opposite, lance-shaped leaves that are wavy-edged and have irregular teeth. The creamy blazing star blooms from March to May, with white to pale yellow flowers that arise from leaf bases at the end of the stem. The fruit is a barrel-shaped to cylindrical capsule on a short stalk that may be erect or bent downward. The capsule contains a compressed, ashy-white seed (Jepson 2010; NatureServe 2012).

The creamy blazing star is endemic to California and grows in Mojave Desert creosotebush scrub communities on rocky and sandy substrates at elevations below 3,900 ft (1,200 m) (Jepson 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012).

The creamy blazing star could occur in the affected area of the proposed Riverside East SEZ.

Death Valley Beardtongue (*Penstemon fruticiformis* ssp. *amargosae*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The Death Valley beardtongue is a shrubby perennial dicot in the Plantaginaceae family that is native and endemic to the Death Valley region of southern Nevada and California, where it is known only from Inyo and San Bernardino Counties in California and from Clark and Nye Counties in Nevada. The plant consists of a densely branched shrub that is 12 to 24 in. (30 to 60 cm) tall and is usually wider than tall. The erect to spreading stems are smooth and bear thick, opposite leaves that are long, narrow, and lance-shaped. The leaves are usually folded lengthwise or curved inward. The Death Valley beardtongue blooms from April to June, with wide-mouthed tubular flowers in shades of white, blue, pink or purple, in clusters that arise from the bases of leaves or bracts at stem nodes. The bottom petal of each flower has a tuft of yellowish hair in its center and several purple veins. The outside of the flower petals are glandular-hairy. The fruit is an oval capsule that contains numerous irregularly angled seeds (Jepson 2010; NatureServe 2012).

The Death Valley beardtongue grows in Mojave desertscrub communities at elevations between 2,800 and 4,600 ft (851 and 1,398 m) (Jepson 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012).

The Death Valley beardtongue could occur in the affected area of the proposed Amargosa Valley SEZ.

Desert Night-Blooming Cereus (*Peniocereus greggii* var. *greggii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (New Mexico)
State Listing Status: Endangered in New Mexico
Rarity: New Mexico State Rank S1; USFWS Species of Concern

The desert night-blooming cereus (*Peniocereus greggii* var. *greggii*) occurs in southern New Mexico and western Texas. Within New Mexico, it occurs in Doña Ana, Grant, Hidalgo, and Luna Counties. Habitat is gently broken to level terrain in desert grassland, Chihuahuan desertscrub, and gravelly flats and washes. Substrate is sandy to silty gravelly soil. It is typically found growing through shrubs, especially creosotebush and honey mesquite (*Prosopis glandulosa*) (NMRPTC 2010).

Flowering nocturnally in June, the desert night-blooming cereus produces fragrant, white flowers. The fruit have small blackish spines and turn red when ripe. The species depends on insect pollinators such as hawkmoths, which is difficult because of the species' extremely patchy dispersal. Pesticide use in the southwestern United States adversely affects pollinator populations, which in turn limits the reproduction of the desert night-blooming cereus (NatureServe 2012; NMRPTC 2010).

Although 15 occurrences have been reported in New Mexico, most of these populations are historic or have been extirpated.

Threats include private and commercial collectors, agriculture, and urbanization.

Currently, the desert night-blooming cereus is listed as sensitive by the BLM, listed as endangered in New Mexico, ranked S1 in New Mexico, and is a USFWS species of concern.

The desert night-blooming cereus may occur within the affected area of the proposed Afton SEZ (NatureServe 2012; NMRPTC 2010).

Eastwood Milkweed (*Asclepias eastwoodiana*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2; USFWS Species of Concern

The Eastwood milkweed is a perennial herbaceous dicot in the Asclepiadaceae (milkweed) family that is native and endemic to Arizona on public and private lands in Esmeralda, Lander, Lincoln, and Nye Counties. The plant consists of several erect to spreading thick stems arising from a buried root crown. The stems are 4 to 8 in. (10 to 20 cm) tall and bear thick, widely separated, opposite leaves that are oval in outline and pointed. The leaf margins are covered with short, woolly hair. The Eastwood milkweed blooms in late spring, with white hooded flowers in clusters that arise from leaf bases near the ends of the stems. After opening, each flower is subtended by a ring of small, purplish, leaf-like bracts. The fruit is an erect, spindle-shaped, dry follicle (capsule) on a short stalk that splits open on one side when mature. Each of the numerous seeds has a tuft of silky hairs that help the seeds disburse on the wind (NatureServe 2012).

The Eastwood milkweed grows in open areas on a wide variety of basic (pH usually >8) soils—including calcareous clay knolls, sand, carbonate or basaltic gravels, and shale outcrops—generally barren and lacking competition. It frequently occurs in small washes or other moisture-accumulating microsites in the shadscale, mixed-shrub, sagebrush, and lower pinyon-juniper zones at elevations between 4,700 and 7,100 ft (1,428 and 2,158 m) (NNHP 2010).

Major threats are associated with habitat disturbance or destruction, recreation, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The Eastwood milkweed could occur in the affected areas of the proposed Dry Lake Valley North, Gold Point, and Millers SEZs.

Flat-Seeded Spurge (*Chamaesyce platysperma*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State Rank S1

The flat-seeded spurge is an herbaceous annual dicot in the Euphorbiaceae family that is native to California but also occurs in Arizona. The plant forms sprawling mounds from 20 to 40 in. (50 to 100 cm) in diameter. The stems are arching-ascending when young but become more prostrate with age, and they contain milky sap. The widely spaced leaves are opposite and oval. The flat-seeded spurge blooms from February to September, with solitary yellowish flowers on short stalks that arise from leaf bases along the stems. The fruit is a round capsule that is exserted from the flower base on a lax stalk and contains a white seed (AZGFD 2010; Jepson 2010; NatureServe 2012).

The flat-seeded spurge grows on sandy substrates of desert dunes within Sonoran desertscrub communities at elevations below 650 ft (200 m) (California Native Plant Society 2010).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The flat-seeded spurge could occur in the affected area of the proposed Imperial East SEZ.

Fragile Rockbrake (*Cryptogramma stelleri)*

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Colorado)
State Listing Status: Not Listed
Rarity: Colorado State Rank S2

The fragile rockbrake is a perennial fern that is native to Colorado but also occurs in several western states and Canada. Ferns reproduce via tiny spores shed into the air; therefore, the plants have no flowers, fruits, or seeds. The spores eventually settle to the soil and germinate to form inconspicuous subterranean gametophytes, from which aerial plants (sporophytes) develop. Fragile rockbrake consists of scaly creeping stems (rhizomes) that are fleshy and brittle, which produce erect pinnately compound fronds (leaves) that are 2 to 8 in. (5 to 20 cm) tall and only persist until late summer, when they die and are shed. In this species, the fertile (spore-bearing) and sterile fronds are different in appearance. The fertile fronds are narrower but slightly longer than the sterile ones, and the edges of the pinnules curl under to cover the spore-bearing structures on their underside edges. Spores are shed during summer (eFloras.org 2010; NatureServe 2012).

The fragile rockbrake grows in moist soils on shaded limestone cliffs and rock ledges, often in association with mosses, at elevations higher than 7,000 ft (2,100 m) (eFloras.org 2010; NatureServe 2012). The fragile rockbrake is afforded some protection by the remote, relatively inaccessible location of its habitat.

Major threats are associated with habitat disturbance or destruction, recreation, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The fragile rockbrake could occur in the affected areas of the proposed Antonito Southeast, Fourmile East, and Los Mogotes East SEZs.

Frisco Buckwheat (*Eriogonum soredium*)

ESA Listing Status: Under review for listing
BLM Listing Status: Sensitive (Utah)
State Listing Status: Not Listed
Rarity: Utah State Rank S1

The Frisco buckwheat is a densely matted, mound-forming, perennial dicot herb that is native to Utah and endemic to the San Francisco Mountains in Beaver County. The plant is 1 to 1.6 in. (2 to 4 cm) tall, and the herbage is white-hairy. The vegetative stems are densely crowded with elongated oval leaves that have a tendency to curl. The short, erect, leafless, flowering stalks (scapes) are hairy and rise above the cushion of vegetative stems, and they bear round clusters of white or pinkish flowers at their ends from June to September. The fruit is a light brown, three-sided achene (eFloras.org 2010; NatureServe 2012; Utah Native Plant Society 2010).

The Frisco buckwheat grows on gravelly to rocky limestone slopes, in mixed saltbush and sagebrush communities and in pinyon-juniper communities on white limestone outcrops at elevations between 6,600 and 7,300 ft (2,006 and 2,220 m) (eFloras.org 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, mining, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Frisco buckwheat could occur in the affected area of the proposed Wah Wah Valley SEZ.

Frisco Clover (*Trifolium friscanum*)

ESA Listing Status: Under review for listing
BLM Listing Status: Sensitive (Utah)
State Listing Status: Not Listed
Rarity: Utah State Rank S1

The Frisco clover is a mat-forming herbaceous perennial dicot in the Fabaceae (bean) family that is endemic to Beaver and Millard Counties in Utah. The plant consists of numerous short stems arising from a rhizomatous woody crown to form a cushion that is 0.3 to 1 in. (0.8 to 3 cm) tall. The stems are obscured by densely crowded, alternate, trifoliate compound leaves. The stems and leaves are silvery-hairy. The Frisco clover blooms in June, with clusters of reddish-purple, pea-like flowers that are produced on stalks arising from leaf bases at the ends of the stems. The fruits are oblong pods that are enclosed in the persistent, withered petals and calyx and contain several smooth brown or black seeds (eFloras.org 2010; NatureServe 2012; Utah Native Plant Society 2010).

The Frisco clover grows on volcanic gravels and limestone substrates in association with pinyon-juniper woodlands at elevations between 6,900 and 7,300 ft (2,098 and 2,219 m) (Utah Native Plant Society 2010).

Major threats are associated with habitat disturbance or destruction, mining, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Frisco clover could occur in the affected area of the proposed Wah Wah Valley SEZ.

Giant Spanish-Needle (*Palafoxia arida* var. *gigantea*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State rank S1

The giant Spanish-needle is a large, shrubby, annual or perennial herbaceous dicot in the Asteraceae (sunflower) family that is native to California but also occurs in Arizona. The plant consists of numerous erect, slender, much-branched stems that are 36 to 72 in. (91 to 183 cm) tall. The stems bear widely spaced, long, linear, pointed, dark green leaves that are opposite near the base and alternate above. The stems may be glandular and hairy on their upper parts. Giant Spanish-needle blooms from February to May, with white to pink-purple composite flowers at the ends of the branches. The fruit is a four-angled achene that has a tuft of scales at the end (a pappus), is dandelion-like, and is dispersed by the wind (California Native Plant Society 2010; NatureServe 2012).

The giant Spanish-needle grows on desert sand dunes, along riverine environments, and irrigation canals at elevations lower than 328 ft (100 m) (California Native Plant Society 2010).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The giant Spanish-needle could occur in the affected areas of the proposed Imperial East and Riverside East SEZs.

Gold Butte Moss (*Didymodon nevadensis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Gold Butte moss is a small, perennial, evergreen moss that is native to Nevada but also occurs in Colorado, Texas, British Columbia (Canada), and southern Chihuahua in Mexico. The plant has a wide distribution but is rare locally. The plants form a dense, mat-like turf, blackish green above and reddish brown below. The moss turf consists of thin, leafy stems, branching occasionally, up to 0.4 in. (1 cm) long. The stems bear crowded, overlapping, long-oval, pointed leaves that are appressed to and twisted around the stem when dry and are weakly spreading when moist. The leaves have a large midvein and inrolled margins. The base of the turf produces several rhizoids that arise from leaf bases near the bases of the stems. Rhizoids are simple root-like structures that anchor the plant and absorb water. Mosses normally reproduce via tiny spores shed into the air; therefore, the plants have no flowers, fruits, or seeds. However, only female plants of the Gold Butte moss have been found, and these reproduce asexually by producing round or oval tubers on branching rhizoids at the soil surface. Seasonal growth is initiated in autumn by the production of new stems from the tubers. Stem elongation occurs through the cooler months of autumn, winter, and early spring (eFloras.org 2010; NatureServe 2012; NNHP 2010).

The Gold Butte moss grows on or near gypsiferous deposits and outcrops or limestone boulders, especially on east- to north-facing slopes of loose, uncompacted soil. It is typically associated with other mosses and lichens. Its elevation ranges between 1,300 and 2,300 ft (395 and 700 m) (eFloras.org 2010; NatureServe 2012; NNHP 2010).

Major threats are associated with habitat disturbance or destruction, recreation, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Gold Butte moss may occur in the affected area of the proposed Dry Lake SEZ.

Grama Grass Cactus (*Sclerocactus papyracanthus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (New Mexico)
State Listing Status: Not Listed
Rarity: Not Listed

The grama grass cactus (*Sclerocactus papyracanthus*) occurs in southern Arizona, New Mexico, and Western Texas. Typical habitat is pinyon-juniper woodland, Chihuahuan desertscrub, and desert and Great Plains grassland on open flats or gentle slopes between 4,900 and 7,200 ft (1,500 and 2,200 m). Sandy soils with a calcareous or gypseous component are characteristic. Associated vegetation includes blue grama grass (*Bouteloua gracilis*), Fendler's three-awn (*Aristida fendleri*), and New Mexico feathergrass (*Stipa neomexicana*) (eFloras.org 2010; NatureServe 2012; NMRPTC 2010).

The grama grass cactus's white flowers appear in April and May, with fruits appearing in early June that are dry and tan colored when mature (eFloras.org 2010; NatureServe 2012).

Once abundant in parts of its range, grama grass cactus populations are sharply reduced because of rangeland degradation, collection, and development. Additional threats include the cactus and succulent trade, overgrazing and trampling by livestock, OHV traffic, and urbanization (NatureServe 2012).

The grama grass cactus may occur in the affected area of the proposed Afton SEZ.

Halfring Milkvetch (*Astragalus mohavensis* var. *hemigyrus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State rank S2; USFWS Species of Concern

The halfring milkvetch is a small, herbaceous, annual or short-lived perennial dicot in the Fabaceae (bean) family that is native and endemic to Nevada. The plant consists of a taproot with a woody crown that gives rise to several open, widely branched, weakly ascending stems that are 2 to 14 in. (5 to 35 cm) long. All of the herbage is covered with fine hair that gives the plant a silvery-gray appearance. The stems bear alternate, widely separated, pinnately compound leaves on long stalks. The oval-pointed, thick leaflets are opposite. The halfring milkvetch blooms during April to June, with ascending clusters of pea-like flowers on stalks arising from leaf bases. The flowers are pinkish purple with darker purple veins, and each flower base (the calyx) is covered with hairs. The fruits are large, oblong, curved, hairy pods that are attached to the plant by short stalks. The stiffly leathery pods contain numerous smooth seeds (Jepson 2010; NatureServe 2012; NNHP 2010).

The halfring milkvetch grows on carbonate gravels and derivative soils on terraced hills and ledges, open slopes, and along washes within the creosotebush-bursage, blackbrush, and mixed-shrub habitat communities. Its elevation ranges between 3,000 and 5,600 ft (914 and 1,707 m) (Jepson 2010; NatureServe 2012; NNHP 2010).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012; NNHP 2010).

The halfring milkvetch could occur in the affected area of the proposed Dry Lake SEZ.

Harwood's Eriastrum (*Eriastrum harwoodii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State rank S2

The Harwood's eriastrum is an annual herbaceous dicot in the Polemoniaceae (phlox) family that is native and endemic to California. The plant consists of a branching erect stem that is up to 8-in. (20-cm) tall. The stems bear widely separated alternate leaves that are thread-like and may be three-lobed near the base. The leaves are yellow-green and densely woolly. The Harwood's eriastrum blooms from March to June, with small, head-like inflorescences that are densely woolly and arise from leaf bases toward the ends of the stems. The individual flowers are straw-yellow, cream, or white. The fruit is a capsule that usually contains two seeds (Jepson 2010; NatureServe 2012).

The Harwood's eriastrum is endemic to southern California and grows on desert sand dunes in creosotebush scrub and other sandy habitats at elevations between 650 and 3,000 ft (200 and 915 m) (California Native Plant Society 2010; Jepson 2010).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (California Native Plant Society 2010).

The Harwood's eriastrum could occur in the affected area of the proposed Riverside East SEZ.

Hohokam Agave (*Agave murpheyi*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Arizona)
State Listing Status: Arizona Highly Safeguarded (HS)
Rarity: Arizona State Rank S2; USFWS Species of Concern

The Hohokam agave is a perennial monocot succulent in the Agavaceae family that is native and endemic to Nevada and Sonora, Mexico. The plant consists of a basal rosette of crowded, fleshy, long-lived leaves, and it is 24 to 47 in. (60 to 120 cm) tall. The ascending leaves are spatula-shaped, have undulating edges armed with spines, and have a stiff spine at the end of the leaf. The smooth leaves are light bluish-green to yellow-green, often cross-banded, and slightly incurved toward the center of the rosette. The Hohokam agave matures to reproductive age after 10 to 30 years. The plant blooms from late winter to spring by producing a very tall, erect, flowering stalk that reaches 10 to 13 ft (3 to 4 m) in height. The terminal one-quarter of this stalk bears crowded flower clusters on slightly ascending side branches. The individual flowers are waxy cream-green with purplish or brownish tips. After flowering, the flower stalk's side branches produce numerous bulbils that can produce new plants. The Hohokam agave blooms once and then dies. The fruit is an oval, beaked capsule on a short stalk. However, the plant rarely produces seed and propagates primarily via bulbils (eFloras.org 2010; NatureServe 2012).

The Hohokam agave grows on benches or alluvial terraces on gentle bajada slopes above major drainages in desertscrub communities at elevations between 1,300 and 3,200 ft (395 and 973 m). The bulbils are easily transported and transplanted, and some occurrences appear to be associated with old American Indian living sites (eFloras.org 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (AZGFD 2010).

The Hohokam agave could occur in the affected area of the proposed Gillespie SEZ.

Holmgren Lupine (*Lupinus holmgrenianus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The Holmgren lupine is an herbaceous perennial dicot in the Fabaceae (bean) family that is native to Nevada and probably endemic to the Death Valley region of southern Nevada and California. The plant consists of several stout, erect stems that are 16 to 26 in. (40 to 70 cm) tall. All of the herbage is covered with long hair. The stems are subtended by large, palmately compound basal leaves with four to seven spindle-shaped leaflets. The stems bear alternate leaves that are similar to the basal leaves, but smaller. The Holmgren lupine blooms during April to June, with attractive spikes of whorled pea-like flowers that rise above the leaves from the ends of the stems or that arise from leaf bases. The flowers are violet to purple with a yellow patch on the upper petal. The fruits are oblong, hairy, legume pods that are attached to the plant by short stalks. Each pod contains five to seven smooth seeds (Jepson 2010; NatureServe 2012).

The Holmgren lupine grows on dry desert slopes, washes, and valleys on volcanic substrates, sometimes in association with big sagebrush (*Artemisia tridentate*)-dominated communities, and in pinyon-juniper woodlands. Its elevation ranges between 4,600 and 8,200 ft (1,398 to 2,493 m) (Jepson 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (Jepson 2010; NatureServe 2012; NNHP 2010).

The Holmgren lupine may occur in the affected areas of the proposed Amargosa Valley and Gold Point SEZs.

Jones' Globemallow (*Sphaeralcea caespitosa*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Utah)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2; Utah State Rank S2

The Jones' globemallow is an herbaceous perennial dicot in the family Malvaceae that is native to Utah but also occurs in Nevada. The plant is 1 to 10 in. (2 to 25 cm) tall and consists of several erect, branching stems arising from a branched woody crown. All of the plant herbage is densely hairy, giving the plant a gray appearance. Thick, fleshy, alternate leaves are crowded on the stems. The Jones' globemallow blooms from May to June and again in September with red-orange flowers on flower stalks that arise from leaf bases at the ends of the stems. The fruit is a globe-shaped group of wedge-shaped carpels. Each carpel has dense hairs on the wide end and contains one or more kidney-shaped seeds (NatureServe 2012; Utah Native Plant Society 2010).

The Jones' globemallow typically grows on calcareous soils and gravels derived from Sevy dolomite, in association with mixed shrub, pinyon-juniper, and grassland communities at elevations between 5,000 and 6,500 ft (1,525 and 1,980 m) (NatureServe 2012; Utah Native Plant Society 2010).

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Jones' globemallow could occur in the affected areas of the proposed Escalante Valley, Milford Flats South, and Wah Wah Valley SEZs.

Las Vegas Bearpoppy (*Arctomecon californica*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed

State Listing Status: Protected in Nevada
Rarity: USFWS Species of Concern

The Las Vegas bearpoppy is an herbaceous, short-lived perennial dicot that is native to Nevada. The plant consists of a stout taproot, from which arises a crowded basal clump of erect leaves that is about 5 in. (13 cm) tall. The leaves are wedge-shaped, with several shallow teeth on the top margin, and densely covered with long, white, shaggy hairs, which make them appear grayish-blue in color. The base of the plant is often surrounded by a layer of ash- or straw-colored dead leaves. The Las Vegas bearpoppy blooms from April to May, with several tall, smooth flowering stems that rise above the basal leaf clump to a height of about 20 in. (50 cm). Each flowering stem bears at its end a cluster of stalked flower buds that are initially nodding but become upright when the buds open to produce attractive yellow flowers with a dark center. The fruit is an upright, egg-shaped, persistent capsule that opens at the top by dark-colored flaps when the fruit dries and becomes mature. The capsule contains numerous small, shiny, black seeds (AZGFD 2010; NatureServe 2012; NNHP 2010).

The Las Vegas bearpoppy grows on open, dry, spongy or powdery, often dissected ("badland") or hummocked soils with a high gypsum content. These soils typically have a well-developed crust and are in areas of generally low relief on all aspects and slopes, with a sparse cover of other gypsum-tolerant species. Its elevation ranges between 1,050 and 3,650 ft (319 and 1,110 m) (NatureServe 2012; NNHP 2010).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Las Vegas bearpoppy could occur in the affected area of the proposed Dry Lake SEZ.

Las Vegas Buckwheat (*Eriogonum corymbosum* var. *nilesii*)

ESA Listing Status: Candidate
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Las Vegas buckwheat is a large perennial dicot shrub that is native and endemic to Nevada. The plant is known only from the Las Vegas and Muddy Mountains region of Clark County, Nevada. The plant consists of a mounded clump of spreading to upright, densely branched woody stems that are 12 to 48 in. (30 to 122 cm) tall. The branches are covered with woolly hair and somewhat swollen at the nodes. The branches bear alternate, oval leaves that are densely hairy on the underside and silvery with very fine hair above. The Las Vegas buckwheat blooms from August to November, with dense, branching clusters of small, yellow flowers that are borne at the ends of the branches. The flowering branches are covered with sparse, silvery tufts of cobwebby hair and may be thorny. The fruit is a light brown, oval, three-sided achene enclosed by three leaf-like bracts (eFloras.org 2010; NatureServe 2012; NNHP 2010).

The Las Vegas buckwheat grows on or near gypsum soils, in washes, drainages, or in areas of generally low relief in the Mojave Desert. Its elevation ranges between 1,900 and 3,850 ft (578 and 1,170 m) (eFloraS.org 2010; NatureServe 2012; NNHP 2010).

Las Vegas buckwheat populations are declining rapidly in Nevada, where the species is known from 15 occurrences encompassing an area of less than 1,500 acres (6 km^2). Because the species is endemic and declining, conservation of this species is essential to ensure it remains a part of Nevada's flora.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (NNHP 2010)

The Las Vegas buckwheat could occur in the affected area of the proposed Dry Lake SEZ.

Latimer's Woodland-Gilia (*Saltugilia latimeri*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State Rank S2

The Latimer's woodland-gilia is an annual herbaceous dicot in the Polemoniaceae (phlox) family that is native and endemic to California. The plant consists of one to several erect branching stems that are 2 to 12 in. (5 to 30 cm) tall. The slender stems are subtended by a rosette of semi-erect basal leaves that are pinnately divided into deep lobes. The widely spaced stem leaves are similar but smaller or are merely toothed near the ends of the stems. Latimer's woodland-gilia blooms from March to June with small, ascending, head-like inflorescences that arise from leaf bases toward the ends of the stems. The individual funnel-shaped flowers are small and have pinkish-lavender petals and a purple throat. The fruit is a narrow, oval capsule that contains numerous seeds (Jepson 2010; NatureServe 2012).

Latimer's woodland-gilia is endemic to California and grows in Mojave desertscrub communities, pinyon-juniper woodlands, and dry washes on rocky or sandy substrates at elevations between 1,300 and 6,500 ft (400 and 2,000 m) (Jepson 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012).

The Latimer's woodland-gilia could occur in the affected area of the proposed Riverside East SEZ.

Little San Bernardino Mountains Linanthus (*Linanthus maculatus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State Rank S1

The Little San Bernardino Mountains linanthus is a very small annual herbaceous dicot in the Polemoniaceae (phlox) family that is native and endemic to California. The plant arises from a long taproot and is 0.4 to 1.2 in. (1 to 3 cm) high. The tiny, hairy stems branch to form small matted clusters on the sand surface. The stems bear oblong-linear, hairy, thick leaves that are only a few millimeters long. The Little San Bernardino Mountains linanthus blooms from March to May, with small, crowded, head-like flower clusters at the ends of the stems. The flowers are white with a red spot near the base of each recurved petal. The fruit is a capsule that contains several seeds (Jepson 2010; NatureServe 2012).

The Little San Bernardino Mountains linanthus is known from fewer than 20 occurrences in southern California near Joshua Tree National Park in the Little San Bernardino Mountains. The plant grows on desert dunes and sandy flats in creosotebush scrub and Joshua tree woodland communities at elevations lower than 6,900 ft (2,100 m) (Jepson 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012).

The Little San Bernardino Mountains linanthus could occur in the affected area of the proposed Riverside East SEZ.

Long-Calyx Milkvetch (*Astragalus oophorus* var. *lonchocalyx*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada and Utah)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2; Utah State Rank S1

The long-calyx milkvetch is an herbaceous perennial dicot in the Fabaceae (bean) family that is native to Colorado but also occurs in Nevada. The plant arises from a woody crown; is 6 to 12 in. (15 to 30 cm) tall; and has erect, branching, hairy stems. The stems bear alternate, pinnately compound hairy leaves. Clusters of pea-like flowers are produced in June on stalks arising from leaf bases at the ends of the stems. The large flowers are pinkish purple and hang down from the nodding flower stalks. The fruits are large, oblong, inflated, hairy pods that remain attached to the plant by short stalks and contain numerous smooth seeds (NatureServe 2012; Utah Native Plant Society 2010).

The long-calyx milkvetch grows in a variety of habitats, including pinyon-juniper woodlands, sagebrush, and mixed desert shrub communities at elevations between 5,800 and 7,500 ft (1,750 and 2,300 m) (Utah Native Plant Society 2010).

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The long-calyx milkvetch could occur in the affected areas of the proposed Dry Lake Valley North, Escalante Valley, and Wah Wah Valley SEZs.

Many-Stemmed Spider-Flower (*Cleome multicaulis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Colorado)
State Listing Status: Not Listed
Rarity: Colorado State Rank S2; USFWS Species of Concern

The many-stemmed spider-flower is a slender herbaceous annual dicot in the Capparaceae family that is native to Colorado. The usually unbranched or sparingly branched leafy stems are 8 to 28 in. (20 to 70 cm) tall, with alternate leaves that are palmately compound with three narrow leaflets that often fold along the midrib. The many-stemmed spider-flower blooms from August to September, with pink flowers that are borne on thin stalks arising from the base of reduced stem leaves. The fruits are large, oblong, multiseeded capsules with a stalk-like base, and they droop at maturity. The round seeds are light brown and smooth (CNHP 2010; NatureServe 2012)

The many-stemmed spider-flower is restricted to habitats that include the margins of moist, slightly saline depressions, such as alkali sinks, alkaline meadows, and old lakebeds at elevations of 3,600 to 4,200 ft (1,098 to 1,281 m) (NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The many-stemmed spider-flower could occur in the affected areas of the proposed Antonito Southeast, Fourmile East, and Los Mogotes East SEZs.

Marble Canyon Rockcress (*Sibara grisea*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (New Mexico)
State Listing Status: Not Listed
Rarity: New Mexico Species of Concern; USFWS Species of Concern

The Marble Canyon rockcress (*Sibara grisea*), also known as gray sibara, occurs in southern New Mexico and western Texas. Within New Mexico, its distribution includes Chaves, Eddy, and Otero Counties. Habitat includes rock crevices, the bases of limestone cliffs, limestone or travertine and cliff faces in chaparral, and mesic mountain canyons and pinyon-juniper woodland communities. Its elevation ranges from 4,500 to 6,000 ft (1,350 to 1,800 m). This annual forb/herb flowers in May and June (NatureServe 2012; NMRPTC 2010).

The Marble Canyon rockcress is listed as sensitive by the BLM New Mexico State Office and is a New Mexico and USFWS species of concern. Livestock grazing and energy development do not threaten this species.

The Marble Canyon rockcress may occur in the affected area of the proposed Afton SEZ.

Money Wild Buckwheat (*Eriogonum nummulare*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Utah)
State Listing Status: Not Listed
Rarity: Utah State Rank S1

The money wild buckwheat is a large perennial dicot shrub in the Polygonaceae family that is native to Utah but also occurs in other western states. The plant consists of a mounded clump of spreading to upright branching stems that are 12 to 31 in. (30 to 80 cm) tall and arise from a woody base. The stems may be hairy or smooth, and each has a cluster of oval basal leaves, with a few smaller alternate leaves along the branches. The leaves are densely white-hairy on the underside and greenish on the upper surface. The money wild buckwheat blooms from July to October, with clusters of white flowers that are borne at the ends of erect, thin, branching stems. The fruit is a light brown, three-sided achene enclosed by three bracts (eFloras.org 2010; NatureServe 2012).

The money wild buckwheat occurs in a variety of habitats that include sandy to occasionally gravelly washes, flats, and slopes; saltbush and sagebrush communities; and pinyon-juniper woodlands at elevations of 2,625 to 8,530 ft (800 to 2,600 m) (eFloras.org 2010).

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The money wild buckwheat could occur in the affected areas of the proposed Escalante Valley, Milford Flats South, and Wah Wah Valley SEZs.

Munz's Cholla (*Opuntia munzii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State Rank S2; USFWS Species of Concern

The Munz's cholla is a large perennial dicot cactus in the Cactaceae family that is native to California but also occurs in Mexico (Baja California). The plant is a large, erect, spiny cactus in the form of a shrub or tree that may attain a height of 6.5 to 13 ft (2 to 4 m). One or more succulent, tree-like trunks produce ascending main branches that are gray-green and bear terminal tufts of usually drooping, jointed branchlets. These stem segments are easily detached and can function as vegetative propagules. The entire plant is armed with clusters of stiff spines arising from wart-like tubercles. Minute detachable bristles (glochids) form tufts at the base of the spines. The Munz's cholla blooms from March to May, with sparse reddish maroon-brown flowers on the branches. The fruit is a globose, dry berry that is tan when mature, contains pale yellow seeds, and is spineless but bears numerous long glochids (eFloras.org 2010; Jepson 2010; NatureServe 2012).

The Munz's cholla grows on gravelly or sandy to rocky soils, often on lower bajadas, washes, and flats. It also occurs on hills and canyon sides and occurs in Sonoran Desert creosotebush shrub communities at elevations below 3,280 ft (1,000 m) (California Native Plant Society 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012).

The Munz's cholla could occur in the affected areas of the proposed Imperial East and Riverside East SEZs.

Needle Mountains Milkvetch (*Astragalus eurylobus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2; USFWS Species of Concern

The Needle Mountains milkvetch is a small, herbaceous perennial dicot in the Fabaceae (bean) family that is native to Nevada and also occurs in Arizona and Utah. In Nevada, the plant is known from only six sites in Lincoln and Nye Counties. The plant consists of a taproot with a woody crown that gives rise to several prostrate or trailing stems that are woody below, and up to 24 in. (61 cm) long. All of the herbage is covered with hair, making the plant appear silvery. The stems bear alternate, pinnately compound leaves. The leaflets are oval-pointed and opposite. The Needle Mountains milkvetch blooms during April to July, with clusters of pink-purple, pea-like flowers on stalks arising from the leaf bases. The fruits are oblong legume pods that are strongly curved with pointed tips and are attached to the plant by short stalks. The wrinkled pods, which may be hairy, lie on the ground and eventually become woody. The pods contain numerous smooth, heart-shaped seeds that are olive, brown, or black (NatureServe 2012; NNHP 2010).

The Needle Mountains milkvetch grows on gravel washes and sandy soils in alkaline desert and arid grasslands at elevations between 4,250 and 6,250 ft (1,292 and 1,900 m) (NatureServe 2012; NNHP 2010).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Needle Mountains milkvetch may occur in the affected areas of the proposed Dry Lake Valley North and Escalante Valley SEZs.

Nevada Dune Beardtongue (*Penstemon arenarius*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2; USFWS Species of Concern

The Nevada dune beardtongue is an herbaceous perennial dicot in the Scrophulariaceae family that is native and endemic to Nevada, where it is known only from Churchill, Mineral, and Nye Counties but is not abundant at any site. The plant consists of several stout, smooth, erect stems that are 4 to 12 in. (10 to 30 cm) tall, arising from a buried root crown. The stems bear widely spaced, leathery, opposite leaves that are oval-pointed and have coarse, sharp-pointed teeth. The leaves are usually folded lengthwise or curved inward along the midvein. The Nevada dune beardtongue blooms from May to July, with clusters of funnel-shaped flowers that arise from the bases of leaves or bracts at stem nodes. The flowers are in shades of white to purple and may be striped with magenta. The bottom petal of each flower has a small tuft of yellowish hair in its center. The fruit is an oval capsule that contains numerous irregularly angled seeds (NatureServe 2012; NNHP 2010).

The Nevada dune beardtongue is dependent on sand dunes or deep sand occurring on deep, loose, sandy soils of valley bottoms, aeolian deposits, and dune skirts, often in alkaline areas, sometimes on road banks and other recovering disturbances crossing such soils, in shadscale communities at elevations of 3,920 to 5,960 ft (1,195 to 1,817 m) (NatureServe 2012; NNHP 2010).

Populations of Nevada dune beardtongue are declining at the sites where they grow in Nevada. Because the plant is endemic to Nevada, conservation of this species is needed to ensure that it remains a part Nevada's flora.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The Nevada dune beardtongue may occur in the affected area of the proposed Millers SEZ.

Nevada Willowherb (*Epilobium nevadense*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada and Utah)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2; Utah State Rank S1; USFWS Species of Concern

The Nevada willowherb is a somewhat shrubby, perennial herb that occurs in Colorado, Nevada, and Utah. The plant consists of several upright, persistent, woody branches that are 6 to 16 in. (15 to 40 cm) tall, arising from a stout taproot. Lance-shaped leaves that may be hairy or nearly smooth are crowded along the hairy branches. The Nevada willowherb blooms from June to September, with flower stalks that arise from leaf bases near the ends of the branches with clusters of rose-purple flowers. The fruit is an elongated hairy and/or glandular capsule on a short stalk that contains numerous dark brown seeds with a tuft of white hairs (pappus) at one end (NatureServe 2012; NNHP 2010; Utah Native Plant Society 2010).

The Nevada willowherb grows in pinyon-juniper woodlands and oak/mountain mahogany communities, on talus slopes and rocky limestone outcrops at elevations between 5,000 and 8,800 ft (1,500 and 2,680 m) (Utah Native Plant Society 2010).

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The Nevada willowherb could occur in the affected areas of the proposed Dry Lake Valley North and Escalante Valley SEZs.

New Mexico Rock Daisy (*Perityle staurophylla* var. *staurophylla*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (New Mexico)
State Listing Status: Not Listed
Rarity: New Mexico Species of Concern; USFWS Species of Concern

The New Mexico rock daisy (*Perityle staurophylla* var. *staurophylla*) is endemic to south-central New Mexico in Doña Ana, Otero, and Sierra Counties and the Sacramento, San Andres, and Caballo Mountains. It occurs in crevices of dry limestone cliffs and boulders on protected north and east faces at elevations between 4,900 and 7,000 ft (1,500 and 2,100 m) (NMRPTC 2010).

The New Mexico rock daisy is classified as a perennial subshrub or forb/herb. It flowers from June to September (NMRPTC 2010). Although the species is locally common in its limited cliffside habitat that protects it from human impacts, it is listed as sensitive by the BLM New Mexico State Office and is a USFWS and New Mexico species of concern.

The New Mexico rock daisy may occur in the affected area of the proposed Afton SEZ.

Orocopia Sage (*Salvia greatae*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State Rank S2

The Orocopia sage is a large shrubby perennial dicot in the Lamiaceae (mint) family that is native and endemic to California. The plant is extensively branched from near ground level, resulting in a very dense, bushy habit. The evergreen, mound-like plants can be up to 4 ft (1.2 m) tall. The stems are covered with glandular hairs and bear widely separated, nondeciduous, opposite, hairy leaves. The thick, leathery leaves are oval in outline and have several long, pointed teeth with a spine at the end of each tooth. The Orocopia sage blooms from March to April, with clusters of lavender flowers arising from the bases of the paired leaves toward the ends of the branches. Each flower is subtended by a woolly, spiny base (the calyx). The fruit is a flat, keeled, gray to brown nutlet. The nutlets develop in groups of four at the base of each flower (Jepson 2010; NatureServe 2012).

The Orocopia sage is endemic to the Sonoran Desert of southern California. Its habitats include the Orocopia Mountains in Riverside County to the Chocolate Mountains in Imperial County. It grows in creosotebush scrub communities and dry washes at elevations lower than 2,600 ft (800 m) (Jepson 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012).

The Orocopia sage could occur in the affected area of the proposed Riverside East SEZ.

Parish's Phacelia (*Phacelia parishii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: California State Rank S1; Nevada State Rank S2; USFWS Species of Concern

The Parish's phacelia is an herbaceous annual dicot in the Boraginaceae family that is native and rare in California but also occurs and is rare in Nevada and Arizona. The plant consists of several erect to ascending stems, branched from the base, that are 2 to 6 in. (5 to 15 cm) tall. All of the herbage is covered with soft, short, glandular hairs. The leaves are alternate and mostly basal. These leaves are oval and fleshy with wavy, rounded teeth. Stem leaves are few and similar to the basal leaves. The Parish's phacelia blooms from April to July, with coiled, spike-like, fuzzy clusters of crowded flowers at the ends of the stems. The flowers are trumpet-shaped with lavender recurved petals and yellowish throats emerging from hairy bases (the calyx). The fruit is a hairy, oblong capsule containing numerous dark-colored, finely pitted oval seeds (Jepson 2010; NatureServe 2012)

The Parish's phacelia is rare in all of the locations where it has been found. The plant grows in Mojave desertscrub communities, dry lake margins, gypsum beds, and playas on alkaline-clay soils at elevations between 1,800 and 3,900 ft (550 and 1,200 m) (California Native Plant Society 2010; Jepson 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012).

The Parish's phacelia could occur in the affected area of the proposed Dry Lake SEZ.

Pioche Blazingstar (*Mentzelia argillicola*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Pioche blazingstar is a perennial herbaceous dicot in the Loasaceae family that is native and endemic to Nevada. The plant consists of a branching, erect to spreading stem with a semiwoody base that is up to 10 in. (25 cm) tall. All of the herbage is bristly-hairy. The stem bears widely separated, alternate, spatula-shaped to long-ovate leaves that are wavy-edged and have shallow, rounded, irregular teeth. The Pioche blazingstar blooms during the spring with yellow flowers on short stalks that arise from leaf bases near the ends of the stems. The fruit is an erect, cylindrical, hairy capsule, tapered to the base, on a short stalk. The capsule has several pointed bracts on its top and contains several oval seeds that are flat at one end (NNHP 2010; NatureServe 2012).

The Pioche blazingstar grows on dry, soft, silty, clay soils on knolls and slopes with sparse vegetation consisting mainly of pygmy sagebrush (*Artemisia pygmaea*), money wild buckwheat, broom snakeweed, and gray ball sage (*Salvia dorrii* var. *dorrii*).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The Pioche blazingstar may occur in the affected area of the proposed Dry Lake Valley North SEZ.

Ripley's Milkvetch (*Astragalus ripleyi*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Colorado)
State Listing Status: Not Listed
Rarity: Colorado State Rank S2

The Ripley's milkvetch is a tall, robust herbaceous perennial dicot in the Fabaceae (bean) family that is native to Colorado but also occurs in New Mexico. The plant arises from a woody crown with rhizomes; is 16 to 36 in. (40 to 100 cm) tall, and has erect, branching stems that are covered with long hairs appressed to the stems. The stems bear alternate, pinnately compound leaves that are hairy on one or both surfaces. Large clusters of pea-like flowers are produced from June to July on stalks arising from the leaf bases. The large flowers are pale lemon yellow and hang down from the nodding flower stalks. The fruits are oblong, pointed legumes (pods) that may be hairy or smooth, remain attached to the plant by long stalks, and contain numerous smooth seeds that are olive, brown, or black (NatureServe 2012).

The Ripley's milkvetch grows in mixed conifer and shrubland habitats on rocky substrates at elevations above 8,000 ft (2,400 m). The plant occurs exclusively on volcanic-derived soils associated with the San Juan volcanic field (CNHP 2010; NatureServe 2012).

The Ripley's milkvetch is a regional endemic that is restricted to soils derived from volcanic formations. Given its limited range, populations are currently vulnerable to habitat alteration resulting from a variety of potential impacts.

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012).

The Ripley's milkvetch could occur in the affected areas of the proposed Antonito Southeast, Fourmile East, and Los Mogotes East SEZs.

Rock Phacelia (*Phacelia petrosa*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The rock phacelia is an herbaceous annual dicot in the Boraginaceae family that is native to Nevada but also occurs in Arizona and Utah. The plant consists of several erect to ascending stems, branched from the base, that are 4 to 12 in. (10 to 31 cm) tall. The stems bear leaves that are alternate and mostly basal. The basal leaves are oval with wavy, rounded teeth. Stem leaves are widely separated, similar to the basal leaves, and become smaller toward the ends of the stems. The leaves are densely covered with spreading, shiny hairs. The rock phacelia blooms in the spring, with coiled, spike-like, fuzzy clusters of crowded flowers at the ends of the stems. The flowers are bell-shaped with blue petals that become lighter toward their bases. The fruit is a hairy, globose capsule containing four light brown, oblong seeds that have corrugated surfaces (NatureServe 2012; NNHP 2010).

The rock phacelia grows on dry limestone and volcanic talus slopes of foothills, washes, and gravelly canyon bottoms on substrates derived from calcareous material. It inhabits mixed desertscrub and creosotebush and blackbrush communities at elevations between 2,500 and 5,800 ft (760 and 1,763 m) (NatureServe 2012; NNHP 2010).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The rock phacelia could occur in the affected area of the proposed Dry Lake SEZ.

Rock Purpusia (*Ivesia arizonica* var. *saxosa*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The rock purpusia (*Ivesia arizonica* var. *saxosa*) is an herbaceous perennial dicot in the Rosaceae (rose) family that is native and endemic to Nevada. The variety is known from only five occurrences in Lincoln and Nye Counties. The plant consists of a small tufted or hanging clump that often grows in crevices in rocks, boulders or cliff walls. All of the herbage may be glandular-hairy and fragrant. The spreading stems are 2 to 4 in. (5 to 10 cm.) long. The stems are subtended by a rosette of pinnately compound basal leaves that have opposite, overlapping leaflets that are round or fan shaped in outline and are coarsely toothed. Old leaf bases often sheath the simple or branched root crown. The stems may bear a few leaves similar to the basal leaves, but smaller. The rock purpusia blooms May through August with small, sparse, white flowers borne near the ends of the stems. The fruit is a smooth, ridged, light brown achene (Jepson 2010; NatureServe 2012; NNHP 2010).

The rock purpusia grows in crevices of cliffs and boulders on volcanic substrates in the upper mixed-shrub, sagebrush, and pinyon-juniper communities at elevations between 4,900 and 6,900 ft (1,490 and 2,098 m) (NNHP 2010).

Major threats are associated with habitat disturbance or destruction, mining, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (NNHP 2010)

The rock purpusia could occur in the affected areas of the proposed Amargosa Valley and Dry Lake Valley North SEZs.

Rock-Loving Aletes (*Neoparrya lithophila*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Colorado)
State Listing Status: Not Listed
Rarity: Colorado State Rank S2

The rock-loving aletes is an herbaceous perennial dicot in the Apiaceae (parsley) family that is endemic to south-central Colorado. The plants grow in clumps from taproots, with upright stems that are 3 to 11 in. (8 to 29 cm) tall. The stems have alternate pinnately compound leaves that are thick, glossy, and leathery. The rock-loving aletes blooms from May to early July, with clusters of pale yellow flowers at the ends of the stems. The fruit consists of two seed-like carpels (a mericarp) that adhere to each other and then separate when ripe (NatureServe 2012).

The habitat of the rock-loving aletes includes igneous outcrops or sedimentary rock derived from extrusive volcanics and north-facing cliffs and ledges within pinyon-juniper woodlands at elevations of 7,000 to 10,000 ft (2,100 to 3,048 m) (CNHP 2010; NatureServe 2012).

The rock-loving aletes is known only from Chaffee, Conejos, Fremont, Huerfano, Rio Grande, and Saguache Counties in south-central Colorado. The rock-loving aletes is afforded some protection by the remote, relatively inaccessible location of its habitat.

Major threats are associated with habitat disturbance or destruction, recreation, effects of small population size, global climate change, and pollution (CNHP 2010; NatureServe 2012).

The rock-loving aletes could occur in the affected areas of the proposed Antonito Southeast, Fourmile East, and Los Mogotes East SEZs.

Rosy Two-Tone Beardtongue (*Penstemon bicolor* ssp. *roseus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: USFWS Species of Concern

The rosy two-tone beardtongue is a large herbaceous perennial dicot in the Plantaginaceae family that is native to Nevada and also occurs in California and Arizona. The plant consists of numerous erect to spreading stout, smooth stems that are up to 60 in. (120 cm) tall. The stems bear widely separated, thick, leathery, opposite leaves that have strongly toothed margins; the teeth are often somewhat spiny. The bases of the paired leaves are united around the stem. The rosy two-tone beardtongue blooms from March to May, with wide-mouthed tubular flowers in shades of cream to magenta in clusters that arise from the bases of leaves or bracts at stem nodes near the ends of the stems. The bottom petal of each flower may have several magenta veins and has a tuft of yellowish hair in its center. The entire inflorescence, including the outside of the flower petals, is glandular-hairy. The fruit is an oval capsule that contains numerous irregularly angled seeds (Jepson 2010; NatureServe 2012; NNHP 2010).

The rosy two-tone beardtongue grows on calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving enhanced runoff, within creosotebush-bursage, blackbrush, and mixed-shrub communities. Elevation ranges between 1,800 and 4,850 ft (549 and 1,475 m) (NNHP 2010).

Populations of the rosy two-tone beardtongue are declining at the sites where it grows in Nevada. Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The rosy two-tone beardtongue could occur in the affected area of the proposed Dry Lake SEZ.

Rough Dwarf Greasebush (*Glossopetalon pungens* var. *pungens*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The rough dwarf greasebush is a perennial dicot shrub in the Crossosomataceae family that is native and endemic to Nevada. The plant is restricted to the Spring and Sheep Ranges in southern Nevada, where it is known from seven occurrences in Clark and Nye Counties. The plant is a low, matted, deciduous shrub that is densely branched from near ground level and is 2 to 8 in. (5 to 20 cm) tall. The stems are greenish, smooth to sparsely hairy and angled. The stems bear crowded alternate leaves that are narrowly elliptical, hairy, and sharply spine-tipped.

The leaf margins and veins are thickened and prominent on the underside. The rough dwarf greasebush blooms from May to June, with small white flowers on short terminal branchlets. The fruit is an oval, beaked, leathery capsule that splits open on one side and usually contains one light brown seed (Jepson 2010; NatureServe 2012; NNHP 2010).

The rough dwarf greasebush grows in crevices of carbonate cliffs and outcrops, generally avoiding southerly exposures, within pinyon-juniper, mountain mahogany, and montane conifer communities. Elevation ranges between 4,400 and 7,800 ft (1,338 and 2,371 m) (NatureServe 2012; NNHP 2010).

Populations of the rough dwarf greasebush are decreasing on the few sites where they grow in Nevada.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The rough dwarf greasebush could occur in the affected area of the proposed Dry Lake SEZ.

Sand Food (*Pholisma sonorae*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Arizona Highly Safeguarded (HS)
Rarity: California State Rank S2; Arizona State Rank S1; USFWS Species of Concern

The sand food is an herbaceous perennial root parasite that lacks chlorophyll and the ability to make its own food, as green plants can. It is a rare and unusual dicot in the Lennoaceae family that is native to California and Arizona. The plant grows in sand dunes and consists of a long, scaly, fleshy stem that extends below the surface to attach to the roots of a nearby desert shrub and draw nourishment from that host plant. The underground stem can be up to 6.5 ft (2 m) long; is grayish, whitish, or brown in color; and has alternate, glandular, scale-like leaves along its surface. The sand food blooms from April to June, with a saucer-shaped, fuzzy inflorescence at, or slightly above, the sand surface that is up to 4 in. (10 cm) in diameter. The inflorescence consists of tightly packed flower buds with hairy bases (the calyx) that are the color of sand. The flower buds open in concentric circles successively from the outer edge of the head to the center. The flowers are star-shaped with purple petals that have white edges. The fruit is a small, dry capsule containing numerous flattened nutlets (AZGFD 2010; California Native Plant Society 2010; Jepson 2010; NatureServe 2012).

The sand food grows in loose, sand dune habitats in creosotebush scrub in the Sonoran Desert at elevations below 650 ft (200 m) (AZGFD 2010; California Native Plant Society 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The sand food could occur in the affected area of the proposed Imperial East SEZ.

Sand Prickly-Pear Cactus (*Opuntia arenaria*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Endangered in New Mexico
Rarity: New Mexico State Rank S2; USFWS Species of Concern

The sand prickly-pear cactus (*Opuntia arenaria*) occurs in the Rio Grande River and adjacent valleys in southern New Mexico, western Texas, and northern Mexico. Within New Mexico, populations exist in southern Doña Ana, Luna, and Socorro Counties. It inhabits sandy, rocky, and silty areas, including semistabilized sand dunes among open Chihuahuan desertscrub, at elevations ranging from 3,800 to 4,300 ft (1,160 to 1,300 m). The species is often associated with honey mesquite and a sparse cover of grasses (NatureServe 2012; NMRPTC 2010).

The sand prickly-pear cactus flowers in May to June. Flowers are yellow and may contain pink or red tints. Green fruits change to tan when ripe, and the dry fruit stays on the plant throughout the summer. The species has fewer chromosomes and higher morphological stability than other dry-fruited species of *Opuntia* (NMRPTC 2010).

Much of the cactus's former habitat has been destroyed by urbanization and agricultural development in the Rio Grande Valley. Cactus collectors and road widening also pose a threat to populations. Currently, only seven populations are known in New Mexico (NatureServe 2012; NMRPTC 2010).

The sand prickly-pear cactus may occur in the affected area of the proposed Afton SEZ.

Sandhill Goosefoot (*Chenopodium cycloides*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (New Mexico)
State Listing Status: Not Listed
Rarity: New Mexico State Rank S2

The sandhill goosefoot (*Chenopodium cycloides*) occurs in south-central New Mexico, southern Colorado, Nebraska, Kansas, Oklahoma, and western Texas. It inhabits open, sandy areas with sparse vegetation, especially along the edges of blowouts on sand dunes, sand sage communities, *Quercus havardii* communities, and short-grass prairie communities. Its elevation ranges from 2,600 to 4,900 ft (800 to 1,500 m). It occurs on gentle slopes, with inclines ranging from 0 to 5%, although it may occur on steeper slopes in dune environments. Its distribution is patchy and clumped, and its abundance varies temporally. It is difficult to measure population trends because few sites have been visited more than once (NatureServe 2012; NMRPTC 2010).

The sandhill goosefoot flowers in late June to August and fruits from early summer to fall. Its fruit is red, ovoid, and minutely tuberculate. The plant may be self- or cross-pollinated, with its pollen dispersed by wind. Seed production varies substantially from year to year depending on factors such as disease, temperature, precipitation, and the herbivory of the flowers. It likely has persistent, large seed banks that exhibit some form of dormancy. Hybridization has not been observed (eFloras.org 2010; NatureServe 2012; NMRPTC 2010).

Eleven occurrences of the sandhill goosefoot have been recorded in New Mexico since 1913.

Threats include urbanization; mineral, oil and gas development; agriculture; range conversion; overgrazing by livestock; and invasive species.

The sandhill goosefoot may occur in the affected area of the proposed Afton SEZ.

Sanicle Biscuitroot (*Cymopterus ripleyi* var. *saniculoides*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: USFWS Species of Concern

The sanicle biscuitroot is an herbaceous perennial dicot in the Apiaceae (carrot) family that is native to Nevada, and also occurs in California. The plant is restricted to western Nevada and southeastern California and is rare in both states. The small, stemless, mound-forming plant consists of a deep taproot with a buried root crown that gives rise directly to a rosette of basal leaves with long stalks and an erect flowering stalk, which together are 4 to 6 in. (10 to 15 cm) tall. The glossy, hairless leaves are round in outline and deeply divided into three wedge-shaped lobes, each of which is further lobed. The Sanicle biscuitroot blooms from April to June, with a spherical inflorescence at the end of the long, smooth flower stalk (scape) that rises above the basal leaves. The ball-like inflorescence is composed of numerous tiny purple or off-white flowers. The fruits are two wedge-shaped, flattened, appressed seeds that are hairy, have ridges, and have wings on the edges (Jepson 2010; NatureServe 2012; NNHP 2010).

The sanicle biscuitroot grows on loose, sandy to gravelly, often somewhat alkaline soils on volcanic tuff deposits and mixed valley alluvium within blackbrush, mixed-shrub, sagebrush, and lower pinyon-juniper communities. Elevation ranges between 3,150 and 6,700 ft (960 and 2,048 m) (NNHP 2010).

Populations of sanicle biscuitroot are declining at the sites where they grow in Nevada and California.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The sanicle biscuitroot could occur in the affected area of the proposed Millers SEZ.

Sheep Fleabane (*Erigeron ovinus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2; USFWS Species of Concern

The sheep fleabane is an herbaceous perennial dicot in the Asteraceae (sunflower) family that is native and endemic to Nevada. The plant is restricted to the Mount Irish, Sheep, and Groom Ranges in southern Nevada, where the species is known from fewer than 15 occurrences in Clark and Lincoln Counties. The plant consists of a taproot with a crown divided into short, thick branches, each of which gives rise to a cluster of spatula-shaped, hairy basal leaves and several erect to ascending hairy stems that are 2 to 6 in. (5 to 15 cm) tall. The widely spaced, alternate stem leaves are similar to the basal leaves and become smaller toward the ends of the stems. The sheep fleabane blooms from June to August, with white to pinkish composite flower heads at the ends of the stems. The fruit is a flattened, oblong achene with a tuft of bristles (a pappus) at one end (eFloras.org, 2010; NatureServe 2012; NNHP 2010).

The sheep fleabane grows in crevices of carbonate cliffs and ridgeline outcrops within pinyon-juniper and montane conifer communities. Elevation ranges between 3,600 and 8,400 ft (1,094 and 2,554 m) (NNHP 2010).

Populations of sheep fleabane are declining at the sites where it grows in Nevada.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The sheep fleabane may occur in the affected area of the proposed Dry Lake SEZ.

Sheep Mountain Milkvetch (*Astragalus amphioxys* var. *musimonum*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive

State Listing Status: Not Listed
Rarity: Nevada State Rank S2; USFWS Species of Concern

The Sheep Mountain milkvetch is a small, herbaceous, short-lived perennial dicot in the Fabaceae (bean) family that is native to the foothills of the Sheep Mountains in Clark and Lincoln Counties in southern Nevada. The plant historically occurred in Arizona. The low, tufted plant consists of several prostrate or trailing stems that are 0.8 to 2.8 in. (2 to 7 cm) long. All of the herbage is covered with dense silvery hair. The stems bear alternate, pinnately compound leaves with leaflets that are oval-pointed and opposite. The Sheep Mountain milkvetch blooms during April to June, with clusters of bright pink-purple pea-like flowers on stalks arising from the leaf bases and rising above the prostrate stems. The large top petal of each flower has a white center that is streaked with purple veins. The fruits are oblong legume pods that are strongly curved with pointed tips, are covered with fine hairs, and are attached to the plant by short stalks. The pods are initially ascending, but usually lie on the ground as they enlarge and mature. The pods contain numerous smooth seeds (NatureServe 2012; NNHP 2010).

The Sheep Mountain milkvetch grows on carbonate alluvial gravels, particularly along drainages, roadsides, and in other microsites with enhanced run-off, at elevations between 4,400 and 6,000 ft (1,338 and 1,824 m) (NNHP 2010).

Populations of Sheep Mountain milkvetch are declining at the sites where it grows in Nevada.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The Sheep Mountain milkvetch may occur in the affected area of the proposed Dry Lake SEZ.

Silverleaf Sunray (*Enceliopsis argophylla*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The silverleaf sunray is an herbaceous, long-lived perennial dicot in the Asteraceae (sunflower) family that is native to Nevada, and nearly entirely confined to Clark County where three populations have been found. The species is also known to occur at a few locations in Arizona and Utah. The plant consists of a stout, branched, woody root crown that gives rise to a dense cushion-shaped clump of basal leaves with numerous leafless flowering stems (scapes) rising above the basal leaves. The plant is 6 to 31 in. (15 to 80 cm) tall, and all of the herbage is silvery-hairy. The basal leaves are closely alternate and diamond-shaped or widely elliptical. Silverleaf sunray blooms from April to June, with large yellow composite flower heads that are borne at the ends of the long, flowering stems. The fruit is a hairy, wedge-shaped achene that is flattened and has two bristles (the pappus) at the wide end (AZGFD 2010; eFloras.org 2010; Jepson 2010, NatureServe 2012; NNHP 2010).

The silverleaf sunray grows in dry, open, relatively barren areas on gypsum badlands, volcanic gravels, or loose sands, within the creosotebush-bursage community. Elevation ranges between 1,200 and 2,400 ft (365 and 730 m) (NatureServe 2012; NNHP 2010).

Major threats are associated with habitat disturbance or destruction, recreation, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The silverleaf sunray may occur in the affected area of the proposed Dry Lake SEZ.

Sneed's Pincushion Cactus (*Escobaria sneedii* var. *sneedii*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Endangered in New Mexico
Rarity: New Mexico State Rank S2

The Sneed pincushion cactus is restricted to limestone substrates on terraces, ridgetops, hillsides, and ledges in the high Chihuahuan Desert of the Franklin, Guadalupe, and Organ Mountains of Texas and New Mexico. Plants occur primarily in cracks in the limestone substrate or in shallow pockets of loamy soil on hillsides and ridgetops between 3,900 and 7,700 ft (1,190 and 2,345 m) in elevation. The subspecies typically occurs in semidesert grasslands or woodlands in an agave-juniper association. In the Guadalupe Mountains, it extends upward in elevation to the lower pinyon-juniper woodland. Like the Lee pincushion cactus, it usually occurs in sparsely vegetated areas with shrubby species, but it is rarely under cover. Associated plant species include lechuguilla (*Agave lechuguilla*), sideoats grama (*Bouteloua curtipendula*), whitecolumn foxtail cactus (*Escobaria albicolumnaria*), common sotol (*Dasylirion wheeleri*), longleaf joint fir (*Ephedra trifurca*), Apache plume (*Fallugia paradoxa*), Pinchot's juniper (*Juniperus pinchotii*), Texas sacahuista (*Nolina texana*), cactus apple (*Opuntia engelmannii*), oak (*Quercus* spp.), and pinyon pine (*Pinus edulis*).

The Sneed's pincushion cactus is a long-lived, succulent, perennial species. Reproduction is sexual; although plants can be propagated vegetatively for cutting, they have no natural mechanism for doing so. Sneed cactus plants likely germinate from late May to early June but do not begin blooming until after they have attained 3 to 4 years of age. The plants bud in March and April, flower in mid- to late April, and fruit from August to November.

The Sneed's pincushion cactus was federally listed as endangered on November 7, 1979 (USFWS 1979b). Critical habitat has not been designated.

This subspecies is threatened by illegal collecting by cactus enthusiasts. Plants are relatively tough, not being affected by many of the fungi and insect predators that adversely affect other cacti.

The Sneed's pincushion cactus may occur in the affected area of the proposed SEZ.

Spring-Loving Centaury (*Centaurium namophilum*)

ESA Listing Status: Threatened
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2

The spring-loving centaury is an endemic to the Ash Meadows area of Nye County, Nevada. The species occurs along the Amargosa River drainage on open, moist to wet, alkali-crusted soils of seeps, springs, outflow drainages, meadows, and hummocks. It is found at elevations of 2,100 to 2,350 ft (640 to 716 m). The species is aquatic or wetland-dependent and commonly occurs with the following species: saltgrass, goldenweed (*Ericameria* spp.), Baltic rush, yerba mansa, western niterwort (*Nitrophila occidentalis*), saltbush (*Atriplex* spp.), Tecopa bird's-beak, ash (*Fraxinus* spp.), mesquite (*Prosopis* spp.), salt cedar, baccharis (*Baccharis* spp.), and cattail (*Typha* spp.). There are 14 occurrences of this species over a range of 9 mi (14 km) on lands administered by the USFWS and the BLM and on privately owned land. The spring-loving centaury is an annual that flowers from July to September. Fruiting occurs in October. Little else is known about the reproduction and life history of this species.

The spring-loving centaury was federally listed as threatened on May 20, 1985 (USFWS 1985). Critical habitat has been designated in the Ash Meadows area of Nye County, Nevada.

The spring-loving centaury may occur in the affected area of the proposed Amargosa Valley SEZ.

Sticky Buckwheat (*Eriogonum viscidulum*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2; USFWS Species of Concern

The sticky buckwheat is a large herbaceous annual dicot in the Polygonaceae family that is native to Nevada and also occurs in Arizona. The plant is known from only a few locations in Clark and Lincoln Counties, Nevada, and adjacent Mohave County, Arizona. The plant is up to 16 in. (40 cm) tall and consists of several erect to spreading, yellowish green, diffusely branched, threadlike stems rising from a basal rosette of circular or kidney-shaped leaves. The leaves are densely white-hairy below and hairy to smooth above. The herbage is sticky due to being covered with glandular hairs, and is often covered with adhering sand particles. Sticky buckwheat blooms from April to June, with delicate, pale yellow flowers that are borne on thin stalks that arise from the bases of bracts at stem nodes. The fruit is a brown, oval, three-sided achene enclosed by three leaf-like bracts (AZGFD 2010; eFloras.org 2010; NatureServe 2012; NNHP 2010).

The sticky buckwheat is dependent on sand dune communities where it occurs on deep, loose, sandy soils in washes, flats, roadsides, steep aeolian slopes, and stabilized dune areas with mesquite (*Prosopis* spp.), creosotebush, and indigo bush (*Psorothamnus* spp.). Elevation ranges between 1,200 and 2,200 ft (366 and 671 m) (eFloras.org 2010; NatureServe 2012; NNHP 2010).

Sticky buckwheat populations are declining at sites where the species grows.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The sticky buckwheat may occur in the affected area of the proposed Dry Lake SEZ.

Sticky Ringstem (*Anulocaulis leisolenus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: None
Rarity: Nevada State Rank S2

The sticky ringstem is a perennial herb that is designated as a sensitive species by the Nevada BLM. It is known from southern Nevada, portions of northern Arizona, New Mexico, Texas, and Mexico. In Nevada, it is primarily known from the Frenchman Mountain area east of Las Vegas and further east to the Muddy Mountains and Gold Butte (VRHCRP 2012). This species occupies soils composed of calcareous shales and clay, loose talus, and gypsum at elevations between 1,700 and 4,000 ft (518 and 1,219 m). It is commonly associated with the Las Vegas bearpoppy.

The sticky ringstem may occur in the affected area of the proposed Dry Lake SEZ.

Straw-Top Cholla (*Opuntia echinocarpa*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Arizona Salvage Restricted (SR)
Rarity: None

The straw-top cholla is a shrubby, perennial, dicot cactus in the Cactaceae family that is native to Arizona but also occurs in California, Nevada, and Utah. The plant is a large, erect to spreading, densely branched, spiny cactus in the form of a shrub or tree that is 1.6 to 6.6 ft (0.5 to 2 m) tall. The trunk and branches are round, segmented, and green or gray-green in color. The stem segments are firmly attached, except for the terminal segments, which are sometimes easily detached and can function as vegetative propagules. The entire plant is armed with clusters of stiff spines arising from wart-like oval tubercles. Each tubercle may bear up to 20 spines. The numerous spines interlace and sometimes obscure the stem. Minute, detachable bristles (glochids) and fine, yellowish wool form tufts at the base of the spines. The straw-top cholla blooms from March to June, with clusters of flowers on the older branches. The flowers are light green to yellow-green, sometimes suffused with maroon or rose. The fruit is a densely spiny, globose, dry berry that is tan when mature and contains numerous pale yellow, angular seeds (AZGFD 2010; eFloras.org 2010; NatureServe 2012).

The straw-top cholla grows on sandy, loamy, alluvial to gravelly substrates in the Mojave and Sonoran Deserts, in creosotebush/white bursage, blackbrush, and saltbush scrub, desert grasslands, juniper and oak-juniper woodlands, flats, bajadas, and canyons at elevations of 164 to 5,575 ft (50 to 1,700 m) (AZGFD 2010; eFloras.org 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, timber harvest, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution.

The straw-top cholla could occur in the affected areas of the proposed Brenda and Gillespie SEZs.

Tecopa Bird's Beak (*Cordylanthus tecopensis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: None
Rarity: Nevada State Rank S2; USFWS Species of Concern

The Tecopa bird's beak is known from Esmeralda and Nye Counties in Nevada, as well as Inyo County, California. It inhabits open, moist alkali-crusted clay soils of deep springs, seeps, and outflow drainages at elevations between 2,100 and 4,900 ft (640 and 1,494 m). Other potentially suitable habitat types include mesic meadows and playa margins.

Major threats to the Tecopa bird's beak are associated with habitat disturbance, exotic species invasion, and impacts on water quality and availability.

The Tecopa bird's beak may occur in the affected area of the proposed Millers SEZ.

Threecorner Milkvetch (*Astragalus geyeri* var. *triquetrus*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2; USFWS Species of Concern

The threecorner milkvetch is a small, herbaceous annual or biennial dicot in the Fabaceae (bean) family that is native to Nevada and also occurs in Arizona. The plant is known from fewer than 25 occurrences in a restricted range in Clark and Lincoln Counties in Nevada and in a few locations in Mohave County in northwestern Arizona. This species is a fast-maturing ephemeral that is not seen for years at a time. It prefers average to above-average rainfall years to germinate. The plant consists of a stout, erect stem with spreading branches that is 4 to 8 in. (10 to 20 cm) tall. All of the herbage is covered with fine hairs that give the plant an ashy appearance. The branches bear large, widely separated, alternate, pinnately compound leaves with thick oval-pointed opposite leaflets. The threecorner milkvetch blooms during April to July, with ascending clusters of pea-like flowers on short stalks arising from leaf bases. The flowers are whitish with faint pink veins, and each flower base (the calyx) is covered with hairs. The fruits are large, oblong, curved, hairy pods that are triangular in cross section and attached to the plant by short stalks. The stiffly leathery pods contain numerous kidney-shaped smooth seeds (AZGFD 2010; NatureServe 2012; NNHP 2010).

The threecorner milkvetch is dependent on open, deep sandy soils, desert washes, or dunes, generally stabilized by vegetation and/or a gravel veneer. Elevations range between 1,500 and 2,500 ft (456 and 760 m) (NatureServe 2012; NNHP 2010).

Threecorner milkvetch populations are declining at sites where the species grows.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The threecorner milkvetch may occur in the affected area of the proposed Dry Lake SEZ.

Tiehm Blazingstar (*Mentzelia tiehmii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Tiehm blazingstar is a perennial herbaceous dicot in the Loasaceae family that is native and endemic to Nevada. The somewhat shrubby plant is up to 15 in. (39 cm) tall and consists of a woody base that gives rise to several branching, erect to spreading stems. All of the herbage is bristly-hairy. The stems bear widely separated, alternate, spatula-shaped to long ovate leaves that are wavy-edged and have shallow, rounded, irregular teeth. The Tiehm blazingstar blooms during the spring, with clusters of yellow flowers on stalks that arise from leaf or bract bases toward the ends of the stems. The fruit is an erect, globose, bristly capsule on a short stalk. The capsule has several pointed bracts on its top and contains several oval seeds that have a flattened depression at one end (NatureServe 2012).

The Tiehm blazingstar grows on hilltops of white clay soil, sparsely vegetated white calcareous knolls, and bluffs with scattered perennials. The plants have been observed at an elevation of 5,198 ft (1,585 m).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The Tiehm blazingstar may occur in the affected area of the proposed Dry Lake Valley North SEZ.

Tonopah Pincushion (*Sclerocactus nyensis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1

The Tonopah pincushion is a small, perennial dicot cactus in the family Cactaceae that is native and endemic to Nevada. This species is a very rare cactus, known only from Nye and Esmeralda Counties in Nevada, where two extant occurrences are recorded. The plant is an erect, spiny cactus with a usually unbranched, unsegmented succulent stem that is cylindrical or globose and is 2 to 4.7 in. (5 to 12 cm) tall and 1.6 to 3 in. (4 to 8 cm) in diameter. The stem has 12 to 15 ribs that are armed with clusters of stiff spines arising from large, wart-like tubercles (areoles). Each areole has 10 to 14 erect and spreading spines, some of which may be hooked and others that may be flat. The spines are mostly white, but some may be reddish-brown. The spines are long and often obscure the stem. The Tonopah pincushion blooms in May, with a cluster of large, funnel-shaped, rose-purple to magenta flowers, which are crowded among the dense spines at the top of the stem. The fruit is a barrel-shaped green, tan, or pale red berry that is usually persistent on the parent plant. When dry and mature, the fruit splits open to release irregularly furrowed black seeds with small warts that are transported by winds and rain (eFloras.org 2010; NatureServe 2012).

The Tonopah pincushion grows on dry rocky volcanic soils and low outcrops of rhyolite, tuff, and possibly other rock types, on gentle slopes in open areas or under shrubs in the upper salt desert and lower sagebrush zones. Elevation ranges between 5,700 and 5,800 ft (1,733 and 1,763 m) (NatureServe 2012; NNHP 2010).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The Tonopah pincushion may occur in the affected area of the proposed Gold Point SEZ.

Toquima Milkvetch (*Astragalus toquimanus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The Toquima milkvetch is an herbaceous perennial dicot in the Fabaceae (bean) family that is native and endemic to Nevada. The plant is known only from the Monitor and Toquima Ranges in Nye County, Nevada, where occurrences are uncommon and widely scattered. The plant consists of a taproot with a woody crown that gives rise to several erect and spreading wiry stems that are 4 to 10 in. (10 to 25 cm) tall. Some stems may be prostrate and trailing. All of the herbage is sparsely to densely hairy. The stems bear alternate, pinnately compound leaves with oval-pointed opposite leaflets. The Toquima milkvetch blooms during May to June, with clusters of pea-like flowers arising from the leaf bases. The flowers are pale yellow, tinged, and veined with lilac. The fruits are oblong legume pods that are beaked and are smooth or finely hairy. The pods contain numerous mit-shaped smooth seeds that are olive, black, or brown (NatureServe 2012; NNHP 2010).

The Toquima milkvetch grows on dry, stiff, sandy to gravelly, generally somewhat basic or calcareous soils, mostly on flats or gentle slopes, frequently growing under or up through shrubs, at elevations between 6,500 and 7,500 ft (1,976 and 2,280 m) (NatureServe 2012; NNHP 2010).

Toquima milkvetch populations are declining at sites in Nevada where the species grows. Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, woody plant encroachment, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The Toquima milkvetch may occur in the affected area of the proposed Millers SEZ.

Tumamoc Globeberry (*Tumamoca macdougalii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Arizona)
State Listing Status: Arizona Salvage Restricted (SR)
Rarity: None

The Tumamoc globeberry is a delicate, perennial dicot vine in the Cucurbitaceae (squash) family that is native and endemic to southern Arizona and northern Mexico. The plant is dormant during the winter and early spring. In late spring, slender, smooth, herbaceous stems arise from succulent tuberous roots and climb, by means of tendrils, up to 10 ft (3 m) into nearby shrubs and trees. Growth is stimulated by spring and summer rains. The annual stems bear thin, alternate, three-lobed leaves with clasping tendrils at the leaf bases. Each leaf lobe is further divided into several irregular lobes. The Tumamoc globeberry blooms from July to August and fruits from August to September. The plant has separate male and female flowers (monoecious) that are star-shaped, are white to greenish-yellow, and arise from leaf bases. The fruit is a small, globose, bright red, several-seeded berry that is relished by wildlife (AZGFD 2010; NatureServe 2012).

The Tumamoc globeberry grows in desertscrub and xeric situations, in shady areas of nurse plants along gullies and washes, in rocky to gravelly, sandy, silty, and clayey soils, at elevations of 1,476 to 2,608 ft (450 to 795 m) (AZGFD 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The Tumamoc globeberry could occur in the affected area of the proposed Gillespie SEZ.

Villard Pincushion Cactus (*Escobaria villardii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (New Mexico)
State Listing Status: Endangered in New Mexico
Rarity: New Mexico State Rank S2; USFWS Species of Concern

The Villard pincushion cactus occurs in the northern Franklin and Sacramento Mountains in Otero and Doña Ana Counties, New Mexico. Its characteristic habitat is nearly flat benches above vertical north-facing limestone cliffs in Chihuahuan Desert and black grama grassland. Its substrate is well-developed, loamy soil. Its elevation ranges from 4,500 to 6,500 ft (1,370 to 2,000 m) (NatureServe 2012; NMRPTC 2010).

The Villard pincushion cactus is a spiny perennial succulent. Pale yellowish, pinkish, or white flowers appear in April. Fruit is elongate and green to reddish. Seeds are brown, pitted, and roughly 0.04 in. (1 mm) long (NatureServe 2012; NMRPTC 2010).

The Villard pincushion is listed as sensitive by the BLM, listed as endangered by the State of New Mexico, is a USFWS species of concern, and is ranked S2 in New Mexico.

The species is common within its area of distribution. Its locations are nearly inaccessible, which severely limits the threat of collection or grazing. Accidental wildfires in grassland habitat pose a threat.

The Villard pincushion cactus may occur within the affected area of the proposed Afton SEZ (NatureServe 2012; NMRPTC 2010).

White Bearpoppy (*Arctomecon merriamii)*

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Not Listed

The white bearpoppy is an herbaceous perennial dicot in the Papaveraceae (poppy) family that is native to Nevada and endemic to the Death Valley region of Clark, Lincoln, and Nye Counties of Nevada and eastern Inyo and San Bernardino Counties of California. The plant consists of a stout taproot, from which arises a crowded basal clump of erect leaves that is about 5 in. (13 cm) tall. The leaves are wedge-shaped with several shallow teeth on the top margin and densely covered with long, white, shaggy hairs, which make them appear grayish-blue in color. The base of the plant is often surrounded by a layer of ash- or straw-colored dead leaves. The white bearpoppy blooms from April to May, with numerous tall, smooth, flowering stems that rise above the basal leaf clump to a height of about 20 in. (50 cm). Each waxy flowering stem bears at its end a large ovoid flower bud that is initially nodding, but becomes upright when the bud opens to produce an attractive white flower with a dark yellow center. The fruit is an upright, oblong, persistent capsule that opens at the top by pointed flaps when the fruit dries and becomes mature. The capsule contains numerous, small, wrinkled, black seeds (eFloras.org, 2010; Jepson 2010; NatureServe 2012; NNHP 2010).

The white bearpoppy grows on a wide variety of dry to sometimes moist basic soils, including alkaline clay and sand, gypsum, calcareous alluvial gravels, and carbonate rock outcrops at elevations between 2,000 and 6,280 ft (610 and 1,914 m) (NatureServe 2012; NNHP 2010).

Populations of white bearpoppy are declining at the sites where it grows in Nevada and California.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NatureServe 2012; NNHP 2010).

The white bearpoppy may occur in the affected areas of the proposed Amargosa Valley and Dry Lake SEZs.

White River Cat’s-Eye (*Cryptantha welshii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive

State Listing Status: Not Listed
Rarity: USFWS Species of Concern

The White River cat's-eye is an herbaceous biennial or short-lived perennial dicot in the Boraginaceae family that is native to Nevada and endemic to Lincoln, Nye, and White Pine Counties. The plant consists of several erect stems that are up to 12 in. (30 cm) tall arising from a branched root crown. All of the herbage is covered with long, stiff hairs. The stems are subtended by a tuft of spatula-shaped basal leaves. The stems bear widely spaced, alternate, long-oval leaves. All of the leaves have pustules on their undersides. The White River cat's-eye blooms in early summer, with clusters of white flowers arising from leaf bases toward the ends of the stems. The urn-shaped base of each flower (the calyx) is densely covered with long, white, stiff hairs. The fruit is a brown, triangular-ovate nutlet, covered with small warts, and which has an open groove on one side. Four nutlets are produced by each flower (NatureServe 2012; NNHP 2010).

The White River cat's-eye grows on dry, open, sparsely vegetated outcrops, and sandy to silty or clay soils derived from whitish calcareous or carbonate deposits, often forming knolls or gravelly hills, and on soils adjacent to such habitats at elevations of 4,540 to 6,660 ft (1,384 to 2,030 m) (NatureServe 2012; NNHP 2010).

Populations of White River cat's-eye are declining at the sites where it grows in Nevada.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The White River cat's-eye may occur in the affected area of the proposed Dry Lake Valley North SEZ.

White-Margined Beardtongue (*Penstemon albomarginatus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Not Listed
Rarity: California State Rank S1; Nevada State Rank S2; USFWS Species of Concern

The white-margined beardtongue is an herbaceous perennial dicot in the Plantaginaceae family that is native to California but also occurs in Arizona and Nevada. The plant consists of several erect, smooth stems that are 6 to 14 in. (15 to 35 cm) tall and arise from a long taproot whose crown is buried in the sand. The stems bear widely spaced, opposite leaves that are pale green, oblong-pointed, weakly toothed, and wavy edged and have a distinct white margin. Near the bases of the stems, the leaves tend to be small and scale-like. The white-margined beardtongue blooms from March to May, with tubular flowers in shades of pink, lavender, or white, with darker purple veins and spots, and with yellow hairs on the inside of the lower petals.

The flowers are borne in spike-like inflorescences at the ends of the stems. The fruit is an oval capsule that contains numerous irregularly angled seeds (eFloras.org 2010; NatureServe 2012).

The white-margined beardtongue grows in loose, windblown, desert, sand dune habitats and Mojave desertscrub communities at elevations below 3,600 ft (1,100 m) (California Native Plant Society 2010; NatureServe 2012).

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution.

The white-margined beardtongue could occur in the affected area of the proposed Amargosa Valley and Riverside East SEZs.

Yellow Two-Tone Beardtongue (*Penstemon bicolor* ssp. *bicolor*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2; USFWS Species of Concern

The yellow two-tone beardtongue is a large, herbaceous perennial dicot in the Plantaginaceae family that is native and endemic to Nevada. The species is known from 32 occurrences in Clark County on lands adjacent to the expanding limits of the Las Vegas urban area. The plant consists of numerous erect to spreading stout, smooth stems that are up to 60 in. (120 cm) tall. The stems bear widely separated, thick, leathery, opposite leaves that have strongly toothed margins; the teeth are often somewhat spiny. The bases of the paired leaves are united around the stem. The yellow two-tone beardtongue blooms from March to May, with wide-mouthed yellow tubular flowers in clusters that arise from the bases of leaves or bracts at stem nodes near the ends of the stems. The bottom petal of each flower has a tuft of yellowish hair in its center. The entire inflorescence, including the outside of the flower petals, is glandular-hairy. The fruit is an oval capsule that contains numerous irregularly angled seeds (Jepson 2010; NatureServe 2012; NNHP 2010).

The yellow two-tone beardtongue grows on calcareous or carbonate soils in washes, roadsides, rock crevices, outcrops, or similar places receiving enhanced runoff, in the creosotebush-bursage, blackbrush, mixed-shrub, and lower juniper zones at elevations between 2,500 and 5,480 ft (762 and 1,670 m) (NNHP 2010).

Populations of yellow two-tone beardtongue are declining at the sites where it grows in Nevada.

Major threats are associated with habitat disturbance or destruction, recreation, fire, grazing, effects of small population size, exotic species invasion, succession, global climate change, and pollution (NNHP 2010).

The yellow two-tone beardtongue may occur in the affected area of the proposed Dry Lake SEZ.

J.6.2 Invertebrates

Amargosa Naucorid *(Pelocoris shoshone amargosa)*

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Amargosa naucorid is endemic to the Amargosa Valley in Nye County, Nevada. It inhabits spring-fed, low-velocity aquatic habitats with an abundance of detritus or aquatic macrophytes. It is often located under overhanging banks associated with marshy habitats (NatureServe 2012; USFWS 1998). Amargosa naucorids are oval-shaped, flattened bugs with front legs that form pincers. The middle and back legs are modified for swimming. They eat dragonflies, midges, mosquito larva, water boatmen, and mollusks (NatureServe 2012; USFWS 1998).

Currently, the Amargosa naucorid is under review for listing under the ESA, listed as sensitive by the BLM, and ranked S2 in Nevada.

The Amargosa naucorid may occur in the affected area of the proposed Amargosa Valley SEZ.

Amargosa Tryonia (*Tryonia variegata*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The Amargosa tryonia occurs in detritus-covered areas on macrophytes, on travertine (a calcium-carbonate rock) blocks, and in soft sediment along the sides of upper segments of freshwater stream outflows. It is endemic to the Amargosa Valley in Nye County, Nevada, and Inyo County, California (Center for Biological Diversity 2009; NatureServe 2012).

The Amargosa tryonia is a springsnail. Springsnails are inextricably linked with their aquatic habitat, often endemic to single water bodies or local drainage systems. Its shell is 0.1 to 0.3 in. (2.8 to 7.5 mm) in height and is conic to elongate-conic in shape (Center for Biological Diversity 2009).

Because of its naturally limited distribution and poor dispersal abilities, habitat loss will result in population extirpation or species extinction. Threats include loss and degradation of spring habitat due to groundwater withdrawal, altered precipitation patterns due to global climate change, and invasive species such as crayfish (*Procambarus clarki*) and redrim melania snails (*Melanoides tuberculata*).

Currently, the Amargosa tryonia is under review for listing under the ESA (Center for Biological Diversity 2009).

The Amargosa tryonia may occur in the affected area of the proposed Amargosa Valley SEZ.

Anthony Blister Beetle (*Lytta mirifica*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: New Mexico Species of Concern
Rarity: USFWS Species of Concern

The Anthony blister beetle occurs in south-central New Mexico, which includes Sierra, Otero, and Doña Ana Counties, although finer-scale distributions have not been specified. It is a terrestrial species that inhabits the flowers and foliage of various plants and agricultural areas, where it may be a pest of certain crops, including tomatoes, potatoes, beets, and clover (NMDGF 2010).

Blister beetles are both plant feeders and parasites, eating grasses and forbs as well as deriving nutrients from living hosts. Larvae parasitize bees by climbing onto flowers and attaching themselves to bees that visit the flowers. The bees carry the larvae to their nest, where they attack bee eggs. They also feed on grasshopper eggs. Adult beetles are plant feeders and can completely defoliate plants. Blister beetles reproduce by laying eggs. They undergo hypermetamorphosis and appear in several forms throughout their life (NMDGF 2010).

The Anthony blister beetle is affected by the extirpation of blacktailed and Gunnison prairie dogs and other large, burrowing rodents. It was listed in the *Federal Register* as a Category 2 species for consideration to be listed as a threatened or an endangered species on November 15, 1994. In 1996, the USFWS changed the listing status of federal candidate species to eliminate category designations, and it no longer considered Category 2 species like the beetle as candidate species. It was classified as a species of concern in March of 1996. Currently, it is listed as sensitive by the BLM and is a USFWS and New Mexico species of concern.

The Anthony blister beetle may occur within the affected area of the proposed Afton SEZ (NMDGF 2010; NMSU 2010).

Ash Meadows Naucorid (*Ambrysus amargosus*)

ESA Listing Status: Threatened
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Ash Meadows naucorid is a creeping water bug that is restricted to Ash Meadows in Nye County, Nevada. It is less than 0.25 in. (0.6 cm) long and is brownish-green to brownish-black in color. It inhabits a unique desert wetland with a shallow flow of water from the seepage of more than 30 springs in the area. The water bugs are usually found on substrates of gravel and stones covered by warm spring water. The adults and nymphs are predatory and move slowly along submerged aquatic vegetation and the shoreline in search of food. This species feeds on a variety of insects, spiders, centipedes, and millipedes that live in Ash Meadows. The Ash Meadows naucorid is believed to occur at only one location in east-central Ash Meadows.

The USFWS reported this species as occurring on the Ash Meadows NWR. It is listed as one of 24 species of plant and animals that are endemic to the refuge.

The Ash Meadows naucorid was federally listed as threatened on May 20, 1985 (USFWS 1985). Critical habitat has been designated for this species in the Ash Meadows NWR.

Threats to the continued existence of the species have included habitat alteration and fragmentation from agriculture, stream channelization, peat mining, and water diversion.

The Ash Meadows naucorid may occur in the affected area of the proposed Amargosa Valley SEZ.

Ash Meadows Pebblesnail (*Pyrgulopsis erythropoma*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Ash Meadows pebblesnail occurs in the Ash Meadows area of Nye County, Nevada, in the Upper Amargosa watershed. It occurs within six springs located within 0.3 mi (0.5 km) of each other. Habitat includes rocky substrate in flowing freshwater thermal water and on stones and travertine blocks in swift currents (Center for Biological Diversity 2009; NatureServe 2012).

Springsnails are inextricably linked with their aquatic habitat, often endemic to single water bodies or local drainage systems. It is small in size with a very short-spired globose-turbinate shell (Center for Biological Diversity 2009).

Currently, the Ash Meadows pebblesnail is under review for listing under the ESA. Threats include groundwater extraction in southern Nevada (Center for Biological Diversity 2009; NatureServe 2012).

The Ash Meadows pebblesnail may occur in the affected area of the Amargosa Valley SEZ.

Big Dune Miloderes Weevil (*Miloderes* sp. 1)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Big Dune miloderes weevil is endemic to the Big Dune area, approximately 3 mi (5 km) east of the Amargosa Valley SEZ. It is dependent upon deep sand habitats.

The Big Dune miloderes weevil may occur in the affected area of the proposed Amargosa Valley SEZ.

Crescent Dunes Aegialian Scarab (*Aegialia crescenta*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Crescent Dunes aegialian scarab is a sand dune obligates species primarily restricted to the Crescent Dunes, approximately 6 mi (10 km) east of the Millers SEZ in Nevada. It may also occur in the San Antonio Dunes in Nye County and the Game Range Dunes in Clark County, Nevada. Adults and larvae of the *Aegialia* species are primarily psammophile, living on stream-deposited sand bars, wind-deposited sand dunes, seaside dunes, or very sandy substrate.

The Crescent Dunes aegialian scarab is reddish brown with yellowish brown legs, mouthparts, and anterior surface. Its head and body are smooth, shiny, and textured with tiny puncture marks. Specimens range in size from 0.15 to 0.2 in. (3.75 to 5 mm) long and 0.08 to 0.1 in. (2.1 to 2.7 mm) wide (WildEarth Guardians 2010).

The Crescent Dunes aegialian scarab is currently under review for listing under the ESA.

This species may occur in the affected area of the proposed Millers SEZ.

Crescent Dunes Serican Scarab (*Serica ammomenisco*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Crescent Dunes serican scarab is a sand dune obligates species primarily restricted to the Crescent Dunes, approximately 6 mi (10 km) east of the Millers SEZ in Nevada. The Crescent Dunes serican scarab is a dark brown beetle. Some body parts have scattered, erect, pale-colored hairs. Average length is 0.3 in. (7.2 mm) (WildEarth Guardians 2010).

Currently, the species is under review for listing under the ESA.

The Crescent Dunes serican scarab may occur in the affected area of the proposed Millers SEZ.

Crystal Springsnail (*Pyrgulopsis crystalis*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The crystal springsnail is a freshwater mollusk endemic to the Ash Meadows region of Nye County, Nevada, where it is known only from Crystal Spring. Within this spring, this species is found clinging to the walls of deep orifices. The crystal springsnail is a small-sized snail with a globose-neritiform shell. The spire is very short, and the aperture is broad and enlarged. Its total length is less than 0.1 in. (2.5 mm), and it has approximately 3 whorls. The shell is colorless, transparent, and thin (Center for Biological Diversity 2009).

The Crystal springsnail may occur in the affected area of the proposed Amargosa Valley SEZ.

Distal Gland Springsnail (*Pyrgulopsis nanus*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The distal gland springsnail is endemic to the Ash Meadows NWR of southern Nye County, Nevada, in the Upper Amargosa watershed. It is known from only four spring systems within the refuge: Five Springs, Mary Scott Spring, Collins Ranch Spring, and a spring north of

Collins Ranch Spring. All these springs occur within 6 mi (10 km) of each other. Habitat is soft sediment and loose travertine in the upper segments of thermal streams (Center for Biological Diversity 2009). This small-sized snail has a globose, short-spired shell. It is less than 0.1 in. (1.5 to 2.4 mm) in height and has 3.0 to 4.0 whorls (Center for Biological Diversity 2009).

Although locally common, the distal gland springsnail's highly limited range is a threat to its survival.

Currently, the distal gland springsnail is under review for listing under the ESA.

The distal gland springsnail may occur in the affected area of the proposed Amargosa Valley SEZ.

Elongate Gland Springsnail (*Pyrgulopsis isolata*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The elongate gland springsnail is endemic to the Ash Meadows NWR in southern Nye County, Nevada. Within the refuge, it is known only from the spring south of Clay Pits. It is locally common on soft substrates in its thermal habitat and can be found on outflows from the marsh (Center for Biological Diversity 2009).

This large-sized snail has a colorless, transparent, broadly conical shell with a moderate spire. The shell is less than 0.1 in. (2.6 to 3.1 mm). It has 3.75 to 4.25 highly convex whorls. The aperture is slightly separated from the body whirl, and the inner lip is complete and thickened (Center for Biological Diversity 2009).

Currently, the elongate gland springsnail is under review for listing under the ESA. It is threatened by its endemic nature and poor dispersal capabilities, which makes populations vulnerable to disturbance.

The elongate gland springsnail may occur in the affected area of the proposed Amargosa Valley SEZ.

Fairbanks Springsnail (*Pyrgulopsis fairbanksensis*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Fairbanks springsnail is endemic to the Ash Meadows NWR in southern Nye County Nevada. Within the refuge, it is known only from Fairbanks Spring. Habitat is soft travertine substrate at the orifice of a large, low-elevation spring (Center for Biological Diversity 2009). The Fairbanks springsnail has 3 to 4 whorls and is less than 0.1 in. (2.5 to 3.4 mm) in height. It is a moderate-sized snail with a short-spired, globose-turbinate shell with a thickened inner lip (Center for Biological Diversity 2009).

Because of its endemic nature, the Fairbanks springsnail is naturally limited in distribution and has very poor dispersal abilities. As a result, habitat loss will result in population extirpation or species extinction.

The Fairbanks springsnail is currently under review for listing under the ESA.

This species may occur in the affected area of the proposed Amargosa Valley SEZ.

Giuliani's Dune Scarab Beetle (*Pseudocotalpa giulianii*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Giuliani's dune scarab beetle is an insect that is endemic to the Big Dune and Lava Dune in Nye County, Nevada. Within these habitats, the species primarily lives beneath the sand surface; adults are active above ground for short periods near sunset. Adults breed on creosotebush and on sand surfaces; larvae develop beneath the sand surface, where they apparently feed on plant roots.

The Giuliani's dune scarab beetle may occur in the affected area of the proposed Amargosa Valley SEZ.

Grated Tryonia (*Tryonia clathrata*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The grated tryonia is endemic to the Muddy River spring system in southeastern Nevada. In Clark County, it occurs in Oasis Spring, Muddy Spring, Cardy Lamb Spring, Apcar Springs, and springs in the Moapa Valley Water District and the Moapa Valley NWR. In Lincoln County, it occurs at Warm Spring, Ash Springs, and Crystal Springs in the Pahranagat Valley. It also occurs in Nye County at Moorman Spring and Hot Creek Spring. The species occurs on or in algae and detritus substrates of warm, slow-moving freshwater spring systems. Water tends to be less than 2 in. (5 cm) deep and moves at less than 8 in. (20 cm) per second. Preferred substrate is sand and fine to coarse particulate organic matter. Gravel and cobbles are avoided. Nearby vegetation includes bulrush (*Schoenplectus* spp.), muskgrass (*Chara vulgaris*), horsehair algae, spikerush (*Eleocharis* sp.), yerba mansa, and saltgrass (Center for Biological Diversity 2009). The grated tryonia is 0.1 to 0.3 in. (2.9 to 7.0 mm) tall with 5.75 to 8.75 whorls. It has a medium to large-sized conical shell with strong collabral sculpture (Center for Biological Diversity 2009).

The grated tryonia is currently under review for listing under the ESA.

Threats include decreased spring discharge due to groundwater development, water diversions, recreation activities, invasive species, and global climate change. In particular, groundwater withdrawals from alluvial and carbonate aquifers in the Muddy River Springs Area are expected to increase with increasing development.

The grated tryonia may occur in the affected area of the proposed Dry Lake SEZ.

Great Basin Silverspot Butterfly (*Speyeria nokomis nokomis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Colorado)
State Listing Status: Not Listed
Rarity: Colorado State Rank S1; New Mexico State Rank S1

The Great Basin silverspot butterfly, also known as the Nokomis fritillary, occurs in isolated populations in streamside meadows, marshes, and open seepage areas associated with violets in generally desert landscapes. Its range stretches from east-central California, Nevada, Utah, and Colorado south through Arizona and New Mexico and into Mexico (NatureServe 2012; Opler et al. 2010).

The butterfly exhibits sexual dimorphism. The male is brownish orange with dark markings, while the female is black with cream-colored spots. Both sexes have hindwings with black-bordered silver spots. The species has only one flight. Mating occurs from July to September, when males patrol for receptive females. Females lay single eggs near host plants, such as the northern bog violet (*Viola nephrophylla*). First-stage caterpillars are unfed and hibernate until spring, when they feed on the leaves of the host. Adults eat flower nectar (Opler et al. 2010). Threats to this species include habitat drainage and development.

The Great Basin silverspot butterfly may occur in the affected areas of the proposed Antonito Southeast and Los Mogotes East SEZs.

Large Aegialian Scarab Beetle (*Aegialia magnifica*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The large aegialian scarab beetle is endemic to the Big Dune and Lava Dune regions of Nye County, Nevada. Adult and larvae of this species live in very sandy substrates, specifically wind-deposited sand dunes. The large aegialian scarab beetle is dependent upon deep sand habitats. The beetle is pale red, smooth, and shiny with tiny puncture marks. It is 0.2 in. (4.4 to (5.9 mm) long and 0.2 in. (2.5 to 3.3 mm) wide (WildEarth Guardians 2010).

The beetle is currently under review for listing under the ESA.

Threats include small populations, limited range, and habitat destruction (WildEarth Guardians 2010).

The large aegialian scarab beetle may occur in the affected area of the proposed Amargosa Valley SEZ.

Median Gland Springsnail (*Pyrgulopsis pisteri*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The median gland springsnail, also known as the median gland Nevada pyrg, is endemic to the Ash Meadows NWR in southern Nye County, Nevada. It is known from only three spring-fed habitats, all within 1 mi (2 km) of each other—North Scruggs Spring, Marsh Spring, and an observation pond below School Spring. Habitat is the outflows of thermal springs on travertine, aquatic macrophytes, or soft substrates (Center for Biological Diversity 2009).

The springsnail is small with a globose shell that is less than 0.1 in. (1.8 to 2.7 mm) high. The shell is colorless and transparent and has a short spire and 3.25 to 4.5 whorls (Center for Biological Diversity 2009).

The median gland springsnail is currently under review for listing under the ESA.

Threats include loss and degradation of spring habitat due to groundwater development (Center for Biological Diversity 2009).

The median gland springsnail may occur in the affected area of the proposed Amargosa Valley SEZ.

Minute Tryonia (*Tryonia ericae*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The minute tryonia is endemic to the Ash Meadows NWR in southern Nye County, Nevada. It is known from less than four spring-fed habitats, including North Scruggs Spring and a spring north of Collins Ranch Spring. Habitat includes macrophytes, stream outflows, travertine bits, and mats of algae at small low-elevation springs (Center for Biological Diversity 2009). This small springsnail is less than 0.1 in. (< 0.19 cm) long. It has a conical shell with impressed sutures and a thickened aperture. Unlike most springsnails, the female sperm tube and brood pouch are fused rather than opening separately (Center for Biological Diversity 2009).

The minute tryonia is under review for listing under the ESA and is ranked S1 (critically imperiled) in Nevada.

Threats include habitat destruction from groundwater development.

The minute tryonia may occur in the affected area of the proposed Amargosa Valley SEZ.

Moapa Pebblesnail (*Pyrgulopsis avernalis*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Moapa pebblesnail is endemic to Moapa Springs in Clark County, Nevada. It is a benthic species that inhabits freshwater springs and brooks. The pebblesnail is associated with coarse gravel substrate, higher current velocities, and warmer water temperatures ranging from 73 to 90°F (23 to 32°C). Nearby vegetation includes ash (*Fraxinus* spp.), mesquite, salt cedar, fan palm (*Washingtonia filifera*), grasses like saltgrass, and perennial herbs. The pebblesnail occupies a wide range of depths, preferring 12 to 16 in. (30 to 40 cm) (Center for Biological Diversity 2009). The Moapa pebblesnail is a medium-sized snail with a globose-trochoid shell. It eats algae and detritus (Center for Biological Diversity 2009).

The Moapa pebblesnail is currently under review for listing under the ESA.

Threats include decreased spring discharge due to groundwater development, water diversions, recreation, invasive species, and global climate change (Center for Biological Diversity 2009).

The Moapa pebblesnail may occur in the affected area of the proposed Dry Lake SEZ.

Moapa Valley Pebblesnail (*Pyrgulopsis carinifera*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Moapa Valley pebblesnail, also known as the Moapa Valley pyrg, is endemic to the Moapa Valley in Clark County, Nevada. It occurs in Apcar Springs, Muddy Spring, springs west of Muddy Spring, and a spring in Moapa Valley NWR. The pebblesnail inhabits freshwater springs with temperatures of around 32°C (90°F). Surrounding vegetation includes ash, mesquite, salt cedar, fan palm (*Washingtonia filifera*), grasses (especially *Distichlis spicata*), and perennial herbs. The pebblesnail prefers waters less than 4 in. (10 cm) deep. Substrate is gravel, with sand, coarse particulate organic matter, fines, and cobbles (Center for Biological Diversity 2009).

The Moapa Valley pebblesnail is currently under review for listing under the ESA and is ranked S1 (critically imperiled) in Nevada.

Threats include decreased spring discharge due to groundwater development, water diversions, recreation, invasive species, and global climate change (Center for Biological Diversity 2009).

The Moapa Valley pebblesnail may occur in the affected area of the proposed Dry Lake SEZ.

Moapa Warm Spring Riffle Beetle (*Stenelmis moapa*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Moapa Warm Spring riffle beetle is endemic to the Warm Springs Area of Clark County, Nevada. Its global distribution is restricted to an area of approximately 988 acres (4 km^2). It occurs in swift, shallow waters of freshwater outlet springs on gravel substrates, warm freshwater streams, and vegetated marshy areas. The beetle is often found near vegetation and bare tree roots. Preferred temperature ranges from 83 to 96°F (28 to 36°C). This reddish-brown, black, and greenish beetle feeds on aquatic plants and algae (NatureServe 2012).

The Moapa Warm Spring riffle beetle is currently under review for listing under the ESA.

Threats include alteration to habitat by human activity.

The Moapa Warm Spring riffle beetle may occur in the affected area of the proposed Dry Lake SEZ.

Mojave Gypsum Bee (*Andrena balsamorhizae*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The Mojave gypsum bee is an insect that is endemic to Nevada, where the species is restricted to gypsum soils associated with habitats of its single larval host plant, silverleaf sunray (*Enceliopsis argophylla*). Such habitats include warm desert shrub communities; dry, open, relatively barren areas on gypsum badlands; and volcanic gravels.

The Mojave gypsum bee may occur in the affected area of the proposed Dry Lake SEZ.

Mojave Poppy Bee (*Perdita meconis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The Mojave poppy bee is an insect known only from Clark County, Nevada, where it is dependent on poppy plants (*Arctemocon* spp.). Such habitats include roadsides, washes, and barren desert areas. The bee belongs to the complex of poppy specialists. It feeds on large-flowered poppy plants. Males are roughly 0.2 in. (5.0 mm) long with a dark green head, black legs with pale yellow stripes, and transparent colorless wings. Females are approximately 0.27 in. (7 mm) long with similar coloring as males. Its flight period is from mid-April to early June.

The Mojave poppy bee may occur in the affected area of the proposed Dry Lake SEZ.

Oasis Valley Springsnail (*Pyrgulopsis micrococcus*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S2

The Oasis Valley springsnail is a freshwater mollusk endemic to the Amargosa River drainage and the Death, Panamint, and Saline Valleys in Inyo County, California, and Nye County, Nevada. The species occurs in small springs and stream outflows, where it is typically found on stone, travertine, and detritus. The springsnail has a globose to ovate-conic shell. It is small to medium-sized with 3.25 to 3.5 whorls.

The Oasis Valley springsnail may occur in the affected area of the proposed Amargosa Valley SEZ.

Pahranagat Naucorid (*Pelocoris shoshone shoshone*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Pahranagat naucorid is an aquatic insect known to occur only in the Muddy and White River Basins in southern Nevada. It inhabits warm, quiet waters of spring-fed systems.

The Pahranagat naucorid may occur in the affected area of the proposed Dry Lake SEZ.

Point of Rocks Tryonia (*Tryonia elata*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The Point of Rocks tryonia is a freshwater mollusk endemic to the Ash Meadows region of Nye County, Nevada. It is found at only two localities at Point of Rocks Springs. Within these habitats, the species is found on travertine mounds near spring outflows.

The Point of Rocks Tryonia has a small to medium-sized, narrow-conic shell (0.1 in. [0.3 cm] long). The penial ornament consists of two distal and one basal papillae along the inner edge. It is distinguished from its congeners by the combination of its small size and narrow-conic shell, and because the brood pouch lacks a posteriorly folded component (Center for Biological Diversity 2009).

The Point of Rocks tryonia may occur in the affected area of the proposed Amargosa Valley SEZ.

Sporting Goods Tryonia (*Tryonia angulata*)

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Nevada State Rank S1

The sporting goods tryonia is a freshwater mollusk endemic to the Ash Meadows region of Nye County, Nevada, where it is known from only three springs: Fairbanks Spring, Big Spring, and Crystal Pool. Within these habitats, the species is found on soft substrates in thermal waters. The sporting goods tryonia is a fairly large-sized snail with an elongate conic shell. It has 5 to 7 whorls, and the shell is colorless and transparent (Center for Biological Diversity 2009).

The sporting goods tryonia may occur in the affected area of the proposed Amargosa Valley SEZ.

Spring Mountains Springsnail (*Pyrgulopsis deaconi*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: New Mexico State Rank S1; Nevada State Rank S1

The Spring Mountains springsnail is endemic to freshwater springs of the Spring Mountains in the drainages of Las Vegas and Pahrump Valleys in Clark and Nye Counties of southern Nevada. In the Las Vegas Valley (Clark County), it occurs at Red Spring and Willow Spring. In the Pahrump Valley (Clark County), it occurs at Kiup Spring. Also in the Pahrump Valley (Nye County), it historically occurred in a spring at Manse Ranch, but it has been extirpated from that site.

The Spring Mountains springsnail depends on artesian spring ecosystems with permanent flowing, unpolluted, highly oxygenated waters with high mineral content. Documented habitat characteristics include the presence of emergent vegetation, water depths between 1.5 and 2.7 in. (4 and 7 cm), and water temperatures between 63 and 68°F (17 and 20°C) (Center for Biological Diversity 2009).

The Spring Mountains springsnail may occur in the affected area of the proposed Dry Lake SEZ.

J.6.3 Fish

Ash Meadows Amargosa Pupfish (*Cyprinodon nevadensis mionectes*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2

The Ash Meadows Amargosa pupfish is found in 10 spring areas within the Ash Meadows of Nye County, Nevada. Most of these springs are on public land within the Ash Meadows NWR (USFWS 2010a). Typical habitat consists of ephemeral pools, headwater spring pools, and outfall drainage and marshes that connect to the spring system. This species feeds mainly on blue-green algae and small invertebrates. It breeds throughout the year, with peaks in spring and early summer (NatureServe 2012).

The Ash Meadows Amargosa pupfish was federally listed as endangered on September 28, 1983 (USFWS 1983). Critical habitat was also designated on this date within the Ash Meadows NWR.

Threats to the species include competition and predation from introduced non-native species, channelization, water impoundment and diversion, groundwater pumping, pollution, and elimination of riparian vegetation (NatureServe 2012).

The Ash Meadows Amargosa pupfish may occur in the affected area of the proposed Amargosa Valley SEZ.

Ash Meadows Speckled Dace (*Rhinichthys osculus nevadensis*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1

The Ash Meadows speckled dace, also known as the Nevada speckled dace, is endemic to spring systems and aquatic habitats formed by spring waters at Ash Meadows, in Nye County, Nevada. Although formerly more widespread in the area, the species is currently restricted to Jackrabbit Spring, Big Spring, the two westernmost springs of the Bradford Springs group, and the outflows of these springs. This dace is known to occur in headwater spring pools, spring outflow creeks (including areas of the creek up to a mile or more from their spring sources), and marshes formed by spring flows. The subspecies also occurs in irrigation ditches and canals that utilize the spring flows for irrigation. The Ash Meadows speckled dace appears to be rather general in its habitat requirements, utilizing areas with a rather fast stream current as well as quiet spring pools (NatureServe 2012).

Speckled dace are typically omnivores. They often feed on bottom materials, including aquatic insect larvae, crustaceans, attached diatoms, snails, and algae. Some mid-water foods or even an occasional surface insect will be taken. Terrestrial insects that fall in the water may also be consumed. Speckled dace typically mature in their second summer. Spawning often occurs during the spring, but some spawning may take place all year, especially in spring habitats with a rather narrow range of temperatures. Speckled dace typically spawn on the gravel edge or riffles in stream habitats. Eggs hatch in approximately 6 days.

Human development in the area consists primarily of small, scattered residences with which subsistence gardens, small orchards, or agricultural fields may be associated. During the early 1970s, a large farm began operating in Ash Meadows. Development of the farm involved the extensive removal of natural vegetation; land leveling; the construction of irrigation wells, ditches, and fences; and other activities necessary for commercial farming. The former major threats from dewatering and development were eliminated with the establishment of the Ash Meadows NWR. However, some of the spring outflows that were diverted into ditches in the past remain today.

The Nevada speckled dace was federally listed as endangered on September 2, 1983 (USFWS 1983). Critical habitat was also designated on this date.

The primary threats to the Nevada speckled dace consist of habitat destruction and the effects of exotic fish introductions. Because of the acquisition of many spring areas by the USFWS, the major threats in the future will most likely consist of additional exotic species introductions rather than physical habitat alteration (NatureServe 2012).

The Ash Meadows speckled dace may occur in the affected area of the proposed Amargosa Valley SEZ.

Devil's Hole Pupfish (*Cyprinodon diabolis*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1

The Devil's Hole pupfish is a small species about 1 in. (2.5 cm) long that occurs in Devil's Hole in the Amargosa Valley of Nevada, located about 90 mi (149 km) northwest of Las Vegas (USFWS 1990). While this species is naturally restricted to Devil's Hole, the species has been introduced in artificial refugia at the Amargosa Pupfish Station in Ash Meadows and in facilities constructed by the Bureau of Reclamation located near the Hoover Dam. It lives only for 1 year or less and spawns between April and mid-June. Population levels vary from about 125 to 550 individuals (USFWS 1990). The variation between spring and fall counts is a function of severe environmental conditions, low oxygen levels, and low sunlight during the winter months, which is a factor in algal production in the cavern. A population maintained within a refugium seems to survive longer and fluctuate less between spring and fall than does the natural population (USFWS 1990). Food of the pupfish includes algae and detritus obtained from the sides and bottom of the cavern.

The Devil's Hole pupfish was federally listed as endangered on March 11, 1967 (USFWS 1967). Critical habitat has not been designated for this species.

The greatest threat to continued survival of the species is the small numbers existing in Devil's Hole. The presence of non-native snails is a threat if they are not controlled. These snails consume algae that the pupfish feed on and rely on for oxygen production (NatureServe 2012).

The Devil's Hole pupfish may occur in the affected area of the proposed Amargosa Valley SEZ.

Moapa Dace (*Moapa coriacea*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1

The Moapa dace is endemic to the warm spring area at the headwaters of the Moapa (Muddy) River, in northern Clark County, southeastern Nevada. It is restricted to 10 warm springs, their outflows, and the warm waters of the upper mainstream Muddy River. The velocity of the water flow is variable, but in many areas, it can be swift. Streamside vegetation is dense throughout most of the Moapa dace habitat, frequently forming a complete canopy over the stream and filling the channel with snags and brush. Streamside vegetation consists of ash (*Fraxinus* spp.), cottonwood (*Populus* spp.), screwbean mesquite (*Prosopis pubescens*), willow (*Baccharis* spp.), salt cedar, grape vines (*Vitis* spp.), and a variety of shrubs, grasses, and herbs (NatureServe 2012). The Moapa dace appears to be predominantly carnivorous and feeds on invertebrates and on lesser amounts of detritus and filamentous algae. Observation of feeding indicates that the species feeds relatively indiscriminately on organisms drifting with the current. Fish tend to congregate at dawn and dusk in swift water near snags and dash up into the current to pick off drift material passing by. Moapa dace will consume benthic invertebrates directly off the bottom in pool habitats. Larvae living in shallower, more slowly moving water probably feed on smaller micro-crustaceans.

Moapa dace can reproduce throughout the year in the nearly constant temperatures of their habitat. Peak reproduction probably occurs from February to April, followed by peak emigration of the young in May. This species has been observed spawning on sandy substrate in a water depth of 6 to 7.5 in. (15 to 19 cm) and a near-bed velocity of 0.1 to 0.3 ft/s (3 to 9 cm/s).

The Moapa dace was federally listed as endangered on March 11, 1967 (USFWS 1967). Critical habitat has not been designated.

The most important factor limiting the distribution and abundance of the Moapa dace within its former range was probably the turbidity caused by irrigation return flows into the formerly clear water. The feeding ability of the Moapa dace may have been severely curtailed by this increased turbidity. Other apparent reasons for the decline of the species include competitive interactions with introduced exotic species, parasites (commonly associated with aquarium fishes and introduced through these exotic fish), and declining water quality (chemical parameters and physical parameters) from channelization and irrigation for agricultural development. Future threats to the species include additional water development for irrigation or any activity that would increase the water turbidity, reduce the low gene pool, channelize the stream course, or add exotic species to the stream in the headwaters of the Muddy River (NatureServe 2012).

The Moapa dace may occur in the affected area of the proposed Dry Lake SEZ.

Moapa Speckled Dace (*Rhinichthys osculus moapae*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1

The Moapa speckled dace is one of several subspecies of the widely distributed speckled dace (*Rhinichthys osculus*). This species is endemic to the Muddy River of Clark County in southern Nevada, where its distribution is confined to the middle portion of the river. Preferred habitats include stream bottoms in shallow, low-velocity cobble riffles. The Moapa speckled dace is omnivorous, feeding primarily on algae, invertebrates, fish eggs, and detritus occurring on the surface or drifting within the water column. Populations have declined because of water depletions from diversions and groundwater pumping, as well as the introduction of non-native fish species (The Nevada Biodiversity Initiative 2008).

The Moapa speckled dace may occur in the affected area of the proposed Dry Lake SEZ.

Moapa White River Springfish (*Crenichthys baileyi moapae)*

ESA Listing Status: Under Review
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2

The Moapa White River springfish is endemic to southern Nevada, where it is restricted to five warmwater springs in the upper Muddy River. This species prefers headwaters springs and spring pools with warmwater temperatures of (80 to 90°F [27 to 32°C]) and low oxygen concentrations. Primary food items include filamentous algae and small aquatic invertebrates. Current levels of abundance and distribution have decreased because of habitat modifications, primarily dam construction and the introduction of non-native fish (The Nevada Biodiversity Initiative 2008).

The Moapa White River springfish may occur in the affected area of the proposed Dry Lake SEZ.

Oasis Valley Speckled Dace (*Rhinichthys osculus* ssp. 6)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1; USFWS Species of Concern

The Oasis Valley speckled dace is a small fish species that is restricted to spring-fed habitats in the Oasis Valley, Nye County, Nevada. This species is primarily known from the Amargosa River in the Oasis Valley. There is little information published on this species.

The Oasis Valley speckled dace may occur in the affected area of the proposed Amargosa Valley SEZ.

Pahrump Poolfish (*Empetrichthys latos*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1

The Pahrump poolfish is a small omnivore that is about 2 in. (5 cm) long at maturity. It is endemic to the Pahrump Valley in southern Nye County, Nevada. After nearly becoming extinct, three populations were re-established at the following locations: Corn Creek Spring on the Desert NWR north of Las Vegas, Nevada; Shoshone Springs southeast of Ely, Nevada; and an irrigation reservoir located on the Spring Mountains Ranch State Park west of Las Vegas. No information was found on reproduction in this species.

Prior to the loss of the Manse Spring population, the habitat consisted of water with a constant temperature of 76°F (24°C), with emergent vegetation in the shallow areas. Larger fish used the open, deeper waters of the spring; juveniles were in the shallows with emergent vegetation.

The Pahrump poolfish was federally listed as endangered on March 11, 1967 (USFWS 1967). Critical habitat has not been designated for this species.

The greatest threat to the re-introduced populations is competition and predation from other fish.

The Pahrump poolfish may occur in the affected area of the proposed Dry Lake SEZ.

Rio Grande Chub (*Gila pandora)*

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Colorado Species of Concern
Rarity: Colorado State Rank S1; New Mexico State Rank S2

The Rio Grande chub is known from isolated areas in the Rio Grande drainage system in south-central Colorado, New Mexico, and western Texas. Formerly, this species was widespread in creeks of the upper Rio Grande and Pecos River watersheds. Currently, the distribution is reduced in the Pecos system, and the species is considered extirpated from the mainstem Rio Grande (USFS 2005). It is known to still occur in tributary streams and some impoundments. In Colorado, the species is currently only known from Hot Creek. It may be introduced elsewhere. The Rio Grande chub is estimated to occur in only 25% of its historic locations.

The Rio Grande chub occurs in flowing pools of headwaters, creeks, and small rivers, often near inflow of riffles and in association with cover such as undercut banks, aquatic vegetation, and plant debris. It may be more associated with sandy substrates than with gravelly or rocky substrates (NatureServe 2012).

Threats to this species include stream degradation and effects of non-native species (NatureServe 2012).

The Rio Grande chub may occur in the affected areas of the proposed Antonito Southeast, De Tilla Gulch, and Los Mogotes East SEZs.

Rio Grande Sucker (*Catostomus plebeius*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Endangered in Colorado
Rarity: Colorado State Rank S1; New Mexico State Rank S2

The Rio Grande sucker occupies a wide-ranging distribution from the Rio Grande basin in Colorado and New Mexico, south to the Rio Yaqui basin in Mexico. It has also been introduced into the Gila River basin in Arizona and New Mexico. It is restricted to pools, runs, and riffles of small to moderately large streams; usually over gravel and/or cobble. It also occurs in backwaters and pools below riffles. It rarely occurs in waters with heavy silt and organic detritus. Its diet includes diatoms, detritus, and benthic invertebrates found among rocks and boulders (NatureServe 2012).

Threats to this species include hybridization and competition with the introduced white sucker (*Catastomus commersoni*). In some areas, populations may have been extirpated by the introduction of predaceous northern pike (*Esox lucius*) (NatureServe 2012).

The Rio Grande sucker may occur in the affected areas of the proposed Antonito Southeast, De Tilla Gulch, and Los Mogotes East SEZs.

Roundtail Chub (*Gila robusta*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Arizona Wildlife Species of Concern
Rarity: Nevada State Rank S1, Arizona State Rank S2; Utah State Rank S2; USFWS Species of Concern

The roundtail chub occupies a wide range in the Colorado River basin. It is known from larger tributaries in the Colorado Basin, from Wyoming south to Arizona, Nevada, New Mexico, as well as through the Rio Yaqui basin in Mexico. It historically occurred in the Little Colorado River basin but is now presumed extirpated from that basin. It is also presumed extirpated from the Zuni and San Francisco drainages in New Mexico. Populations in the Gila River basin in Arizona and New Mexico are recognized as a distinct species (headwater chub; *G. nigra*).

The roundtail chub is a relatively large (10 to 14 in. [25 to 35 cm] long) minnow. Both sexes have an orange-red color on their ventrolateral surfaces and on all fins except their dorsal fin. This coloration becomes more intense among males during the breeding season. Spawning typically occurs from March to May. The roundtail chub occupies cool to warmwater streams and rivers consisting of pools adjacent to riffles and runs. It is an opportunistic forager, consuming available aquatic and terrestrial insects, gastropods, crustaceans, fish, and algae.

Threats to this species include alterations of hydrology such as impoundment, channelization, sedimentation, water diversion, and groundwater pumping. The competition and predation by non-native species also poses risks to this species (NatureServe 2012).

The roundtail chub may occur in the affected area of the proposed Gillespie SEZ.

Warm Springs Pupfish (*Cyprinodon nevadensis pectoralis*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1

The warm springs pupfish occupies six springs, outflow drainages, and marsh habitats in Ash Meadows, Nye County, Nevada. These springs are North Scruggs Springs, South Scruggs

Springs, Marsh Springs, North Indian Springs, South Indian Springs, and School Springs. The characteristics of the habitat of the springs are fairly constant. Temperatures in the springs range from 86 to 91°F (30 to 33°C), and the pools are less than 4 ft (1.3 m) deep. *Chara* and *Spirogyra* are the common submerged plants; *Scirpus* and *Typha* make up most of the emergent vegetation. Salinity in these habitats is generally low. Little is known of the food habits of the warm springs pupfish, but it is thought to feed primarily on algae and detritus throughout the year.

Reproduction occurs throughout the year at some springs and from February through September in both North and South Indian Springs. Several generations may be produced in a given year. Spawning habitat is in open water with soft silt or sandy substrate. Fry occupy shallow areas where algal growth is high.

The warm springs pupfish was federally listed as endangered on October 13, 1970 (USFWS 1970). No critical habitat is designated for this species.

Threats to the species include competition and predation from introduced non-native fish species. Bullfrogs and crayfish are potential predators in much of the pupfish's habitat (NatureServe 2012).

The warm springs pupfish may occur in the affected area of the proposed Amargosa Valley SEZ.

J.6.4 Amphibians

Amargosa Toad (*Bufo nelsoni*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2

The Amargosa toad is a small toad that is endemic to a very small range (<40 mi^2 [100 km^2]) in the Amargosa Valley in Nye County, Nevada. The species is confined to isolated riparian and spring-fed habitats along the Amargosa River. Amargosa toads require early-to-intermediate successional stage riparian habitats. Within theses habitats, wetlands characterized as being open, ponded, or flowing; having low, emergent vegetation along the edges; and partial canopy closure are necessary for breeding and population recruitment (USFWS 2010d). Other habitat components include burrows, debris piles, spaces under logs or rocks, and areas of dense vegetation that are utilized daily shelters. Foraging for spiders, insects, and scorpions occurs along the edges of wetlands as well as within adjacent upland areas (USFWS 2010d).

The Amargosa toad was designated as a Category 1 Candidate species under the ESA in 1982. In 1996, after a review of available scientific and commercial information, the USFWS determined that listing of the species was not warranted (USFWS 1996). In 2010, the USFWS responded to a 2008 petition to list the species with the determination that listing of the Amargosa toad is not warranted (USFWS 2010d). Despite its limited distribution, recent surveys indicate that the status of the Amargosa toad is relatively stable.

The Amargosa Toad may occur in the affected area of the proposed Amargosa Valley SEZ.

Lowland Leopard Frog (*Lithobates yavapaiensis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Arizona)
State Listing Status: Arizona Wildlife Species of Concern
Rarity: California Species of Concern; USFWS Species of Concern

The lowland leopard frog occurs in a variety of natural and man-made aquatic systems. General habitat associations include small to medium-sized streams, rivers, channels, springs, ponds, and stock ponds within desertscrub, grassland, woodland, and pinyon-juniper habitats dominated by bulrushes, cattails, and riparian grasses near or under an overstory of Fremont cottonwoods (*Populus fremonti*) and willows and mesquite *(Prosopis* sp.). Selected sites are characterized as having a semipermanent to permanent hydrological cycle, a salinity range of 6.0 to 9.0%, and a thermal range of 51.8 to 84.2°F (11 to 29°C) (AmphibiaWeb 2010). Within these communities, individuals select daily basking sites close to refugia in the form of emergent and perimeter vegetation, deep water, root masses, undercut banks, and debris piles. Foraging is also conducted within these sites, since a wide variety of insects and other arthropods make up this frog's diet (NatureServe 2012).

The historic distribution of the lowland leopard frogs once extended discontinuously from Arizona and New Mexico in the south, west to California, and north to Nevada and Utah. Recent studies, however, indicate that habitat changes associated with agriculture, livestock grazing, development, reservoir construction, and exotic predatory species have caused this range to contract by nearly 50%. Populations of lowland leopard frogs are currently limited to Arizona and New Mexico at an elevation ranging from sea level to 5,961 ft (0 to 1,817 m).

The lowland leopard frog was formerly a Category 2 candidate species under the ESA until the classification system was modified and subsequently removed from the list.

The lowland leopard frog could occur in the affected areas of the proposed Brenda and Gillespie SEZs.

Northern Leopard Frog (*Lithobates pipiens*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive

State Listing Status: Not Listed
Rarity: California State Rank S2; Nevada State Rank S2; New Mexico State Rank S2; Colorado Species of Concern

The northern leopard frog requires a broad range of habitats in close proximity because of its complicated life history (Smith and Keinath 2007). Critical habitat types vary by season and life stage, and they tend to exhibit a high degree of site fidelity (Jennings and Hayes 1994). Breeding habitat consists of a variety of aquatic habitats, with preferred sites characterized as having a semipermanent to seasonal hydrological cycle; a shallow water depth (<7 ft [<2 m]); an areal extent of less than 20 acres (0.08 km^2); abundant emergent vegetation dominated by cattails; an unconsolidated bottom; a low canopy cover (<30%); low salinity; and an absence of predatory fish (Smith and Keinath 2007). Following reproduction, adult and juvenile northern leopard frogs disperse into adjacent riparian habitat that is dominated by dense, relatively tall grasses or forbs and has a moist substrate, where they forage opportunistically for insects, arachnids, worms, and crustaceans (Jennings and Hayes 1994). Overwintering occurs beneath leaf litter or below logs or within ponds or flowing streams.

The size of the home range of the northern leopard frog is determined by the spatial configuration of breeding and nonbreeding habitats across the landscape. This area typically encompasses a relatively small areal extent of 161 to 6,458 ft^2 (15 to 600 m^2). Within these territories, individuals disperse from 16 to 26,247 ft (5 to 8,000 m) from natal ponds into terrestrial habitat, with juveniles making larger movements (>2,625 ft [>800 m]) than adults (<328 ft [<100 m]) (Jennings and Hayes 1994).

Historically, the northern leopard frog was one of the most common and widespread anurans in North America, occurring from southern Canada, south to Pennsylvania and Kentucky, and west to the Pacific states. However, since the 1970s, this species has experienced significant declines and local extirpations throughout most of its range, particularly in the western states of California, Colorado, Montana, Idaho, eastern Washington, and Arizona (Smith and Keinath 2007).

The western population of the northern leopard frog, including populations within California, Arizona, Colorado, Idaho, Iowa, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Texas, Utah, Washington, Wisconsin, and Wyoming, was petitioned for listing under the ESA on July 9, 2009. In response to that petition, the USFWS initiated a status review for this species on October 28, 2009, to determine whether listing is warranted (USFWS 2009a).

The northern leopard frog could occur in the affected areas of the proposed Antonito Southeast and Los Mogotes East SEZs.

Southwestern Toad (*Bufo microscaphus*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive

State Listing Status: Utah Species of Concern
Rarity: Nevada State Rank S2; Utah State Rank S2; USFWS Species of Concern

The southwestern toad is associated with desert, pine-fir forest, and pine-oak woodlands at an elevational range of 480 to 8,400 ft (146 to 2,560 m) (AZGFD 2002). Within these natural communities, individuals occupy gravelly areas of permanent or intermittent streams, arroyos, and washes having sandy or rocky substrates, where both breeding and foraging of invertebrates occur.

The southwestern toad has a scattered distribution along the headwaters and tributaries of the Colorado River from southwestern Utah, southern Nevada, central Arizona, southwestern New Mexico, and south into Mexico. Throughout its range, this species is locally common; however, population trends are currently declining (Hammerson and Schwaner 2004).

The southwestern toad may occur in the affected areas of the proposed Dry Lake and Gillespie SEZs.

J.6.5 Reptiles

Colorado Desert Fringe-Toed Lizard (*Uma notata*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Arizona)
State Listing Status: Not Listed
Rarity: California State Rank S2; California Species of Concern

The Colorado Desert fringe-toed lizard, an aeolian sand specialist, is restricted to sparsely vegetated areas with fine, loose, windblown sand, including dunes, flats, and riverbanks and washes of very arid desert (NatureServe 2012). Individuals establish home ranges that extend from 0.2 to 0.5 acres (0.001 to 0.002 km^2) within areas that provide critical habitat components, including (1) access to sands on windward ends of small accretion dunes, and (2) sparse shrubs and annual vegetation that provide primary dietary resources (e.g., ants, beetles, true bugs, grasshoppers, and caterpillars) (Mayhew 1964). Preferred habitats generally occur within creosote scrub desert communities at elevations ranging from sea level to 1,600 ft (0 to 490 m).

The geographic distribution of the Colorado Desert fringe-toed lizard extends from extreme southeast California in the Colorado Desert from the Salton Sea and Imperial sand hills east to the Colorado River, south to the Colorado River delta, and on into extreme northeastern Baja California. The lizard's range extends west as far as the east base of Borrego Mountain.

Specific estimates of population size are not known, but the lizard's status is considered relatively stable rangewide. However, recent investigations have suggested that many populations are vulnerable to, or have already undergone, local extirpation as a result of disruption to dune formation processes, OHVs, and increased predator populations (CaliforniaHerps 2010; Murphy et al. 2006; NatureServe 2012).

The Colorado Desert fringe-toed lizard may occur within the affected area of the proposed Imperial East SEZ.

Desert Tortoise (*Gopherus agassizii*)

ESA Listing Status: Threatened (Mojave Desert populations);
Candidate (Sonoran populations)
BLM Listing Status: Sensitive (Arizona)
State Listing Status: Arizona Wildlife Species of Concern; Threatened in California
Rarity: None

The desert tortoise occurs in desert regions of the southwestern United States and northwestern Mexico. Within the six-state study area, it occurs in portions of Arizona, California, Nevada, and Utah. Populations of this species are found in the Mojave and Sonoran Deserts. The Mojave population, which includes desert tortoises north and west of the Colorado River, is currently listed as threatened under the ESA. The Sonoran population, which occurs south and east of the Colorado River, is currently a candidate for listing under the ESA.

Within the varied plant communities of the Mojave and Sonoran Desert regions, desert tortoises can potentially survive and reproduce where their basic habitat requirements are met. These requirements include sufficient suitable plants for forage and cover and suitable substrates for burrow and nest sites. Desert tortoises occur primarily on flats and bajadas that have soils ranging from sand to sandy-gravel and that are characterized by scattered shrubs and abundant inter-shrub space for growth of herbaceous plants. Desert tortoises are also found on rocky terrain and slopes in parts of the Mojave and Sonoran Desert regions. There is substantial geographic variation in the way tortoises use available resources. Desert tortoises spend much of their lives in burrows; they emerge to feed and mate during late winter and early spring. They typically remain active through the spring, and they sometimes emerge again after summer storms. During these activity periods, desert tortoises eat a wide variety of herbaceous plants, particularly grasses and the flowers of annual plants. Desert tortoises exhibit delayed maturity and live long lives. Females typically create a nest under a large shrub or at a burrow entrance and lay from 2 to 14 eggs from May to July (UDWR 2010). Adults are well protected against most predators (apart from humans) and other environmental hazards. During hibernation, several individuals often occupy the same burrow (UDWR 2010). Their longevity helps compensate for their variable annual reproductive success, which is correlated with environmental conditions.

Several factors have led to declining populations of the desert tortoise. Reductions in tortoise numbers have been attributed to direct and indirect human-caused mortality, coupled with the inadequacy of existing regulatory mechanisms to protect desert tortoises and their habitat. Impacts, such as the destruction, degradation, and fragmentation of habitat, result from urbanization, agricultural development, livestock grazing, mining, and roads. In addition, an upper respiratory tract disease is an additional major cause of mortality and population decline, particularly in the western Mojave Desert. Predators that prey on adult desert tortoises include the coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), raccoon (*Procyon lotor*), bobcat (*Felis rufus*), badger (*Taxidea taxus),* and feral dog (*Canis familiaris*). Predators of tortoise eggs and young include the common raven (*Corvus corax*), gila monster (*Heloderma suspectum*), snakes, roadrunner (*Geococcyx californianus*), red-tailed hawk (*Buteo jamaicensis*), and American badger (*Taxidea taxus*.) (USFWS 2008a).

The Mojave population of desert tortoise (including any Sonoran Desert tortoises that are outside their normal range) was federally listed as threatened on April 2, 1990. On February 8, 1994, the USFWS designated approximately 6.4 million acres (25,900 km^2) of desert as critical habitat for this species. The Mojave population was listed in response to precipitous declines in desert tortoise numbers in many areas.

Mojave populations of the desert tortoise, listed as threatened under the ESA, may occur in the affected areas of the proposed Amargosa Valley, Dry Lake, Dry Lake Valley North, and Riverside East SEZs. Sonoran populations of the desert tortoise, currently considered as a candidate for listing under the ESA, may occur in the affected areas of the proposed Brenda and Gillespie SEZs.

Flat-Tailed Horned Lizard (*Phrynosoma mcallii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California)
State Listing Status: Arizona Wildlife Species of Concern
Rarity: Arizona State Rank S2; California State Rank S2

The flat-tailed horned lizard is confined to dunes, sandy hills and washes, badlands, and salt flats within desertscrub communities. It occurs at an elevational range of 0 to 1,606 ft (0 to 520 m) primarily on fine, windblown silica sand deposits, with gravelly soils utilized to a lesser extent. White bursage (*Ambrosia dumosa*), indigo bush (*Dalea emoryi*), saltbush (*Atriplex canescens* and *A. polycarpa*), and big galleta grass (*Pleuraphis rigida*) are highly correlated to high species density, presumably for their ability to trap windblown sand and provide shade for thermal cover (Flat-Tailed Horned Lizard Interagency Coordinating Committee 2003). Home ranges encompass a spatial extent of 0.5 to 8.8 acres (0.02 to 0.4 km^2) and coincide closely with the presence of the lizard's primary prey item, harvester ants (*Pogonomyrex californicus*).

The geographic distribution of the flat-tailed lizard is the most limited of any horned lizard species in the United States; its range is in the extreme southwestern corner of Arizona, the southeastern corner of California, and adjoining portions of Sonora and Baja California, Mexico. Populations occur in (1) southwestern Yuma County south of the Gila River and west of the Butler and Gila Mountains of Arizona, and (2) Imperial, Riverside, and San Diego Counties in California, where they are experiencing slight to moderate declines, respectively (AZGFD 2010; CaliforniaHerps 2010; NatureServe 2012).

The USFWS originally proposed listing the flat-tailed horned lizard as a threatened species on November 29, 1993. The proposal was withdrawn in 1997, challenged, and later reinstated in 2002. After an extensive comment period and data review, the USFWS again withdrew the proposed listing in 2003. Following additional challenges against the withdrawal of the proposed rule, the USFWS reinstated the proposed rule to list this species as threatened under the ESA on March 2, 2010 (USFWS 2010b). On March 15, 2011, the USFWS determined that listing of the flat-tailed horned lizard was not warranted and withdrew the proposal (USFWS 2011).

The flat-tailed horned lizard could occur in the affected area of the proposed Imperial East SEZ.

Gila Monster (*Heloderma suspectum*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: California State Rank S1; Utah State Rank S1; Nevada State Rank S2; USFWS Species of Concern

The gila monster is a large-bodied venomous lizard that primarily inhabits desertscrub habitats along low mountain slopes or rocky canyons dominated by paloverde, saguaro, willow, mesquite, salt cedar, and mulefat. Thorn scrub, riparian, xero-riparian, desert grassland, and oak woodland plant associations are also utilized, however, but to a lesser extent. Within these communities, gila monsters establish home ranges (14.8 to 363.2 acres [0.06 to 1.5 km^2]) that encompass spring, summer, and winter shelters. They spend the majority of their time within these shelters and exhibit high site-fidelity toward them (Beck and Jennings 2003; Beck 2005). Boulder piles, rock crevices, tortoise burrows, or woodrat (*Neotoma lepida*) mounds serve as such shelters and are selected based on specific internal structural and micro-environmental attributes.

The gila monster is an opportunistic carnivore; nestling birds, rodents, small rabbits, squirrels, lizards, as well as bird and reptile eggs, are common prey items (CDFG 2010). This species apparently takes almost anything on the surface, underground, or in low bushes.

The geographic distribution of the gila monster extends broadly throughout the southwestern United States and northwestern Mexico at an elevational range of sea level to more than 3,937 ft (1,200 m). However, despite the availability of visually similar habitat types, this species is rare in California and is confined to the Mojave and Colorado Deserts east of 116° longitude (Lovich and Beaman 2007). Such a sporadic and scattered distribution may be the result of a number of factors, including (1) gila monsters are a relict population in California; (2) the requirement of a biphasic climate; or (3) a low availability of shelters within the state, as the occurrence and persistence of this subterranean species is dictated by its ability to find suitable refugia. Specific estimates of population size are not known because of its fossorial tendencies, but its status is apparently declining rangewide because of overcollection and habitat loss (NatureServe 2012).

The gila monster may occur in the affected areas of the proposed Brenda, Dry Lake, and Gillespie SEZs.

Milk Snake (*Lampropeltis triangulum*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Colorado)
State Listing Status: Not Listed
Rarity: Not Listed

The milk snake is a widely distributed species with a total of 25 subspecies known from the snake's geographical range. Each is distinguished by slight color variations and habitat affinities. Of these subspecies, two occur in Colorado: *L. t. taylori* and *L. t. gentilis*. Milk snakes of these subspecific groups use a variety of rocky grassland and shrubland habitat types, including scrub, shortgrass prairie, sagebrush desert, and pinyon-juniper woodland communities. Individuals select microhabitats with limestone or igneous outcroppings on hillsides, canyons, river valleys, and high plains at elevations primarily below 8,000 ft (2,440 m), where they generally remain concealed within rock crevices or beneath debris.

Geographically, milk snakes range throughout much of the continental United States, with a species presence in Colorado that occurs in Conejos County in the West. Accurate information on its population status within the states is not known because of the snake's fossorial and nocturnal behavior.

The milk snake could occur in the affected areas of the proposed Antonito Southeast and Los Mogotes East SEZs.

Mojave Fringe-Toed Lizard (*Uma scoparia*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Arizona and California)
State Listing Status: Arizona Wildlife Species of Concern
Rarity: Arizona State Rank S1; California Species of Concern

The Mojave fringe-toed lizard, an aeolian sand specialist, is restricted to sparsely vegetated areas with fine, loose, windblown sand, including dunes, flats, and riverbanks and washes of very arid desert (NatureServe 2012). Individuals establish home ranges that extend from 0.2 to 0.5 acres (0.001 to 0.002 km^2) within areas that provide critical habitat components, including (1) access to sands affording adequate nesting opportunities as well as a gradient of solar and temperature conditions needed to maintain an optimal thermal preferenda of 99.5°F (37.5°C), and (2) sparse shrubs and annual vegetation that provide primary dietary resources (e.g., seeds, flowers, grasses, and insects) (Mayhew 1964). Preferred habitats generally occur within creosote scrub desert communities at an elevation ranging from sea level to 3,002 ft (0 to 915 m).

The geographic distribution of the Mojave fringe-toed lizard ranges discontinuously in the Mojave Desert, from Death Valley south to the Colorado River near Blythe, California, and extreme southwestern Arizona, where it occurs as small, scattered populations. Specific estimates of population size are not known; however, recent investigations have suggested that many populations are vulnerable to, or have already undergone, local extirpation (Murphy et al. 2006).

The Amargosa River Population of the Mojave fringe-toed lizard, which occurs in portions of San Bernardino County, California, was petitioned for listing under the ESA on April 10, 2006. In response to that petition, the USFWS initiated a status review for this species to determine whether listing is warranted on January 10, 2008 (USFWS 2008b). However, populations under review for listing under the ESA do not occur in the vicinity of any of the SEZs.

The Mojave fringe-toed lizard could occur in the affected area of the proposed Riverside East SEZ.

Rosy Boa (*Charina trivirgata*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Arizona and California)
State Listing Status: Not Listed
Rarity: California State Rank S2

The rosy boa is one of two boid species native to the United States. It is a heavy-bodied snake with smooth, shiny scales and a blunt but tapered tail that is primarily crepuscular in nature. As a saxicolous species, the rosy boa is strongly associated with rocky habitats, including deserts, canyons, and arid scrublands. Individuals have well-defined, stable home ranges averaging 4.0 acre (0.02 km^2) in size, and a moderate level of site fidelity is displayed (Diffendorfer et al. 2005). Within these areas, microhabitats characterized as having a moderate to high density of vegetation and rocks, available intermittent or permanent water, and a southern exposure at elevations from sea level to 6,791 ft (0 to 2,070 m) are preferred. The diet of the rosy boa includes such prey items as rodents, small birds, lizards, snakes, and amphibians (NatureServe 2012).

The geographic distribution of the rosy boa extends from southern California and southwestern Arizona, where it occurs in scattered populations. There are two special status subspecies of rosy boa that may occur within the affected areas of the SEZs—desert rosy boa (*C. t. gracia*) and Mexican rosy boa (*C. t. trivirgata*). Specific estimates of population size are not known because of the boa's fossorial and nocturnal tendencies. Its status, however, is apparently secure rangewide, although overcollection and road mortality have resulted in some local population declines.

The desert rosy boa may occur within the affected area of the proposed Riverside East SEZ. The Mexican rosy boa may occur within the affected area of the proposed Gillespie SEZ.

Tucson Shovel-Nosed Snake (*Chionactis occipitalis klauberi*)

ESA Listing Status: Candidate
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Arizona State Rank S1

The Tucson shovel-nosed snake is a small, nocturnal species which, with its shovel-shaped head, valved nostrils, flattened ventral side, and smooth scales, is highly adapted to a subterranean existence. Accordingly, it is strongly associated with deserts, dunes, washes, and sandy flats of creosote-mesquite floodplain habitats. The species is usually found near sandy washes, dunes, or bajadas. Individuals establish home ranges encompassing a spatial extent of 5 acres (0.02 km^2) within which movements away from refugia rarely exceed 30.5 m (100 ft). Utilized sites are characterized as being sparsely vegetated and composed of soft, sandy loam substrates devoid of large rocks or stones (AZGFD 2010). The diet of the Tucson shovel-nosed snakes forage consists primarily of scorpions, centipedes, spiders, ants, beetles, cockroaches, and moths (NatureServe 2012).

Historic geographic distribution of the Tucson shovel-nosed snake extended from Maricopa and Pinal Counties in the north and south to Pima County. However, severe habitat loss has caused local population declines, thereby reducing its current range to southwestern portions of Pinal County and eastern Maricopa County (USFWS 2010e).

The Tucson shovel-nosed snake was petitioned for listing under the ESA on December 15, 2004. In response to that petition on July 29, 2008, the USFWS initiated a status review for this species to determine whether listing is warranted (USFWS 2010e).

The Tucson shovel-nosed snake may occur in the affected area of the proposed Gillespie SEZ.

J.6.6 Birds

American Peregrine Falcon (*Falco peregrinus anatum*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
Listing Status: Arizona Wildlife Species of Concern; Threatened in New Mexico

Rarity: Colorado State Rank S2; New Mexico State Rank S2;
Colorado and USFWS Species of Concern

The American peregrine falcon has reoccupied much of its historic habitat in New Mexico, California, and Arizona, where it occurs in mountainous regions in the summer or year-round. The falcons breed throughout North America south of the arctic tundra, in the Sea of Cortez region and the Central Plateau in Mexico, and in the southern Appalachian Mountains. It migrates to the Caribbean and South America in winter. The falcons nest along cliffs in forested areas near water and bluffs and in urban areas on buildings next to large grasslands, meadows, and lakes, where these predators can hunt. They use a wide variety of habitat and may be found at elevations ranging from 3,500 to 9,000 ft (1,070 to 2,740 m) (NMDGF 2010).

American peregrine falcons are carnivores and eat primarily birds like jays, woodpeckers, swifts, mourning doves, and pigeons. They also occasionally feed on bats, small mammals, and reptiles. Reproduction begins at 3 years of age. The falcons are monogamous and mate for life; they perform elaborate courtship displays from April to June. Clutches of 3 to 4 eggs are incubated for 28 days and fledged 35 to 42 days after hatching, with fledgling success ranging from 0.7 to 1.5 young (NMDGF 2010).

The American peregrine falcon was federally listed as endangered in 1970 following drastic population declines coinciding with the spread of DDT (dichlorodiphenyltrichloroethane) application. Populations rebounded following bans on the use of DDT, and the species was delisted in 1999. It was listed as a federal species of concern by the USFWS in 2007.

Present threats include pesticide poisoning, low breeding density, reproductive isolation, lack of gene flow between isolated populations, and reduction in foraging habitat and the availability of avian prey.

This species may occur within the affected areas of the proposed Afton, Antonito Southeast, Brenda, De Tilla Gulch, Fourmile East, and Los Mogotes East SEZs (NMDGF 2010).

American White Pelican (*Pelecanus erythrorhynchos*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Colorado State Rank S1; Utah State Rank S1; Nevada State Rank S2;
USFWS Species of Concern

The American white pelicans of North America are divided into two populations, roughly separated by the Continental Divide (BLM 2004). This species occurs primarily throughout the Canadian and U.S. prairies, patchily south and west through the Intermountain West, reaching their southwestern limit in southern Oregon, northeastern California, and western Nevada. Their winter range encompasses the Pacific Coast and lowlands from central California and southern Arizona south through Baja California and west Mexico to Nicaragua, and from Florida and the

Gulf states south through the Gulf Coast and central plateau of Mexico to the northern Yucatán Peninsula. American white pelicans inhabit shallow ponds, marshes, and low, bare islands of large inland lakes. Within such areas, this highly gregarious species congregates in large flocks of 100 individuals or more to breed and loaf on the banks or shallows (BLM 2004). Nests are typically a mound of earth approximately 3 ft (1 m) across with a central, unlined hollow (BLM 2004). They are constructed on muddy, sandy, or rocky shores having a flat to moderate slope and in either in open or short, shrubby situations (Shuford and Gardali 2008).

American white pelicans are highly mobile and participate in both daily and seasonal migratory movements. Within the breeding season, radiotelemetry studies indicate that individuals may disperse greater than 280 mi (450 km) to foraging sites (Shuford and Gardali 2008). Seasonally, breeding populations migrate south to winter ranges in the southern states and Mexico.

The American white pelican may occur in the affected areas of the proposed Fourmile East and Milford Flats South SEZs.

Bald Eagle *(Haliaeetus leucocephalus)*

ESA Listing Status: Threatened (Sonoran populations); Delisted elsewhere
BLM-Sensitive Status: Sensitive
State Status: Arizona Wildlife Species of Concern; Threatened in Colorado; Threatened in New Mexico; Protected in Nevada
Rarity: Colorado State Rank S1; New Mexico State Rank S1; Nevada State Rank S1; Utah State Rank S1; USFWS Species of Concern (all populations but Sonoran); Utah Species of Concern

The bald eagle ranges throughout much of North America and nests on both coasts—from Florida to Baja California, Mexico, in the south; and from Labrador to the western Aleutian Islands, Alaska, in the north. Within this range, bald eagles are absent as breeding birds in most of the Great Basin, the prairie and plains region, and the eastern United States west of the Appalachian Mountains. It occurs in all states in the six-state study area.

The bald eagle is a bird of aquatic ecosystems, which frequents estuaries, large lakes, major rivers, and some seacoast habitats. The species may also use prairies if adequate food is available. To support bald eagles, these areas must provide an adequate food base, perching areas near the shoreline, and suitable nesting sites. Fish is the major component of the bald eagle's diet, but waterfowl, seagulls, and carrion are also eaten. In winter (defined as the non-nesting period), bald eagles often congregate at specific wintering sites that are close to open water and offer good perch trees, night roosts, and an abundance of shallow-water fish or waterfowl as prey. Large concentrations of eagles are often observed at salmon spawning rivers.

Nest sites are usually in large trees along shorelines, in relatively remote areas that are free of disturbance. Trees must be sturdy and open to support bald eagle nests, which are often 5 ft (1.5 m) wide and 3 ft (0.9 m) deep. The nesting season lasts about 6 months. Breeding times for bald eagles vary by elevation as well as by latitude; mating occurs in late September through November in the south, in January through March in the central states, and in late March to early April in Alaska. Adults tend to use the same breeding areas year after year, and often use the same nest, although a breeding area may include one or more alternate nest(s).

The decline of bald eagles in most of the United States was caused by a combination of hunting, a decline in major prey species, and DDT usage. Since a recovery program for the species was established in the mid-1970s, the bald eagle population has increased in number and expanded in range. This improvement is attributable to the banning of DDT and other persistent organochlorides, habitat protection, and other recovery efforts.

The bald eagle was once federally listed as endangered in all of the lower 48 states (March 11, 1967), with the exception of Michigan, Minnesota, Wisconsin, Washington, and Oregon, where it was designated as threatened. It has since been delisted due to recovery in all populations (72 FR 37345, 73 FR 23966, 76 FR 54711). Recently, a finding by the USFWS indicated that listing for the Sonoran population of the bald eagle (those residing in specific portions of Arizona) is not warranted (75 FR 8601). Critical habitat for this species has not been designated.

Populations of bald eagle that are delisted from the ESA may occur in the affected areas of the proposed Afton, Antonito Southeast, De Tilla Gulch, Escalante Valley, Fourmile East, Los Mogotes East, Milford Flats South, and Wah Wah Valley SEZs.

Barrow's Goldeneye (*Bucephala islandica*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Colorado)
State Listing Status: Threatened in New Mexico
Rarity: Colorado State Rank S2; New Mexico State Rank S2

The Barrow's goldeneye winters on lakes, rivers, estuaries, and bays and is often seen in large flocks. The species will nest in wooded or open country near a lake or pond that is surrounded by dense vegetation. It nests in natural tree or rock cavities, abandoned woodpecker holes, or on stream banks, and will often nest in the same area in successive years. In summer, the species is found in small, scattered groups. The Barrow's goldeneye forages for aquatic insects, crustaceans, some plant food, small fishes, and fish eggs in freshwater, and feeds on mollusks, seastars, and marine worms in saltwater (NatureServe 2012).

The Barrow's goldeneye is a winter resident within the San Luis Valley. The Barrow's goldeneye may occur in the affected areas of the proposed Antonito Southeast, De Tilla Gulch, and Fourmile East SEZs.

Bell's Vireo (*Vireo bellii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (New Mexico)
State Listing Status: Threatened in New Mexico
Rarity: New Mexico State Rank S2; USFWS Species of Concern

The Bell's vireo breeds from southern California, the Southwest, and the central Great Plains and adjacent Midwest to northern Mexico. Within New Mexico, it occurs in the lower Gila Valley, Guadalupe Canyon, lower San Francisco Valley, and Hidalgo and Eddy Counties. It winters in central and South America. Its habitat includes dense shrublands or woodlands along lower-elevation riparian areas among willows, scrub oak, and mesquite; annual grasslands; desertscrub; and marshes. The species may potentially nest in any successional stage with dense understory vegetation (NMDGF 2010).

The Bell's vireo feeds mostly on hemipterans, lepidopterans, orthopterans, coleopterans, and hymenopterans, although the birds will consume lesser amounts of snails, spiders, dipterans, and plants. They breed from May to July, laying three to five eggs per clutch (NMDGF 2010).

Natural threats include heavy cowbird parasitism, severe weather, and predation. Anthropogenic threats include livestock grazing, agricultural pesticides, and loss of habitat from urbanization, flood control, and reservoir construction. Populations have declined in New Mexico, likely due to extensive habitat destruction. Currently, the species is listed as threatened by the State of New Mexico and ranked S2 in New Mexico and is a USFWS species of concern.

The Bell's vireo may occur within the affected area of the proposed Afton SEZ (NMDGF 2010).

Bendire's Thrasher (*Toxostoma bendirei*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Not Listed

The Bendire's thrasher is a small neotropical migrant bird that is a summer breeding resident in southern California. It is closely associated with flat areas of Mohave desertscrub and Joshua tree habitats (CDFG 2010). These areas serve as both breeding and foraging grounds and are characterized as having scattered stands of thorny shrubs and cactus for cover as well as hard, firmly packed dirt substrates, whereas steep slopes and rocky terrain are generally avoided. Dominant vegetative components include Joshua tree, Spanish bayonet (*Yucca baccata*), Mohave yucca (*Yucca schidigera*), and cholla cacti (*Opuntia* spp.). Nests are erected 0.5 to 20 ft (0.2 to 6 m) above ground level within cholla, yucca, paloverde, thorny shrub, or small trees (CDFG 2010).

The breeding range of the Bendire's Thrasher has patchy distribution within the Colorado and Mohave Deserts, encompassing southern Nevada, Utah, and Colorado south through southeastern California, Arizona, and western New Mexico to Sonora, northern Sinaloa, and extreme northern Chihuahua, Mexico. The winter range includes southern Arizona, southwestern New Mexico, or Mexico (CDFG 2010).

There is little information regarding the abundance of the Bendire's thrasher; however, what is known is that populations are small, disjunct, and isolated, all of which serve to increase their vulnerability to anthropogenic threats (England and Laudenslaver 1989).

The Bendire's thrasher may occur in the affected area of the proposed Riverside East SEZ.

California Black Rail (*Laterallus jamaicensis coturniculus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Arizona Wildlife Species of Concern; Threatened in California (California Fully Protected)
Rarity: Arizona State Rank S1; California State Rank S1; USFWS Species of Concern

The California black rail is a small, wetland bird that inhabits coastal and freshwater marshes of southern California and western Arizona. This species is dependent upon upper zones of tidal emergent wetlands dominated by common threesquare (*Schoenoplectus pungens*), pickleweed, arrow weed (*Pluchea sericea*), rush (*Juncus effusus and J. balticus*), and cattail (CDFG 2010). Occupied site characteristics include high vegetation density, close proximity to open water, low human disturbance, and surrounded by open grassland, pastures, or oak savannas.

California black rails are insectivorous and glean isopods, insects, and other arthropods from the surface of mud and vegetation. Populations establish non-overlapping home ranges. However, they do perform limited local movements away from wetlands in late summer and autumn (CDFG 2010).

The California black rail may occur in the affected area of the proposed Imperial East SEZ.

Ferruginous Hawk (*Buteo regalis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive

State Listing Status: Arizona Wildlife Species of Concern
Rarity: Arizona State Rank S2; California State Rank S2; New Mexico State Rank S2; Nevada State Rank S2; Utah State Rank S2; Colorado Species of Concern; USFWS Species of Concern

The ferruginous hawk is known to occur throughout the western United States. This species inhabits open grasslands, sagebrush flats, desertscrub, and the edges of pinyon-juniper woodlands. The ferruginous hawk nests in tall trees or willows along streams, on steep slopes, cliff ledges, hillsides, and power line towers.

The main threat to the ferruginous hawk is habitat loss due to agricultural development. In addition, the invasion of exotic annuals compromises the ability of native grasslands and shrublands to support viable populations of the species. The density and productivity of the ferruginous hawk is associated with cycles of prey abundance. The species avoids areas of intensive agriculture or human activity (NatureServe 2012).

The ferruginous hawk may occur in the affected areas of the proposed Afton, Amargosa Valley, Antonito Southeast, Brenda, De Tilla Gulch, Dry Lake, Dry Lake Valley North, Escalante Valley, Fourmile East, Gillespie, Gold Point, Imperial East, Los Mogotes East, Milford Flats South, Millers, Riverside East, and Wah Wah Valley SEZs.

Gila Woodpecker (*Melanerpes uropygialis*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Endangered in California
Rarity: California State Rank S1

The geographic distribution of the Gila woodpecker extends from southwestern New Mexico, through southern Arizona, north to the Mogollon Rim, and west to extreme southeast California. Within Nevada and California, populations are confined to the last riparian remnants of the Colorado River and the Imperial Valley (McCreedy 2008). Gila woodpeckers occur primarily in desert riparian and desert wash communities with old-growth xeric riparian woodlands, orchards, vineyards, and urban areas being utilized to a lesser extent. As a cavity nester, the Gila woodpecker requires the occurrence of mature saguaro cacti (*Carnegia gigantea)*, Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), Arizona sycamore (*Platanus wrightii*), blue palo verde (*Cercidium floridum*), honey mesquite, screwbean mesquite (*Prosopis pubescens*), Athel tamarisk (*Tamarix aphylla*), eucalyptus (*Eucalyptus* sp.), or blue fan palm (*Erythea armata*) having a height of at least 4.0 m (12 ft) and an average diameter at breast height (DBH) of 22 in. (56.0 cm) (McCreedy 2008). The Gila woodpecker is omnivorous and gleans insects, mistletoe berries, cactus fruits, and acorns from trunks and branches (Zeiner et al. 1990).

The Gila woodpecker is considered uncommon throughout its range as it has experienced significant declines in its abundance in recent decades (Zeiner et al. 1990). In Arizona, research indicates a negative population trend (−2.2%), while near extirpations have occurred in southeastern California (McCreedy 2008). It is a fairly uncommon resident in southern California and southwestern Arizona, where it occurs in desert riparian and wash habitats along the lower Colorado River Basin.

The Gila woodpecker is listed as an endangered species under the California Endangered Species Act (CESA).

The Gila woodpecker may occur in the affected area of the proposed Riverside East SEZ.

Golden Eagle (Aquila chrysaetos)

ESA Listing: Not Listed
BLM Listing Status: Sensitive
State Listing Status: California Fully Protected
Rarity: None

The golden eagle is a common to uncommon resident of western North America. It occurs in a variety of habitats from sea level up to nearly 12,000 ft (0 to 3,650 m) elevation. Habitat generally consists of rolling foothills, mountain areas, sagebrush, mixed shrublands, pinyon-juniper woodlands, and arid desert regions. This species is known to occur in all six states analyzed in this Final Solar PEIS.

The golden eagle requires visually open areas for hunting. It feeds primarily on rabbits, hares, and rodents. Other prey species include birds, reptiles, and carrion. It sometimes pirates food from other predators.

The golden eagle nests on cliffs and large trees in visually open areas. It builds large platform nests, often 10 ft (3 m) across and 3 ft (1 m) high, of sticks, twigs, and greenery. Rugged, open habitats with steep cliffs and canyons are most frequently used for nesting.

Threats to the golden eagle include mortality associated with energy infrastructure (e.g., power lines and windmills), ingestion of poisoning and toxic wastes from mining activities, occasional shootings, and habitat loss (NatureServe 2012).

The golden eagle may occur in the affected area of all SEZs.

Gray Vireo (*Vireo vicinior*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Threatened in New Mexico
Rarity: California State Rank S2; Colorado State Rank S2; New Mexico State Rank S2; USFSW Species of Concern

The gray vireo is an uncommon summer resident in arid pinyon-juniper and chaparral habitats of southern California, New Mexico, Texas, Colorado, Utah, and Arizona. Within New Mexico, gray vireos summer in the Guadalupe Mountains and Doña Ana and Otero Counties in arid juniper woodlands on foothills and mesas with a well-developed grass component. Nonforest habitat is open to dense stands of shrubs and low trees. Associated vegetation includes juniper, oak, big sagebrush, saltbush, greasewood (*Sarcobatus vermiculatus*), and creosotebush. Its elevation ranges from 2,000 to 6,500 ft (600 to 2,000 m) (NMDGF 2010).

Gray vireos are insectivores and eat mainly Lepidopterans. They also feed on the fruits of the elephant tree (*Bursera microphylla*). The species incubates clutches of 3 to 5 eggs for 14 to 15 days. Nests are parasitized frequently by cowbirds (NMDGF 2010; NatureServe 2012).

The gray vireo was listed as endangered in New Mexico on July 22, 1983. It was ranked S2 in New Mexico in 2006. Currently, it is listed as sensitive by the BLM; listed as threatened in New Mexico; ranked S2 in Colorado, California, and New Mexico; and is a USFWS species of concern.

Threats include old-growth forest, fire exclusion, loss and alteration of quality juniper-grassland habitat, and cowbird nest parasitism.

The species is unlikely to occur in the affected area of any SEZ because of the lack of suitable habitat; however, it may occur within the affected area of the proposed Afton SEZ (NMDGF 2010).

Great Egret (*Ardea alba*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Arizona Wildlife Species of Concern
Rarity: Arizona State Rank S1

The geographic distribution of the great egret extends from southern Oregon and southern Idaho; south through California, Nevada, and southwestern Arizona; east from southern Canada, central Minnesota, southwestern Wisconsin, central Illinois, southern Indiana, northern Ohio, Vermont, and Maine; south through the Gulf states; west to eastern Colorado, southern New Mexico, and south-central Texas; along both coasts of Mexico; and through the Bahamas, Antilles, Middle America, and South America (AZGFD 2010). The great egret is considered to be a year-round resident in the lower Colorado River Valley in southwestern Arizona and southeastern California. This species is primarily associated with open water areas such as marshes, lakes, ponds, and reservoirs.

Great egrets are highly mobile and participate in both daily and seasonal migratory movements. Within its summer range, individuals may disperse several kilometers to foraging sites (NatureServe 2012). Seasonally, northern populations migrate south to winter ranges in the southern states and Mexico. Little information is available regarding population trends of the great egret. However, it has been suggested that the amount of suitable nesting habitat is restricted (NatureServe 2012).

The great egret may occur in the affected areas of the proposed Brenda and Gillespie SEZs.

Greater Sage-Grouse (*Centrocercus urophasianus*)

ESA Listing Status: Candidate
BLM Listing Status: Sensitive
State Listing Status: Utah Species of Concern
Rarity: Utah State Rank S2

The greater sage-grouse inhabits plains, foothills, and mountain valleys dominated by sagebrush (*Artemisia* sp.). Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground, where sagebrush density is higher. Some populations may travel up to 60 mi (96 km) between summer and winter habitats.

The greater sage-grouse nests in the same area in successive years; on the ground in a shallow depression with thick cover in sagebrush habitat. Sagebrush of varying densities and heights, native grass cover for nesting, and high protein forbs and insects for feeding during nesting and brood-rearing are necessary for brood survival.

Males and females gather in separate flocks in winter, as do broodless hens in summer. Hens move their broods to wetter sites in June and July and use seeps, wet meadows, riparian areas, alfalfa and potato fields, and other cultivated areas. Males and broodless females will inhabit uplands and high mountain meadows and grasslands. The greater sage-grouse is adapted to winter extremes, but sagebrush is necessary for food and cover.

The species was once abundant in many areas of the West. Early declines of the species are attributed to hunting, with more recent declines due to loss, fragmentation, and degradation of sagebrush habitat. Sagebrush habitats have been converted to agricultural use and are now at risk for energy development.

Increases in wildfire frequency, the spread of invasive species, and livestock management and domestic grazing all threaten sagebrush habitats (NatureServe 2012).

The greater sage-grouse may occur in the affected areas of the proposed Escalante Valley, Gold Point, Milford Flats South, Millers, and Wah Wah Valley SEZs.

Gunnison Sage-Grouse (*Centrocercus minimus*)

ESA Listing Status: Under Review
BLM Listing Status: Sensitive (Colorado)
State Listing Status: Not Listed
Rarity: Colorado State Rank S1; Colorado Species of Concern

The status of the Gunnison sage-grouse is under review by the USFWS to determine whether it should be listed as endangered or threatened under the ESA (USFWS 2009b). The Gunnison sage-grouse is considered a distinct species of sage-grouse on the basis of morphological, genetic, behavioral, and geographical characteristics. The species is about one-third smaller than the greater sage-grouse (*Centrocercus urophasianus*). The geographic range for the Gunnison sage-grouse is restricted to those portions of Colorado and Utah that are south of the Colorado River. The greatest concentration of this species (estimated between 2,000 and 3,000 birds) exists within the Gunnison Basin in southwestern Colorado. The total adult (breeding) population is estimated to be fewer than 4,000 (NatureServe 2012).

The mating behavior of sage-grouse is perhaps one of the most complex and stereotyped behaviors known among birds. From mid-March to early June, males will exhibit a display on leks, which are open areas that provide good visibility for acoustics and predator detection. The male mating display is characterized by the male inflating its esophageal air sac in a strut behavior with the wings held stiffly at either side. During this period, the air sac is evident through the apteria (area of bare skin) on the male's neck. These skin patches inflate repeatedly to create an acoustic and visual display to attract females. The strutting display of the Gunnison sage-grouse is distinct from other sage-grouse species. During a typical strutting display, Gunnison sage-grouse inflate the apteria of their necks nine times, as compared to twice for the greater sage-grouse (USFWS 2009c).

Following courtship, females will select nests in tall and dense stands of shrubs—usually sagebrush—from about 650 ft (200 m) to 5 mi (8 km) from the leks. Clutches average 7 to 9 eggs that will hatch after a 27- or 28-day incubation period (American Bird Conservancy 2010).

The Gunnison sage-grouse utilizes a variety of habitats throughout the year, but it is mostly associated with sagebrush ecosystems. Sagebrush provides shelter for nests and supports diverse insect and forb communities that serve as food sources for young and adult individuals. During the winter, Gunnison sage-grouse become dependent on sagebrush leaves as their sole food source (American Bird Conservancy 2010). During the spring and summer months, the species may also utilize healthy grasslands and riparian ecosystems.

Population declines and range contractions of the Gunnison sage-grouse are attributable to a number of anthropogenic factors. As identified in the *Gunnison Sage-Grouse Conservation Plan* (Gunnison Sage-Grouse Rangewide Steering Committee 2005), these factors were grouped into three major categories that may contribute to the continued decline of the species. These factors include (1) degradation in sagebrush-steppe habitat quality and composition; (2) loss or fragmentation of sagebrush-steppe habitats from agricultural, energy, residential, and transportation infrastructure developments; and (3) physical disturbance of individuals through predation, diseases, invasive species, and recreational activities, such as hunting, bird watching, and OHV use.

The Gunnison sage-grouse may occur in the affected area of the proposed De Tilla Gulch SEZ.

LeConte's Thrasher (*Toxostoma lecontei*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2; USFWS Species of Concern

The LeConte's thrasher is an uncommon year-round resident in Arizona, southern California, and southern Nevada. Elevational range is below sea level to 5,250 ft (1,600 m). This species inhabits saltbush-cholla scrub communities in desert flats, dunes, or alluvial fans. The majority of shrubs rarely exceed 8 ft (2.5 m) in height, with occasional desert trees. Surface water rarely exists within several kilometers. Nests are located in thick, dense, thorny desert shrubs, small trees, or cholla cactus. They will also nest in artificial sites, up to 11 ft (3.5 m) above ground. The diet of LeConte's thrasher consists of spiders, scorpions, small fruits and seeds, and occasionally lizards and small snakes. Accumulated leaf litter is important as cover for arthropod prey.

Threats to the species included degradation, fragmentation, and loss of habitat to agriculture, irrigation, urbanization, oil and gas development, fire, and overgrazing by sheep or cattle. The fragile habitat is easily altered by vehicular traffic, such as OHVs (NatureServe 2012).

The LeConte's thrasher may occur in the affected area of the proposed Dry Lake SEZ.

Long-Billed Curlew (*Numenius americanus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Utah Species of Concern
Rarity: Colorado State Rank S2; Utah State Rank S2; Nevada State Rank S2

The long-billed curlew is known to occur in the region as a summer resident and migrant in short-grass grasslands near standing water. The species will nest in dry prairies and moist meadows. In Utah, the nests tend to be in small patches of short vegetation near barren ground. The long-billed curlew is an opportunistic feeder and eats various insects and berries. During migration, the species will feed on crayfishes, crabs, snails, and toads.

The long-billed curlew may occur in the affected areas of the proposed Escalante Valley, Milford Flats South, and Wah Wah Valley SEZs.

Mountain Plover (*Charadrius montanus*)

BLM Listing Status: Sensitive (Colorado)
State Listing Status: Not Listed
Rarity: Utah State Rank S1; California State Rank S2; California Species of Concern; Utah Species of Concern

The mountain plover inhabits prairie grasslands and arid plains and fields; nesting occurs in shortgrass prairie habitats within shallow depressions on the ground. The breeding range extends from northern Montana, south to Arizona, with most nesting occurring in Colorado, Wyoming, and Montana. Most of the population overwinters in California, with fewer birds in Arizona, Texas, and Mexico. Significant populations of nonbreeding, nonwintering birds occur in southeastern Colorado and New Mexico. Mountain plovers feed primarily on insects.

Outside of breeding season, mountain plovers forage and roost in loose flocks of changing composition, and flock size may exceed 1,000 on the southern Great Plains in late summer.

The USFWS originally proposed to list the mountain plover on December 5, 2002. However, that proposal was withdrawn on September 9, 2003, on the basis that threats to the species were not as significant as previously believed. On June 29, 2010, the USFWS reinstated the proposed rule to list the mountain plover as a threatened species (USFWS 2010f), but this proposal was dropped on May 12, 2011 (76 FR 27756).

Threats to the mountain plover include the conversion of shortgrass prairie to agricultural land, and the conversion to crops where the ground stays fallow until after the mountain plover has begun nesting (NatureServe 2012).

The mountain plover may occur in the affected areas of the proposed Antonito Southeast, De Tilla Gulch, Fourmile East, and Los Mogotes East SEZs.

Northern Aplomado Falcon (*Falco femoralis septentrionalis*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Endangered in New Mexico
Rarity: New Mexico State Rank S1

The northern aplomado falcon inhabits the desert grasslands and savannas of Latin America. In the United States, the subspecies historically inhabited desert grasslands with mesquite and yucca, riparian woodlands in open grasslands, and sand ridges with yuccas on the coastal prairies of Texas, New Mexico, and southeastern Arizona. In general, open landscapes with scattered trees and shrubs provide good habitat. Other necessary habitat components include moderately low ground cover, an abundance of small to medium-sized birds, and a supply of nesting platforms. There are a total of 22 grassland areas within the historical range of the species in southeastern Arizona and southern New Mexico that offer suitable habitat conditions for the aplomado falcon (NMDGF 2010; NatureServe 2012).

Aplomado falcons prey primarily on other birds (e.g., cuckoos, doves, woodpeckers, blackbirds, flycatchers, and thrushes) and supplement their diet with insects, small mammals, reptiles, and amphibians (e.g., grasshoppers, butterflies, crickets, wasps, frogs, lizards, bats, and rodents). Aplomado falcons do not construct their own nests and are thus dependent on nesting platforms constructed by other species, such as the stick nests of Swainson's hawks, crested caracaras, and Chihuahuan ravens. In desert habitats, nest availability is determined by the presence of species that build large nests, such as crows, kites, ravens, or hawks. The breeding season lasts for 6 to 8 months, with most eggs laid between March and May. Clutches consist of 2 to 3 eggs, and the incubation period (both parents tending) lasts 32 days. Nestlings fledge after approximately 35 days and remain in the vicinity of the nest for another month (NatureServe 2012).

The northern aplomado falcon was federally listed as endangered on February 25, 1986. Critical habitat has not been designated. At the time of listing, the falcon was no longer breeding in the United States. Recently, however, there have been sightings of falcons in New Mexico, which suggests that the subspecies is dispersing from breeding locations in Mexico back into the southwestern United States.

The northern aplomado falcon previously experienced large population declines because of pesticides, especially DDT applied in Mexico. It has also lost large areas of suitable habitat through brush encroachment and agriculture clearing (NatureServe 2012).

The northern aplomado falcon may occur in the affected area of the proposed Afton SEZ.

Northern Goshawk (*Accipiter gentilis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Arizona Wildlife Species of Concern; Protected in Nevada
Rarity: New Mexico State Rank S2; Nevada State Rank S2;
New Mexico Species of Concern; USFWS Species of Concern

The northern goshawk inhabits mature mountain forest and riparian zone habitats. It nests in trees in mature deciduous, coniferous, and mixed forests. It forages in both heavily forested and relatively open shrubland habitats.

The northern goshawk may occur in the affected areas of the proposed Afton, Amargosa Valley, Escalante Valley, Milford Flats South, and Wah Wah Valley SEZs.

Phainopepla (*Phainopepla nitens*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2; USFWS Species of Concern

The phainopepla occurs in the southwestern United States and Mexico in desertscrub, mesquite, and pinyon-juniper woodland communities as well as in desert riparian areas and orchards. Nests are typically constructed in trees and shrubs from 3 to 45 ft (1 to 15 m) above the ground.

The phainopepla may occur in the affected areas of the proposed Amargosa Valley and Dry Lake SEZs.

Prairie Falcon (*Falco mexicanus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Not Listed
Rarity: Not Listed

The prairie falcon is known to occur throughout the western United States. The species occurs in open habitats in mountainous areas, sagebrush-steppe, grasslands, or cultivated areas. Nests are typically constructed in well-sheltered ledges of rocky cliffs and outcrops.

The prairie falcon may occur in the affected areas of the proposed Amargosa Valley, Dry Lake Valley North, Gold Point, and Millers SEZs.

Short-Eared Owl (*Asio flammeus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Utah Species of Concern; Colorado State Rank S2; Utah State Rank S2;
New Mexico State Rank S2

The short-eared owl inhabits grasslands, shrublands, and other open habitats. It is nomadic, often selecting unique breeding sites each year, depending on local rodent densities. It nests on the ground near shrubs.

The short-eared owl may occur in the affected areas of the proposed Antonito Southeast, De Tilla Gulch, Escalante Valley, Fourmile East, Los Mogotes East, Milford Flats South, and Wah Wah Valley SEZs.

Snowy Egret (*Egretta thula*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Wildlife Species of Concern in Arizona
Rarity: Arizona State Rank S1; Colorado State Rank S2

The snowy egret is considered to be a year-round resident in the lower Colorado River Valley in southwestern Arizona and southeastern California. This species is primarily associated with open water areas such as marshes, lakes, ponds, and reservoirs.

The snowy egret may occur in the affected area of the proposed Gillespie SEZ.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Arizona Wildlife Species of Concern; Endangered in California; Endangered in Colorado; Endangered in New Mexico; Protected in Nevada
Rarity: Arizona State Rank S1; California State Rank S1; Nevada State Rank S1; Utah State Rank S1; New Mexico State Rank S2

The southwestern willow flycatcher is a subspecies of willow flycatcher that breeds in southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, and extreme northwest Mexico. It may also breed in southwestern Colorado, but nesting records are lacking. All willow flycatchers are migratory.

The southwestern willow flycatcher occurs in riparian habitats along rivers, streams, or other wetlands, where there are dense growths of willows, baccharis (*Baccharis* spp.), cottonwood, buttonbush, and other deciduous shrubs and trees. Flycatchers nest in thickets of trees and shrubs that are approximately 13 to 23 ft (4 to 7 m) or more in height, have dense foliage from approximately 13 ft (7 m) above the ground, and often have a high percentage of canopy cover. The diversity of nest site plant species may be low or comparatively high, and nest site vegetation may be even- or uneven-aged, but it is usually dense and structurally homogeneous. Although the southwestern willow flycatcher historically nested in native plant communities, and it still does so when such vegetation is available, the species is now known to nest in thickets dominated by the non-native species tamarisk and Russian olive (*Elaeagnus angustifolia*). The subspecies virtually always nests near surface water or saturated soil. At some nest sites, surface water may be present early in the breeding season, but by late June or early July, only damp soil is present. Ultimately, a water table close enough to the surface to support riparian vegetation is necessary (NatureServe 2012).

The southwestern willow flycatcher is an insectivore. It forages within and above dense riparian vegetation and takes insects on the wing or gleans them from foliage. It also forages in areas adjacent to nest sites, which may be more open. No information is available on specific prey species.

Southwestern willow flycatchers arrive at breeding sites and begin singing by mid-May, and they build nests in late May and early June. Birds construct a cup-shaped nest in a fork or horizontal branch of a medium-sized bush or small tree, approximately 3.2 to 15 ft (1 to 4.5 m) above the ground. Typically, there is dense vegetation above and around the nest. The subspecies fledges young in early to mid-July. Some variations in these dates have been observed; they may be related to altitude, latitude, and renesting.

The southwestern willow flycatcher was federally listed as endangered on February 27, 1995 (60 FR 10693). On July 22, 1997, approximately 599 river mi (960 km) of waterways and their adjacent riparian habitats in Arizona, California, and New Mexico were designated as critical habitat.

Threats to continued existence have primarily included habitat loss and degradation. Extensive loss of the habitat of this subspecies has occurred through the conversion of floodplains to agriculture, flood-control projects, and urban development. Other threats include overgrazing and brood-parasitism by the brown-headed cowbird (NatureServe 2012).

The southwestern willow flycatcher may occur in the affected areas of the proposed Antonito Southeast, De Tilla Gulch, Dry Lake, Fourmile East, Gillespie, and Los Mogotes East SEZs.

Swainson's Hawk (*Buteo swainsoni*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Nevada)
State Listing Status: Protected in Nevada
Rarity: California State Rank S2; Nevada State Rank S2; USFWS Species of Concern

The Swainson's hawk occurs throughout the southwestern United States. It inhabits desert, savanna, open pine-oak woodland, grassland, and cultivated habitats. Nests are typically constructed in solitary trees, bushes, or small groves; sometimes the hawks nest near urban areas.

The Swainson's hawk may occur in the affected areas of the proposed Amargosa Valley, Dry Lake Valley North, Gold Point, and Millers SEZs.

Western Burrowing Owl (*Athene cunicularia hypugaea*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive

State Listing Status: Threatened in Colorado
Rarity: Species of Concern in Arizona, California, New Mexico, and Utah; Arizona State Rank S2; California State Rank S2; USFWS Species of Concern

The western burrowing owl is a year-round resident throughout the southwestern United States. California, New Mexico, and Arizona are important wintering areas within the United States. It forages in grasslands, shrublands, and open disturbed areas, and it nests in burrows usually constructed by mammals. It forages on invertebrates and small mammals. The western burrowing owl spends much of its time on the ground or on low perches or soil mounds. The species feeds on insects and rodents and occasionally birds and amphibians. Prey is caught during flight or on the ground.

Primary threats include the loss of habitat and fragmentation to agricultural and urban land uses, and the control and extermination of colonial burrowing mammals (NatureServe 2012).

The western burrowing owl may occur in the affected areas of the proposed Afton, Amargosa Valley, Antonito Southeast, Brenda, De Tilla Gulch, Dry Lake, Dry Lake Valley North, Escalante Valley, Fourmile East, Gillespie, Gold Point, Imperial East, Los Mogotes East, Milford Flats South, Millers, Riverside East, and Wah Wah Valley SEZs.

Western Least Bittern (*Ixobrychus exilis hesperis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Arizona Wildlife Species of Concern; Protected in Nevada; Species of Concern in California
Rarity: California State Rank S1; Nevada State Rank S2; USFWS Species of Concern

The least bittern is a common summer resident in suitable habitats of the lower Colorado River in southwestern California and southwestern Arizona. The species inhabits freshwater marsh habitats containing dense, emergent vegetation, such as cattail and reeds (*Phragmites* sp.).

The western least bittern may occur in the affected area of the proposed Imperial East SEZ.

Western Snowy Plover (*Charadrius alexandrinus nivosus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Arizona Wildlife Species of Concern; Protected in Nevada
Rarity: Species of Concern in Colorado; Arizona State Rank S1; Colorado State Rank S1; USFWS Species of Concern

There are two distinct populations of western snowy plover *Charadrius alexandrinus nivosus*), only one of which is federally listed. The Pacific Coast population of the western snowy plover, which is genetically isolated from interior-breeding western snowy plovers, is defined as those individuals that nest adjacent to or near tidal waters, including all nesting colonies on the mainland coast, peninsulas, offshore islands, adjacent bays, and estuaries (USFWS 2007).

Snowy plovers forage on invertebrates (NatureServe 2012). The western snowy plover breeds on alkali flats around reservoirs and sandy shorelines. Nest initiation and egg laying occur from mid-March through mid-July. Typically, the clutch size is 3 eggs, and incubation averages 27 days, with both sexes incubating the eggs. This species is a known summer breeder and winter resident in portions of the six-state study area.

The Pacific Coast population is federally listed as threatened and does not occur in the vicinity of the six-state study area. The interior population of the western snowy plover is not listed under the ESA; this species may occur in the vicinity of the solar energy program areas.

The western snowy plover may occur in the affected areas of the proposed Dry Lake Valley North, Fourmile East, and Gillespie SEZs.

Western Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*)

ESA Listing Status: Candidate
BLM Listing Status: Not Listed
State Listing Status: Arizona Wildlife Species of Concern; Endangered in California; Protected in Nevada
Rarity: California State Rank S1; Nevada State Rank S1; Utah State Rank S1; New Mexico Species of Concern

The western yellow-billed cuckoo is considered by the USFWS as a Distinct Population Segment (DPS) (subspecies *occidentalis*) of the yellow-billed cuckoo. Populations of the yellow-billed cuckoo are more common in the central and eastern United States; the western yellow-billed cuckoo DPS, however, has experienced significant population declines. This species is a medium-sized, insectivorous, migratory bird species that occupies scattered, isolated habitats west of the Rocky Mountains in Arizona, California, Colorado, Nevada, and New Mexico.

Typical breeding habitats for the western yellow-billed cuckoo are deciduous riparian woodlands, particularly cottonwood and willow. Dense riparian understory foliage is an important factor in nest site selection in some areas. Nests are commonly created in dense covers of trees and shrubs. The species does not appear to select specific habitats types during the nonbreeding season, as they are known to inhabit various types of forest, woodland, and shrub-scrub habitats.

The USFWS determined that the western yellow-billed cuckoo was a candidate for federal listing under the ESA on July 25, 2001 (66 FR 38611).

Primary threats to the western yellow-billed cuckoo DPS include habitat destruction and pesticide application. Most habitat loss results from the conversion of riparian habitats to agriculture (including livestock grazing) and water development infrastructure. The spread of invasive non-native species, particularly salt cedar, has also contributed to the decline of suitable breeding habitats.

The western yellow-billed cuckoo may occur in the affected areas of the proposed Afton and Gillespie SEZs.

White-Faced Ibis (*Plegadis chihi*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: New Mexico Species of Concern; California State Rank S1; Arizona State Rank S2; Colorado State Rank S2; New Mexico State Rank S2; USFWS Species of Concern

The white-faced ibis is a migratory wading bird with distinct breeding and wintering areas. Breeding primarily occurs in temperate areas of western North America in marshes, swamps, and riverine systems. Wintering occurs in marshes, meadows, riverine systems, and meadows from southern California and Arizona, to coastal Texas and Louisiana, and south to Central and South America.

The white-faced ibis may occur in the affected area of the proposed Imperial East SEZ.

Yuma Clapper Rail (*Rallus longirostris yumanensis*)

ESA Listing Status: Endangered
BLM Listing Status: Not Listed
State Listing Status: Arizona Wildlife Species of Concern; Threatened in California; Protected in Nevada
Rarity: California State Rank S1; Nevada State Rank S1

The Yuma clapper rail is a subspecies that occurs in inland habitats in the southwestern United States. Yuma clapper rails are found in shallow, freshwater marshes containing dense stands of cattails and bulrushes, along the Colorado River from California, southern Nevada, and Arizona south into Mexico. They also occur in dense, near-monotypic stands of cattail at the Salton Sea in Imperial County, California, and in marshes and riparian habitats in western Arizona and southern Nevada. Unlike other clapper rails, which are associated with tidal marshes, the Yuma clapper rail occupies freshwater marshes during the breeding season. Until recently, most of the population was thought to retreat to Mexico during the winter; it is now estimated that more than 70% of the breeding population winters along the Lower Colorado River.

The Yuma clapper rail feeds on crayfish and other crustaceans, and it is believed that the abundance of food animals at a particular site is a better predictor of rail population densities than is vegetation. Yuma clapper rails breed from March through July. Nests are built in three major microhabitats: at the base of living clumps of cattail or bulrush, under wind-thrown bulrush, or on the top of dead cattails remaining from the previous year's growth. Nesting materials and cover are obtained from mature cattail/bulrush stands. Clutch size is typically six to eight eggs, and most eggs hatch during the first week of June (NatureServe 2012).

The Yuma clapper rail was federally listed as endangered on March 11, 1967 (USFWS 1967). Critical habitat for this subspecies has not been designated.

Threats to continued survival of the Yuma clapper rail include loss and degradation of habitat by activities such as water projects and the draining or filling of marshes for development or agriculture. Other threats to this species include catastrophic flooding, invasion of non-native plant species such as salt cedar, and pollution from urban runoff, industrial discharges, and sewage effluent. Although population numbers of the species appear to be stable, habitat throughout its range is not secure (NatureServe 2012).

The Yuma clapper rail may occur in the affected areas of the proposed Gillespie and Imperial East SEZs.

J.6.7 Mammals

Arizona Myotis (*Myotis occultus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: New Mexico Species of Concern; California State Rank S2;
USFWS Species of Concern

The Arizona myotis is known from extreme southeastern California and southern Arizona and New Mexico, where it occurs along river lowlands and in adjacent desert mountain ranges. It inhabits ponderosa pine and oak-pine woodlands in close proximity to water; it also occurs in riparian forests within desert areas along the Colorado River.

Arizona myotis feeds predominantly on mosquitoes and midges. Specific foraging habitat types vary by altitude, with orchards, permanent water, and riparian areas being utilized at low elevations; ponds within forest clearings are utilized at higher elevations (Western Bat Working Group 2010).

Home range size of the Arizona myotis is not known. Seasonal migration between summer ranges and hibernacula, as well as daily movements from day roosts and foraging areas are likely to be local within a short distance, as summer and winter ranges are thought to coincide (AZGFD 2010).

The Arizona myotis may occur in the affected area of the proposed Riverside East SEZ.

Big Free-Tailed Bat (*Nyctinomops macrotis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: California Species of Concern; Nevada State Rank S1; California State Rank S2; New Mexico State Rank S2; Utah State Rank S2; USFWS Species of Concern

The big free-tailed bat is associated with bare rock/talus/scree, cliff, shrub desert, hardwood woodland, and riparian communities. This species roosts in rock crevices on cliff faces or in buildings (Ellison et al. 2003). It forages primarily in coniferous forests and arid shrublands to feed on moths. Foraging occurs in the open and often ranges up to high altitudes (Hester and Grenier 2005).

Home range size of the big free-tailed bat is determined by the spatial distribution of specific roosting and prey resources. This species has not been found hibernating and is probably a seasonal migrant throughout much of its range. During the activity season, summer ranges may extend greater than 50 mi (80 km) from day roosts to foraging areas (Hester and Grenier 2005).

The big free-tailed bat is widely distributed; however, the species occurs discontinuously throughout the southwestern United States. Its geographic range encompasses most of South America, Mexico, Arizona, New Mexico, southern and western Texas, southern California and southeastern Nevada, southern Utah, and north to central Colorado (Ellison et al. 2003).

The big free-tailed bat may occur as a migratory species in the affected areas of the proposed Antonito Southeast, De Tilla Gulch, Dry Lake, Fourmile East, and Los Mogotes East SEZs.

Brazilian Free-Tailed Bat (*Tadarida brasiliensis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: Not Listed

The Brazilian free-tailed bat is known from isolated locations throughout the southwestern United States. It is found in a variety of habitats with dry, open woodlands, shrublands, and grasslands being preferred (Harris 1999). Roost and hibernation habitat components include caves, rock crevices of cliffs, tree hollows, buildings, or mines.

Brazilian free-tailed bats are opportunistic insectivores. This species utilizes echolocation to feed on swarming insects, primarily small-sized moths. Home range size of the Brazilian free-tailed bat is determined by the spatial distribution of roosting and prey resources. Seasonal and daily movements of this species are extensive. Seasonally, populations migrate up to 1,125 mi (1,800 km) from their winter range in Central America to their summer ranges within the southern portion of the United States, while daily movements from night roosts and foraging areas range from 25 to 40 mi (40 to 65 km) (Harris 1999; Bradley et al. 2006).

The geographic distribution of the Brazilian free-tailed bat encompasses southern Oregon, Nevada, northern Utah, northern Nebraska, Arkansas, northern Alabama, Mississippi, Georgia, and southern North Carolina in the north, to Central America in the south occurring at an elevational range of 660 to 10,500 ft (220 to 3,500 m). However, despite their widespread distribution, recent studies have suggested that populations have declined drastically in the southern states, whereby the majority of individuals are confined to only 20 caves (NatureServe 2012).

The Brazilian free-tailed bat may occur in the affected areas of the proposed Dry Lake and Gold Point SEZs.

California Leaf-Nosed Bat (*Macrotus californicus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Arizona Wildlife Species of Concern
Rarity: California State Rank S2; California Species of Concern;
USFWS Species of Concern

The California leaf-nosed bat is confined to lowland Sonoran Desert habitats, including desert riparian, desert wash, desertscrub, desert succulent shrub, alkali desertscrub, and palm oasis. Since this species neither migrates nor hibernates, it relies on the availability of suitable roost sites that afford precise season-specific microclimatic conditions in order to successfully exploit temperate zone deserts. Such roost sites occur almost exclusively within mines or caves and have the following characteristics: They are a source of geothermal heat, have a stable temperature of about 84°F (29°C), have high humidity (>50%), have no air circulation, have high ceilings, and are at least 300 ft (100 m) in length. The proximal occurrence of desert wash vegetation is an additional critical habitat component, because it provides California leaf-nosed bats with a local source of their primary prey; this resource is necessary to minimize winter foraging excursions (NatureServe 2012; Western Bat Working Group 2010).

California leaf-nosed bats are purely insectivorous, with moths (sphingid, noctuid, and cossid), butterflies, grasshoppers, and katydids making up the majority of their diet. Foraging occurs close to the ground (<2 ft [<6 m]), where prey items are gleaned from vegetation. The sizes of the home ranges of California leaf-nosed bat populations are determined by the spatial distribution of roosting and resources. Seasonally, movements between summer and winter roosts are typically less than 2 mi (2.6 km), with core activity occurring up to 1 mi (1.3 km) from roosts sites (CDFG 2010; NatureServe 2012; Western Bat Working Group 2010).

California leaf-nosed bats are the most northerly representative of the family Phyllostomidae (Western Bat Working Group 2010). Historically, their geographic range extended across southern California, Arizona, and southern Nevada. However, studies suggest that during the recent century, this species has disappeared from the coastal basins of California and is currently limited to the eastern portion of its former range (CDFG 2010; NatureServe 2012; Western Bat Working Group 2010). Such rapid range contraction has been attributed to roost disturbance, renewed mining in historic districts, mine closures, and destruction of foraging habitat. Moreover, the restrictive roosting requirements, limited distribution, and tendency to form large but relatively few roosting aggregations that are characteristics of California leaf-nosed bats act to further exasperate the effects incurred by these threats.

The California leaf-nosed bat was formerly a Category 2 candidate (C2) species under the ESA and is now considered a species of concern (nonstatutory ranking) by the USFWS.

The California leaf-nosed bat may occur in the affected areas of the proposed Brenda, Gillespie, Imperial East, and Riverside East SEZs.

Cave Myotis (*Myotis velifer*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: California State Rank S1; USFWS Species of Concern

The cave myotis is generally within the Sonoran and Transition life zones, particularly desertscrub, desert succulent shrub, desert wash, desert riparian, and pine-oak communities. Creosotebush, palo verde, brittlebush, and cactus are dominant vegetative components of utilized sites (Western Bat Working Group 2005). Within these communities, this crevice-dwelling species requires cavern-like structures for roosting during all the stages of its life cycle in which it exhibits a high level of site fidelity (CDFG 2010). Preferred roost sites are typically caves; however, mines, bridges, or buildings may also be utilized if characterized as having a thermal range of 46 to 52°F (8 to 11°C), a high relative humidity (>50%), and low air circulation.

The diet of the cave myotis consists primarily of lepidopterans and coleopterans, but weevils, antlions, and other flying insects may also be taken opportunistically. Foraging occurs over dense riparian vegetation and in drier desert washes at heights of 12 to 50 ft (4 to 12 m) (Western Bat Working Group 2010).

Home range size of the cave myotis is determined by the spatial distribution of roost sites and prey resources. Because this species tends to make extensive daily movements between summer roosting areas and foraging habitat, home ranges may encompass areas as large as 618 mi ($1,600 km^2$) (AZGFD 2010).

The geographic distribution of the cave myotis extends from Kansas, Oklahoma, and western Texas, to southern Nevada and to southeastern California (along the Colorado River only), south through Mexico to the Honduras at elevations of 300 to 8,800 ft (92 to 2,684 m). In California, this species has experienced significant declines as the result of roost disturbance, loss of riparian vegetation, and pesticides, and it is currently restricted to lowlands of the Colorado River and adjacent mountain ranges (CDFG 2010).

The cave myotis was formerly a Category 2 candidate (C2) species under the ESA and is now considered a species of concern (nonstatutory ranking) by the USFWS.

The cave myotis could occur in the affected areas of the proposed Brenda, Gillespie, and Riverside East SEZs.

Dark Kangaroo Mouse (*Microdiposops megacephalus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Utah Species of Concern; Utah State Rank S2

The dark kangaroo mouse occurs in the Great Basin region of the western United States, including Oregon, Utah, California, and Nevada at an elevational extent of 3,904 to 8,050 ft (1,190 to 2,455 m) (Kim 1999). Nocturnally active during warm weather, the species remains in underground burrows during the day and cold winter months. The dark kangaroo mouse occurs exclusively in shrubland communities of the Upper Sonoran Life-Zone (O'Farrell and Blaustein 1974). Within these temperate shrubland and desert habitats, individuals establish relatively large home ranges that are centered on burrow systems constructed in fine, gravelly soils (O'Farrell and Blaustein 1974). Dark kangaroo mice are primarily granivorous; however, they shift to an insectivorous feeding strategy during the summer season.

The dark kangaroo mouse may occur in the affected areas of the proposed Milford Flats South and Wah Wah Valley SEZs.

Desert Bighorn Sheep (*Ovis canadensis mexicana*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Endangered in New Mexico
Rarity: New Mexico Species of Concern; New Mexico State Rank S1

The desert bighorn sheep is currently listed as threatened in the State of New Mexico. It is one of several subspecies of bighorn sheep that is known to occur in the southwestern United States. This subspecies is known to occur in eastern Arizona, New Mexico, and Texas. Within New Mexico, desert bighorn sheep inhabit visually open, rocky, desert, mountain ranges in the southern portion of the state. The species rarely uses desert lowlands and valleys, but these areas may be occasionally used as movement corridors between mountain ranges.

The desert bighorn sheep may occur in the affected area of the proposed Afton SEZ.

Desert Valley Kangaroo Mouse (*Microdipodops megacephalus albiventer*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2; USFWS Species of Concern

The Desert Valley kangaroo mouse is endemic to central Nevada, where it inhabits desert areas at playa margins, and dune habitats at elevations ranging from 3,904 to 8,050 ft (1,190 to 2,455 m) (Kim 1999). This species occurs exclusively within shrub-scrub and alkali sink plant communities of the Upper Sonoran Life-Zone (O'Farrell and Blaustein 1974). Within these temperate shrubland and desert habitats, individuals establish relatively large home ranges that are centered around burrow systems constructed in fine, gravelly soils (O'Farrell and Blaustein 1974). Desert Valley kangaroo mice are primarily granivorous; however, they shift to an insectivorous feeding strategy during the summer season.

The Desert Valley kangaroo mouse may occur in the affected area of the proposed Dry Lake Valley North SEZ.

Fringed Myotis (*Myotis thysanodes*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: Utah Species of Concern; Nevada State Rank S2; USFWS Species of Concern

The fringed myotis is a snag-dependent species that occurs in a wide variety of mesic habitat types, including ponderosa pine forests as well as oak, pinion, and juniper woodlands, with deserts and grasslands being utilized to a lesser extent. Within these communities, the fringed myotis requires snags and rock crevices for day and night roosting. Selection of diurnal roost-sites is based on a combination of surrounding vegetation structure, tree attributes, and thermal regime, as these features serve to enable proper thermoregulation, facilitate flight access, and maximize predator avoidance. In addition, water resources are another habitat component, as this species must drink daily immediately after emerging from day roosts (Keinath 2003). Hibernation, however, typically occurs in caves or mines whose microclimates maintain high humidity and a constant temperature (Keinath 2003).

The fringed myotis is an opportunistic predator whose diet is composed of a variety of insect classes. Foraging preferentially occurs along forest or field edges where prey items are gleaned from vegetation.

Home range size of the fringed myotis during the active season is approximately 95 acres (0.4 km^2) and is determined by the spatial distribution of roosting, prey, and water resources. Within these activity areas, daily movements are short as roost sites and foraging habitat tend to be within localized areas.

The fringed myotis is predominantly a western species occurring as scattered populations from southern Canada, south through southern Mexico, eastward to Montana and Wyoming at an elevational range of 4,000 to 9,350 ft (1,200 to 2,850 m). Throughout its geographic distribution, abundance has fluctuated, perhaps causing populations to become increasing smaller and more isolated in recent decades (Keinath 2003).

The fringed myotis may occur in the affected areas of the proposed Afton, Amargosa Valley, Dry Lake Valley North, Escalante Valley, Gold Point, Milford Flats South, and Millers SEZs.

Gunnison's Prairie Dog (*Cynomys gunnisoni*)

ESA Listing Status: Candidate
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: New Mexico State Rank S2

The Gunnison's prairie dog occurs in grasslands and shrublands in two separate range portions: those that inhabit montane habitats (higher elevation, moister climate), and those that inhabit prairie habitats (lower elevation, drier climate). Gunnison's prairie dogs are diurnal herbivores that live in colonies and spend much of their time underground. The diet of the Gunnison's prairie dog includes grasses, forbs, sedges, and shrubs. Invertebrates make up a small portion of the diet. They are inactive or torpid during severe winter weather (NatureServe 2012). Adults emerge from their burrows in March or early April. Reproduction occurs in spring, but the timing of reproduction varies somewhat by latitude, elevation, and year. Following birth, the young stay underground for about 1 month.

Gunnison's prairie dog colonies are often smaller than those of other species and may consist of fewer than 50 individuals (NatureServe 2012). Colonial groups are organized into territories that generally contain one adult male and several adult females and nonbreeding juveniles. Survivorship is low. The Gunnison's prairie dog is an important prey species for raptors. Rangewide, habitats occupied by the species have declined by nearly 98% between 1916 and the present (NatureServe 2012).

Montane Gunnison's prairie dog populations are more vulnerable to the sylvatic plague because in the montane region, colonies are fewer in number, smaller, and more scattered. These factors would make it more difficult for individuals to recolonize sites that were extirpated as a result of the disease (73 FR 6660). Compared with the lower-elevation prairie habitat regions, moister montane areas may have more hospitable climates for fleas and, in turn, plague outbreaks. Although plague outbreaks have occurred in the drier prairie portions of the Gunnison's prairie dog range, populations in these habitats can recover much more quickly because of the availability of nearby colonies.

Gunnison's prairie dog populations within montane habitats in central and south-central Colorado and north-central New Mexico were listed as candidates for federal protection under the ESA on February 5, 2008 (73 FR 6660).

Threats to the continued existence of Gunnison's prairie dog are primarily related to the spread of sylvatic plague. Sylvatic plague is a bacterial disease that is generally transmitted among rodents by fleas. The disease is not native to North America and has been known in the United States since 1900. The disease can severely reduce or extirpate populations within a short time frame (3 to 10 years).

The Gunnison prairie dog could occur in the affected areas of the proposed Antonito Southeast, De Tilla Gulch, and Los Mogotes East SEZs.

Kit Fox (*Vulpes macrotis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Utah)
State Listing Status: Not Listed
Rarity: Not Listed

The kit fox occurs in desert and semiarid communities, including mixed-grass shrublands, shrublands, grasslands, and margins of pinyon-juniper woodlands. It occurs at an elevational range of 4,800 to 6,000 ft (1,463 to 1,829 m) on sites of sandstone or shale derivation with a high clay to clay-loam content and generally avoids areas with gravelly substrates (Meaney et al. 2006). Diurnal den sites, because they ameliorate extreme temperatures, reduce heat loads, conserve water, and protect against predators, are an important habitat component for this semifossorial species. Because of this, overlapping home ranges that are 620 to 2,866 acres (1.02 km^2 to 4.6 km^2) in size are established in areas that provide adequate den site availability and high densities of primary prey items, including lagomorphs, prairie dogs, and kangaroo rats (Meaney et al. 2006; NatureServe 2012).

The geographic distribution of the kit fox extends from northern Baja California, north through western Texas, west of the Rocky Mountains, to southwestern Idaho and southeastern Oregon, and it is in portions of California, Arizona, Nevada, Utah, New Mexico, and western Colorado, where it tends to occur in small, isolated populations. Despite maintaining the majority of its historical range, this species is declining in many of the states in which it occurs, including Utah.

Kit fox populations could occur in the affected areas of the proposed Escalante Valley, Milford Flats South, and Wah Wah Valley SEZs.

Long-Legged Myotis (*Myotis volans*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: Not Listed

The long-legged myotis is primarily associated with montane or subalpine forested habitats, including ponderosa pine woodland, pinyon-juniper woodland, and montane shrublands composed of willows or sagebrush. However, this species also occurs at low altitudes in riparian and desert regions of Baja California (Warner and Czaplewski 1984). Within these communities, the long-legged myotis requires snags, and to a lesser extent caves, mines, or cliff crevices, for roosting and hibernating. Roost-site, and potentially hibernacula, selection is based on structural attributes that provide the most suitable microclimate, whereby, preferred roosts are characterized as having the following features: (1) of the decay class 1, (2) greater than 105 ft (32 m) in height, and (3) have exfoliating bark that forms a shingle-like pattern. In addition to these vegetative components, water resources are another critical habitat requirement, as the long-legged myotis has poor urine-concentrating abilities, and thus drinks regularly (Zeiner et al. 1990).

The diet of the long-legged myotis consists primarily of moths (Lepidoptera), but it will also consume a variety of other soft-bodied invertebrates, including flies (Diptera) termites (Isoptera), lacewings (Neuroptera), wasps (Hymenoptera), bugs (Hemiptera), leafhoppers (Homoptera), and small beetles (Coleoptera) (Warner and Czaplewski 1984). Foraging occurs above water bodies, among the canopy layer, or within openings of chaparral, coastal scrub, Great Basin shrub, and early successional forests, where individuals exhibit high site fidelity (Zeiner et al. 1990).

Home range size of the long-legged myotis is determined by the spatial distribution of specific roosting, water, and prey resources. Seasonal migration between summer ranges and hibernacula, as well as daily movements between roost sites and foraging habitat have not been fully elucidated.

The long-legged myotis has a geographic distribution that extends across western North America from southeastern Alaska, British Columbia, and Alberta to Baja California and central Mexico at elevations ranging from sea level to 3,500 m (10,500 ft) (Ellison et al. 2003).

The long-legged myotis may occur in the affected area of the proposed Afton SEZ.

Nelson's Bighorn Sheep (*Ovis canadensis nelsoni*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Threatened in California
Rarity: USFWS Species of Concern

The Nelson's bighorn sheep (also called desert bighorn sheep) is a subspecies of bighorn sheep known to occur in the southwestern United States. This species occurs in desert mountain ranges in Arizona, California, Nevada, Oregon, and Utah. General habitat associations include alpine dwarf-shrub, low sage, sagebrush, bitterbrush, pinyon-juniper, palm oasis, desert riparian, desert succulent shrub, desertscrub, subalpine conifer, perennial grassland, montane chaparral, and montane riparian. Within these communities, physical and visual adaptations enable Nelson bighorn sheep to exploit open slopes having steep, rocky terrain, particularly of limestone substrates, and sparse vegetation. Such areas provide a diversity of topographic attributes that serve as refuge against predators and severe environmental conditions. Site occupancy is also highly dependent upon the proximal availability of water and forage resources as well, whereby Nelson's bighorn sheep populations aggregate in areas that afford permanent watering holes and a diversity of plant species. Individuals exhibit high site fidelity to natal home range areas. Seasonal migratory movements are extensive, typically between mountain ranges, whereas daily movements are relatively small, within the individual mountain range (Zeiner et al. 1990).

Historically, the Nelson's bighorn sheep was distributed from Baja California and Texas in the South, eastward to western Nebraska, north to the Canadian Rockies, and California in the West. Populations have declined in the past century and are currently restricted to the Colorado Desert within Arizona, California, Nevada, and Utah at an elevational range of 2,953 to 13,123 ft (900 to 4,000 m).

The Nelson's bighorn sheep primarily uses montane shrubland, forest, and grassland habitats, and they may utilize desert valleys as corridors for travel between range habitats.

The Nelson's bighorn sheep may occur in the affected areas of the proposed Amargosa Valley, Dry Lake, Dry Lake Valley North, Gold Point, Millers, and Riverside East SEZs.

Pahranagat Valley Montane Vole (*Microtus montanus fucosus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2; USFWS Species of Concern

The Pahranagat Valley montane vole is endemic to Lincoln County, Nevada, where it is restricted to springs in the Pahranagat Valley. Within that area, isolated populations utilize mesic montane and desert riparian habitat.

The Pahranagat Valley montane vole may occur in the affected area of the proposed Dry Lake Valley North SEZ.

Pale Kangaroo Mouse (*Microdipodops pallidus*)

ESA Listing Status: Not Listed
BLM Listing Status: Not Listed
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S2

The pale kangaroo mouse is a rodent that is endemic to southwestern Nevada and southeastern California. This species inhabits fine sands in alkali sink and desertscrub habitats dominated by shadscale or big sagebrush (*Artemisia tridentata*). The species often burrows in areas of soft, windblown sand piled at the bases of shrubs.

The pale kangaroo mouse may occur in the affected area of the proposed Gold Point SEZ.

Pallid Bat (*Antrozous pallidus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: California Species of Concern; USFWS Species of Concern

The pallid bat occurs in a variety of woodland, grassland, riparian, wetland, and agricultural habitats but is most abundant in xeric communities, such as deserts and canyon lands. Within these habitat types, this species requires rocky outcrops, cliffs, crevices, mines, or buildings for roosting. Tree cavities in oak (*Quercus* spp.), ponderosa pine (*Pinus ponderosa*), coastal redwood (*Sequoia sempervirens*), or giant sequoia (*Sequoiadendron giganteum*) also serve as roost sites. Preferred characteristics of roost sites are relatively cool and stable thermal conditions and unobstructed entrances that occur high above the ground surface. In addition, water resources are a critical habitat component, since pallid bats often drink immediately after emergence (NatureServe 2012; Western Bat Working Group 2010).

Pallid bats are opportunistic generalists that glean a variety of invertebrate prey—including beetles, moths, and crickets—from surfaces. Foraging occurs in and among the vegetation of open shrub-steppe grasslands, oak savannah grasslands, open Ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards (NatureServe 2012; Western Bat Working Group 2010).

The sizes of the home ranges of pallid bat populations are determined by the spatial distribution of roosting, prey, and water resources. Seasonal migration between summer ranges and hibernacula, as well as daily movements from night roosts and foraging areas, are local and range from 1 to 3 mi (0.5 to 2.5 km) (NatureServe 2012; Western Bat Working Group 2010).

The geographic distribution of the pallid bat extends throughout western North America, from southern British Columbia south to Latin America, and east to Texas, at elevations of 6,000 to 7,000 ft (1,830 to 2,100 m). In California, this species is locally common within the Great Basin, Mojave, and Sonoran Deserts. Current population trends are unknown; however, because the loss of critical roost sites has resulted in a general decline in the abundance of cave-dwelling bat species throughout North America, concern over the status of pallid bat populations has increased.

The pallid bat could occur in the affected areas of the proposed Amargosa Valley, Dry Lake, Gold Point, and Riverside East SEZs.

Palm Springs Pocket Mouse (*Perognathus longimembris bangsi*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: California State Rank S2

The Palm Springs pocket mouse is known to occur only in Riverside County within the Coachella Valley in California. This species inhabits desertscrub and grassland communities on sandy soils. This subspecies occurs in the lower Sonoran life zone of California, inhabiting creosote scrub, desertscrub, and grasslands communities. Common plant associates include creosotebush, brittlebush (*Encelia farinosa*), burrobush, indigo bush (*Psorothamnus schottii*), cheesebush (*Hymenoclea salsola*), honey mesquite, and various annual plants such as dune primrose (*Oenothera deltoides*), desert mallow (*Sphaeralcea ambigua*), and dove weed (*Croton californica*), all of whose seed and vegetative matter provide critical forage. As a nocturnal species, activity is conducted during the night, where foraging excursions are performed. Individuals then retreat to their burrows during the day as well as throughout the winter season (NatureServe 2012; Sierra Club 2006).

The historic distribution of the Palm Springs pocket mouse once extended from the San Gorgonio Pass area east to southern Joshua Tree National Park, and south through the Coachella Valley to Ocotillo (Sierra Club 2006). However, increased habitat loss, OHV use, and the introduction of non-native vegetation have caused this range to be severely reduced. Currently, occurrences of Palm Springs pocket mouse populations are highly fragmented. They are restricted to roughly 142,000 acres (465,878 km^2) of the lower Sonoran Desert from the San Gorgonio Pass area east to the Little San Bernardino Mountain, and south along the eastern edge of the Peninsular Range to Borrego Valley and the east side of San Felipe Narrows (Sierra Club 2006).

The Palm Springs pocket mouse may occur in the affected area of the proposed Riverside East SEZ.

Pygmy Rabbit (*Brachylagus idahoensis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (Utah)
State Listing Status: Protected in Nevada
Rarity: Utah State Rank S2; Utah Species of Concern

The pygmy rabbit is a sagebrush (*Artemisia* spp.) obligate, restricted to sagebrush-steppe areas of the Great Basin and adjacent intermountain regions. Within these sagebrush-dominated communities, individuals establish relatively small home ranges encompassing an areal extent of 1.1 to 4.9 acres (0.004 to 0.02 km^2). These home ranges are characterized as having relatively high sagebrush cover (21 to 36%) and being centered around burrow systems constructed on loose, alluvial soils. Together, these habitat properties serve to minimize the risk of predation risk and provide adequate forage as well, since big sagebrush constitutes 51 to 99% of their diet (Lee 2008; NatureServe 2012).

Beyond being considered a keystone species within big sagebrush habitat, pygmy rabbits are also considered to be unique among leporids, which enhances their ecological importance. Distinctive behaviors include scurrying locomotion, emission of distress vocalization, and high fossoriality (Lee 2008; NatureServe 2012; Oliver 2004).

Historically, the geographic range of pygmy rabbits has been limited in the North to the Great Basin and adjacent intermountain areas of eastern Washington and southwestern Montana, and in the South to California and eastern Utah. Current studies suggest that this species has suffered rapid declines over this last century, likely because of its high susceptibility to anthropogenic changes, which has resulted in a patchy distribution of DPSs (Lee 2008; NatureServe 2012; Oliver 2004).

The Great Basin populations of the pygmy rabbit were petitioned for listing under the ESA in 2003, but no federal protective status was received. However, Columbia populations in the state of Washington are listed as endangered under the ESA (Oliver 2004).

The pygmy rabbit could occur in the affected areas of the proposed Dry Lake Valley North, Escalante Valley, Milford Flats South, and Wah Wah Valley SEZs.

Silver-Haired Bat (*Lasionycteris noctivagans*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: USFWS Species of Concern

The silver-haired bat is known from forested areas at high elevations of 1,600 to 8,500 ft (488 to 2,590 m), composed of aspen, cottonwood, white fir, pinyon-juniper, subalpine fir, willow, and spruce communities. Roost and nursery sites occur in tree foliage or cavities or under loose bark. This species rarely hibernates in caves. The geographic distribution of the silver-haired bat extends from southeastern Alaska and much of western Canada, south to central California into northern Mexico, and east through Georgia. Silver-haired bats prefer lepidopteran (moths and butterflies) prey but will feed opportunistically on other insects (Schmidt 2003). Foraging occurs above the canopy layer of coniferous and mixed deciduous forests in close proximity to ponds, slow-moving streams, and other standing bodies of water where this species utilizes echolocation to detect swarms of prey (NatureServe 2012; Schmidt 2003).

The silver-haired bat may occur in the affected areas of the proposed Dry Lake and Gold Point SEZs.

Spotted Bat (*Euderma maculatum*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada; Threatened in New Mexico
Rarity: California State Rank S2; Colorado State Rank S2; New Mexico State Rank S2; Utah State Rank S2; Utah Species of Concern; USFWS Species of Concern

The spotted bat occurs in a wide variety of arid habitat types, including desert shrub habitat, subalpine meadows, pinyon juniper woodlands, cliffs, riparian areas, and coniferous forests. Black oak (*Quercus velutina*), ponderosa pine (*Pinus ponderosa*), incense cedar (*Calocedrus decurrens*), giant sequoia (*Sequoiadendron giganteum*), red fir (*Abies magnifica*), lodgepole pine (*Pinus contorta*), and white fir (*Abies concolor*) are common vegetative associations of utilized sites. Within these communities, this species requires rocky cliff features for roosting during all stages of its life cycle. It exhibits a high level of site fidelity. Roost sites typically occur in crevices of high, steep, cliffs composed of granite, basalt, limestone, sandstone, or other sedimentary rock; site selection appears to be determined by its thermal conditions and protective ability. In addition, water resources in the form of rivers, lakes, marshes, or man-made bodies of water are another critical habitat component, since spotted bats are highly susceptible to water loss (Luce and Keinath 2007; NatureServe 2012; Western Bat Working Group 2010).

The spotted bat prefers lepidopteran prey, with more than 97% of its diet consisting of moths (Luce and Keinath 2007). Foraging occurs in the open-air space along linear landscape elements within woodlands, canopy gaps, stream corridors, and edges of riparian zones.

Home range size of the spotted bat is determined by the spatial distribution of roosting, prey, and water resources. The migratory behavior of this species is restricted to daily movements of 6 to 24 mi (10 to 38.5 km) between roost sites and foraging habitat, since both the hibernating range and summer range occur within the same area (Luce and Keinath 2007).

The spotted bat is widely distributed across western North America, from the southern Canadian province of British Columbia; south through eastern Oregon, Idaho, south-central

Montana, central and western Wyoming, western Colorado and Nevada; to southern California, southwestern Arizona, New Mexico and west Texas; to central Mexico at elevations of 187 ft below sea level to 9,800 ft (–57 to 3,000 m). Within its range, this species occurs at low densities as localized subpopulations; thus, both its distribution and its abundance are constrained by the availability of suitable roost sites (Luce and Keinath 2007; NatureServe 2012; Western Bat Working Group 2010).

The spotted bat was formerly a candidate species under the ESA until the classification system was modified and subsequently removed from the list. Currently, this species is considered a species of concern (nonstatutory ranking) by the USFWS.

The spotted bat could occur in the affected areas of the proposed Amargosa Valley, Antonito Southeast, De Tilla Gulch, Dry Lake, Dry Lake Valley North, Escalante Valley, Gold Point, Los Mogotes East, Milford Flats South, Millers, Riverside East, and Wah Wah Valley SEZs.

Townsend's Big-Eared Bat (*Corynorhinus townsendii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Protected in Nevada
Rarity: California State Rank S2; Colorado State Rank S2; Nevada State Rank S2; California, Colorado, Utah, and USFWS Species of Concern

The Townsend's big-eared bat is widespread throughout the western United States and occurs in each of the six states in the PEIS study area. The pale Townsend's big-eared bat (*C. t. pallescens)*, a subspecies of the Townsend's big-eared bat, occurs primarily in Colorado and New Mexico. The Townsend's big-eared bat is generally associated with dry upland habitats, particularly desertscrub, mixed conifer forest, and pinion-juniper forest habitat, but it will also utilize mesic coniferous and deciduous forests. Within these communities, this species requires spacious, cavern-like structures for roosting during all stages of its life cycle, in which it exhibits a high level of site fidelity. Limestone caves, mines, lava tubes, bridges, or buildings may serve as such roosting structures. Roosting site selection seems to be determined by a combination of the site's internal complexity, dimensions, and opening aperture, since these features regulate and maintain the temperature and humidity. Preferred structural characteristics of maternal roosts include an internal thermal range of 64 to 86ºF (18 to 30ºC) and an entrance with a diameter of at least 6 by 12 in. (15 by 31 cm) occurring at a height of 8 to 16 ft (2.4 to 4.9 m); whereas hibernacula have a thermal range of 30.2 to 52.0ºF (–1.0 to 11.2 2ºC), moderate airflow, and low disturbance (CDFG 2010; NatureServe 2012; Western Bat Working Group 2010).

Townsend's big-eared bats are lepidopteran specialists, with more than 90% of their diet consisting of moths. Foraging occurs along linear landscape elements within woodlands, canopy gaps, stream corridors, and edges of riparian zones dominated by Douglas-fir, California bay, and willow species, where the bats glean insects from vegetation. Such habitat areas also provide a critical source of drinking water (CDFG 2010; NatureServe 2012; Western Bat Working Group 2010).

Home range size of the Townsend's big-eared bat is determined by the spatial distribution of roosting, prey, and water resources. Seasonally, movements between summer roosting areas to hibernacula range from 2 to 40 mi (3.1 to 64 km), whereas in summer areas, which encompass a roosting and foraging habitat, migratory movements may extend as far as 6.5 mi (10.5 km) from roost sites.

The geographic distribution of the Townsend's big-eared bat extends from the Pacific Coast east to Nevada and Idaho, and north from central Mexico to southern British Columbia at elevations of 4,501 to 10,459 ft (1,372 to 3,188 m). Within its range, this species is apparently not very abundant; such rarity likely results from the limited availability of suitable roosting habitat. Disturbance to, as well as loss of, this critical habitat component has led to rapid declines throughout the western United States (CDFG 2010; NatureServe 2012; Western Bat Working Group 2010).

The Townsend's big-eared bat was formerly a Category 2 candidate (C2) species under the ESA, and it is now considered a species of concern (nonstatutory ranking) by the USFWS.

The Townsend's big-eared bat could occur in the affected areas of the proposed Afton, Amargosa Valley, Antonito Southeast, Brenda, De Tilla Gulch, Dry Lake, Escalante Valley, Fourmile East, Gold Point, Imperial East, Los Mogotes East, Milford Flats South, Millers, Riverside East, and Wah Wah Valley SEZs.

Utah Prairie Dog (*Cynomys parvidens*)

ESA Listing Status: Threatened
BLM Listing Status: Not Listed
State Listing Status: Not Listed
Rarity: Utah State Rank S1

The Utah prairie dog is endemic to southwestern Utah, where it occurs in grasslands, level mountain valleys, and areas with deep, well-drained soils and low-growing vegetation that allows for good visibility. It is one of three prairie dog species in the state of Utah. Utah prairie dogs are diurnal herbivores that live in colonies and spend much of their time underground. They are inactive or torpid in severe winter weather. Adults emerge from mid-March to early April. Breeding occurs in the spring, and young emerge from the burrows during May and early June. Adults are often dormant from mid-July to mid-August and are not often seen above ground during this period. Juveniles enter dormancy during October and November (NatureServe 2012; USFWS 2010c).

The Utah prairie dog feeds primarily on grasses and various seeds and flowers of shrubs and insects when available. Common plant species consumed include alfalfa, leafy aster, European glorybind, and wild buckwheat seeds. The size of the home range of the Utah prairie dog varies, depending on the quality of the habitat, from 3 to 20 acres (0.01 to 0.08 km^2). Available habitat for the Utah prairie dog has declined from an estimated 448,000 acres (1,813 km^2) to less than 7,000 acres (28 km^2) at the present time (NatureServe 2012; USFWS 2010c).

The size of its population has varied considerably during historic times. In 1920, before programs to control the Utah prairie dog, its total population was estimated at 95,000. Shooting and poisoning of the species by ranchers (and likely periodic reductions from the plague) led to a decrease in the size of the population; it was estimated to be about 3,700 by 1984. By the spring of 1989, the adult population reached 9,200. The USFWS, in its Report to Congress, reported that at this size, the population was considered as being at risk of a crash from a plague outbreak (NatureServe 2012; USFWS 2010c).

The Utah prairie dog was first federally listed as endangered on June 4, 1973 (USFWS 1973). In 1984, it was reclassified as threatened by the USFWS (USFWS 1984). A recovery plan that was prepared in 1991 and revised in 2010 (USFWS 2010c) described the current extent of the existing populations and laid out management goals for ensuring the continued survival of the species. A major goal was to improve the chances of long-term survival of the species in the following areas: West Desert in southern Beaver and Iron Counties; Paunsaugunt in western Garfield County, eastern Iron County, and extreme northwestern Kane County; and the Awapa Plateau, which extends from Sevier County southward through western Wayne and Piute Counties into northern Garfield County. No updated information on the population sizes or the success and locations of transplanted populations has been found. The recovery plan also described plans to transplant Utah prairie dogs to unoccupied habitats, and it defined procedures for monitoring the transplants.

The Utah prairie dog could occur in the affected areas of the proposed Escalante Valley, Milford Flats South, and Wah Wah Valley SEZs.

Western Mastiff Bat (*Eumops perotis californicus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive (California and Nevada)
State Listing Status: Protected in Nevada
Rarity: Nevada State Rank S1; USFWS Species of Concern

The western mastiff bat is the largest native bat in the Unites States. This cliff-dwelling species occurs in a wide variety of open, semiarid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desertscrub, and urban locations of the Upper and Lower Sonoran zone. Low-growing California buckwheat (*Eriogonum fasciculatum*), greasewood (*Adenostoma fasciculatum*), black sage (*Salvia mellifera*), white sage (*Salvia apiana*), and coastal sagebrush (*Artemisia califomica*) are common vegetative components of utilized sites. Within these communities, the western mastiff bat requires rocky cliffs or outcrops for roosting. Roosting site selection is based on vegetative structure as well as entrance height, orientation, and aperture. Preferred roost sites are characterized as having the following features: (1) little vegetation; (2) a clear, vertical drop of at least 9.8 ft (3 m) from the entrance; (3) entrances with a bottom access that are oriented horizontally and face downward; and (4) an aperture of 10 by 6 in. (25 by 15 cm); all of these accommodate specific flight requirements. These diurnal refugia typically occur in deep crevices that are 12 to 24 in. (30 to 60 cm) in width within granitic rocks and consolidated sandstone substrates. In addition, water resources in the form of large bodies of water longer than 100 ft (30 m) are another critical habitat component, since western mastiff bats are highly susceptible to water loss (CDFG 2010; NatureServe 2012; Western Bat Working Group 2010).

Western mastiff bats are insectivorous and feed on small to large insects of soft to intermediate hardness characterized as having a low and weak flight pattern. Foraging occurs near ground level within the open-air space along linear landscape elements within woodlands, canopy gaps, stream corridors, and edges of riparian zones (CDFG 2010; NatureServe 2012; Western Bat Working Group 2010).

The western mastiff bat exhibits nocturnal activity year-round. Unlike most molossids, this species is nonmigratory; the migratory behavior of this species is restricted to daily movements of 6 to 15 mi (10 to 25 km) between roost sites and foraging habitat as well as alternate day roosts.

The geographic distribution of the western mastiff bat extends from central Mexico across the southwestern United States, including southern California, southern Nevada, Arizona, southern New Mexico, and western Texas, at elevations of 197 ft below sea level to 1,230 ft (–60 to 375 m). Within its range, it has experienced severe declines as a result of the loss and disturbance of roost sites, pest control operations, and grazing and pesticide applications in foraging areas (NatureServe 2012; Western Bat Working Group 2010).

The western mastiff bat could occur in the affected areas of the proposed Dry Lake, Imperial East, and Riverside East SEZs.

Western Red Bat (*Lasiurus blossevillii*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Arizona Wildlife Species of Concern; Protected in Nevada
Rarity: Nevada State Rank S1; Utah State Rank S1; New Mexico State Rank S2; USFWS Species of Concern

The western red bat is an uncommon year-round resident in the southwestern United States. The western red bat has a broad geographic distribution that extends from southern Canada through the western United States, south to Panama and South America at elevations of 656 to 7,200 ft (200 to 2,196 m). Throughout much of the xeric west, however, this species occurs in low densities where it is confined to cottonwood riparian corridors (CDFG 2010).

The western red bat is strongly associated with forested communities such as deciduous riparian habitats dominated by cottonwood (*Populus* spp.), sycamore (*Platanus* spp.), walnut (*Juglans* spp.), and willow (*Salix* spp.). The species also inhabits mixed conifer forests, orchards, and open fields. Within these habitat communities, the western red bat requires the availability of large, undisturbed trees or shrubs for roosting. Western red bats are purely insectivorous, with moths, crickets, beetles, and cicadas composing the majority of their diet. Foraging occurs from ground level to above the canopy within grasslands, shrublands, open woodlands and forests, and croplands (CDFG 2010; NatureServe 2012).

The western red bat may occur in the affected areas of the proposed Afton and Gillespie SEZs.

Western Small-Footed Myotis (*Myotis ciliolabrum*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: California State Rank S2; USFWS Species of Concern

The western small-footed myotis is generally associated with semiarid to arid upland habitats, particularly desertscrub, grasslands, sagebrush steppe, pinyon-juniper forests, and pine-fir forests, but it prefers more mesic areas with increasing elevation. Within these communities, this species requires the availability of suitable roost sites. Crevices and cracks of canyon walls serve as day roosts, whereas limestone caves and mines are commonly utilized for hibernation. A combination of internal depth, dimensions, and opening aperture appears to determine the roost sites selected by western small-footed myotis, because these features regulate and maintain temperature and humidity. Preferred structural characteristics of roosts include an internal thermal range of 79 to 84ºF (26 to 29ºC), high humidity, an average entrance diameter of 1.4 in. (3.5 cm), and a shallow depth ranging from 1 to 8 in. (2.5 to 20.5 cm). In addition, water resources are a critical habitat component, because individuals often drink immediately after emergence (CDFG 2010; NatureServe 2012).

The western small-footed myotis is an aerial feeder that preys on a variety of flying insects, particularly Lepidoptera. Foraging occurs along woodland margins or over water bodies at a range of 3 ft (1 m) above ground level to treetop height. Such habitat areas also provide a critical source of drinking water.

The sizes of the home ranges of western small-footed myotis populations are determined by the spatial distribution of roosting, prey, and water resources. Seasonal migration between summer ranges and hibernacula, as well as daily movements from day roosts and foraging areas, are local, since summer and winter ranges apparently coincide (CDFG 2010).

The western small-footed myotis inhabits most of western North America, where its geographic distribution extends from southwestern Canada to central Mexico. In California, it occurs along the southern coast as well as along the Sierra Nevada at elevations from sea level to 8,900 ft (0 to 2,700 m).

The western small-footed myotis could occur in the affected areas of the proposed Afton, Amargosa Valley, Dry Lake, Dry Lake Valley North, Gold Point, Millers, and Riverside East SEZs.

Western Yellow Bat (*Lasiurus xanthinus*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Arizona Wildlife Species of Concern
Rarity: Arizona State Rank S2; California Species of Concern

The western yellow bat occurs in a variety of habitat types throughout its range, from dry tropical forests to semitropical wet forests. This species is especially associated with Washington fan palm trees (*Washingtonia filifera*), because they provide critical roosting sites for this foliage rooster. However, sites composed of other broad-leaved, deciduous species (e.g., sycamores, hackberries, and cottonwoods) are also utilized. Roost sites are almost exclusively in the skirts of palm trees, where the dense frond cover modifies the microclimate and protects individuals from severe weather and predators (AZGFD 2010; NatureServe 2012; Western Bat Working Group 2010).

Western yellow bats are insectivorous and feed on a variety of medium-sized, night-flying Hymenoptera, Dipterans, Lepidoptera, and Coleoptera. Foraging occurs above water features within open grassland, scrub, and canyon and riparian locations (NatureServe 2012; Western Bat Working Group 2010).

The distribution of the western yellow bat is primarily in Mexico and Central America; its range is restricted to the southern portions of California, Arizona, New Mexico, and possibly southwestern Texas at elevations of 550 to 6,000 ft (168 to 1,830 m).

The western yellow bat could occur in the affected areas of the proposed Brenda, Gillespie, and Riverside East SEZs.

Yuma Myotis (*Myotis yumanensis*)

ESA Listing Status: Not Listed
BLM Listing Status: Sensitive
State Listing Status: Not Listed
Rarity: USFWS Species of Concern

The Yuma myotis is a widespread, year-round resident throughout much of the southwestern United States. It is uncommon in the Mojave and Sonoran Desert regions, except for mountain ranges bordering the Colorado River and the San Bernardino Mountains. It prefers montane forest habitats at elevations between 2,000 and 8,000 ft (600 and 2,400 m). It roosts in buildings, mines, caves, and crevices.

The diet of Yuma myotis consists primarily of aquatic emergent insects, including caddis flies, flies, midges, small moths, ants, homopterans, and small beetles. Foraging occurs over ponds streams, and stock tanks, which also provide a critical source of water for drinking. Home range size of Yuma myotis is not known. Seasonal migration between summer ranges and hibernacula as well as daily movements from day roosts and foraging areas are likely to be local within a short distance, as summer and winter ranges are thought to coincide (CDFG 2010; NatureServe 2012).

The Yuma myotis may occur in the affected areas of the proposed Antonito Southeast and Los Mogotes East SEZs.

J.7 REFERENCES

Note to Reader: This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

American Bird Conservancy, 2010, *Species Profile: Gunnison Sage-Grouse.* Available at http://www.abcbirds.org/conservationissues/species/profiles/sage_grouse.html. Accessed Feb. 4, 2010.

AmphibiaWeb, 2010, *Information on Amphibian Biology and Conservation.* Available at http://amphibiaweb.org. Accessed Aug. 21, 2010.

AZDA (Arizona Department of Agriculture), 2010, *Arizona Native Plant Law*. Available at http://www.azda.gov/Rules/NpRulesHomePage.htm. Accessed Aug. 20, 2010.

AZGFD (Arizona Game and Fish Department), 2002, Arizona Toad (*Bufo microscaphus microscaphus*), unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, Ariz.

AZGFD, 2010, *Plant and Animal Abstracts, Distribution Maps, and Illustrations.* Available at http://www.azgfd.gov/w_c/edits/hdms_abstracts.shtml. Accessed Oct. 25, 2010.

Beck, D.D., 2005, *Biology of Gila Monsters and Beaded Lizards,* University of California Press, Berkley, Calif.

Beck, D.D, and R.D. Jennings, 2003, “Habitat Use by Gila Monsters: the Importance of Shelters,” *Herpetological Monographs* 17:111–129.

BLM (Bureau of Land Management), 2004, *Final Environmental Impact Report and Statement for the West Mojave Plan: A Habitat Conservation Plan and California Desert Conservation Area Plan Amendment, Volume II*, U.S. Department of the Interior, Washington, D.C.

BLM, 2008, *BLM Manual 6840—Special Status Species Management*, Release 6-125, U.S. Department of the Interior, Washington, D.C., Dec. 12.

Bradley, P.V., et al., 2006, *The Revised Nevada Bat Conservation Plan*, Nevada Bat Working Group, Reno, Nev.

CaliforniaHerps, 2010, *California Herps: A Guide to the Reptiles and Amphibians of California.* Available at http://www.californiaherps.com/index.html. Accessed June 18, 2010.

California Native Plant Society, 2010, *Inventory of Rare and Endangered Plants.* Available at http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi. Accessed Oct. 20, 2010.

CDFG (California Department of Fish and Game), 2010, *California Wildlife Habitat Relationships System: Life History Accounts and Range Maps (CWHR).* Available at http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx. Accessed Sept. 2010.

Center for Biological Diversity, 2009, *Petition to List 42 Species of Great Basin Springsnails from Nevada, Utah, and California as Threatened or Endangered under the Endangered Species Act*, petition submitted to the U.S. Secretary of the Interior, Feb. 17.

CNHP (Colorado Natural Heritage Program), 2010, *Colorado Rare Plant Field Guide.* Available at http://www.cnhp.colostate.edu/download/projects/rareplants/intro.html. Accessed Oct 20, 2010.

Diffendorfer, J.E., et al., 2005, "Movement and Space Use by Coastal Rosy Boas (*Lichanura trivirgata roseofusca*) in Coastal Southern California," *Journal of Herpetology* 39(1):24–36.

Ellison, L.E., et al., 2003, *Colorado Bat Conservation Plan*, Colorado Committee of the Western Bat Working Group. Available at http://www.wbwg.org/colorado/colorado.htm.

eFloras.org, 2010, *Flora of North America*. Available at http://www.efloras.org. Accessed Aug. 12, 2010.

England, A.S., and W.F. Laudenslayer, Jr., 1989, *Review of the Status of Bendire's Thrasher in California*, Administrative Report No. 89-3, California Department of Fish and Game, Wildlife Management Division, Sacramento, Calif.

Flat-Tailed Horned Lizard Interagency Coordinating Committee, 2003, *Flat-Tailed Horned Lizard Rangewide Management Strategy, 2003 Revision.*

Gunnison Sage-Grouse Rangewide Steering Committee, 2005, *Gunnison Sage-Grouse Rangewide Conservation Plan*, Colorado Division of Wildlife, Denver, Colo.

Hammerson, G., and T. Schwaner, 2004, "Anaxyrus microscaphus," in *International Union for Conservation of Nature* (*IUCN) 2010. IUCN Red List of Threatened Species*, Version 2010.4. Available at www.iucnredlist.org. Accessed March 6, 2011.

Harris, J., 1999, *California's Wildlife,* California Department of Fish and Game, Sacramento, Calif.

Hester, S.G., and M.B. Grenier, 2005, *A Conservation Plan for Bats in Wyoming,* Wyoming Game and Fish Department, Nongame Program, Lander, Wyo.

Jennings, M.R., and M.P. Hayes, 1994, *Amphibian and Reptiles Species of Special Concern in California,* California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, Calif.

Jepson (The Jepson Herbarium), 2010, *The Jepson Flora Project.* Available at http://ucjeps.berkeley.edu/jepson_flora_project.html. Accessed Aug. 12, 2010.

Keinath, D.A., 2003, *Conservation Assessment for the Fringed Myotis* (Myotis thysanodes) *in Wyoming*, Bureau of Land Management Wyoming State Office, Cheyenne, Wyo.

Kim, D., 1999, "Microdipodops megacephalus, "*Animal Diversity Web*, University of Michigan Museum of Zoology. Available at http://animaldiversity.ummz.umich.edu/site/accounts/information/Microdipodops_megacephalus.html. Accessed March 11, 2011.

Lee, J.E., 2008, "Pygmy Rabbit (*Brachylagus idahoensis*) Habitat Use, Activity Patterns, and Conservation in Relationship to Habitat Treatments," *Western North American Naturalist* 65(4):490–500.

Lovich, J.E., and K.R. Beaman, 2007, "A History of Gila Monster (*Heloderma suspectum cinctum*): Records from California with Comments on Factors Affecting their Distribution," *Bulletin of Southern California Academy of Sciences* 106(2):39–58.

Luce, R.J., and D. Keinath, 2007, Spotted Bat (Euderma maculatum): *A Technical Conservation Assessment*, U.S. Department of Agriculture, Forest Service, Rocky Mountain Region.

Mayhew, W.W., 1964, "Photoperiodic Responses in Three Species of the Lizard Genus *Uma*," *Herpetologica* 20(2):95–113.

McCreedy, C., 2008, "Gila Woodpecker (*Melanerpes uropygialis*)," in *The Desert Bird Conservation Plan*, California Partners in Flight. Available at http://www.prbo.org/calpif/htmldocs/desert.html

Meaney, C.A., et al., 2006, *Kit Fox* (Vulpes macrotis): *A Technical Conservation Assessment,* U.S. Department of Agriculture, Forest Service, Rocky Mountain Region. Available at http://www.fs.fed.us/r2/projects/scp/assessments/kitfox.pdf.

Murphy, R.W., et al., 2006, “Conservation Genetics, Evolution, and Distinct Population Segments of the Mojave Fringe-Toed Lizard, *Uma scoparia*,” *Journal of Arid Environments* 67:226–247.

NatureServe, 2012, *NatureServe Explorer: An Online Encyclopedia of Life*, Version 7.1, NatureServe, Arlington, Va. Available at http://www.natureserve.org/explorer. Accessed June 5, 2012.

NMDGF (New Mexico Department of Game and Fish), 2010, *Biota Information System of New Mexico (BISON-M).* Available at http://www.bison-m.org. Accessed Aug. 17, 2010.

NMRPTC (New Mexico Rare Plant Technical Council), 2010, *New Mexico Rare Plants Web Site.* Available at http://nmrareplants.unm.edu. Accessed Oct. 25, 2010.

NMSU (New Mexico State University), 2010, *SGCN and Factors That Influence Species*. Available at http://fws-case-12.nmsu.edu/cwcs/sgcnfactorsspeciesreport.php?&orderby=2& sortorder=ASC>. Accessed Nov. 2, 2010.

NNHP (Nevada Natural Heritage Program), 2010, *Nevada Rare Plant Atlas*. Available at http://heritage.nv.gov/atlas/atlas.html. Accessed Oct. 20, 2010.

O’Farrell, M. J., and Blaustein, A.R., 1974, “Microdipodops megacephalus,” *Mammalian Species* 46:1–3.

Oliver, G.V., 2004, *Status of the Pygmy Rabbit* (Brachylagus idahoensis) *in Utah*, Final Report prepared by Utah Natural Heritage Program for U.S. Department of the Interior, Bureau of Land Management, Salt Lake City, Utah.

Opler, P.A., et al., 2010, *Butterflies and Moths of North America*, *Collecting and Sharing Data about Lepidoptera,* Big Sky Institute, Bozeman, Mont. Available at http://wwbutterfliesandmothsw.org/. Accessed Dec. 21, 2010.

Schmidt, C.A., 2003*, Conservation Assessment for the Silver-Haired Bat in the Black Hills National Forest, South Dakota and Wyoming,* Wyoming Cooperative Fish and Wildlife Research Unit, Laramie, Wyo.

Shuford, W.D. ,and T. Gardali, 2008, *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California, Studies of Western Birds 1*, Western Field Ornithologists, Camarillo, Calif., and California Department of Fish and Game, Sacramento, Calif.

Sierra Club, 2006, *Petition to List Palm Springs Pocket* Mouse (Perognathus longimembris bangsi Mearns 1898) *as a Federal Endangered Species under the U.S. Endangered Species Act*, prepared for the U.S. Department of the Interior.

Smith, B.E., and D.A. Keinath, 2007, *Northern Leopard Frog* (Rana pipiens): *A Technical Conservation Assessment*, U.S. Department of Agriculture, Forest Service, Rocky Mountain Region. Available at http://www.fs.fed.us/r2/projects/scp/assessments/northernleopardfrog.pdf. Accessed June 2010.

The Nevada Biodiversity Initiative, 2008, *Nevada Fishes*. Available at http://heritage.nv.gov/reports/nvfishes.pdf. Accessed April 2011.

UDWR (Utah Division of Wildlife Resources), 2010, *Utah Conservation Data Center—Desert Tortoise*. Available at http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FlNm=gophagas. Accessed Aug. 20, 2010.

USFS (U.S. Forest Service), 2005, "Rio Grande Chub (*Gila Pandora*): A Technical Conservation Assessment," USDA Forest Service, Rocky Mountain Region, Species Conservation Project. May 11, 2005.

USFWS (U.S. Fish and Wildlife Service), 1967, "Native Fish and Wildlife; Endangered Species," *Federal Register* 32:4001.

USFWS, 1970, "Appendix D—United States List of Endangered Native Fish and Wildlife," *Federal Register* 35:16047–16048.

USFWS, 1973, "Amendments to List of Endangered Fish and Wildlife," *Federal Register* 37:14678.

USFWS, 1979a, "Determination That *Echinocereus kuenzleri* is an Endangered Species," *Federal Register* 44:61924–61927.

USFWS, 1979b, "Determination That *Escobaria sneedii* var. *sneedii* is an Endangered Species," *Federal Register* 44:64741–64743.

USFWS, 1983, "Endangered and Threatened Wildlife and Plants; Emergency Determination of Endangered Status and Critical Habitats for Two Fish Species in Ash Meadows, Nevada," *Federal Register* 48:608–625.

USFWS, 1984, "Endangered and Threatened Wildlife and Plants; Final Rule to Reclassify Utah Prairie Dog as Threatened with Special Rule to Allow Regulated Taking," *Federal Register* 49:22330–22334.

USFWS, 1985, "Endangered and Threatened Wildlife and Plants; Determination of Threatened Status with Critical Habitat for Six Plants and One Insect in Ash Meadows, Nevada, and California; and Endangered Status with Critical Habitat for One Plant in Ash Meadows, Nevada, and California," *Federal Register* 50:20777–20794.

USFWS, 1987, "Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species; Notice of Review; Proposed Rule," *Federal Register* 52:2242.

USFWS, 1990, *Recovery Plan for the Endangered and Threatened Species of Ash Meadows, Nevada*, Reno, Nev.

USFWS, 1996, "Endangered and Threatened Wildlife and Plants; 12-Month Finding for a Petition to List the Amargosa Toad (*Bufo nelsoni*) as Endangered," *Federal Register* 61:8018–8019.

USFWS, 1998, *Recovery Plan for the Aquatic and Riparian Species of Pahranagat Valley*, Portland, Ore.

USFWS, 2007, *Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (Charadrius alexandrines nivosus), Volume 1: Recovery Plan*, Sacramento, Calif.

USFWS, 2008a, *Status of the Desert Tortoise—Rangewide*, Oct.

USFWS, 2008b, "Endangered and Threatened Wildlife and Plants; 90-Day Finding on Petition to List the Amargosa River Population of the Mojave Fringe-Toed Lizard (*Uma scoparia*) as Threatened or Endangered with Critical Habitat," *Federal Register* 73:1855–1861.

USFWS, 2009a, "Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition to List the Northern Leopard Frog (*Lithobates [=Rana] pipiens*) in the Western United States as Threatened," *Federal Register* 207:55525–55526.

USFWS, 2009b, "Endangered and Threatened Wildlife and Plants; Notice of Intent to Conduct a Status Review of Gunnison Sage-Grouse (*Centrocercus minimus*)," *Federal Register* 74:61100–61102.

USFWS, 2010a, *U.S. Fish and Wildlife Service, Environmental Online Database, Ash Meadows Amargosa Pupfish*. Available at http://ecos.fws.gov/docs/life_histories/E042.html. Accessed Sept. 11, 2006.

USFWS, 2010b, "Endangered and Threatened Wildlife and Plants; Listing the Flat-Tailed Horned Lizard as Threatened," *Federal Register* 75(40):9377–9379.

USFWS, 2010c, *Draft Revised Recovery Plan for the Utah Prairie Dog* (Cynomys parvidens), USFWS Utah Ecological Services, West Valley City, Utah, Aug.

USFWS, 2010d, "Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Amargosa Toad as Threatened or Endangered," *Federal Register* 75: 42040–42054.

USFWS, 2010e, "Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Tucson Shovel-nosed Snake (*Chionactis occipitalis klauberi*) as Threatened or Endangered with Critical Habitat. Proposed Rule," *Federal Register* 75: 16050–16065.

USFWS, 2010f, "Endangered and Threatened Wildlife and Plants; Listing the Mountain Plover as Threatened," *Federal Register* 75:37353–37358.

USFWS, 2011, "Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule to List the Flat-Tailed Horned Lizard as Threatened," *Federal Register* 76:14209–14268.

USGS (U.S. Geological Survey), 2005a, *National Gap Analysis Program, Southwest Regional GAP Analysis Project—Land Cover Descriptions*. RS/GIS Laboratory, College of Natural Resources, Utah State University. Available at http://earth.gis.usu.edu/swgap/legend_desc.html. Accessed March 15, 2010.

USGS, 2005b, *Southwest Regional GAP Analysis Project*, U.S. Geological Survey National Biological Information Infrastructure. Available at http://fws-nmcfwru.nmsu.edu/swregap/habitatreview/Review.asp.

USGS, 2010, *National Biological Informatics Infrastructure (NBII), California Regional Gap Analysis Project (CAReGAP)*. Available at http://gapanalysis.nbii.gov/portal/community/GAP_Analysis_Program/Communities/Maps,_Data,_&_Reports/Find_Updated_GAP_Regional_Data. Accessed March 4, 2010.

Utah Native Plant Society, 2010, *Utah Rare Plant Guide*. Available at http://www.utahrareplants.org/rpg_species.html#All. Accessed July 22, 2010.

VRHCRP (Virgin River Habitat Conservation & Recovery Program), 2012, *Sticky Ringstem (*Anulocaulis leisolenus*) Protection Warranted*. Available at http://vrhcrp.mesquitenv.gov/data/species/sticky%20ringstem%20072208%20with%20photo.pdf. Accessed March 28, 2012.

Warner, R.M., and N.J Czaplewski, 1984, "Mammalian Species," *The American Society of Mammologists* 224:1–4.

Western Bat Working Group, 2010, *Species Accounts.* Available at http://www.wbwg.org/speciesinfo/species_accounts/species_accounts.html. Accessed Oct. 20, 2010.

WildEarth Guardians, 2010, *Petition to List Six Sand Dune Beetles under the Endangered Species Act*, petition to the U.S. Fish and Wildlife Service, Santa Fe, N.M.

Zeiner, D.C., et al., 1990, *California's Wildlife,* Vols. I–III, California Department of Fish and Game, Sacramento, Calif.

This page intentionally left blank.

APPENDIX K:

UPDATE TO GOVERNMENT-TO-GOVERNMENT AND CULTURAL RESOURCE CONSULTATIONS

This page intentionally left blank.

APPENDIX K:

UPDATE TO GOVERNMENT-TO-GOVERNMENT AND CULTURAL RESOURCE CONSULTATIONS

K.1 UPDATE TO TRIBAL CONSULTATION

This section of Appendix K provides detailed information on the status of government-to-government consultation for the Final *Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern Western States* (Solar PEIS). The information presented in this update to Section K.1 for the Final Solar PEIS supplements, but does not replace, the information provided in the corresponding Section K.1 in the Draft Solar PEIS. The information herein post-dates the release of the Draft Solar PEIS and is therefore a continuation of consultation activities that have occurred since December 2010.

K.1.1 Introduction

Government-to-government consultation was initiated in 2008 by the Bureau of Land Management (BLM) for the Solar PEIS under Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments" (*Federal Register*, Volume 65, pages 67249–67252, Nov. 9, 2000). A record of consultation that occurred prior to release of the Draft Solar PEIS in December 2010 is available in Appendix K of the Draft Solar PEIS. This section provides an overview of tribal consultation efforts that have occurred between the release of the Draft Solar PEIS and June 15, 2012.

On February 15, 2011, a package was sent to 314 federally recognized Native American tribes, bands, and chapters containing a copy of the Reader's Guide and Executive Summary for the Draft Solar PEIS, a DVD containing the full text of the Draft Solar PEIS, and a copy of the draft proposed Solar Programmatic Agreement (PA). This letter was issued in support of Section 106 of the National Historic Preservation Act (NHPA) and requested their comments or concerns on the drafts. See Table K-1 and Section K.1.2.

On October 26, 2011, a letter was sent to 314 federally recognized Native American tribes, bands, and chapters seeking comments on the Supplement to the Draft Solar PEIS, the revised Draft Solar PA, and the ethnographic studies that were conducted in support of the Draft Solar PEIS. This mailing also included a question and answer (Q&A) fact sheet explaining the BLM tribal consultation process. See Table K-1 and Section K.1.2.

In December 2011, the BLM issued Instruction Memorandum (IM) 2012-032, which established the schedule and procedure for ongoing government-to-government consultation in connection with the solar energy program. The IM directed BLM field offices to take additional steps to explain to Native American tribes how their input was taken into account during the preparation of the Final Solar PEIS and how consultation will continue upon the receipt of project-specific solar applications. See Section K.1.3 to view a copy of the IM.

TABLE K-1 Update to Index of Agencies, Organizations, and Tribal Governments Since the Release of the Draft Solar PEIS

Date	Originating Agency/ Tribal Government	Recipient Organization	Page
February 15, 2011	BLM	Various	K-40
October 26, 2011	BLM	Various	K-51

More than 65 tribes have participated in the consultation process through correspondence, phone conversations, e-mails, and the transmission of maps, documents, and reports. Face-to-face meetings with 18 tribes have led to the exchange of information and discussion of concerns that have shaped the outcome of this PEIS process. The status of this information and process is provided in Table K-2.

Fifteen federally recognized tribes (Big Pine Paiute Tribe of the Owens Valley, Chemehuevi Indian Tribe, Colorado River Indian Tribe, Duckwater Shoshone Tribe, the Gila River Indian Community, the Hopi Tribe, the Pawnee Nation of Oklahoma, the Quechan Indian Tribe, San Manuel Band of Mission Indians, Soboba Band of Luiseno Indians, Summit Lake Paiute Tribe, Susanville Indian Rancheria, Washoe Tribe of Nevada and California, Yavapai Prescott Indian Tribe, and Ysleta del Sur Pueblo) provided comments on the Draft Solar PEIS, the Draft Solar PA, and/or the Supplement to the Draft Solar PEIS through the National Environmental Protection Act (NEPA) process by submitting written letters and/or by speaking at public meetings. Responses to all comments are presented in Volume 7 of this Final Solar PEIS (Comments and Responses), except for the letters in which the comments that were made would not result in a change to the Solar PEIS between the Draft and the Final: (1) The Yavapai Prescott Indian Tribe requested to consult on the Solar PA after receiving the February 15 letter from the BLM. (2) The Gila River Indian Community found the Draft Solar PEIS and Draft Solar PA to be in acceptable form. (3) Susanville Indian Rancheria stated that their aboriginal territory would not be directly impacted but wished to remain on BLM's list of contacts. (4) The Pawnee Nation of Oklahoma stated they had no known historic properties that would be affected by the proposed action.

Consultation between the BLM and the tribes is ongoing and will continue to take place after the release of the Final Solar PEIS.

TABLE K-2 Update to Summary of BLM Consultation with Federally Recognized Native American Tribes

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
AZ	Ak Chin Indian Community Council	Maricopa	+	+	+	+		**2012/04/17 –** The Ak Chin Indian Community was represented at a BLM presentation to the Four Southern Tribes Cultural Resources Group focusing on the Restoration Design Energy Project (RDEP) EIS, related to the Solar PEIS. **2012/05/23 –** Ak Chin represented at BLM Arizona tribal meeting on renewable energy.	**2012/04/17 –** No comments or questions on the Solar PEIS were raised at the BLM presentation/discussion. **2012/05/23 –** Tribes at renewable energy meeting stress the need for early consultation, timely and appropriate review opportunities, and ethnographic studies for energy projects on BLM lands.
AZ	Cocopah Tribal Council	Somerton	+	+	+	+		**2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS.	
AZ	Colorado River Indian Tribal Council	Parker	+		+	+	+	**2012/01/24 –** The Pahrump Field Office spoke with Chairman Enas. Mr. Enas indicated that he had heard of the Solar PEIS but did not have any details. **2012/01/24 –** The Pahrump Field Office emailed SEZ descriptions for Nevada to Mr. Enas. **2012/2/24** – The Pahrump Field Office left message with Mr. Enas's secretary asking for any comments/concerns about PEIS and Dry Lake/Armargosa SEZs. **2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS and the RDEP EIS.	**2012/01/27 –** The Colorado River Indian Tribe (CRIT) provided comments on the Supplement to the Draft Solar PEIS. CRIT believes that insufficient data are provided on the topic of cultural resources and agrees with the Quechan letter. CRIT would like to see a delay in the implementation of California SEZs until the differing explanations of the Desert Renewable Energy Conservation Plan are resolved and the plan is completed. CRIT believes that developers should pay a cultural resources mitigation fee and that excavation does not mitigate disturbance. CRIT maintains that they have not seen a copy of the PA* and that additional ethnographic studies were necessary. (*A copy of the PA was sent via certified mail and was signed for by a member of the tribe.)
AZ	Fort McDowell Yavapai Tribal Council	Fountain Hills	+	+	+	+			

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
AZ	Fort Yuma Quechan Tribe	Yuma	+	+	+	+	+	**2011/12/07 –** El Centro Field Office Public Scoping Meeting held. **2012/01/25 –** BLM received a letter from Quechan's Seattle lawyers. **2012/05/23** – Quechan represented at BLM Arizona tribal meeting on renewable energy.	**2011/03/07** – Letter from Frank Joziak and Thane Summerville, attorneys for the Quechan Tribe, submitting comments on the Draft Solar PEIS. The letter indicates that the purpose and need are misleading and that there is no legal mandate for utility-scale solar development on public lands. The Tribe opposes the "No Action Alternative" and the "Modified Development Program Alternative," but supports the concept of the "Solar Energy Zone Alternative." The letter indicates that Class L lands within the California Desert Conservation Area should be excluded from potential development and that the Imperial East SEZ should be dropped as a potential SEZ. The Quechan feel they are directly affected by solar development on BLM land because some of the SEZs are located in Quechan traditional territory. The Tribe expects full compliance with regard to Section 106 and government-to-government consultation. The Tribe encourages the use of previously used lands for solar development and disagrees with the impact characterizations for each alternative provided in the draft. **2011/05/02 –** Letter submitted by Courtney Coyle, attorney for the Quechan Indian Nation, through its Culture Committee, in response to the Draft Solar PEIS. The letter indicates that the Quechan are surprised and disappointed to see the Indian Pass Area

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									included in the PEIS as "Lands Available for Application" and respectfully request that the lands east of Ogilby Road in Imperial County, California, be taken off all Solar PEIS maps for any type of renewable energy application or zone. The Quechan also request that meaningful consultation occur between the federal government and the Quechan Indian Nation prior to the Solar PEIS Record of Decision (ROD) in order to determine which areas, if any, west of Ogilby Road may be appropriate to study for renewable energy development. The Quechan would also like the government to take appropriate steps to protect the Indian Pass Area in perpetuity.
									2012/01/20 – E-mail from John Bathke, Historic Preservation Officer to Argonne National Laboratory. Letter requests extension for submitting comments on the Draft Solar PEIS and Draft Solar PA and anticipates sending comments by January 27. Return e-mail from Heidi Hartmann, Argonne, informing Mr. Bathke that January 27 would be acceptable. **2012/01/25** – Letter from Frank Jozwiak and Thane Somerville, attorneys for the Quechan, commenting on the Supplement to the Draft Solar PEIS. The Tribe finds their comments on the draft were not adequately addressed in the supplement. The existence of a federal mandate for utility-scale solar energy projects is questioned. The Tribe is

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									opposed to the No Action Alternative and the modified solar energy program alternative. It finds the modified SEZ program to be the best alternative. The Tribe challenges the legality of utility-scale solar development on Class L lands and contends that BLM cannot legally continue to process solar energy projects without a program in place and that the Imperial East SEZ should be removed. The tribe finds there has been has been no government-to-government consultation with the tribe. Cultural resources must be taken into account early in the process for developing solar energy projects. **2012/05/23** – Tribes at the renewable energy meeting stress the need for early consultation, timely and appropriate review opportunities, and ethnographic studies for energy projects on BLM lands.
AZ	Gila River Indian Community Council	Sacaton	+	+	+	+	+	**2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS. **2012/04/17 –** Gila River Indian Community represented at a BLM presentation to the Four Southern Tribes Cultural Resources Group focusing on the RDEP EIS, related to the Solar PEIS.	**2011/4/12** – Letter from Barnaby B. Lewis, Tribal Historic Preservation Officer (THPO)-Gila River Indian Community, to Minerals and Realty Management, in response to the Draft Solar PEIS and Draft Solar PA, indicating that the THPO has reviewed the documents and found them in acceptable form. The Tribe would like to review the Solar PA when it becomes available. The letter identifies the proposed project area as being within the ancestral lands of the Four Southern Tribes (Gila River Indian Community, Salt River-Pima Maricopa Indian

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									Community, the Ak-Chin Indian Community, and the Tohono O'odham Nation). **2012/04/17** – No comments or questions on the Solar PEIS were raised at the BLM presentation/discussion.
AZ	Havasupai Tribal Council	Supai	+		+	+		**2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS.	
AZ	Hopi Tribal Council	Kykotsmovi	+	+	+	+	+	**2012/04/25** – Alicia Beat, Renewable Energy Team Archaeologist, San Luis Valley Public Lands Center, met with members of the Hopi Tribe to discuss ethnographic work in the San Luis Valley and the Solar PEIS.	**2012/01/23 –** Letter from the Hopi Tribe. The Hopi are interested in consulting on any proposal for lands within Arizona, New Mexico, Nevada, or Utah, when there is potential for harming archaeological sites. The Hopi indicated that the Supplement to the Draft Solar PEIS demonstrates how little the BLM knows about cultural resources that are in its care because few surveys have occurred in the proposed SEZs. The Hopi support cultural resource surveys and continued government-to-government consultation. The Hopi support the Nevada tribes' comments that the cultural significance of the proposed SEZ is expressed in terms of the connection between the surrounding landscape and its associated artifacts. The Hopi note that no survey has been conducted within the Brenda SEZ and that further ethnographic studies and consultations need to be conducted. **2012/01/31 –** Letter from the Hopi Tribe supplying comments on the Supplement to the Draft Solar PEIS. The Hopi claim cultural affiliation to prehistoric cultural

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									groups in Arizona and believe that archaeological sites are the "footprints" of their ancestors. To this end, the Hopi support the identification and avoidance of prehistoric archaeological sites and appreciate the BLM's efforts to consult with the Hopi. The Hopi are interested in how the BLM will address cumulative impacts from alternative energy development in landscape-scale terms. The Hopi look forward to consulting on the design and implementation of the Brenda SEZ archaeological sample survey. The letter states that an additional letter dated August 11, 2011, was included with this letter and is summarized as follows: The Hopi are interested in continuing consultation on the proposed Agua Caliente SEZ and would like to see the results of the archaeological sample survey of the area as well as the potential impacts of the proposal on Sears Point. **2012/02/13** – Letter from the Hopi indicating that they claim cultural affiliation with prehistoric cultural groups in Colorado. They reiterated that archaeological sites are the "footprints" of their ancestors and that they support the identification and avoidance of prehistoric archaeological sites and appreciate the BLM's efforts to consult with the Hopi. The Hopi indicated that the Supplement to the Draft Solar PEIS demonstrates how little the BLM knows about cultural resources that are in its care because few surveys have occurred

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									in the proposed SEZs. The Hopi support cultural resource surveys and continued government-to-government consultation. The Hopi support the Nevada tribes' comments that the cultural significance of the proposed SEZ is expressed in terms of the connection between the surrounding landscape and its associated artifacts. The Hopi are interested in how the BLM will address cumulative impacts from alternative energy development in landscape-scale terms and look forward to consulting on the design and implementation of archaeological sample surveys for the proposed Colorado SEZs. **2012/04/25:** The Hopi Tribe had no further comments than what had already been submitted on the Solar PEIS.
AZ	Hualapai Tribal Council	Peach Springs	+	+	+	+		**2012/03/08 –** Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS. **2012/05/23** – Hualapai represented at BLM Arizona tribal meeting on renewable energy.	**2012/05/23** – Tribes at renewable energy meeting stress need for early consultation, timely and appropriate review opportunities, and ethnographic studies for energy projects on BLM lands.
AZ	Kaibab Paiute Tribal Council	Fredonia	+		+			**2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS. **2012/05/23 –** Kaibab Paiute represented at BLM Arizona tribal meeting on renewable energy.	**2012/05/23** – Tribes at renewable energy meeting stress need for early consultation, timely and appropriate review opportunities, and ethnographic studies for energy projects on BLM lands.

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
AZ	Navajo Nation	Window Rock	+	+	+			**2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS. **2012/04/26** – Alicia Beat, Renewable Energy Team Archaeologist, San Luis Valley Public Lands Center, met with members of the Navajo Nation to discuss ethnographic work in the San Luis Valley and the Solar PEIS.	**2012/04/26** – The Navajo Nation had no further comments than what had already been submitted during the scoping period for the PEIS (see Draft Solar PEIS).
AZ	Navajo Nation, Birdsprings Chapter	Winslow	+		+				
AZ	Navajo Nation, Black Mesa Chapter	Pinon	+		+				
AZ	Navajo Nation, Blue Gap/Tachee Chapter	Blue Gap	+		+				
AZ	Navajo Nation, Bodaway-Gap Chapter	Gap	+		+				
AZ	Navajo Nation, Cameron Chapter	Cameron	+		+				
AZ	Navajo Nation, Chilchinbeto Chapter	Kayenta	+						**2009/9/17 –** Mr. Albert Tinhorn, the Community Services Director for the Chapter, communicated to Linda Resseguie of BLM via telephone that the solar energy study areas were not located near areas of the Chapter's interest and the Chapter does not want any further information on the Solar PEIS.[a]
AZ	Navajo Nation, Chinle Chapter	Chinle	+		+				
AZ	Navajo Nation, Coalmine Canyon Chapter	Tuba City	+		+				
AZ	Navajo Nation, Coppermine Chapter	Page	+		+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
AZ	Navajo Nation, Cornfields Chapter	Ganado	+		+				
AZ	Navajo Nation, Cove Chapter	Red Valley	+		+				
AZ	Navajo Nation, Dennehotso Chapter	Dennehotso	+		+				
AZ	Navajo Nation, Dilkon Chapter	Winslow	+		+				
AZ	Navajo Nation, Forest Lake Chapter	Pinon	+		+				
AZ	Navajo Nation, Fort Defiance Chapter	Fort Defiance	+		+				
AZ	Navajo Nation, Ganado Chapter	Ganado	+		+				
AZ	Navajo Nation, Greasewood Springs Chapter	Ganado	+		+				
AZ	Navajo Nation, Hardrock Chapter	Kykotsmovi	+		+				
AZ	Navajo Nation, Houck Chapter	Houck	+		+				
AZ	Navajo Nation, Indian Wells Chapter	Indian Wells	+		+				
AZ	Navajo Nation, Inscription House Chapter	Tonalea	+		+				
AZ	Navajo Nation, Jeddito Chapter	Keams Canyon	+		+				
AZ	Navajo Nation, Kaibeto Chapter	Kaibeto	+		+				
AZ	Navajo Nation, Kayenta Chapter	Kayenta	+		+				
AZ	Navajo Nation, Kinlichee Chapter	St. Michael	+		+				
AZ	Navajo Nation, Klagetoh Chapter	Ganado	+			+			**2009/07/13 –** Nancy Chee confirmed to the BLM via phone that the solar energy study areas are not close enough to Chapter lands, there is little interest in

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									solar energy projects at this point in time, and the Klagetoh Chapter is not interested in further consultation.[a]
AZ	Navajo Nation, LeChee Chapter	Page	+		+				
AZ	Navajo Nation, Leupp Chapter	Leupp	+		+				
AZ	Navajo Nation, Low Mountain Chapter	Blue Gap	+			+			**2010/3/30 –** Gerald Ahsteen, Low Mountain Chapter President, communicated to the BLM via telephone that the nearest BLM land was 150 miles away from the Chapter location and that the Chapter has no real interest or concern with regard to the BLM Solar PEIS effort.[a]
AZ	Navajo Nation, Lukachukai Chapter	Lukachukai	+		+				
AZ	Navajo Nation, Lupton Chapter	Lupton	+		+				
AZ	Navajo Nation, Many Farms Chapter	Many Farms	+		+				
AZ	Navajo Nation, Mexican Water Chapter	Teec Nos Pos	+		+				
AZ	Navajo Nation, Nahata Dzill Chapter	Sanders	+		+				
AZ	Navajo Nation, Navajo Mountain Chapter	Tonalea	+		+				
AZ	Navajo Nation, Nazlini Chapter	Nazlini	+		+				
AZ	Navajo Nation, Oak Springs Chapter	Window Rock	+		+				
AZ	Navajo Nation, Pinon Chapter	Pinon	+		+				
AZ	Navajo Nation, Red Valley Chapter	Red Valley	+		+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
AZ	Navajo Nation, Rock Point Chapter	Rock Point	+		+				
AZ	Navajo Nation, Rough Rock Chapter	Chinle	+		+				
AZ	Navajo Nation, Round Rock Chapter	Round Rock	+		+				
AZ	Navajo Nation, Sawmill Chapter	Ft. Defiance	+		+				
AZ	Navajo Nation, Shonto Chapter	Shonto	+		+				
AZ	Navajo Nation, St. Michael Chapter	St. Michael	+		+				
AZ	Navajo Nation, Steamboat Chapter	Ganado	+		+				
AZ	Navajo Nation, Sweetwater Chapter	Teec Nos Pos	+		+				
AZ	Navajo Nation, Teec Nos Pos Chapter	Teec Nos Pos	+		+				
AZ	Navajo Nation, Teesto Chapter	Winslow	+		+				
AZ	Navajo Nation, Toh Nanees Dizi Chapter	Tuba City	+		+				
AZ	Navajo Nation, Tolani Lake Chapter	Winslow	+		+				
AZ	Navajo Nation, Tonalea Chapter	Tonalea	+		+				
AZ	Navajo Nation, Tsaile/Wheatfields Chapter	Tsaile	+		+				
AZ	Navajo Nation, Tselani/Cottonwood Chapter	Chinle	+		+				
AZ	Navajo Nation, Whippoorwill Chapter	Pinon	+		+				
	Navajo Nation, White Cone Chapter	Indian Wells	+		+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
AZ	Navajo Nation, Wide Ruins Chapter	Chambers	+		+				
AZ	Pascua Yaqui Tribal Council	Tucson	+		+			**2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS. **2012/05/23** – Pascua Yaqui represented at BLM Arizona tribal meeting on renewable energy.	**2012/05/23** – Tribes at renewable energy meeting stress need for early consultation, timely and appropriate review opportunities, and ethnographic studies for energy projects on BLM lands.
AZ	Salt River Pima-Maricopa Indian Community Council	Scottsdale	+	+	+	+		**2012/03/08 –** Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS. **2012/04/17 –** The Salt River Pima-Maricopa Indian Community was represented at a BLM presentation to the Four Southern Tribes Cultural Resources Group focusing on the RDEP EIS, which is related to the Solar PEIS.	**2012/04/17** – No comments or questions on the Solar PEIS were raised at the BLM presentation/discussion.
AZ	San Carlos Tribal Council	San Carlos	+	+	+			**2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS.	
AZ	San Juan Southern Paiute Council	Tuba City	+		+				
AZ	Tohono O'odham Nation	Sells	+		+	+		**2012/02/16 –** The Lower Sonoran Field Office offered to meet with the THPO, Tohono O'odham Council, and Four Southern Tribes Cultural Committee. **2012/03/08 –** Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS. **2012/04/17 –** The Tohono O'odham Nation was represented at a BLM presentation to the Four Southern Tribes Cultural Resources Group focusing on the RDEP EIS, which is related to the Solar PEIS.	**2012/02/15** – Letter from Tohono O'odham indicating concerns for cultural sites and landscapes in the area. This part of the Gila River is being considered for protection. They have requested survey results and USGS maps of the area. **2012/04/17** – No comments or questions on the Solar PEIS were raised at the BLM presentation/discussion.

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
AZ	Tonto Apache Tribal Council	Payson	+		+			**2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS.	
AZ	White Mountain Apache Tribe	Whiteriver	+					**2012/03/08** – Letter from BLM State Office explaining the relationship of the Solar PEIS to the RDEP EIS. **2012/03/09 –** The Las Cruces District Office offered to meet with the White Mountain Apache and provide maps and information.	
AZ	Yavapai-Apache Nation Tribal Council	Camp Verde	+		+	+			
AZ	Yavapai-Prescott Board of Directors	Prescott	+		+		+		**2011/05/11 –** Letter from President Ernest Jones in response to the Draft Solar PEIS indicating they would like to participate in consultation.
CA	Agua Caliente Band of Cahuilla Indians	Palm Springs	+	+	+				
CA	Alturas Rancheria	Alturas	+		+				
CA	Augustine Band of Mission Indians	Coachella	+	+	+				
CA	Barona Group of the Capitan Grande	Lakeside	+	+	+				
CA	Bear River Band of Rohnerville Rancheria	Loleta	+		+				
CA	Benton Paiute Reservation	Benton	+		+				
CA	Berry Creek Rancheria	Oroville	+		+				
CA	Big Lagoon Rancheria	Trinidad	+		+				
CA	Big Pine Paiute Tribe of the Owens Valley	Big Pine	+	+	+		+	**2011/02/14** – L. Resseguie responded to e-mail from Bill Helmer. E-mail provided Draft PA and Linda's contact information to the Tribe.	**2011/03/07** – Bill Helmer, THPO, called Bruce Verhaaren of Argonne National Laboratory in response to the March 1 mailing of the Draft Solar PEIS to tribal specialists. Mr. Helmer was concerned

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
								2011/03/03 – Three additional copies of the Draft PEIS and PA provided to the Tribe. **2011/04/06** – Ashley Conrad-Saydh, BLM California State Office (CASO), met with the Big Pine Council.	that the draft was not sent to THPOs at the same time as the initial December 2010 mailing was sent and wondered why the Solar PA was not included when the Draft Solar PEIS was released. He indicated that it would be difficult to meet the March 17 deadline to review the documents and suggested that the local BLM field office should be involved in informing tribes regarding projects such as the Solar PEIS. Mr. Verhaaren explained to Mr. Helmer that he could request additional time for review from the BLM. **2011/03/14 –** THPO requests that BLM brief the tribal council on the PEIS. **2011/04/06** – Ashley Conrad-Saydh, CASO, met with the Big Pine Council. The council wanted to ensure that site-specific reviews would occur for specific future projects. It was concerned about effects on water and wildlife. It wanted to know how developers are vetted. **2011/04/07** – THPO met with Charlotte Hunter, BLM State Archaeologist and Native American Liaison for California (at Big Pine). THPO's major concern was that there was not enough time to review the PEIS and PA, get questions answered, and prepare a presentation for the tribal council; nonetheless, it was a cordial meeting. **2011/06/09 –** Letter from Virgil Moose, Council Chairperson, in response to the

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									Draft Solar PEIS and Draft Solar PA. The letter thanks the BLM for extending the comment period for tribes and for their presentation on April 6. The letter indicates that the Solar PEIS is too large in scope and that it is impossible for tribes to adequately analyze it due to its large size. The letter claims that government-to-government was inadequate. Mr. Moose indicates that there is no congressional or presidential mandate for utility-scale solar development and that solar development efforts should be concentrated on already-developed lands or brownfields rather than on BLM lands. The letter states that the Alternatives section is inadequate and does not provide a true range of alternatives. Mr. Moose states that the Solar PA was not sent to the Big Pine Paiute until two months after the distribution of the PEIS and that he believes it is virtually impossible to conduct meaningful consultation with tribes given the "fast-track" nature of the PEIS. He states that meaningful consultation was never conducted. The Big Pine Paiute strongly favor well-planned solar development projects but believe that distributed generation and solar rooftops should be at the forefront of energy policy. **2012/01/27** – Letter from Virgil Moose providing comments on the Supplement to the Draft Solar PEIS and Draft Solar PA. The letter states that the Supplement did not address comments provided by

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									the Tribe. Specifically, the Supplement did not address the “distributed generation” alternative. The Tribe believes that large-scale solar projects should not be built on desert lands that are not disturbed, degraded, or contaminated and that development should be concentrated on already-disturbed lands. The Tribe believes that the modified Solar Energy Development Program Alternative is inadequate and does not support it. The letter reiterates that the Big Pine Paiute Tribe favors well-planned solar energy development and that efforts should be concentrated on distributed generation and solar rooftops.
CA	Big Sandy Rancheria	Auberry	+		+				
CA	Big Valley Rancheria	Lakeport	+		+				
CA	Bishop Paiute Tribe	Bishop	+	+	+				
CA	Blue Lake Rancheria	Blue Lake	+	+	+				
CA	Bridgeport Indian Colony	Bridgeport	+		+				
CA	Buena Vista Rancheria	Sacramento	+		+				
CA	Cabazon Band of Cahuilla Mission Indians	Indio	+	+	+				
CA	Cahto Tribal Executive Committee	Laytonville	+		+				
CA	Cahuilla Band of Mission Indians	Anza	+	+	+				**2011/06/09** – The Cahuilla Band of Mission Indians provided comments on the Draft Solar PEIS and Draft Solar PA during the public comment period. The Cahuilla feel the Solar PEIS is too large in scope and that there has been inadequate government-to-government consultation.

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
CA	California Valley Miwok Tribe	Stockton	+		+				
CA	Campo Band of Mission Indians	Campo	+		+				
CA	Cedarville Rancheria	Alturas	+	+	+				
CA	Chemehuevi Tribal Council	Havasu Lake	+		+	+	+	**2011/02/13** – The Chemehuevi met with the BLM Colorado River District Office. **2012/01/24** – Mark Spencer and Kathy Sprowl of the Pahrump Field Office spoke with Chairman Wood. **2012/03/09** – Mark Spencer spoke with Chairman Wood. **2012/03/09** – E-mail follow-up from the Pahrump Field Office containing SEZ and PEIS information.	**2011/02/13** – Chairman Wood spoke at a Barstow, California, public meeting. He stated that the tribes believe that they have been neglected when considering where to site energy development and that the tribes want energy development on their lands. They are concerned about tortoise habitat, intaglios, water rights, congestion, and industrial development as a result of solar energy development within the Iron Mountain, Riverside East, and Pisgah SEZs. They would like to know the Bureau of Indian Affairs' (BIA's) involvement. The tribes expressed the sentiment that Indians have personal ties to the land. **2012/03/09** – During a phone conversation with Mark Spencer, Chairman Wood mentioned that there are some tribal ties to Ash Meadows, but he would probably have no major concerns with regard to the Amargosa or Dry Lake SEZs. Chairman Wood requested that Spencer re-send him the link to the Solar PEIS, the SEZ information, and the question and answer (Q&A) fact sheet.
CA	Chicken Ranch Rancheria	Jamestown	+		+				
CA	Cloverdale Rancheria	Cloverdale	+		+				
CA	Cold Springs Rancheria	Tollhouse	+		+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
CA	Colusa Rancheria	Colusa	+		+				
CA	Cortina Rancheria	Williams	+		+				
CA	Coyote Valley Reservation	Redwood Valley	+		+				
CA	Dry Creek Rancheria	Geyserville	+		+				
CA	Elem Indian Colony	Clearlake Oaks	+		+				
CA	Elk Valley Rancheria	Crescent City	+		+				
CA	Enterprise Rancheria	Oroville	+		+				
CA	Ewiiaapaayp Band of Kumeyaay Indians	Alpine	+		+				
CA	Federated Indians of Graton Rancheria	Rohnert Park	+		+				
CA	Fort Bidwell Reservation	Fort Bidwell	+		+				
CA	Fort Independence Indian Reservation	Independence	+		+				
CA	Fort Mojave Tribal Council	Needles	+	+	+	+		**2012/01/12** – Mark Spencer spoke with Chairman Williams and described the purpose of the Solar PEIS follow-up call. **2012/01/12** – E-mail follow-up, provided SEZ handouts for Amargosa and Dry Lake.	**2012/01/12** – Chairman Williams indicated he was setting up meetings in the California Desert District with BLM in January and February in Palm Springs, to create tribally generated maps that show culturally sensitive areas and areas where solar development would be considered okay. He invited the Southern Nevada District Office to attend the meeting and recommended that a similar meeting be held in Nevada. The Tribe is in favor of solar development on tribal lands. **2012/01/12 –** During a phone call with Mark Spencer, Chairman Williams requested SEZ descriptions, the fact sheet, and the link to the Solar PEIS. **2012/01/31** – During a phone conversation with Mark Spencer, the

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									secretary for Chairman Williams, Dolores, indicated that Chairman Williams was unavailable and that there were no comments, but he would respond.
CA	Greenville Rancheria	Greenville	+		+				
CA	Grindstone Rancheria	Elk Creek	+		+				
CA	Guidiville Rancheria	Talmage	+		+				
CA	Habematolel Pomo of Upper Lake	Upper Lake	+		+				
CA	Hoopa Valley Tribal Council	Hoopa	+		+				
CA	Hopland Reservation	Hopland	+		+				
CA	Inaja-Cosmit Reservation	Escondido	+		+				
CA	Ione Band of Miwok Indians	Ione	+		+				
CA	Jackson Rancheria	Jackson	+		+				
CA	Jamul Indian Village	Jamul	+		+				
CA	Karuk Tribe of California	Happy Camp	+		+				
CA	La Jolla Band of Luiseño Indians	Pauma Valley	+		+				
CA	La Posta Band of Mission Indians	Boulevard	+		+				
CA	Lone Pine Paiute Shoshone Reservation	Lone Pine	+		+				
CA	Los Coyotes Band of Cahuilla & Cupeno Indians	Warner Springs	+		+				
CA	Lower Lake Rancheria	Santa Rosa	+		+				
CA	Lytton Rancheria	Santa Rosa	+		+				
CA	Manchester - Point Arena Band of Pomo Indians	Point Arena	+		+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
CA	Manzanita Band of Mission Indians	Boulevard	+		+				
CA	Mechoopda Indian Tribe of the Chico Rancheria	Chico	+		+				
CA	Mesa Grande Band of Mission Indians	Santa Ysbel	+		+				
CA	Middletown Rancheria	Middletown	+		+				
CA	Mooretown Rancheria	Oroville	+		+				
CA	Morongo Band of Mission Indians	Banning	+		+				
CA	North Fork Rancheria	North Fork	+	+	+				
CA	Pala Band of Mission Indians	Pala	+	+	+				
CA	Paskenta Band of Nomlaki Indians	Orland	+		+				
CA	Pauma/Yuima Band of Mission Indians	Pauma Valley	+		+				
CA	Pechanga Band of Mission Indians	Temecula	+	+	+				
CA	Picayune Rancheria of Chukchansi Indians	Coarsegold	+		+				
CA	Pinoleville Reservation	Ukiah	+		+				
CA	Pit River Tribal Council	Burney	+		+				
CA	Potter Valley Tribe	Ukiah	+		+				
CA	Quartz Valley Reservation	Fort Jones	+		+				
CA	Ramona Band of Mission Indians	Anza	+		+				
CA	Redding Rancheria	Redding	+	+	+				
CA	Redwood Valley Reservation	Redwood Valley	+	+	+				
CA	Resighini Rancheria	Klamath	+	+	+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
CA	Rincon Band of Mission Indians	Valley Center	+	+	+				
CA	Robinson Rancheria	Nice	+	+	+				
CA	Round Valley Reservation	Covelo	+		+				
CA	Rumsey Rancheria	Brooks	+		+				
CA	San Manuel Band of Mission Indians	Patton	+	+	+		+		**2011/02/23** – Anthony Madrigal, Director of Cultural Resources of the San Manuel Band of Mission Indians, provided comments on the Draft Solar PEIS at the Barstow, California, public meeting. Mr. Madrigal stated his concern that cultural resources are usually not considered or are the last to be considered and that consultation with Indian people is inadequate. He stated that he was working with the Desert Renewable Energy Conservation Plan (DRECP) to put together a cultural sensitivity map and would like it to be integrated into the Solar PEIS. **2011/05/02 –** Letter from Anthony Madrigal, Director of Cultural Resources of the San Manual Band of Mission Indians, supplying comments on the Draft Solar PEIS. The letter states that the parties involved in the PEIS should look at the “fast-track” solar projects that are currently in development. The letter claims these projects did not allow enough time for adequate tribal input because consultation was initiated very late in the process and, as a result, cultural resources have been destroyed. Mr. Madrigal cites the Genesis Solar Project as an example. He urges the BLM to make a commitment to improve

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									the consultation process. The letter states that the San Manual Band of Mission Indians specifically opposes the Iron Mountain and Pisgah SEZs, which are located within Serrano traditional territory, and states that cultural resource surveys of both SEZs should be conducted. The Tribe prefers limiting solar development to discrete areas, such as SEZs, and, if feasible, to land that has already been disturbed. The Tribe requests that the BLM engage in consultation and requests an extension to the Solar PEIS comment period.
CA	San Pasqual Band of Mission Indians	Valley Center	+		+				
CA	Santa Rosa Band of Mission Indians	Hemet	+		+				
CA	Santa Rosa Rancheria	Lemoore	+		+				
CA	Santa Ynez Band of Mission Indians	Santa Ynez	+		+				
CA	Santa Ysabel Band of Dieguено Indians	Santa Ysabel	+		+				
CA	Scotts Valley Rancheria	Lakeport	+		+				
CA	Sherwood Valley Rancheria	Willits	+		+				**2011/04/05 –** Letter from Michael Fitzgerald, Tribal Chairperson of the Sherwood Valley Rancheria, indicating the area of potential effect is not located on or near aboriginal territory of the Sherwood Valley Rancheria Tribe. However, some BLM properties are located near Cow Mountain, and the Tribe would like to be notified and involved with any activity occurring near Cow Mountain. Contact information was provided.

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
CA	Shingle Springs Rancheria	Shingle Springs	+		+				
CA	Smith River Rancheria	Smith River	+		+				
CA	Soboba Band of Luiseño Indians	San Jacinto	+	+	+		+	**2010/04/06 –** Argonne spoke with Mr. Ontiveros on the phone. He requested maps, and maps were e-mailed.[a]	**2010/04/06** – During a phone conversation, Mr. Joseph Ontiveros, Soboba Cultural Resources Department, indicated there were several villages near Desert Center and requested a map by e-mail.[a]
CA	Stewarts Point Rancheria	Santa Rosa	+		+				
CA	Susanville Indian Rancheria	Susanville	+		+		+		**2011/05/04 –** E-mail from Melany Johnson to Linda Resseguie indicating that after review of the PEIS, the Rancheria found that there will be no impact on its aboriginal territory but would like to remain on the list of contacts. The Rancheria does not waive its rights to consultation.
CA	Sycuan Band of the Kumeyaay Nation	El Cajon	+		+				
CA	Table Mountain Rancheria	Friant	+		+				
CA	Timbisha Shoshone Tribe	Death Valley	+	+	+			**2012/01/04 –** The Pahrump Field Office called Chairman George Cholson. **2012/01/11 –** E-mail follow-up with information on Amargosa and Dry Lake. **2012/03/09 –** Mark Spencer spoke with Chairman Cholson.	**2009/09/17** – During a field trip to visit sites within the Pahrump Field Office territory, Ms. Durham was asked if the Timbisha had any formal comments that they would like passed on to the planners of the Solar PEIS regarding tribal concerns. She said the main four concerns for the Amargosa study area are in regard to water use, effects on the vegetation and effects on the animals in the area, and any visual changes to the landscape.[a]

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									2012/01/31 – During a telephone conversation with Mark Spencer, Chairman George Cholson stated he briefly looked over the documents and wants to take a look at them again. **2012/03/09:** Mr. Cholson indicated that he did not have any comments at this time.
CA	Torres-Martinez Desert Cahuilla Indians	Thermal	+		+				
CA	Trinidad Rancheria	Trinidad	+		+				
CA	Tule River Reservation	Porterville	+		+				
CA	Tuolumne Rancheria	Tuolumne	+		+				
CA	Twenty-Nine Palms Band of Mission Indians	Coachella	+	+	+	+			
CA	United Auburn Indian Community	Auburn	+	+	+				
CA	Viejas Band of Mission Indians	Alpine	+	+	+				
CA	Wiyot Tribe	Loleta	+	+					
CA	Woodfords Community Council	Markleeville	+	+					
CA	Yurok Tribe	Klamath	+	+					
CO	Southern Ute Tribe	Ignacio	+	+	+	+			
CO	Ute Mountain Ute Tribe	Towaoc	+	+	+	+			
ID	Shoshone-Bannock Tribes	Fort Hall	+		+				
MT	Northern Cheyenne Tribal Council	Lame Deer	+		+				
ND	Standing Rock Sioux Tribal Council	Fort Yates	+	+	+				
NM	All Indian Pueblo Council	Albuquerque	+	+	+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
NM	Eight Northern Indian Pueblos Council	San Juan Pueblo	+		+				
NM	Five Sandoval Indian Pueblos	Bernalillo	+		+				
NM	Jicarilla Apache Nation	Dulce	+	+	+	+			
NM	Mescalero Apache Tribe	Mescalero	+	+	+			**2009/10/19 –** The Las Cruces District Office held a meeting with the Fort Sill, Mescalero, and San Carlos Apache. The BLM provided a presentation along with an informational packet that included maps.[a] **2012/09/09** – The Las Cruces District Office offered to meet with the Mescalero Apache Tribe and provide letters, maps, and other information.	**2009/10/19 –** The Fort Sill, Mescalero, and San Carlos Apache met with the BLM. The BLM provided a presentation along with an informational packet that included maps. There was no discussion.[a]
NM	Navajo Nation, Alamo Chapter	Magdalena	+		+				
NM	Navajo Nation, Baahaali Chapter	Gallup	+		+				
NM	Navajo Nation, Baca/Prewitt Chapter	Prewitt	+		+				
NM	Navajo Nation, Becenti Chapter	Crownpoint	+		+				
NM	Navajo Nation, Beclabito Chapter	Shiprock	+		+				
NM	Navajo Nation, Casamero Lake Chapter	Prewitt	+		+				
NM	Navajo Nation, Chichiltah Chapter	Gallup	+		+				
NM	Navajo Nation, Churchrock Chapter	Churchrock	+		+				
NM	Navajo Nation, Counselor Chapter	Counselor	+		+				
NM	Navajo Nation, Coyote Canyon	Brimhall	+		+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
	Chapter								
NM	Navajo Nation, Crownpoint Chapter	Crownpoint	+		+				
NM	Navajo Nation, Crystal Chapter	Navajo	+		+				
NM	Navajo Nation, Gadii'ahi/To'koi Chapter	Shiprock	+		+				
NM	Navajo Nation, Huerfano Chapter	Bloomfield	+		+				
NM	Navajo Nation, Iyanbito Chapter	Fort Wingate	+		+				
NM	Navajo Nation, Lake Valley Chapter	Crownpoint	+		+				
NM	Navajo Nation, Little Water Chapter	Crownpoint	+		+				
NM	Navajo Nation, Manuelito Chapter	Manuelito	+		+				
NM	Navajo Nation, Mariano Lake Chapter	Smith Lake	+		+				
NM	Navajo Nation, Mexican Springs Chapter	Mexican Springs	+		+				
NM	Navajo Nation, Nageezi Chapter	Nageezi	+		+				
NM	Navajo Nation, Nahodishgish Chapter	Crownpoint	+		+				
NM	Navajo Nation, Naschitti Chapter	Sheep Springs	+		+				
NM	Navajo Nation, Nenahnezad Chapter	Fruitland	+		+				
NM	Navajo Nation, Newcomb Chapter	Newcomb	+		+				
NM	Navajo Nation, Ojo Encino Chapter	Cuba	+		+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
NM	Navajo Nation, Pinedale Chapter	Churchrock	+		+				
NM	Navajo Nation, Pueblo Pintado Chapter	Cuba	+		+				
NM	Navajo Nation, Ramah Chapter	Ramah	+		+				
NM	Navajo Nation, Red Lake #18 Chapter	Navajo	+		+				
NM	Navajo Nation, Red Rock Chapter	Gallup	+		+				
NM	Navajo Nation, Rock Springs Chapter	Yatahey	+		+				
NM	Navajo Nation, San Juan Chapter	Fruitland	+		+				
NM	Navajo Nation, Sanostee Chapter	Sanostee	+		+				
NM	Navajo Nation, Sheep Springs Chapter	Sheep Springs	+		+				
NM	Navajo Nation, Shiprock Chapter	Shiprock	+		+				
NM	Navajo Nation, Smith Lake Chapter	Smith Lake	+		+				
NM	Navajo Nation, Standing Rock Chapter	Crownpoint	+		+				
NM	Navajo Nation, Thoreau Chapter	Thoreau	+		+				
NM	Navajo Nation, Tiis Tsoh Sikaad Chapter	Newcomb	+		+				
NM	Navajo Nation, Toadlena/Two Grey Hills Chapter	Newcomb	+		+				
NM	Navajo Nation, Tohatchi Chapter	Tohatchi	+		+				
NM	Navajo Nation, Tohajiilee Chapter	Tohajiilee	+		+				

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
NM	Navajo Nation, Torreon Chapter	Cuba	+		+				
NM	Navajo Nation, Tsayatoh Chapter	Mentmore	+		+				
NM	Navajo Nation, Tse Daa K'aan Chapter	Shiprock	+		+				
NM	Navajo Nation, Twin Lakes Chapter	Yatahey	+						
NM	Navajo Nation, Upper Fruitland Chapter	Fruitland	+		+				
NM	Navajo Nation, White Rock Chapter	Crownpoint	+		+				
NM	Navajo Nation, Whitehorse Lake Chapter	Cuba	+		+				
NM	Ohkay Owingeh	San Juan Pueblo	+		+				
NM	Pueblo of Acoma	Acoma	+	+	+				
NM	Pueblo of Cochiti	Cochiti	+		+			**2012/03/07 –** The San Luis Valley Field Office followed up with tribe	**2012/03/07** – Discussions with BLM indicate that the tribe has no great interest in the Solar PEIS.
NM	Pueblo of Isleta	Isleta	+	+	+			**2009/10/21** – Jane Childress of the BLM Phoenix District Office met with the Pueblo of Isleta.[a] **2009/10/26 –** Jane Childress followed up with THPOs.[a] **2012/09/09 –** The Las Cruces District Office offered to provide additional information and maps and offered consultation.	**2009/08/23** – Representatives from the Pueblo of Isleta met with the BLM and were presented with a map of the study areas. There were no questions or discussion.[a]
NM	Pueblo of Jemez	Jemez Pueblo	+		+				
NM	Pueblo of Laguna	Laguna	+		+				
NM	Pueblo of Nambe	Santa Fe	+		+				
NM	Pueblo of Pecuris	Penasco	+		+			**2012/04/16** – Alicia Beat, Renewable Energy Team Archaeologist, San Luis	

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
								Valley Public Lands Center, met with the Pueblos of Picuris, Santa Ana, and Santa Clara to discuss ethnographic work in the San Luis Valley and the Solar PEIS.	
NM	Pueblo of Pojoaque	Santa Fe	+	+	+				
NM	Pueblo of San Felipe	San Felipe Pueblo	+		+				
NM	Pueblo of San Ildefonso	Santa Fe	+		+	+			
NM	Pueblo of Sandia	Bernalillo	+		+				
NM	Pueblo of Santa Ana	Santa Ana Pueblo	+		+	+		**2012/04/16 –** Alicia Beat, Renewable Energy Team Archaeologist, San Luis Valley Public Lands Center, met with the Pueblos of Picuris, Santa Ana, and Santa Clara to discuss ethnographic work in the San Luis Valley and the Solar PEIS.	
NM	Pueblo of Santa Clara	Espanola	+		+	+		**2012/04/16 –** Alicia Beat, Renewable Energy Team Archaeologist, San Luis Valley Public Lands Center, met with the Pueblos of Picuris, Santa Ana, and Santa Clara to discuss ethnographic work in the San Luis Valley and the Solar PEIS.	**2012/03/07 –** The Pueblo of Santa Clara indicated that the solar energy project is of no great interest to the Tribe at this time.
NM	Pueblo of Santo Domingo (Kewa Pueblo)	Santo Domingo Pueblo	+		+	+			
NM	Pueblo of Taos	Taos	+		+	+			
NM	Pueblo of Tesuque	Santa Fe	+	+	+				
NM	Pueblo of Zia	Zia Pueblo	+		+				
NM	Pueblo of Zuni	Zuni	+	+	+			**2009/08/13** – Signa Larralde of the BLM provided a briefing to Zuni Pueblo.[a] **2009/10/26 –** Jane Childress followed up with THPOs.[a] **2012/02/09 –** The Las Cruces District	**2009/08/13 –** During the BLM briefing, the Zuni representatives advised working directly with their cultural resources people to review any concerns about the study area and also said that it may be important for them to visit the study area. They also desired to review

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
								Office offered to provide additional information and maps and offered consultation. **2012/03/08** – Letter from the BLM Arizona State Office explaining the relationship of the Solar PEIS to the RDEP EIS.	the draft Solar PA, and it was agreed that the Solar PA would be provided to them. (Versions of the PA were sent in February and May 2012.)[a]
NV	Battle Mountain Band Council	Battle Mountain	+		+				
NV	Carson Community Council	Carson City	+		+				
NV	Dresslerville Community Council	Gardnerville	+		+				
NV	Duckwater Shoshone Tribal Council	Duckwater	+		+	+	+	**2011/01/25 –** E-mail from L. Resseguie to M. Frank-Churchill explaining that only limited funds were available for the ethnographic studies and that the BLM was unable to expand the scope of the effort to include more tribes. The BLM is very interested in the tribe's thoughts about potential solar energy development in its areas of traditional interest and would like to know if the Shoshone would like to continue this discussion with Tom Seley, the BLM Field Manager in the Tonopah Field Office. The BLM will make every effort to work with the tribe. **2011/02/10 –** E-mail from L. Resseguie to M. Frank-Churchill explaining that she will continue to investigate the possibility of conducting an ethnographic study with the tribe. **2011/02/15 –** BLM held a public scoping meeting in Nevada.	**2011/01/24** – Maurice Frank-Churchill sent an e-mail to Linda Resseguie of BLM on behalf of the Duckwater Shoshone Tribe, indicating that the Tribe has cultural, historical, and religious ties to the area that is proposed for development and that the Tribe wishes to participate in the ethnographic process. **2011/02/15 –** Mr. Frank-Churchill provided comments at the Las Vegas public meeting. Mr. Frank-Churchill indicated that central Nevada is Western Shoshone homeland and that there are a lot of cultural sites, including archaeological sites, as well as plant-gathering areas, hunting areas, and trail systems there. The Tribe is concerned with impacts on these resources. **2011/05/03** – Letter from Mr. Frank-Churchill containing comments on the Cumulative Impacts section of the Solar PEIS. Mr. Churchill states that

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
								2012/02/09 – Elvis Wall called Virginia Sanchez, Tribal Chairperson, to follow up on a number of projects, including the Solar PEIS. **2012/03/22 –** Elvis Wall, Ely District Field Office, called Mr. Frank-Churchill to follow up with respect to the January 2012 letter inviting the tribe to participate in government-to-government consultation regarding the Solar PEIS. **2012/04/30** – The BLM met with the Duckwater Shoshone Council and provided additional information on the Dry Lake Valley North SEZ.	cumulative impacts need to be considered for a 100-mile area surrounding the SEZ. Mr. Churchill is concerned with dramatic climate change from the installation of solar panels; fugitive dust from construction; and the effects of solar development on soil, water resources, vegetation, wildlife, and aquatic biota. Mr. Frank-Churchill is further concerned that Native people will lose sources of native medicinal and edible plants and that the landscapes that give songs to the Native people will be destroyed. **2011/05/04** – Letter from M. Frank-Churchill thanking L. Resseguie for including Duckwater in the ethnographic study **2012/02/09 –** Mr. Frank-Churchill informed Mr. Wall that the Duckwater Shoshone Tribe declined to participate in the East Mormon Mountains and Delmar Valley ethnographic data collection because the study areas were within Southern Paiute traditional homeland. **2012/22/4 –** Mr. Frank-Churchill indicated that he was planning to formally reply via mail to accept the invitation to enter into government-to-government consultation. **2012/03/27 –** Letter from Virginia Sanchez. Since visits to the Dry Lake Valley North SEZ were curtailed because of the weather, Duckwater

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									cultural authorities would like to reschedule visits to Dry Lake Valley North and initiate formal consultation on the project.
NV	Elko Band Council	Elko	+		+				
NV	Ely Shoshone Tribe	Ely	+		+				
NV	Fallon Paiute Shoshone Tribal Business Council	Fallon	+		+				
NV	Fort McDermitt Paiute-Shoshone Tribal Council	McDermitt	+	+	+				
NV	Inter-Tribal Council of Nevada	Sparks	+		+				
NV	Las Vegas Tribal Council	Las Vegas	+	+	+	+		**2012/01/03 –** Mark Spencer, Pahrump Field Office, spoke with Chairwoman Tania Means. Mark explained the Solar PEIS. Mark Spencer and Kathy Sprowl spoke with Kenny Anderson. Mark explained the Solar PEIS to Kenny.	**2012/01/03 –** During a telephone conversation with Chairperson Tania Means, Ms. Means designated Kenny Anderson as the point of contact for this project. Kenny requested an information packet for review. **2012/01/11 –** During a telephone conversation with the Pahrump Field Office, Kenny Anderson had no questions and stated that the ethnographic study conducted for the project addresses the pertinent concerns of the Paiute about both the Amargosa and Dry Lake SEZs.
NV	Lovelock Tribal Council	Lovelock	+		+				
NV	Moapa Business Council	Moapa	+	+	+	+			**2009/07/28 –** Letter from Philbert Swain, Tribal Chairman, indicating that the Moapa Band of Paiute Indians just learned of the solar energy study and that since the study is located along the southwest boundary of the Moapa River Reservation near the Arrow Canyon

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									Range, the Tribe would like an opportunity to review the proposal and provide comments. The Tribe requested a 60-day extension so it can evaluate the proposal, determine its impact on the reservation, and submit comments.[a] **2009/09/08** – Ian Zabarte called the BLM in response to the July 1, 2009, letter from the California Desert District. Mr. Zabarte had some questions regarding the deadline for comments. Consultation was offered but was deferred at the time.[a] **2012/01/04** – In a telephone conversation with Mark Spencer, Southern Nevada District Office, Chairman Anderson requested an information packet via e-mail, stated that his Tribe has participated in the ethnographic study, and provided comments regarding SEZs in southern Nevada. **2012/01/24** – During a telephone conversation with Mark Spencer, Chairman Anderson indicated the ethnographic study was sufficient and that the Tribe has no additional concerns.
NV	Pyramid Lake Paiute Tribal Council	Nixon	+	+	+				
NV	Reno-Sparks Tribal Council	Reno	+	+	+				**2011/03/06 –** Michon Ebon, THPO, called in response to the February 15, 2011, mailing of the Solar PEIS, requesting more time to review the documents. She indicated she would be

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									asking the chairman and staff about requesting a face-to-face meeting on the initiative.
NV	Duck-Valley Shoshone-Paiute Business Council	Owyhee	+	+	+				
NV	South Fork Band Council	Lee	+	+	+				
NV	Stewart Community Council	Gardnerville	+		+				
NV	Summit Lake Paiute Tribal Council	Sparks	+	+	+	+	+		**2011/03/14** – The Summit Lake Paiute provided comments during the public scoping period. **2012/01/27** – E-mail from Chairman Warner Barlese indicating that the Tribe would like to add additional Paiute traditional territory to the maps provided and have those removed from development. He also indicated that the Tribe is ready to do a meaningful government-to-government consultation.
NV	Te-Moak Tribe of Western Shoshone Tribal Council	Elko	+		+				
NV	Walker River Paiute Tribal Council	Schurz	+	+	+				
NV	Washoe Tribal Council	Gardnerville	+	+	+		+	**2011/06/01 -** New visual resource inventories (VRIs) were shared with the Washoe Tribe.	**2011/04/14 –** Letter in response to the Draft Solar PEIS and Draft Solar PA from Ms. Tara Hess-McGeown (Environmental Specialist) on behalf of the Tribe. **2012/01/12 –** Mr. Cruz indicated to Mr. Carter (BLM) that he was not aware of the Solar PEIS, but he knew that the Tribe had interest in solar development on both private and public lands. He

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									then provided Mr. Carter with Ms. Hess-McGeown's contact information. Ms. Hess-McGeown informed Mr. Carter that the Tribe was interested in continued consultation on the Draft Solar PEIS, on opportunities available for renewable energy development by tribes in Nevada and on tribal lands, and on how the federal government might help tribes to facilitate that development. She also informed Mr. Carter that the Tribe had been awarded a federal grant to serve as the host for the Nevada Intertribal Energy Consortium, that she held the position of "host" for the tribes, and that she would get any energy information to the 27 tribes of Nevada.
NV	Wells Indian Colony Band Council	Wells	+		+				
NV	Winnemucca Tribal Council	Winnemucca	+		+	+		**2010/10/07 –** The Humboldt Field Office spoke with Winnemucca Tribal Council via phone.[a]	**2009/10/07 –** The Tribe had no concerns.[a]
NV	Yerington Paiute Tribe	Yerington	+		+				
NV	Yomba Tribal Council	Austin	+		+				
OK	Apache Tribe of Oklahoma	Anadarko	+		+				
OK	Cheyenne-Arapaho Tribes of Oklahoma	Concho	+	+	+				
OK	Comanche Nation	Lawton	+	+	+	+			
OK	Fort Sill Apache Tribe of Oklahoma	Apache	+	+	+	+			**2009/10/16 –** The Fort Sill, Mescalero, and San Carlos Apache met with the BLM. The BLM provided a presentation along with an informational packet that included maps. There was no discussion.[a]

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
OK	Kiowa Tribe of Oklahoma	Carnegie	+	+	+	+			
OK	Pawnee Nation of Oklahoma	Pawnee	+	+	+		+		
SD	Cheyenne River Lakota Sioux Tribe	Eagle Butte	+	+	+				
SD	Crow Creek Sioux Tribal Council	Fort Thompson	+	+	+				
SD	Oglala Sioux Tribal Council	Pine Ridge	+	+	+				
SD	Rosebud Sioux Tribal Council	Rosebud	+	+	+				
TX	Ysleta del Sur Pueblo	El Paso	+	+	+	+	+		**2011/12/05 –** Letter from THPO indicating the Tribe still has no concerns with the project.
UT	Goshute Business Council	Ibapah	+	+	+				
UT	Navajo Nation, Aneth Chapter	Montezuma Creek	+		+				
UT	Navajo Nation, Oljato Chapter	Monument Valley	+		+				
UT	Navajo Nation, Red Mesa Chapter	Montezuma Creek	+		+				
UT	Navajo Utah Commission	Montezuma Creek	+		+				
UT	Northwestern Band of Shoshone Nation	Brigham City	+		+				
UT	Paiute Indian Tribe of Utah Tribal Council	Cedar City	+	+	+			**2010/03/09 –** Rachel Tueller of the BLM Color Country District Office sent Chairwoman Jeanine Borchardt a follow-up e-mail explaining the Draft Solar PEIS and provided a link to the PEIS Web site.[a]	**2009/07/10 –** E-mail from Gaylord Robb, Economic Development Director of Paiute Indian Tribe of Utah, suggesting that the area north of Milford, Utah, be incorporated in the study area and that if any development takes places, to incorporate solar facilities into the wind energy facilities that currently reside in the area. Linda Ressequie responded and requested that Mr. Robb submit his comment to the Solar PEIS

TABLE K-2 (Cont.)

State	Organization	City	Draft EIS and PA Letter Feb. 2011	Draft EIS and PA Sent to Tribal Specialists March 2011	Suppl. Letter and PA Oct. 2011	Suppl. Follow-up Jan./Feb. 2012	Tribal Comments on Draft PEIS Received?	Additional BLM Follow-up (E-mail, phone contact, face-to-face meeting)	Tribal Response Summary (E-mail, phone contact, face-to-face meeting)
									Web site.[a] **2010/03/02** – E-mail from Chairwoman, Jeanine Borchardt, requesting more information about the project or a BLM contact as soon as possible.[a]
UT	Paiute Indian Tribe of Utah, Cedar Band	Cedar City	+		+				
UT	Paiute Indian Tribe of Utah, Indian Peak Band	Cedar City	+		+				
UT	Paiute Indian Tribe of Utah, Kanosh Band	Kanosh	+		+				
UT	Paiute Indian Tribe of Utah, Koosharem Band	Cedar City	+		+				
UT	Paiute Indian Tribe of Utah, Shivwits Band	Ivins	+		+				
UT	Skull Valley Band of Goshute Indians General Council	Grantsville	+		+				
UT	Ute Indian Tribe	Ft. Duchesne	+	+	+				
UT	White Mesa Ute Tribe	Blanding	+	+	+				
WY	Eastern Shoshone Business Council	Fort Washakie	+	+	+	+			
WY	Northern Arapaho Business Council	Fort Washakie	+	+	+	+			

[a] Entries in this table dated prior to December 2010 are present because they were not included in Appendix K of the Draft Solar PEIS.

K.1.2 Letters to Tribes: (a) February 15, 2011, Letter with Distribution List

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240
http://www.blm.gov

TAKE PRIDE IN AMERICA

In Reply Refer To:
1610 (350)

February 15, 2011

«First» «Last», «Suffix», «Title»
«Organization»
«Address»
«City», «State» «Zip»

Dear «Title» «Last»:

In previous correspondence, the Bureau of Land Management (BLM) has described its joint effort with the Department of Energy (DOE) to prepare a programmatic environmental impact statement (PEIS) for solar energy development including lands in Arizona, California, Colorado, Nevada, New Mexico, and Utah. Enclosed for your review and comment are a copy of the Reader's Guide and Executive Summary of the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States and a DVD containing the full text of the Draft PEIS. Additionally, this letter initiates formal consultation under Section 106 of the National Historic Preservation Act (NHPA) on a proposed Programmatic Agreement (PA) among the BLM, the six State Historic Preservation Officers (SHPO) (AZ, CA, CO, NM, NV, and UT), and the Advisory Council on Historic Preservation (ACHP) regarding solar energy development on BLM-administered lands. A draft of the proposed PA is also enclosed.

Background on the PEIS. The BLM and DOE prepared the PEIS in consultation with cooperating agencies and in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; the Council on Environmental Quality, DOE, and Department of the Interior regulations implementing the NEPA (40 CFR parts 1500-1508, 10 CFR part 1021, 43 CFR part 46); and the Federal Land Policy and Management Act of 1976, as amended. The PEIS assesses environmental, social, and economic impacts associated with development and implementation of agency-specific programs and guidance that would facilitate environmentally responsible utility-scale solar energy development in six southwestern states. Through the Draft PEIS, the BLM is evaluating a new solar energy program that would be applicable to utility-scale solar energy development on BLM-administered lands in the six-state area. The DOE is evaluating new program guidance relevant to DOE-supported solar projects on Federal, state, tribal, or private lands.

Key sections of the PEIS that discuss cultural resources and Native American concerns include Sections 4.15 and 4.16, describing the general affected environment over the six-state study area, and Sections 5.15 and 5.16, describing the common impacting factors to these general resources of concern and potential mitigating measures to avoid or reduce impacts. Appendix A describes the programmatic design features to minimize adverse effects that would be implemented as part of BLM's Solar Energy Program under its two action alternatives as presented in the PEIS. These design features would be required for any solar energy projects granted rights-of-way on BLM-administered lands. More detailed descriptions of the resources of concern and potential impacts of solar energy development are found in the sections pertaining to the 24 proposed Solar Energy Zones (SEZ) (Chapters 8-13); SEZ-specific mitigation measures are also presented if not already covered by or are more specific than programmatic design features. Maps showing all of the locations affected by the alternatives are included on the enclosed DVD and are available on the project Web site: http://solareis.anl.gov. The Web site also provides KMZ files for viewing all locations in greater detail using downloadable Google Earth or Arc GIS Explorer software.

Background on Section 106 NHPA Consultation. The BLM previously determined that its decisions regarding implementation of a solar energy program meets the threshold of review by the Advisory Council on Historic Preservation (ACHP) under Section 4(b)(1) of the "PROGRAMMATIC AGREEMENT AMONG THE BUREAU OF LAND MANAGEMENT, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND THE NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS REGARDING THE MANNER IN WHICH BLM WILL MEET ITS RESPONSIBILITIES UNDER THE NATIONAL HISTORIC PRESERVATION ACT." In accordance with regulations at 36 CFR 800.14(b)(3), the BLM has notified and invited the ACHP pursuant to 36 CFR 800.6(a)(1)(C) to participate in consultation to resolve the potential effects of the Undertaking on Historic Properties, and as documented in its letter dated October 2, 2008, the ACHP has elected to participate in the proposed PA.

The proposed PA describes the process by which the BLM, in consultation with the SHPOs, ACHP, Indian tribes, and other consulting parties, will consider the scale and scope of the decisions of the Solar PEIS and appropriate steps for the agency to take into account the potential effects of the BLM's proposed solar energy program on historic properties as required by Section 106 of the NHPA. The proposed PA also establishes a process for complying with Section 106 of the NHPA for subsequent site-specific decisions related to individual solar energy projects.

The BLM and DOE are seeking information and comments pertaining to the analysis presented in the Draft PEIS and the proposed PA.

Commenting on the Draft PEIS. Please submit your comments on the Draft PEIS electronically by using the online comment form available at the project Web site: http://solareis.anl.gov. To facilitate analysis of comments and information submitted, we strongly encourage you to submit comments in an electronic format. You may also send your comments by mail to: Solar Energy Draft PEIS, Argonne National Laboratory, 9700 S. Cass Avenue – EVS/240, Argonne, Illinois 60439. Further guidance on submitting comments is available in the Dear Reader Letter at the beginning of the Executive Summary and at the Web site. Public meetings on the Draft PEIS are being held in each of the six states and have been announced through local media and on the project Web site. The public comment period for the Draft PEIS closes on March 17, 2011.

Commenting on the Proposed PA. Please submit your comments on the proposed PA by mail to Solar Energy PA, Argonne National Laboratory, 9700 S. Cass Avenue – EVS/240, Argonne, Illinois 60439. We would like to receive your comments on the proposed PA by March 17, 2011. If you plan to submit comments but cannot do so by that date, please notify Linda Resseguie (contact information below), so we can make provisions for incorporating your comments in the final PA and PEIS. Oral or written comments on the proposed PA will also be accepted at the Solar PEIS meetings discussed above.

For More Information. If you would like more information about the Draft PEIS or proposed PA, you may contact me at (202) 208-4201 or Linda Resseguie, the BLM project manager for this initiative, by telephone at (202) 912-7337 or by email at linda_resseguie@blm.gov.

Government-to-Government Consultation. The BLM's tribal consultation policy requires BLM officials to consult with tribes in government-to-government meetings to identify and consider the concerns of tribes in land use planning and decision-making. Through this letter, we are requesting tribal participation and inviting tribes to enter into government-to-government consultation on the Draft PEIS and proposed PA so that the decisions we make about solar energy development can be appropriately informed. We are requesting tribes who wish to engage in such consultation to notify Linda Resseguie (contact information provided above) so that an appropriate meeting can be arranged.

SHPO Consultation. The BLM also requests participation of SHPOs in the Section 106 consultation process. Those officials are encouraged to contact the appropriate BLM State Archeologist to discuss relevant state-level issues.

We look forward to working with you as we move forward on these important documents that could form the basis of a new BLM solar energy program.

Sincerely,

Michael D. Nedd
Assistant Director
Minerals and Realty Management

Enclosures

1

	Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
√	AZ	Louis	Manuel	Jr.	Chairperson	Ak Chin Indian Community Council	42507 W. Peters & Nall Road	Maricopa	AZ	85239
√	AZ	Sherry	Cordova		Chairperson	Cocopah Tribal Council	County 15th & Avenue G	Somerton	AZ	85350
√	AZ	Michael	Tsosie		Dr.	Colorado River Indian Tribes Museum	26600 Mohave Rd.	Parker	AZ	85344
√	AZ	Eldred	Enas		Chairman	Colorado River Tribal Council	26600 Mohave Rd.	Parker	AZ	85344
√	AZ	Clinton	Pattea		President	Fort McDowell Yavapai Tribal Council	P.O. Box 17779	Fountain Hills	AZ	85268
√	AZ	Mike	Jackson	Sr.	President	Fort Yuma Quechan Tribe	P.O. Box 1899	Yuma	AZ	85366
√	AZ	William Roy	Rhodes		Governor	Gila River Indian Community Council	P.O. Box 97	Sacaton	AZ	85247
√	AZ	Bernadine	Jones		Chairwoman	Havasupai Tribal Council	P.O. Box 10	Supai	AZ	86435-0010
√	AZ	Leroy	Shingoitewa		Chairman	Hopi Tribal Council	P.O. Box 123	Kykotsmovi	AZ	86039
√	AZ	Wilfred	Whatanome	Sr.	Chairman	Hualapai Tribal Council	P.O. Box 179	Peach Springs	AZ	86434
√	AZ	Timothy	Rogers		Chairperson	Kaibab Paiute Tribal Council	HC 65, Box 2	Fredonia	AZ	86022
√	AZ	Roy W.	Malacki		Chairman	Navajo Fish & Wildlife, Natural Heritage Program	P.O. Box 1480	Window Rock	AZ	86515
√	AZ	Joe	Shirley	Jr.	President	Navajo Nation	P.O Box 7440	Window Rock	AZ	86515
√	AZ	Lawrence T.	Morgan		Speaker	Navajo Nation Council	200 Parkway Administration Bldg 1	Window Rock	AZ	86515
√	AZ	Harry Kee	Wagoner		President	Navajo Nation, Birdsprings Chapter	HC 61, Box K	Winslow	AZ	86047
√	AZ	Marvin	Yellowhair		President	Navajo Nation, Black Mesa Chapter	P.O. Box 97	Pinon	AZ	86510
√	AZ	Joe J.	Jim		President	Navajo Nation, Blue Gap/Tachee Chapter	P.O. Box 4427	Blue Gap	AZ	86520
√	AZ	Billy	Arizona	Jr.	President	Navajo Nation, Bodaway-Gap Chapter	P.O. Box 1546	Gap	AZ	86020
√	AZ	Edward	Singer		President	Navajo Nation, Cameron Chapter	P.O. Box 85	Cameron	AZ	86020
√	AZ	Lee J.	Gambler		President	Navajo Nation, Chilchinbeto Chapter	P.O. Box 1681	Kayenta	AZ	86033
√	AZ	Leonard	Pete		President	Navajo Nation, Chinle Chapter	P.O. Box 1809	Chinle	AZ	86503
√	AZ	Kenneth	Nez		President	Navajo Nation, Coalmine Canyon Chapter	P.O. Box 1464	Tuba City	AZ	86045
√	AZ	Sid	Whitehair		President	Navajo Nation, Coppermine Chapter	P.O. Box 1323	Page	AZ	86040
√	AZ	Jimmie	Taliman	Sr.	President	Navajo Nation, Cornfields Chapter	P.O. Box 478	Ganado	AZ	86505
√	AZ	Harrison	Dick		President	Navajo Nation, Cove Chapter	P.O. Box 276	Red Valley	AZ	86544
√	AZ	Chester	Begay		President	Navajo Nation, Dennehotso Chapter	P.O. Box 301	Dennehotso	AZ	86535
√	AZ	Felix	Tsinijinnie		President	Navajo Nation, Dilkon Chapter	HCR 63 Box E	Winslow	AZ	86047
√	AZ	Donald T.	Chee		President	Navajo Nation, Forest Lake Chapter	P.O. Box 441	Pinon	AZ	86510
√	AZ	Ben	Bennett		President	Navajo Nation, Fort Defiance Chapter	P.O. Box 366	Fort Defiance	AZ	86504
√	AZ	Lavenna	George		President	Navajo Nation, Ganado Chapter	P.O. Box 188	Ganado	AZ	86505
√	AZ	Franklin	Gishey	Sr.	President	Navajo Nation, Greasewood Springs Chapter	P.O. Box 1260	Ganado	AZ	86505
√	AZ	Percy	Deal		President	Navajo Nation, Hardrock Chapter	P.O. Box 20	Kykotsmovi	AZ	86039
√	AZ	Ernest	Hubbell		President	Navajo Nation, Houck Chapter	P.O. Box 127	Houck	AZ	86506
√	AZ	Laverne	Yazzie-Benally		President	Navajo Nation, Indian Wells Chapter	P.O. Box 3049	Indian Wells	AZ	86031
√	AZ	Larry	Goodman		President	Navajo Nation, Inscription House Chapter	P.O. Box 5205	Tonalea	AZ	86044
√	AZ	Lennard	Eltsosie		President	Navajo Nation, Jeddito Chapter	P.O. Box 798	Keams Canyon	AZ	86034
√	AZ	Kelsey	Begaye		President	Navajo Nation, Kaibeto Chapter	P.O. Box 1761	Kaibeto	AZ	86053
√	AZ	Stanley	Clitso		President	Navajo Nation, Kayenta Chapter	P.O. Box 1088	Kayenta	AZ	86033
√	AZ	Johnny	Curtis	Sr.	President	Navajo Nation, Kinlichee Chapter	P.O. Box 860	St. Michael	AZ	86511
√	AZ	Ernest	Benally		President	Navajo Nation, Klagetoh Chapter	HC58 Box 90, Unit 42	Ganado	AZ	86505
√	AZ	Arlene Nez	Whitekiller		President	Navajo Nation, LeChee Chapter	P.O. Box 4720	Page	AZ	86040
√	AZ	Thomas L.	Cody		President	Navajo Nation, Leupp Chapter	CPO Box 5085	Leupp	AZ	86035
√	AZ	Gerald	Ahasteen		President	Navajo Nation, Low Mountain Chapter	P.O.B. 4416	Blue Gap	AZ	86520
√	AZ	Samual	Yazzie		President	Navajo Nation, Lukachukai Chapter	P.O. Box 248	Lukachukai	AZ	86507
√	AZ	Jackie	Yazzi	Jr.	President	Navajo Nation, Lupton Chapter	P.O. Box 403	Lupton	AZ	86508

√	AZ	Katherine O.	Arthur		President	Navajo Nation, Many Farms Chapter	P.O. Box 185	Many Farms	AZ	86538
√	AZ	Jerry	Tsosie		President	Navajo Nation, Mexican Water Chapter	HC 61 Box 38	Teecnospos	AZ	86514
√	AZ	Arnold R.	Begay		President	Navajo Nation, Nahata Dzill Chapter	P.O. Box 400	Sanders	AZ	86512
√	AZ	Alex	Bitsinnie		President	Navajo Nation, Navajo Mountain Chapter	P.O. Box 10070	Tonalea	AZ	86044
√	AZ	Johnson	Claw		President	Navajo Nation, Nazlini Chapter	P.O. Box 7387	Nazlini	AZ	86505
√	AZ	Edison J.	Wauneka		President	Navajo Nation, Oak Springs Chapter	P.O. Box 486	Window Rock	AZ	86515
√	AZ	Bessie S.	Allen		President	Navajo Nation, Pinon Chapter	P.O. Box 127	Pinon	AZ	86510
√	AZ	Lee	Zhonnie	Jr.	President	Navajo Nation, Red Valley Chapter	P.O. Box 304	Red Valley	AZ	86544
√	AZ	Clarence Cecil	Begay		President	Navajo Nation, Rock Point Chapter	P.O. Box 190	Rock Point	AZ	86545
√	AZ	Frances	Teller		President	Navajo Nation, Rough Rock Chapter	P.O. Box 633-RRDS	Chinle	AZ	86503
√	AZ	Kellywood	Harvey		President	Navajo Nation, Round Rock Chapter	P.O. Box 10	Round Rock	AZ	86547
√	AZ	Herman	Begay	Sr.	President	Navajo Nation, Sawmill Chapter	P.O. Box 1786	Ft. Defiance	AZ	86504
√	AZ	Lorenzo	Isaac	Jr	President	Navajo Nation, Shonto Chapter	P.O. Box 7800	Shonto	AZ	86054
√	AZ	Raymond	Castillo		President	Navajo Nation, St. Michael Chapter	P.O. Box 829	St. Michael	AZ	86511
√	AZ	Andrew	Simpson		President	Navajo Nation, Steamboat Chapter	P.O. Box 117	Ganado	AZ	86505
√	AZ	Lena	Clark		President	Navajo Nation, Sweetwater Chapter	P.O. Box 105	Teecnospos	AZ	86514
√	AZ	Roy	Kady		President	Navajo Nation, Teec Nos Pos Chapter	P.O. Box 106	Teec Nos Pos	AZ	86514
√	AZ	Susie	Wauneka		President	Navajo Nation, Teesto Chapter	P.O. Box 7166	Winslow	AZ	86047
√	AZ	Max	Goldtooth	Sr	President	Navajo Nation, Toh Nanees Dizi Chapter	P.O. Box 727	Tuba City	AZ	86045
√	AZ	Freddie	Howard		President	Navajo Nation, Tolani Lake Chapter	P.O. Box HC61-SR-Box 3001	Winslow	AZ	86047
√	AZ	Chester	Claw		President	Navajo Nation, Tonalea Chapter	P.O. Box 207	Tonalea	AZ	86044
√	AZ	Zane	James		President	Navajo Nation, Tsaile/Wheatfields Chapter	P.O. Box 667	Tsaile	AZ	86556
√	AZ	Harrison	Kee		President	Navajo Nation, Tselani/Cottonwood Chapter	P.O. Box 1139	Chinle	AZ	86503
√	AZ	George	Denezpi		President	Navajo Nation, Whippoorwill Chapter	P.O. Box 279	Pinon	AZ	86510
√	AZ	Bennie	Hanley	Sr	President	Navajo Nation, White Cone Chapter	P.O. Box 338	Indian Wells	AZ	86031
√	AZ	Lyle	Baldwin		President	Navajo Nation, Wide Ruins Chapter	P.O. Box 208	Chambers	AZ	86502
√	AZ	Peter	Yucupicio		Chairperson	Pascua Yaqui Tribal Council	7474 S. Camino de Oeste	Tucson	AZ	85746
√	AZ	Diane	Enos		President	Salt River Pima-Maricopa Indian Community Council	10005 E. Osborn	Scottsdale	AZ	85256
√	AZ	Wendsler	Nosie	Sr.	Chairperson	San Carlos Tribal Council	P.O. Box 0	San Carlos	AZ	85550
√	AZ	Mary Lou	Boone		Vice President	San Juan Southern Paiute Council	P.O. Box 2710	Tuba City	AZ	86045
√	AZ	Ned	Norris	Jr.	Chairman	Tohono O'odham Nation	P.O. Box 837	Sells	AZ	85634
√	AZ	Ivan	Smith		Chairman	Tonto Apache Tribal Council	Tonto Apache Reservation #30	Payson	AZ	85541
√	AZ	Ronnie	Lupe		Chairman	White Mountain Apache Tribe	P.O. Box 700	Whiteriver	AZ	85941
√	AZ	Thomas	Beauty		Chairman	Yavapai-Apache Nation Tribal Council	2400 W. Datsi Rd.	Camp Verde	AZ	86322
√	AZ	Ernest	Jones	Sr.	President	Yavapai-Prescott Board of Directors	530 E. Merritt Street	Prescott	AZ	86301-2038
√	CA	Richard	Milanovich		Chairman	Agua Caliente Band of Cahuilla Indians	600 East Tahquitz Canyon Way	Palm Springs	CA	92262
√	CA	Phillip	Del Rosa		Chairman	Alturas Rancheria	P.O. Box 340	Alturas	CA	96101
√	CA	Mary Ann	Green		Chairperson	Augustine Band of Mission Indians	P.O. Box 846	Coachella	CA	92236
√	CA	Edwin	Romero		Chairman	Barona Group of the Capitan Grande	1095 Barona Rd	Lakeside	CA	92040
√	CA	Leonard	Bowman		Chairman	Bear River Band of Rohnerville Rancheria	27 Bear River Drive	Loleta	CA	95551
√	CA	Mike	Keller		Chairman	Benton Paiute Reservation	567 Yellow Jacket Rd	Benton	CA	93512
√	CA	James	Edwards		Chairman	Berry Creek Rancheria	5 Tyme Way	Oroville	CA	95966
√	CA	Virgil	Moorehead		Chairman	Big Lagoon Rancheria	P.O. Drawer 3060	Trinidad	CA	95570
√	CA	Virgil	Moose		Chairperson	Big Pine Paiute Tribe of the Owens Valley	P.O. Box 700	Big Pine	CA	93513
√	CA	Elizabeth	Kipp		Chairperson	Big Sandy Rancheria	P.O. Box 337	Auberry	CA	93602
√	CA	Valentino	Jack		Chairperson	Big Valley Rancheria	2726 Mission Rancheria Road	Lakeport	CA	95453

√	CA	William	Vega		Chairman	Bishop Paiute Tribe	50 Tu Su Lane	Bishop	CA	93514
√	CA	Claudia	Brundin		Chairperson	Blue Lake Rancheria	P.O. Box 428	Blue Lake	CA	95525
√	CA	Joseph	Sam		Chairperson	Bridgeport Indian Colony	P.O. Box 37	Bridgeport	CA	93517
√	CA	Rhonda L.	Morningstar Pope		Chairwoman	Buena Vista Rancheria	P.O. Box 162283	Sacramento	CA	95816
√	CA	David	Roosevelt		Chairman	Cabazon Band of Cahuilla Mission Indians	84-245 Indio Springs Drive	Indio	CA	92201
√	CA	Cristy	Taylor		Chairperson	Cahto Tribal Executive Committee	P.O. Box 1239	Laytonville	CA	95454
√	CA	Luther	Salgado	Jr.	Chairman	Cahuilla Band of Mission Indians	P.O. Box 391760	Anza	CA	92539-1760
√	CA	Silvia	Burley		Chairperson	California Valley Miwok Tribe	10601 Escondido Place	Stockton	CA	95212
√	CA	Monique	La Chappa		Chairwoman	Campo Band of Mission Indians	36190 Church Road, Suite 1	Campo	CA	91906
√	CA	Cherie	Rhoades		Chairperson	Cedarville Rancheria	200 South Howard Street	Alturas	CA	96101
√	CA	Charles	Wood		Chairman	Chemehuevi Tribal Council	P.O. Box 1976	Havasu Lake	CA	92362
√	CA	Lloyd	Mathieson		Chairman	Chicken Ranch Rancheria	P.O. Box 1159	Jamestown	CA	95327
√	CA	Patricia	Hermosillo		Chairperson	Cloverdale Rancheria	555 S. Cloverdale Blvd., Suite 1	Cloverdale	CA	95425
√	CA	Robert	Marquez		Chairman	Cold Springs Rancheria	P.O. Box 209	Tollhouse	CA	93667
√	CA	Wayne	Mitchum		Chairman	Colusa Rancheria	3730 Highway 45	Colusa	CA	95932
√	CA	Elaine	Patterson		Chairperson	Cortina Rancheria	P.O. Box 1630	Williams	CA	95987
√	CA	John	Feliz	Jr.	Chairman	Coyote Valley Reservation	P.O. Box 39	Redwood Valley	CA	95470
√	CA	Harvey	Hopkins		Chairman	Dry Creek Rancheria	P.O. Box 607	Geyserville	CA	95441
√	CA	Geraldine	Johnson		Chairman	Elem Indian Colony	P.O. Box 989	Clearlake Oaks	CA	95423
√	CA	Dale A.	Miller		Chairman	Elk Valley Rancheria	2332 Howland Hill Road	Crescent City	CA	95531
√	CA	Glenda	Nelson		Chairperson	Enterprise Rancheria	3690 Olive Highway	Oroville	CA	95966
√	CA	Robert	Pinto	Sr.	Chairman	Ewiiaapaayp Band of Kumeyaay Indians	4054 Willows Rd	Alpine	CA	91901
√	CA	Greg	Sarris		Chairman	Federated Indians of Graton Rancheria	6400 Redwood Dr. Suite 300	Rohnert Park	CA	95928
√	CA	Bernard	Pollard		Chairman	Fort Bidwell Reservation	P.O. Box 129	Fort Bidwell	CA	96112
√	CA	Dorothy	Buff		Chairperson	Fort Independence Indian Reservation	P.O. Box 67	Independence	CA	93526
√	CA	Timothy	Williams		Chairperson	Fort Mojave Tribal Council	500 Merriman Avenue	Needles	CA	92363
√	CA	Kyle	Self		Chairperson	Greenville Rancheria	P.O. Box 279	Greenville	CA	95947
√	CA	Ronald	Kirk		Chairman	Grindstone Rancheria	P.O. Box 63	Elk Creek	CA	95939
√	CA	Merlene	Sanchez		Acting Chairperson	Guidiville Rancheria	P.O. Box 339	Talmage	CA	95481
√	CA	Carmella	Icay-Johnson		Interim Chairperson	Habematolel Pomo of Upper Lake	P.O. Box 516	Upper Lake	CA	95485
√	CA	Clifford Lyle	Marshall		Chairman	Hoopa Valley Tribal Council	P.O. Box 1348	Hoopa	CA	95546
√	CA	Roman	Carrillo	Jr.	Chairperman	Hopland Reservation	3000 Shanel Road	Hopland	CA	95449
√	CA	Rebecca	Osuna		Chairperson	Inaja-Cosmit Reservation	2005 S. Escondido Blvd.	Escondido	CA	92025
√	CA	Mathew	Franklin		Chairman	Ione Band of Miwok Indians	P.O. Box 1190	Ione	CA	95640
√	CA	Margaret	Dalton		Chairperson	Jackson Rancheria	P.O. Box 1090	Jackson	CA	95642
√	CA	Kenneth	Meza	Sr.	Chairman	Jamul Indian Village	P.O. Box 612	Jamul	CA	91935
√	CA	Arch	Super		Chairman	Karuk Tribe of California	P.O. Box 1016	Happy Camp	CA	96039
√	CA				Chairman	Kern Valley Indian Communitiy	P.O. Box 147	Caliente	CA	93518
√	CA				Tribal Administrator	Kwaaymii Laguna Band of Indians	P.O. Box 775	Pine Valley	CA	91962
√	CA	Larriann	Musick		Chairperson	La Jolla Band of Luiseño Indians	22000 Highway 76	Pauma Valley	CA	92061
√	CA	Gwendolyn	Parada		Chairperson	La Posta Band of Mission Indians	P.O. Box 1120	Boulevard	CA	91905
√	CA	Richard	Button		Chairperson	Lone Pine Paiute Shoshone Reservation	P.O. Box 747	Lone Pine	CA	93545
√	CA	Francine	Kupsch		Chairwoman	Los Coyotes Band of Cahuilla & Cupeno Indians	P.O. Box 189	Warner Springs	CA	92086

√	CA	Daniel D.	Beltran		Chairman	Lower Lake Rancheria	P.O. Box 3162	Santa Rosa	CA	95402
√	CA	Marjorie	Mejia		Chairperson	Lytton Rancheria	1300 N. Dutton, Suite A	Santa Rosa	CA	95401
√	CA	Nelson	Pinola		Chairman	Manchester - Point Arena Band of Pomo Indians	P.O. Box 623	Point Arena	CA	95468
√	CA	Leroy J.	Elliott		Chairman	Manzanita Band of Mission Indians	P.O. Box 1302	Boulevard	CA	91905
√	CA	Dennis	Ramirez		Chairman	Mechoopda Indian Tribe of the Chico Rancheria	125 Mission Ranch Blvd.	Chico	CA	95926
√	CA	Mark	Romero		Chairman	Mesa Grande Band of Mission Indians	P.O. Box 270	Santa Ysbel	CA	92070
√	CA	Jose	Simon	III	Chairman	Middletown Rancheria	P.O. Box 1035	Middletown	CA	95461
√	CA	Gary	Archuleta		Chairman	Mooretown Rancheria	1 Alverda Drive	Oroville	CA	95966
√	CA	Robert	Martin		Chairman	Morongo Band of Mission Indians	11581 Potrero Road	Banning	CA	92220
√	CA	Dave	Singleton			Native American Heritage Commission	915 Capitol Mall, Room 364	Sacramento	CA	95814
√	CA	Kurt	Russo			Native American Land Conservancy	NALC P.O. Box 3074	Indio	CA	92202-3074
√	CA	Judy E.	Fink		Chairperson	North Fork Rancheria	P.O. Box 929	North Fork	CA	93643-0929
√	CA	Robert	Smith		Chairman	Pala Band of Mission Indians	35008 Pala Temecula Road	Pala	CA	92059
√	CA	Everett	Freeman		Chairman	Paskenta Band of Nomlaki Indians	P.O. Box 398	Orland	CA	95963
√	CA	Christobal C.	Devers	Sr.	Chairman	Pauma/Yuima Band of Mission Indians	P.O. Box 369	Pauma Valley	CA	92061
√	CA	Mark	Macarro		Chairman	Pechanga Band of Mission Indians	P.O. Box 1477	Temecula	CA	92593
√	CA	Morris	Reid		Chairman	Picayune Rancheria of Chukchansi Indians	46575 Road 417	Coarsegold	CA	93614
√	CA	Leona	Williams		Chairperson	Pinoleville Reservation	500 Pinoleville Road, Suite A	Ukiah	CA	95492-7121
√	CA	Ida	Riggins		Chairperson	Pit River Tribal Council	36970 Park Avenue	Burney	CA	96013
√	CA	Salvador	Rosales		Chairman	Potter Valley Tribe	2251 South State Street	Ukiah	CA	95482
√	CA	Harold	Bennett		Chairman	Quartz Valley Reservation	13601 Quartz Valley Road	Fort Jones	CA	96032
√	CA	Joseph	Hamilton		Chairman	Ramona Band of Mission Indians	P.O. Box 391372	Anza	CA	92539
√	CA	Barbara	Murphy		Chairman	Redding Rancheria	2000 Redding Rancheria Road	Redding	CA	96001
√	CA	Elizabeth	Hansen		Chairperson	Redwood Valley Reservation	3250 Road I	Redwood Valley	CA	95470
√	CA	Rick S.	Dowd		President	Resighini Rancheria	P.O. Box 529	Klamath	CA	95548
√	CA	Frederick	Mazzetti		Chairman	Rincon Band of Mission Indians	P.O. Box 68	Valley Center	CA	92082
√	CA	Tracy	Avila		Chairperson	Robinson Rancheria	P.O. Box 428	Nice	CA	95464
√	CA	Carlino	Bettga		President	Round Valley Reservation	P.O. Box 448	Covelo	CA	95428
√	CA	Marshall	McKay		Chairperson	Rumsey Rancheria	P.O. Box 18	Brooks	CA	95606
√	CA	James	Ramos		Chairman	San Manuel Band of Mission Indians	P.O. Box 266	Patton	CA	92369
√	CA	Allen	Lawson		Spokesman	San Pasqual Band of Mission Indians	P.O. Box 365	Valley Center	CA	92082
√	CA	Terry	Hughes		Administrator	Santa Rosa Band of Mission Indians	P.O. Box 609	Hemet	CA	92546
√	CA	Clarence	Atwell	Jr.	Chairman	Santa Rosa Rancheria	P.O. Box 8	Lemoore	CA	93245
√	CA	Vincent	Armenta		Chairman	Santa Ynez Band of Mission Indians	P.O. Box 517	Santa Ynez	CA	93460
√	CA	Johnny	Hernandez		Chairperson	Santa Ysabel Band of Diegueno Indians	P.O. Box 130	Santa Ysabel	CA	92070
√	CA	Donald	Arnold		Chairperson	Scotts Valley Rancheria	301 Industrial Avenue	Lakeport	CA	95453
√	CA	Michael	Fitzgerral		Chairman	Sherwood Valley Rancheria	190 Sherwood Hill Drive	Willits	CA	95490
√	CA	Nicholas H.	Fonseca		Chairman	Shingle Springs Rancheria	P.O. Box 1340	Shingle Springs	CA	95682
√	CA	Kara L.	Miller		Chairperson	Smith River Rancheria	140 Rowdy Creek Road	Smith River	CA	95567
√	CA	Robert	Salgado	Sr.	Chairman	Soboba Band of Luiseño Indians	P.O. Box 487	San Jacinto	CA	92581
√	CA	Ralph	Sepulveda		Chairman	Stewarts Point Rancheria	3535 Industrial Drive, Suite B-2	Santa Rosa	CA	95403
√	CA	Stacy	Dixon		Chairman	Susanville Indian Rancheria	Drawer U	Susanville	CA	96130
√	CA	Daniel J.	Tucker		Chairman	Sycuan Band of the Kumeyaay Nation	5459 Sycuan	El Cajon	CA	92019
√	CA	Leanne	Walker-Grant		Chairperson	Table Mountain Rancheria	P.O. Box 410	Friant	CA	93626
√	CA	Joe	Kennedy		Chairman	Timbisha Shoshone Tribe	P.O. Box 206	Death Valley	CA	92328-0206
√	CA	Mary	Resvaloso		chairwoman	Torres-Martinez Desert Cahuilla Indians	P.O. Box 1160	Thermal	CA	92274
√	CA	Garth	Sundberg	Sr.	Chairperson	Trinidad Rancheria	P.O. Box 630	Trinidad	CA	95570

√	CA				Chairperson	Tubatulabals of Kern Valley	P.O. Box 226	Lake Isabella	CA	93240
√	CA	Ryan	Garfield		Chairperson	Tule River Reservation	P.O. Box 589	Porterville	CA	93258
√	CA	Kevin	Day		Chairman	Tuolumne Rancheria	P.O. Box 699	Tuolumne	CA	95379
√	CA	Darrell	Mike		Chairperson	Twenty-Nine Palms Band of Mission Indians	46-200 Harrison Place	Coachella	CA	92236
√	CA	Jessica	Tevares		President	United Auburn Indian Community	10720 Indian Hills Road	Auburn	CA	95603
√	CA	Bobby	Barrett		Chairman	Viejas Band of Mission Indians	P.O. Box 908	Alpine	CA	91903-0908
√	CA	Gail	Green		Chairperson	Wiyot Tribe	1000 Wiyot Dr.	Loleta	CA	95551````
√	CA	Gail	Green		Chairperson	Wiyot Tribe	1000 Wiyot Drive	Loleta	CA	95551
√	CA	DeAnn	Roberts		Chairperson	Woodfords Community Council	96 Washoe Blvd.	Markleeville	CA	96120
√	CA	Maria	Tripp		Chairperson	Yurok Tribe	P.O. Box 1027	Klamath	CA	95548
√	CO	Matthew	Box		Chairman	Southern Ute Tribe	P.O. Box 737	Ignacio	CO	81137
√	CO	Ernest	House	Sr.	Chairman	Ute Mountain Ute Tribe	P.O. Box 248	Towaoc	CO	81334-0248
√	DC	Bambi	Kraus		President	National Association of Tribal Historic Preservation Officers	P.O. Box 19189	Washington	DC	20036
√	ID	Alonzo A.	Coby		Chairman	Shoshone-Bannock Tribes	Fort Hall Business Council	Fort Hall	ID	83203-0306
√	MT	Leroy	Spang		Chairman	Northern Cheyenne Tribal Council	P.O. Box 128	Lame Deer	MT	59043
√	ND	Ron	His Horse is Thunder		Chairman	Standing Rock Sioux Tribal Council	P.O. Box D	Fort Yates	ND	58538
√	NM	Joe	Garcia		Chairman	All Indian Pueblo Council	2101 12th St., NW	Albuquerque	NM	87103
√	NM	Mike	Miller		Executive Director	Eight Northern Indian Pueblos Council	P.O. Box 969	San Juan Pueblo	NM	87566
√	NM	Roger	Madalena		Chairman	Five Sandoval Indian Pueblos	1043 Highway 313	Bernalillo	NM	87004
√	NM	Levi	Pesata		President	Jicarilla Apache Nation	P.O. Box 507	Dulce	NM	87528
√	NM	Carlton	Naiche-Palmer		President	Mescalero Apache Tribe	P.O. Box 227	Mescalero	NM	88340
√	NM	Scott	Apachito		President	Navajo Nation, Alamo Chapter	P.O. Box 827	Magdalena	NM	87825
√	NM	Isabell	Morgan		President	Navajo Nation, Baahaali Chapter	P.O. Box 6118	Gallup	NM	87305
√	NM	Cecil	Lewis	Jr.	President	Navajo Nation, Baca/Prewitt Chapter	P.O. Box 562	Prewitt	NM	87045
√	NM	Benjamin	Benally		President	Navajo Nation, Becenti Chapter	P.O. Box 708	Crownpoint	NM	87313
√	NM	George	Kelly	Jr.	President	Navajo Nation, Beclabito Chapter	Beclabito Trading Post	Shiprock	NM	87420
√	NM	Fernie	Yazzie		President	Navajo Nation, Casamero Lake Chapter	P.O. Box 549	Prewitt	NM	87045
√	NM	Jess	Kirwin	Sr.	President	Navajo Nation, Chichiltah Chapter	P.O. Box 1436	Gallup	NM	87305
√	NM	Johnny	Henry		President	Navajo Nation, Churchrock Chapter	P.O. Box 549	Churchrock	NM	87311
√	NM	Samuel	Sage		President	Navajo Nation, Counselor Chapter	P.O. Box 209	Counselor	NM	87018
√	NM	Chavez	John		President	Navajo Nation, Coyote Canyon Chapter	P.O. Box 257	Brimhall	NM	87310
√	NM	McGarrett	Pablo		President	Navajo Nation, Crownpoint Chapter	P.O. Box 336	Crownpoint	NM	87313
√	NM	Mae	Mallahan		President	Navajo Nation, Crystal Chapter	P.O. Box 775	Navajo	NM	87328
√	NM	Elizabeth	Harrison		President	Navajo Nation, Gadii'ahi/To'koi Chapter	P.O. Box 1318	Shiprock	NM	87420
√	NM	Ben	Woody	Jr.	President	Navajo Nation, Huerfano Chapter	P.O. Box 968	Bloomfield	NM	87413
√	NM	Dorothy	Rogers		President	Navajo Nation, Iyanbito Chapter	P.O. Box 498	Fort Wingate	NM	87316
√	NM	Tony	Padilla	Jr.	President	Navajo Nation, Lake Valley Chapter	P.O. Box 190	Crownpoint	NM	87313
√	NM	George S.	Jim		President	Navajo Nation, Little Water Chapter	P.O. Box 1898	Crownpoint	NM	87313
√	NM	Milton	Davidson		President	Navajo Nation, Manuelito Chapter	P.O. Box 69	Manuelito	NM	86505
√	NM	Anthony	Begay		President	Navajo Nation, Mariano Lake Chapter	P.O. Box 164	Smith Lake	NM	87365
√	NM	Anselm	Bitsoi		President	Navajo Nation, Mexican Springs Chapter	P.O. Box 93	Mexican Springs	NM	87320
√	NM	Ervin	Chavez		President	Navajo Nation, Nageezi Chapter	P.O. Box 100	Nageezi	NM	87037
√	NM	Tony	Padilla		President	Navajo Nation, Nahodishgish Chapter	P.O. Box 369	Crownpoint	NM	87313

√	NM	Hoskie	Bryant		President	Navajo Nation, Naschitti Chapter	Drawer D	Sheep Springs	NM	87364
√	NM	Lucinda	Bennally		President	Navajo Nation, Nenahnezad Chapter	P.O. Box 438	Fruitland	NM	87416
√	NM	Donna	Bennally		President	Navajo Nation, Newcomb Chapter	P.O. Box 7982	Newcomb	NM	87455
√	NM	Roger	Toledo		President	Navajo Nation, Ojo Encino Chapter	HCR 79 Box 1500	Cuba	NM	87013
√	NM	Anselm	Morgan		President	Navajo Nation, Pinedale Chapter	P.O. Box 3	Churchrock	NM	87311
√	NM	Frank Chee	Willetto	Sr.	President	Navajo Nation, Pueblo Pintado Chapter	HCR 79 Box 3026	Cuba	NM	87013
√	NM	Alfred	Barney		President	Navajo Nation, Red Lake #18 Chapter	P.O. Box 130	Navajo	NM	87328
√	NM	Martha	Tom		President	Navajo Nation, Red Rock Chapter	P.O. Box 2548	Gallup	NM	87301
√	NM	Tulley	Haswood		President	Navajo Nation, Rock Springs Chapter	P.O. Box 4608	Yatahey	NM	87375
√	NM	Rickie	Nez		President	Navajo Nation, San Juan Chapter	P.O. Box 1636	Fruitland	NM	87416
√	NM	Eddie	Mike		President	Navajo Nation, Sanostee Chapter	P.O. Box 219	Sanostee	NM	87461-0219
√	NM	Tommy	Sandman		President	Navajo Nation, Sheep Springs Chapter	P.O. Drawer 1	Sheep Springs	NM	87364
√	NM	William	Lee		President	Navajo Nation, Shiprock Chapter	P.O. Box 3810	Shiprock	NM	87420
√	NM	Bobby J.	Willie		President	Navajo Nation, Smith Lake Chapter	P.O. Box 60	Smith Lake	NM	87365
√	NM	Johnny	Johnson		President	Navajo Nation, Standing Rock Chapter	P.O. Box 247	Crownpoint	NM	87313
√	NM	Valerie	Vigil		President	Navajo Nation, Thoreau Chapter	P.O. Box 779	Thoreau	NM	87323
√	NM	Wilson R.	Benally		President	Navajo Nation, Tiis Tsoh Sikaad Chapter	P.O. Box 7359	Newcomb	NM	87455
√	NM	Stanley	Hardy		President	Navajo Nation, Toadlena/Two Grey Hills Chapter	P.O. Box 7950	Newcomb	NM	87455
√	NM	Edwin J.	Begay		President	Navajo Nation, Tohatchi Chapter	P.O. Box 1236	Tohatchi	NM	87325
√	NM	Joe L.	Cayadito	Jr.	President	Navajo Nation, Torreon Chapter	P.O. Box 1024	Cuba	NM	87013
√	NM	David	Lee		President	Navajo Nation, Tsayatoh Chapter	P.O. Box 86	Mentmore	NM	87319
√	NM	Charlie	Jones	Jr.	President	Navajo Nation, Tse Daa K'aan Chapter	P.O. Box 1288	Shiprock	NM	87420
√	NM	Notah	Barney		President	Navajo Nation, Twin Lakes Chapter	P.O. Box 4424	Yatahey	NM	87375
√	NM	Leroy	Lee		President	Navajo Nation, Upper Fruitland Chapter	P.O. Box 1257	Fruitland	NM	87416
√	NM	Lucinda	Henry		President	Navajo Nation, White Rock Chapter	P.O. Box 660	Crownpoint	NM	87313
√	NM	Andrew	Jim		President	Navajo Nation, Whitehorse Lake Chapter	HCR 79 Box 4069	Cuba	NM	87013
√	NM	Marcelino	Aquino		Governor	Ohkay Owingeh	P.O. Box 1099	San Juan Pueblo	NM	87566
√	NM	Chandler	Sanchez		Governor	Pueblo of Acoma	P.O. Box 309	Acoma	NM	87034
√	NM	Vernon	Garcia		Governor	Pueblo of Cochiti	P.O. Box 70	Cochiti	NM	87072
√	NM	Robert J.	Benavides		Governor	Pueblo of Isleta	P.O. Box 1270	Isleta	NM	87022
√	NM	Joshua	Madalena		Governor	Pueblo of Jemez	P.O. Box 100	Jemez Pueblo	NM	87024
√	NM	John E.	Antonio	Sr.	Governor	Pueblo of Laguna	P.O. Box 194	Laguna	NM	87026
√	NM	Ernest	Mirabal		Governor	Pueblo of Nambe	Route 1, Box 117-BB	Santa Fe	NM	87501
√	NM	Manuel	Achuleta		Governor	Pueblo of Picuris	P.O. Box 127	Penasco	NM	87553
√	NM	George	Rivera		Governor	Pueblo of Pojoaque	17746 US Highway 84/285	Santa Fe	NM	87506
√	NM	Anthony	Ortiz		Governor	Pueblo of San Felipe	P.O. Box 4339	San Felipe Pueblo	NM	87001
√	NM	Perry	Martinez		Governor	Pueblo of San Ildefonso	Route 5, Box 315-A	Santa Fe	NM	87501
√	NM	Joe M.	Lujan		Governor	Pueblo of Sandia	481 Sandia Loop	Bernalillo	NM	87004
√	NM	Feliciano	Candelaria		Governor	Pueblo of Santa Ana	2 Dove Road	Santa Ana Pueblo	NM	87004
√	NM	Walter	Dashend		Governor	Pueblo of Santa Clara	P.O. Box 580	Espanola	NM	87532
√	NM	Tony	Tortalita		Governor	Pueblo of Santo Domingo	P.O. Box 99	Santo Domingo Pueblo	NM	87052
√	NM	James	Lujan		Governor	Pueblo of Taos	P.O. Box 1846	Taos	NM	87571
√	NM	Frederick	Vihil		Governor	Pueblo of Tesuque	RR 42, Box 360-T	Santa Fe	NM	87506-2632
√	NM	Marcellus	Medina		Governor	Pueblo of Zia	135 Capitol Square Drive	Zia Pueblo	NM	87053-6013
√	NM	Norman	Cooeyate		Governor	Pueblo of Zuni	P.O. Box 339	Zuni	NM	87327

√	NM	Roger	Martinez		President	Ramah Navajo Chapter	Route 2, Box 13	Ramah	NM	87321
√	NM	Tony	Secatero		President	Tohajiilee Navajo Chapter	P.O. Box 3398	Tohajiilee	NM	87026
√	NV	Michael	Young		Chairman	Battle Mountain Band Council	37 Mountain View Drive	Battle Mountain	NV	89820
√	NV	Chad	Malone		Chairman	Carson Community Council	2900 S. Curry Street	Carson City	NV	89703
√	NV	L. Mark	Kizer		Chairman	Dresslerville Community Council	1585 Watasheamu Rd.	Gardnerville	NV	89460-7457
√	NV	Virginia	Sanchez		Chairperson	Duckwater Tribal Council	P.O. Box 140068	Duckwater	NV	89314
√	NV	Gerald	Temoke		Chairman	Elko Band Council	1745 Silver Eagle Drive	Elko	NV	89801
√	NV	Diana	Buckner		Chairperson	Ely Shoshone Tribe	16 Shoshone Circle	Ely	NV	89301
√	NV	Alvin	Moyle		Chairman	Fallon Paiute Shoshone Tribal Business Council	565 Rio Vista Road	Fallon	NV	89406-9159
√	NV	Billy	Bell		Chairperson	Fort McDermitt Tribal Council	P.O. Box 457	McDermitt	NV	89421
√	NV	Albin	Moyle		President	Inter-Tribal Council of Nevada	680 Greenbrae Drive	Sparks	NV	89431
√	NV	Benny	Tso		Chairperson	Las Vegas Tribal Council	Number One Paiute Drive	Las Vegas	NV	89106
√	NV	Victor	Mann		Chairman	Lovelock Tribal Council	P.O. Box 878	Lovelock	NV	89419
√	NV	Darren	Daboda		Chairman	Moapa Business Council	P.O. Box 340	Moapa	NV	89025-0340
√	NV	Richard	Arnold		Tribal Chair	Pahrump Paiute Tribe	P.O. Box 3411	Pahrump	NV	89041
√	NV	Mervin	Wright	Jr.	Chairman	Pyramid Lake Paiute Tribal Council	P.O. Box 256	Nixon	NV	89424
√	NV	Arlan D.	Melendez		Chairman	Reno-Sparks Tribal Council	98 Colony Road	Reno	NV	89502
√	NV	Robert	Bear		Chairman	Shoshone-Paiute Business Council	P.O. Box 219	Owyhee	NV	89832
√	NV	Sim	Malotte		Chairman	South Fork Band Council	Box B-13	Lee	NV	89829
√	NV	Wanda	Batchelor		Chairperson	Stewart Community Council c/o Washoe Tribe of Nevada/California	919 Highway 395 South	Gardnerville	NV	89410
√	NV	Warner	Barlese		Chairman	Summit Lake Paiute Tribal Council	1708 H. St.	Sparks	NV	89431-4337
√	NV	Brian	Cassadore		Chairman	Te-Moak Tribe of Western Shoshone Tribal Council	525 Sunset Street	Elko	NV	89801
√	NV	Lorren	Sammaripa		Chairman	Walker River Paiute Tribal Council	P.O. Box 220	Schurz	NV	89427
√	NV	Waldo W.	Walker		Chairman	Washoe Tribal Council	919 Highway 395 South	Gardnerville	NV	89410
√	NV	Paula	Salazar		Chairperson	Wells Indian Colony Band Council	P.O. Box 809	Wells	NV	89835
√	NV	Linda	Ayer		Chairman	Winnemucca Tribal Council	P.O. Box 1370	Winnemucca	NV	89446
√	NV	Elwood	Emm		Chairman	Yerington Paiute Tribe	171 Campbell Lane	Yerington	NV	89447
√	NV	James	Birchim		Chairman	Yomba Tribal Council	HC61, Box 6275	Austin	NV	89310
√	OK	Alonzo	Chalepah		Tribal Chairman	Apache Tribe of Oklahoma	P.O. Box 1220	Anadarko	OK	73005
√	OK	Darrell	Flyingman		Chairman	Cheyenne-Arapaho Tribes of Oklahoma	P.O. Box 38	Concho	OK	73022
√	OK	Michael	Burgess		Chairman	Comanche Nation	P.O. Box 908	Lawton	OK	73502
√	OK	Jeff	Houser		Chairman	Fort Sill Apache Tribe of Oklahoma	Route 2, Box 121	Apache	OK	73006
√	OK	Donnie	Pofpi		Chairman	Kiowa Tribe of Oklahoma	P.O. Box 369	Carnegie	OK	73015
√	OK	George	Howell		President	Pawnee Nation of Oklahoma	P.O. Box 470	Pawnee	OK	74058
√	SD	Joseph	Brings Plenty		Chairman	Cheyenne River Lakota Sioux Tribe	P.O Box 590	Eagle Butte	SD	57625
√	SD	Brandon	Sazue	Sr.	Chairman	Crow Creek Sioux Tribal Council	P.O. Box 50	Fort Thompson	SD	57339
√	SD	Theresa	Two Bulls		President	Oglala Sioux Tribal Council	P.O. Box 2070	Pine Ridge	SD	57770
√	SD	Rodney	Bordeaux		President	Rosebud Sioux Tribal Council	P.O. Box 430	Rosebud	SD	57570
√	TX	Frank	Paiz		Governor	Ysleta del Sur Pueblo	P.O Box 17579 - Ysleta Station	El Paso	TX	79917
√	UT	Rupert	Steele		Chairman	Goshute Business Council	P.O. Box 6104	Ibapah	UT	84034
√	UT	John	Billie		President	Navajo Nation, Aneth Chapter	P.O. Box 430	Montezuma Creek	UT	84534
√	UT	James	Black		President	Navajo Nation, Oljato Chapter	P.O. Box 360455	Monument Valley	UT	84531
√	UT	Herman	Farley		President	Navajo Nation, Red Mesa Chapter	P.O. Box 422	Montezuma Creek	UT	84534

√	UT	Clarence	Rockwell		Executive Director	Navajo Utah Commission	P.O. Box 570	Montezuma Creek	UT	84534
√	UT	Gwen	Davis		Chairman	Northwestern Band of Shoshone Nation	707 N. Main St	Brigham City	UT	84302
√	UT	Jeanine	Borchardt		Chairperson	Paiute Indian Tribe of Utah Tribal Council	440 N. Paiute Drive	Cedar City	UT	84720-2613
√	UT	Alex	Shepherd		Chairman	Paiute Indian Tribe of Utah, Cedar Band	440 N. Paiute Drive	Cedar City	UT	87420-2613
√	UT	Anthonia	Tom		Chairwoman	Paiute Indian Tribe of Utah, Indian Peak Band	440 N. Paiute Drive	Cedar City	UT	84720
√	UT	Phil	Pikyavit		Chairman	Paiute Indian Tribe of Utah, Kanosh Band	P.O. Box 101	Kanosh	UT	84637
√	UT	Cyndi	Charles		Chairwoman	Paiute Indian Tribe of Utah, Koosharem Band	223 East 575 North	Cedar City	UT	84720
√	UT	Charlotte	Lomeli		Chairwoman	Paiute Indian Tribe of Utah, Shivwits Band	6060 West 3650 North	Ivins	UT	84738
√	UT	Lawrence	Bear		Chairman	Skull Valley Band of Goshute Indians General Council	P.O. Box 448	Grantsville	UT	84029
√	UT	Curtis	Cesspooch		Chairperson	Ute Indian Tribe	P.O. Box 190	Ft. Duchesne	UT	84026
√	UT	Leona	Eyetoo		Councilwoman	White Mesa Ute Tribe	P.O. Box 7096	Blanding	UT	84511
√	WY	Ivan D.	Posey		Chairman	Eastern Shoshone Business Council	P.O. Box 217	Fort Washakie	WY	82514
√	WY	Harvey	Spoonhunter		Chairman	Northern Arapaho Business Council	P.O. Box 396	Fort Washakie	WY	82514

(b) October 26, 2011, Sample Letter and Q&A Fact Sheet with Distribution List

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240
http://www.blm.gov

TAKE PRIDE IN AMERICA

In Reply Refer To:
1610 (301)

Louis Manuel, Jr., Chairperson
Ak Chin Indian Community Council
42507 W. Peters & Nall Road
Maricopa, AZ 85239

Dear Chairperson Manuel, Jr:

This letter continues the Bureau of Land Management's (BLM) government-to-government consultation with you regarding the establishment of a national solar energy program. Information about this effort, its legislative underpinnings, geographic scope, and the environmental analysis underway was included in several previous letters to Indian tribes beginning in June 2008. A Question and Answer Fact Sheet explaining the BLM-Tribal consultation procedures being followed for this program is enclosed.

The main purpose of this letter is to request tribal review and input on three key components prepared by the BLM to fully assess the effects of solar development on the environment, cultural resources, and Indian tribes within six southwestern states. The BLM would appreciate written tribal comments on the Supplement to the Draft Solar Programmatic Environmental Impact Statement (PEIS); the revised Programmatic Agreement governing compliance with Section 106 of the National Historic Preservation Act; and ethnographic studies carried out to inform decisions within the PEIS. This letter provides you with mailing addresses, e-mail addresses, and telephone numbers of key points of contact to facilitate your input. Face-to-face meetings with tribes and public meetings are being scheduled. Contact information is provided so that you can check on the scheduling of these events.

The BLM is evaluating the effects of solar energy development on the public lands in Arizona, California, Colorado, New Mexico, Nevada, and Utah in the PEIS. In February 2011, we sent you a copy of the Draft PEIS describing 24 proposed Solar Energy Zones (SEZ) where solar energy development could be prioritized. The Final PEIS is expected to be released in the summer of 2012. As a result of tribal and public input and additional environmental analyses, a number of SEZs proposed for consideration in the Draft PEIS have been eliminated while others have been reduced in size. These and other changes are described in the Supplement to the Draft PEIS enclosed with this letter. The Supplement is also available online through the project Web site: http://solareis.anl.gov.

The BLM developed this Supplement in response to extensive public and tribal comments regarding the Draft PEIS. The additional analyses contained within this document address:

- Modifications of the action alternatives

- Refinement of which SEZs will be carried forward
- A description of additional information that will be collected and analyzed for each SEZ to be carried forward
- A process for identifying new SEZs in the future
- A variance process for applicants seeking to develop projects outside of SEZs

The BLM is also working on a Programmatic Agreement (PA) describing the process by which the BLM will take into account the effect of the solar energy program on historic properties as required by Section 106 of the National Historic Preservation Act. In our February 2011 mailing, we included the draft PA for your consideration. We received a number of suggestions on how to improve that document, and the revised draft is included for your further review.

In the fall of 2010, the BLM awarded a contract to develop an ethnographic overview of select SEZs in the Great Basin region in Nevada and Utah to SWCA Environmental Consultants. The objective of the contract was to obtain tribal input on sacred landscapes and traditional cultural properties for consideration when solar applications are submitted in the future within designated SEZs in those two states. Cooperating tribes included the Timbasha Shoshone, Pahrump Paiute, Paiute Indian Tribe of Utah, Duckwater Shoshone, the Moapa Band of Paiute Indians, and the Confederated Tribes of the Goshute Reservation. The overview includes a literature review and field visits with tribal members as well as tribal interviews. All documentation released to the BLM was first reviewed and approved by tribal governments. The Tribes and their appointed cultural representatives provided this input into the PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and sites of historic encounters that exist in and around the proposed SEZs.

Tribes attested that numerous landscape features, locations, sites, and resources were culturally significant. These included:

- Volcanic boulders used to hold the prayers of travelers
- "Doctor" rocks used in healing ceremonies and prayer
- Mountain tops used for vision questing and power acquisition
- Topographic features tied to Creation stories and songs
- Culturally significant plants and animals
- Physical and spiritual trails
- Volcanic features considered sacred and powerful
- Rock peckings and rock paintings (petroglyphs and pictographs)
- Viewscapes needed for ceremonial activities, including vision questing
- Hot springs, fresh water springs, and sulfur springs
- Archeological and historical sites
- Landscapes of origin
- Regions of refuge
- Locations used for round dances, balancing ceremonies, Ghost dances, or other ceremonies

Tribal input received as a result of this effort is summarized in Appendices B and C of the Supplement. The full tribally approved text is also available through the project Web site at: http://solareis.anl.gov.

The BLM would like to know if your tribe shares similar concerns to those expressed in the ethnographic study. For those areas of cultural and historical importance to your tribe, are there landscape features, sites, or resources that you feel are of cultural, historical, or sacred importance that the BLM should consider at this stage of the environmental review process? Would you be willing to identify traditional cultural properties similar to those mentioned above? Are there other types of traditional use sites, ethnobotanical resources, or landscape features that the BLM should be aware of when considering solar development proposals? Are there published or unpublished ethnographic accounts or other studies your tribe would recommend the BLM review when evaluating sacred landscapes or traditional cultural properties in areas subject to solar development? The confidentiality of any information your tribe would care to share with us would be respected to the full extent allowed by law.

The BLM recognizes that its national solar energy program is currently very broadly defined and, perhaps, somewhat abstract. Whether you choose to share any information now, please be assured that the BLM views its obligations to carry out government-to-government consultation regarding the solar energy program as an ongoing process. The BLM, through its line officers, will contact tribes in the future as specific applications are submitted and will provide opportunities for tribes to identify sacred sites and traditional cultural properties as the specific details of development projects become known.

When site-specific applications for solar development are received, whether within the SEZs or on other lands available for application through a variance process described in the Supplement, the BLM line officers will continue cultural resources consultation with affected tribes. We will seek information and insight on a site-specific basis that will be used to evaluate historic properties and landscapes. Tribal consultation results will be fully considered when the BLM line officer decides whether a proposed project may or may not be allowed to proceed. The agency will consult with tribes regarding programs of mitigation, monitoring, and eventual plans for remediation and retirement of solar facilities.

Solar companies must submit a complete and acceptable application before the BLM line officer will initiate processing of the right-of-way grant. Line officers will schedule a number of pre-application meetings with the proponent in which required cultural resource studies will be identified. Decisions regarding any required ethnographic studies will be made following tribal consultation. All cultural resource inventories and ethnographic studies will be completed and referenced in a final application before consideration of the request can proceed.

Commenting on the Supplement to the Draft PEIS. Please submit your comments on the Supplement to the Draft PEIS electronically by using the online comment form available at the project Web site: http://solareis.anl.gov. To facilitate analysis of comments and information submitted, we strongly encourage you to submit comments in an electronic format. You may also send your comments by mail to: Solar Energy Draft PEIS, Argonne National Laboratory, 9700 S. Cass Avenue – EVS/240, Argonne, Illinois 60439. Public meetings on the Supplement are being held in Las Vegas, Nevada, November 30; Phoenix, Arizona, December 1; El Centro, California, December 7; and Palm Desert, California, December 8. More information about these meetings can be found on the project Web site. The public comment period for the Supplement will end 90 days after the Notice of Availability has been published in the *Federal Register* or on January 23, 2012, whichever date is later. Our contact person for the status of the Supplement to the Draft PEIS is Shannon Stewart, and she can be reached by telephone at 202-912-7219 or by e-mail at scstewar@blm.gov.

<u>Commenting on the Proposed PA and Ethnographic Issues</u>. Please submit your comments on the proposed PA or any concerns or input regarding traditional cultural properties or sacred sites by mail to Solar Energy Draft PEIS/PA, Argonne National Laboratory, 9700 S. Cass Avenue – EVS/240, Argonne, Illinois 60439. We would like to receive your comments on the proposed PA or any ethnographic issues by January 23, 2012. Oral or written comments on the proposed PA will also be accepted at the Solar PEIS meetings discussed above. If you would like more information about the PA or the manner in which ethnographic information will be taken into account in the consideration of future solar undertakings, feel free to contact Stephen Fosberg, Solar PEIS Project Archeologist, by telephone at 828-693-9310 or by e-mail at sfosberg@blm.gov.

<u>Government-to-Government Consultation</u>. The BLM's tribal consultation policy requires BLM officials to consult with tribes in government-to-government meetings to identify and consider the concerns of tribes in land use planning and decision making. Through this letter, we are requesting tribal participation and inviting tribes to engage in government-to-government consultation on the Supplement, the proposed PA, and ethnographic issues so that the decisions we make about solar energy development can be appropriately informed. BLM officials within each of the six solar states will be telephoning those tribes that have provided detailed written comments about the draft PEIS and those tribes with cultural and/or historical ties to the proposed SEZs to determine if tribes wish to meet face-to-face to discuss the solar energy program and the issues mentioned above. For information regarding such meetings, you may contact the BLM State Archeologist within each of the six solar states. These contacts are:

Arizona—Michael Johnson, 602-417-9236, or mdjohnso@blm.gov
California—Charlotte Hunter, 916-978-4648, or cahunter@blm.gov
Colorado—Daniel Haas, 303-239-3647, or dhaas@blm.gov
Nevada—Tom Burke, 775-861-6415, or t1burke@blm.gov
New Mexico—Signa Larralde, 505-954-2179, or slarrald@blm.gov
Utah—Byron Loosle, 801-539-4074, or bloosle@blm.gov

Thank you for your consideration. We appreciate tribal participation in this government-to-government consultation and look forward to future discussions with you.

Sincerely,

Michael D. Nedd
Assistant Director, Minerals and Realty Management

Enclosures

Question and Answer Fact Sheet
BLM-Tribal Consultation Procedures Regarding Solar Energy Development on Public Lands in Six Southwestern States

The Bureau of Land Management (BLM) will complete a Programmatic Environmental Impact Statement (PEIS) to evaluate and establish a national solar energy program by the fall of 2012. This fact sheet explains how the agency will consult with Indian tribes regarding this undertaking. Following a brief introduction, Questions and Answers address the manner and timing of government-to-government consultation with federally recognized tribes and compliance with Section 106 of the National Historic Preservation Act (NHPA) through execution of a Programmatic Agreement (PA).

Introduction

The BLM and the Department of Energy are jointly preparing a PEIS for solar development in six southwestern states. The PEIS analyzes a new solar energy program that would be applicable to utility-scale solar energy development on BLM-administered lands. Following release of the PEIS, the BLM will consider future site-specific applications for solar development under the solar energy program through project-specific National Environmental Policy Act documents.

The BLM State Directors initiated consultation with Indian tribes in June 2008 regarding the preparation of the PEIS. They sent a letter to the elected leadership of 253 federally recognized Tribes, Chapters, and Bands, notifying them of the forthcoming Solar PEIS, inviting them to be cooperating parties, and requesting government-to-government consultation. Such government-to-government consultation addressed the agency's affirmative consultation obligations, including those that pertain to Section 106 of the NHPA.

In July 2009, the California Desert District Manager mailed a letter on behalf of the agency to all tribes with ties to the six southwestern states, including maps of proposed Solar Energy Zones (SEZ), again inviting them to consult. Responsible line officers followed-up with phone calls, emails, and face-to-face visits to make sure that cultural resource personnel within the tribes were aware of these notification efforts. In the fall and winter of 2010/2011, staff from Argonne National Laboratory called all tribes with ties to the SEZs or other developable areas who had not responded to make sure the tribes had received the maps. Argonne re-sent maps and information packets as needed.

The BLM and Department of Energy have contracted Argonne National Laboratory to produce the PEIS. Argonne National Laboratory is the Department of Energy's largest research center. It conducts applied research and assists in the preparation of environmental impact statements. As a contractor for the Solar PEIS effort, Argonne has contacted tribes on behalf of the agencies, and collected and analyzed information. However, the BLM has the sole responsibility to negotiate and make commitments to tribes. Only the BLM will conduct government-to-government consultation for this program.

The discussion below outlines the context and timing of these discussions. For further information on this project, please visit http://www.solareis.anl.gov.

Questions and Answers

1. What is the relationship between current "priority" solar energy proposals and applications that "will be considered" under the terms of the PEIS?

Developers submitted hundreds of solar project applications prior to the initiation of the PEIS. Applicants withdrew many of these projects and the responsible BLM line officers cancelled some projects due to insufficient information or lack of diligence on the part of the applicant.

Other applicants provided sufficiently detailed plans and analyses for the agency to process right-of-way authorizations for development of specific projects on the public lands. The BLM gives those applications that are sufficiently complete to meet certain deadlines priority review and refers to them as "priority" projects (formerly "fast track" projects). The responsible BLM line officers will evaluate these and other applications during the preparation of the PEIS and will process them in accordance with existing policies. The BLM treats these priority projects separately and independently from the PEIS. The BLM will analyze and process them under existing solar program guidance and treat them as project-specific undertakings under Section 106 of the NHPA. The agency will incorporate the program established through the PEIS into the processing of site-specific applications for solar development considered after the release of the Record of Decision.

The following tables list those priority projects that the BLM has approved or is currently processing. These projects include those for which the companies have demonstrated sufficient progress and expertise to start the environmental review and public participation process. Responsible line officers are conducting tribal consultation for these priority projects under established tribal consultation policies and Section 106 consultation procedures specified within individual state protocol agreements or under the 36 CFR 800 regulations. (Follow the link www.blm.gov/wo/st/en/prog/more/CRM.html for an explanation of how state protocols guide the cultural resources program and links to state-specific protocols.)

Approved Applications				
Serial Number	**Customer Name (Project Name)**	**MWs**	**Total BLM Acres**	**BLM Field Office**
CACA049537	TESSERA SOLAR (Calico Solar) - acquired by K Road Power	664	4,604	Barstow
CACA048880	NextEra/BOULEVARD ASSOCIATES LLC (Genesis/Ford Dry Lake)	250	1,950	Palm Springs-Southcoast
CACA048811	SOLAR MILLENNIUM/CHEVRON (Blythe)	1,000	7,025	Palm Springs-Southcoast
CACA049561	CHEVRON ENERGY SOLUTIONS CO (Lucerne Valley)	45	422	Barstow
CACA047740	TESSERA SOLAR (Imperial Valley Solar) - acquired by AES Solar	709	6,459	El Centro
CACA048668	SOLAR PARTNERS I LLC (Ivanpah SEGS includes CACA 049502, 3, and 4)	370	3,501	Needles
CACA048649	FIRST SOLAR (Desert Sunlight)	550	4,165	Palm Springs-Southcoast
NVN084359	SOLAR MILLENNIUM LLC (Amargosa Farm Road)	484	4,350	Pahrump
NVN085077	NEXTLIGHT RENEWABLE POWER LLC (Silver State North)	50	618	Las Vegas
NVN086292	Solar Reserve/TONOPAH SOLAR ENERGY LLC (Crescent Dunes)	110	2,250	Tonopah

Priority Projects				
Serial Number	**Customer Name (Project Name)**	**MWs**	**Total BLM Acres**	**BLM Field Office**
AZA034187	NextEra/BOULEVARD ASSOC LLC (Sonoran Solar)	500	4,000	Lower Sonoran
CACA048810	SOLAR MILLENNIUM/ CHEVRON (Palen)	500	5,160	Palm Springs-Southcoast
CACA051625	SAN DIEGO GAS & ELECTRIC CO (Ocotillo Sol)	14	115	Barstow
AZA034666	*SOLAR RESERVE LLC (Quartzsite)*	*100*	*1,500*	*Yuma*
AZA034425	*PACIFIC SOLAR INVST INC (Iberdrola) (Hyder)*	*350*	*4,500*	*Lower Sonoran; Yuma*
CACA048728	*NextEra ENERGY (McCoy)*	*250*	*7,754*	*Palm Springs-Southcoast*
CACA049397	*FIRST SOLAR (Desert Quartzite)*	*700*	*7,245*	*Palm Springs-Southcoast*
CACA048669	*FIRST SOLAR (Stateline/Ivanpah)*	*380*	*3,454*	*Needles*
CACA 049491	*ENXCO (Desert Harvest)*	*100*	*930*	*Palm Springs - Southcoast*
NVN084052	*NV POWER CO (Dry Lake Valley)*	*125*	*919*	*Las Vegas*
NVN084465	*PACIFIC SOLAR INVESTMENTS INC (Iberdrola) (Amargosa North)*	*150*	*7,500*	*Las Vegas*
NVN085077	*FIRST SOLAR (Silver State South)*	*350*	*1,400*	*Las Vegas*

Italicized entries in the table above are draft and subject to change. These projects have not yet been shared with the general public.

2. Why has the BLM placed so much emphasis on government-to-government consultation at the programmatic level?

Throughout this planning process, the BLM engaged tribes in discussions early on in the process. Tribal expressions of concern tied to specific geographical regions, identification of cultural sites and resources on the ground, and documentation of landscape use have been critical. The identification of tribal issues and concerns allowed the agency to make adjustments through the planning process to minimize the impacts to places and resources considered important by tribes.

The PEIS process provided several opportunities for tribes to affect decisions regarding where to concentrate solar development so that we could reduce the time pressures of project-specific consultation.

The BLM acknowledges that the tribes may consider the disclosure of information pertaining to sacred sites by tribal members to be culturally inappropriate, uncomfortable, and even spiritually dangerous. The agency will continue to use all legal means available to protect such sensitive information from unwarranted disclosure.

3. What is the Supplement to the Draft Solar PEIS (Supplement) and how does it relate to ongoing government-to-government consultation?

The Supplement, included with this mailing, provides additional information to address key issues identified through public comments. The Supplement includes:

a) Modification of the action alternatives;
b) Refinement of which SEZs will be carried forward;
c) A description of additional information that will be collected and analyzed for each SEZ to be carried forward;
d) A process for identifying new SEZs in the future; and
e) A variance process for applicants who wish to develop projects outside of SEZs.

Copies of the Supplement are available through the project Web site (http://solareis.anl.gov) and have been mailed to tribes along with correspondence described in question 5 below. The public has 90 days to comment on the new information.

4. How will the BLM notify tribes regarding how the Final PEIS was influenced by the issues and by concerns expressed by tribes during the consultation process?

Language of the Final PEIS will reflect tribal consultation, oral testimony, written comments, and the findings of ethnographic research. The BLM will provide detailed feedback to tribe that goes beyond normal EIS procedures. The BLM Washington Office will respond to each comment letter or public testimony received from tribes regarding the Draft PEIS and the Supplement in the Final PEIS. The agency will provide a written summary to all tribes informing them of the changes that were made to reflect the input they provided in written comments, oral testimony, and face-to-face meetings. If the BLM cannot make the requested changes, it will justify its decision. The agency will also reiterate plans for ongoing consultation regarding future site-specific applications for solar development.

5. What efforts are currently underway to continue government-to-government consultation with tribes concerning the BLM's solar energy program?

The responsible BLM line officers continue to strengthen efforts to consult with tribes concerning how they may be affected by solar projects approved under the terms of the PEIS. Line officers will first call those tribes who have submitted written comments on the PEIS. BLM line officers will **request** a government-to-government meeting with elected tribal officials so that we can discuss issues raised in tribal correspondence and the process for finalizing the PEIS and Record of Decision. BLM line officers in the six solar states will also telephone tribes with historical and cultural ties to the SEZ areas and **offer to meet** face-to-face. At such meetings, topics may include the content of the Supplement; the consultation procedures described within this Question and Answer Fact Sheet; projected timeframes and procedures for finalizing the PEIS; procedures for tribal consultation when we receive and consider project-specific solar applications under provisions of the PEIS; and proposed Section 106 consultation procedures contained within the revised draft PA. The BLM will initiate these contacts in late October 2011.

Concurrent with release of the Supplement, the National Renewable Energy Coordination Office will mail the Supplement, the Question and Answer Fact Sheet, and the PA to all tribes. Recipient tribes will include those who commented regarding the draft PEIS, those with cultural and/or historical ties to the SEZ area, and those with cultural and /or historical ties to lands subject to solar development through the variance process. Letters will request additional government-to-government consultation. They will explain future consultation procedures the responsible BLM line officers will propose when we receive site-specific solar applications.

6. How will the BLM handle tribal consultation for site-specific solar applications?

The government-to-government consultations initiated for the PEIS will continue and become more focused as the BLM receives and considers future site-specific applications for solar development. The BLM understands that the large-scale and hypothetical nature of some of the issues under consideration in the PEIS made it difficult for tribes to come forward and identify specific places, sites, and resources of concern. The Preferred Alternative recommended in the Draft PEIS, for example, proposes that nearly 22 million acres in six southwestern states would remain open for possible solar energy development. When a BLM field office receives future site-specific applications for solar development, the responsible line officer will determine which tribes are most likely to have historical and/or cultural ties to the project's area of potential effect. The responsible BLM line officers will make reasonable and good faith attempts to meet with the affected tribe(s) so that the BLM and the affected tribes can discuss the proposed development in detail. The BLM will make initial contacts with the tribes by letter and telephone. Either the tribal or BLM cultural staff may make the arrangements for any face-to-face meetings, and the line officers (the District Manager, Field Office Manager, or other BLM decisionmaker) will attend. The BLM will request that elected tribal officials, ideally the tribal Chairman or President, attend at least one such meeting in order to address government-to-government concerns. The purpose of the meetings will be to describe the proposed project and discuss cultural resources or other tribal issues of concern. Any agency decisions to authorize or modify the proposed solar project will take tribal issues and concerns into account.

7. Are the proposed BLM procedures to meet its government-to-government consultation obligations for the solar energy program compatible with the Secretary of the Interior's proposed policy governing Consultation with Indian Tribes?

The Secretary of the Interior will soon issue a new policy to improve consultation with Indian tribes. Published in the *Federal Register* on May 17, 2011, the public comment period for this draft policy closed on July 18, 2011.

The six BLM states affected by the new solar energy program are conducting consultation with Indian tribes that is consistent with the draft Secretarial policy. The BLM's procedures for tribal consultation regarding the solar energy program will be fully compatible with the signed final policy. Such a process will likely include a number of key directives listed in the current draft:

- BLM officials engaged in consultation will be those line officers who have delegated authority in the disposition and implementation of an action.
- BLM line officers responsible for the proposed project area will request that tribal consultation partners involve those officials who are elected, appointed, or officially delegated in writing to represent the tribe.
- BLM line officers will consult with tribes for those proposed actions with tribal implications. Such actions may have a substantial direct effect on tribal cultural practices, lands, resources, or access to traditional areas of cultural or religious importance on federally managed lands.
- Notices will provide a description of the topic(s) to be discussed, a timeline of the process, and possible outcomes.
- If tribes do not respond to requests for consultation, the responsible BLM line officers will make reasonable and periodic efforts throughout the planning process to repeat the invitation.
- BLM line officers will consult with tribes during the initial planning stage, proposal development stage, and implementation stage of actions. Communication with tribes will be in the form of telephone calls, letters, face-to-face meetings, or other forms of interaction.
- Final decisions on Departmental actions with tribal implications will be communicated in writing to affected tribes with a summarized explanation of the final decision.

The agency implements its responsibilities to consult with tribes using a phased approach. As required by the Secretary's draft policy, the BLM has made continuing efforts to engage with Indian tribes regarding the proposed solar energy program.

8. How will BLM use ethnographic data to meet its affirmative responsibilities to consult with tribes regarding the solar energy program?

The BLM Washington Office contracted with SWCA Environmental Consultants to produce an ethnographic overview of six tribes within the Great Basin region. These tribes were the Moapa Band of Paiute Indians, the Paiute Indian Tribe of Utah, the Timbisha Shoshone Tribe, the Duckwater Shoshone Tribe, the Pahrump Paiute Tribe, and the Confederated Tribes of the

Goshute Indian Reservation. Tribes were selected based upon their expressed interest and willingness to cooperate with the research necessary to produce an ethnographic overview. Results of the ethnographic contract will be used to produce an overview of tribal concerns in the Great Basin area relative to solar energy development. The overview will be based on existing literature and ethnographic data. An ethnographer interviewed tribal members in the field to discuss places of religious and traditional use and tribal concerns regarding the impacts of solar development on cultural landscapes. Information gained during the ethnographic research will be used to identify traditional cultural properties, significant ethnobotanical resources, visual resources, and tribal perspectives on the direct and indirect effects of solar development on tribal interests. Due to concerns over information sensitivity, the contract's Statement of Work stipulates that only the BLM Washington Office will receive a complete report. Any information to be shared with the public must first go through a redaction and approval process by the concerned and affected tribes.

9. What about other tribes?

Based on the results of the ethnographic studies mentioned above, the BLM is contacting tribes with cultural and/or historical ties to all lands available for development. The draft ethnographic reports from the southern Great Basin (available on the Solar PEIS project website at http://solareis.anl.gov) will give the BLM the opportunity to recognize and consider tribal concerns for particular site types before finalizing the PEIS. These reports have summarized key findings and concerns and the BLM Washington office is now writing to other tribes asking if they have similar issues or concerns. The findings of the ethnographic reports are presented at a very general level. Concerns raised about trails, plant gathering areas, or rock art sites, for example, give the agency the opportunity to ask if those are the types of sites or issues that other tribes care to bring to the agency's attention for SEZs in their regions.

10. Will more ethnographic studies be carried out in the future?

Government-to-government consultation and project-specific consultations with tribal staff will be used as opportunities for tribes to identify traditional cultural properties or sacred sites. However, there may be times when BLM line officers need new ethnographic research to provide sufficient information to adequately consider the effects of solar development on issues and resources of concerns to tribes. The BLM Field Office cultural staff, including specialists assigned to Renewable Energy Coordination Offices, in consultation with their Deputy Preservation Officer, will recommend to the responsible BLM line officers whether new ethnographic data are required for a given solar application. If new ethnographic research, studies, or interviews are necessary, the BLM cultural staff, in consultation with tribal officials, will recommend to BLM line officers the appropriate scope of the study as well as provisions for safeguarding data confidentiality.

11. When will other cultural resource data be acquired and included in a future site-specific Plan of Development?

Solar companies must submit a complete and acceptable application before the responsible BLM line officer will initiate processing of the right-of-way grant. Line officers will schedule a number of pre-application meetings with the applicant in which required cultural resource studies will be identified. Decisions regarding any required ethnographic studies will be made following tribal consultation. All cultural resource inventories and ethnographic studies will be completed and referenced in a final application before consideration of the request can proceed. The responsible line officer may deny an application if the applicant does not provide the additional information requested in a timely manner. The terms and conditions of the right-of-way grant will require that a Plan of Development include documentation of a completed BLM-approved cultural resources mitigation program(s) before ground disturbance and construction begins. Requirements to meet the BLM's responsibilities under NHPA are also likely to be specified within Memoranda of Agreement (MOA) or specific Programmatic Agreements developed for the solar project.

12. What level of cultural resource inventory will be required for future solar applications?

The responsible BLM line officers will require that solar company officials meet with them prior to the submission of a formal Plan of Development. The BLM Instruction Memorandum No. 2011-061 dated February 7, 2011, describes the pre-application and screening procedures required for solar and wind energy applications. Agency policy requires at least two pre-application meetings with the applicant. The purpose of these meetings is to identify needed cultural resource studies and tribes are encouraged to participate. However, screening criteria encourage the responsible BLM line officers to prioritize the processing of applications for areas with the lowest potential for conflicts, including cultural resource concerns.

Based on the company's initial plans for development, the Field Office cultural resources staff will determine the Area of Potential Effect (APE) for the proposed undertaking. This APE will include reasonably foreseeable direct and indirect effects.

New Class III cultural resource inventories for archeological and architectural resources, as appropriate, will be normally be required for the entire APE, except where (in the judgment of the responsible BLM cultural resources staff) reliable Class III inventory data already exist or where geomorphological or human-caused land disturbances would preclude the existence of historic properties. Those portions of the APE requiring new cultural resource inventories will usually be surveyed at one time. The agency must approve a phased survey approach in advance. Complete survey results facilitate development of mitigation plans and tribal consultation. Depending on the geologic conditions, geomorphological testing may need to be included as part of site identification strategies.

13. Who pays for the acquisition of cultural resource data for consideration in future site-specific applications for solar development?

The applicant must provide sufficient funding to acquire any needed archeological, historical, or ethnographic data. Applications for solar energy facilities are processed as right-of-way authorizations under Title V of the Federal Lands Policy Management Act and Title 43, Part 2800 of the Code of Federal Regulations. The developer must submit a completed and acceptable application before the responsible line officer will initiate processing the right-of-way application. Most proposals under the solar program will be full cost recovery applications.

Right-of-way authorizations will contain appropriate stipulations relating to all aspects of project development including cultural resources mitigation and monitoring. Appendix A of the PEIS discusses a set of design features to reduce adverse impacts of solar energy development on the public lands. Unless cultural resources are absent from the APE, required design features attached to all solar energy applications must include a Cultural Resources Management and Mitigation Plan. Terms and conditions of each right-of-way grant will require that these plans be included in the Plan of Development and that the holder of the grant fully comply with the provisions of the plans.

14. How has the BLM consulted with tribes under Section 106 of the National Historic Preservation Act?

In June 2008, BLM State Directors informed tribes that the PEIS was being prepared, asked if tribes wished to participate as cooperating agencies, and offered government-to-government consultation. In July 2009, the California Desert District Manager announced that public scoping was being extended and invited tribal views and comments on the PEIS and proposed solar energy study areas within the six southwestern states. The letter stated that a PA would be developed to facilitate compliance with Section 106 of the NHPA for the new solar energy program. Tribes were told that more information about the PA would be forthcoming. In February 2011, the BLM Assistant Director, Minerals and Realty Management, wrote to tribes with a request for comment on the Draft PEIS, and a draft PA was enclosed for tribal review.

At public scoping meetings held in 2008 and 2011, the BLM took public testimony from tribes and tribal members. These public meetings, while addressing concerns over the Draft PEIS, were also used as information gathering opportunities for tribal comment on the draft PA. The BLM line officers at both the State and Field Office level continue to meet with tribal officials to explain the proposed solar energy program and how the PA will determine the process by which the agency will comply with Section 106 of the NHPA.

The BLM recognizes that its national solar energy program is currently very broadly defined. When site-specific applications for solar development are received, whether within the proposed SEZs or on other lands available for application, BLM line officers will continue consultation with affected tribes. The agency will seek information and insight on a site-specific basis, which will be used for the evaluation of historic properties. Tribal consultation results will be fully taken in account when the responsible line officer decides whether a proposed project may or may not be allowed to proceed. The agency will consult with tribes regarding programs of mitigation, monitoring, and eventual plans for remediation and retirement of solar facilities.

Ongoing government-to-government consultation relative to cultural resources will focus on identifying, evaluating, considering the effect upon, and mitigating impacts to historic properties of concern to Indian tribes. Although procedures pertaining to the agency's compliance with Section 106 of the NHPA may dominate some discussions with tribes, tribes will also have the opportunity to raise any issues regarding other resources in meetings and correspondence with the agency as part of the BLM's government-to-government consultation. The agency acknowledges that it has broad responsibilities to consult with tribes and will involve the appropriate program specialists and managers in consultations so that all issues of concern can be addressed.

15. How will Section 106 responsibilities for future solar undertakings be met and what is the relationship between the new solar program Programmatic Agreement and individual state protocol agreements?

The establishment of a national solar energy program will identify and prioritize development in locations best suited for this purpose. Amendments to BLM land use plans in the six-state area will then adopt those elements of the new solar energy program that pertain to planning. This program represents an interstate undertaking that could have direct and adverse effects upon National Historic Landmarks or National Register-eligible properties of national significance. For these reasons and because the development of the solar program is highly controversial, the BLM requested review and involvement of the Advisory Council on Historic Preservation (ACHP) to resolve potential adverse effects of solar energy development under terms of the national Programmatic Agreement. Negotiations currently underway among the BLM, the ACHP, and the six State Historic Preservation Officers (SHPO) for the affected six southwestern states will result in creation of a PA for the solar energy program. Indian tribes have been invited to participate as Consulting Parties in the development of the PA. The PA will replace and supersede the Section 106 compliance procedures that the six BLM states usually follow according to their state-specific protocol agreements with individual SHPOs created under the terms of the national PA. Tribal consultation for future project-specific applications, therefore, will follow the procedures contained within the new PA. This interaction may differ somewhat from consultation steps currently taken by the local BLM Field Offices for more routine undertakings; however, the existing BLM cultural resource manuals and handbooks will still apply, as will the Departmental tribal consultation policy when finalized.

The full effects of the implementation of the solar energy program on historic properties cannot be fully determined prior to approval of the program. The PA is being created to specify how the BLM will continue its consultation with tribes, the ACHP, and SHPOs in order to meet its Section 106 responsibilities for future site-specific applications for solar development. This step-down, customized approach for meeting an agency's Section 106 compliance obligations is authorized by 36 CFR 800.4(b)(2) and 36 CFR 800.14(b)(3). A final solar PA will be executed prior to the signing of the Record of Decision.

Acronyms Used in this Question and Answer Fact Sheet

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
BLM	Bureau of Land Management
CFR	Code of Federal Regulation
NHPA	National Historic Preservation Act
PA	Programmatic Agreement
PEIS	Programmatic Environmental Impact Statement
SEZ	Solar Energy Zone
SHPO	State Historic Preservation Officer

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
AZ	Louis	Manuel	Jr.	Chairperson	Ak Chin Indian Community Council	42507 W. Peters & Nall Road	Maricopa	AZ	85239
AZ	Sherry	Cordova		Chairperson	Cocopah Tribal Council	County 15th & Avenue G	Somerton	AZ	85350
AZ	Michael	Tsosie		Dr.	Colorado River Indian Tribes Museum	26600 Mohave Rd.	Parker	AZ	85344
AZ	Eldred	Enas		Chairman	Colorado River Tribal Council	26600 Mohave Rd.	Parker	AZ	85344
AZ	Clinton	Pattea		President	Fort McDowell Yavapai Tribal Council	P.O. Box 17779	Fountain Hills	AZ	85268
AZ	Mike	Jackson	Sr.	President	Fort Yuma Quechan Tribe	P.O. Box 1899	Yuma	AZ	85366
AZ	William Roy	Rhodes		Governor	Gila River Indian Community Council	P.O. Box 97	Sacaton	AZ	85147
AZ	Bernadine	Jones		Chairwoman	Havasupai Tribal Council	P.O. Box 10	Supai	AZ	86435-0010
AZ	Leroy	Shingoitewa		Chairman	Hopi Tribal Council	P.O. Box 123	Kykotsmovi	AZ	86039
AZ	Wilfred	Whatanome	Sr.	Chairman	Hualapai Tribal Council	P.O. Box 179	Peach Springs	AZ	86434
AZ	Manuel	Savala		Chairperson	Kaibab Paiute Tribal Council	HC 65, Box 2	Fredonia	AZ	86022
AZ	Roy W.	Malacki		Chairman	Navajo Fish & Wildlife, Natural Heritage Program	P.O. Box 1480	Window Rock	AZ	86515
AZ	Joe	Shirley	Jr.	President	Navajo Nation	P.O Box 7440	Window Rock	AZ	86515
AZ	Lawrence T.	Morgan		Speaker	Navajo Nation Council	200 Parkway Administration Bldg 1	Window Rock	AZ	86515
AZ	Harry Kee	Wagoner		President	Navajo Nation, Birdsprings Chapter	HC 61, Box K	Winslow	AZ	86047
AZ	Marvin	Yellowhair		President	Navajo Nation, Black Mesa Chapter	P.O. Box 97	Pinon	AZ	86510
AZ	Joe J.	Jim		President	Navajo Nation, Blue Gap/Tachee Chapter	P.O. Box 4427	Blue Gap	AZ	86520
AZ	Billy	Arizona	Jr.	President	Navajo Nation, Bodaway-Gap Chapter	P.O. Box 1546	Gap	AZ	86020
AZ	Edward	Singer		President	Navajo Nation, Cameron Chapter	P.O. Box 85	Cameron	AZ	86020
AZ	Leonard	Pete		President	Navajo Nation, Chinle Chapter	P.O. Box 1809	Chinle	AZ	86503
AZ	Kenneth	Nez		President	Navajo Nation, Coalmine Canyon Chapter	P.O. Box 1464	Tuba City	AZ	86045

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
AZ	Sid	Whitehair		President	Navajo Nation, Coppermine Chapter	P.O. Box 1323	Page	AZ	86040
AZ	Jimmie	Taliman	Sr.	President	Navajo Nation, Cornfields Chapter	P.O. Box 478	Ganado	AZ	86505
AZ	Harrison	Dick		President	Navajo Nation, Cove Chapter	P.O. Box 276	Red Valley	AZ	86544
AZ	Chester	Begay		President	Navajo Nation, Dennehotso Chapter	P.O. Box 301	Dennehotso	AZ	86535
AZ	Felix	Tsinijinnie		President	Navajo Nation, Dilkon Chapter	HCR 63 Box E	Winslow	AZ	86047
AZ	Donald T.	Chee		President	Navajo Nation, Forest Lake Chapter	P.O. Box 441	Pinon	AZ	86510
AZ	Ben	Bennett		President	Navajo Nation, Fort Defiance Chapter	P.O. Box 366	Fort Defiance	AZ	86504
AZ	Lavenna	George		President	Navajo Nation, Ganado Chapter	P.O. Box 188	Ganado	AZ	86505
AZ	Franklin	Gishey	Sr.	President	Navajo Nation, Greasewood Springs Chapter	P.O. Box 1260	Ganado	AZ	86505
AZ	Percy	Deal		President	Navajo Nation, Hardrock Chapter	P.O. Box 20	Kykotsmovi	AZ	86039
AZ	Ernest	Hubbell		President	Navajo Nation, Houck Chapter	P.O. Box 127	Houck	AZ	86506
AZ	Laverne	Yazzie-Benally		President	Navajo Nation, Indian Wells Chapter	P.O. Box 3049	Indian Wells	AZ	86031
AZ	Larry	Goodman		President	Navajo Nation, Inscription House Chapter	P.O. Box 5205	Tonalea	AZ	86044
AZ	Lennard	Eltsosie		President	Navajo Nation, Jeddito Chapter	P.O. Box 798	Keams Canyon	AZ	86034
AZ	Kelsey	Begaye		President	Navajo Nation, Kaibeto Chapter	P.O. Box 1761	Kaibeto	AZ	86053
AZ	Stanley	Clitso		President	Navajo Nation, Kayenta Chapter	P.O. Box 1088	Kayenta	AZ	86033
AZ	Johnny	Curtis	Sr.	President	Navajo Nation, Kinlichee Chapter	P.O. Box 860	St. Michael	AZ	86511
AZ	Arlene Nez	Whitekiller		President	Navajo Nation, LeChee Chapter	P.O. Box 4720	Page	AZ	86040
AZ	Thomas L.	Cody		President	Navajo Nation, Leupp Chapter	CPO Box 5085	Leupp	AZ	86035
AZ	Samual	Yazzie		President	Navajo Nation, Lukachukai Chapter	P.O. Box 248	Lukachukai	AZ	86507
AZ	Jackie	Yazzi	Jr.	President	Navajo Nation, Lupton Chapter	P.O. Box 403	Lupton	AZ	86508
AZ	Katherine O.	Arthur		President	Navajo Nation, Many Farms Chapter	P.O. Box 185	Many Farms	AZ	86538

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
AZ	Jerry	Tsosie		President	Navajo Nation, Mexican Water Chapter	HC 61 Box 38	Teecnospos	AZ	86514
AZ	Arnold R.	Begay		President	Navajo Nation, Nahata Dzill Chapter	P.O. Box 400	Sanders	AZ	86512
AZ	Alex	Bitsinnie		President	Navajo Nation, Navajo Mountain Chapter	P.O. Box 10070	Tonalea	AZ	86044
AZ	Johnson	Claw		President	Navajo Nation, Nazlini Chapter	P.O. Box 7387	Nazlini	AZ	86505
AZ	Edison J.	Wauneka		President	Navajo Nation, Oak Springs Chapter	P.O. Box 486	Window Rock	AZ	86515
AZ	Bessie S.	Allen		President	Navajo Nation, Pinon Chapter	P.O. Box 127	Pinon	AZ	86510
AZ	Lee	Zhonnie	Jr.	President	Navajo Nation, Red Valley Chapter	P.O. Box 304	Red Valley	AZ	86544
AZ	Clarence Cecil	Begay		President	Navajo Nation, Rock Point Chapter	P.O. Box 190	Rock Point	AZ	86545
AZ	Frances	Teller		President	Navajo Nation, Rough Rock Chapter	P.O. Box RRTP-IHH	Chinle	AZ	86503
AZ	Kellywood	Harvey		President	Navajo Nation, Round Rock Chapter	P.O. Box 10	Round Rock	AZ	86547
AZ	Herman	Begay	Sr.	President	Navajo Nation, Sawmill Chapter	P.O. Box 1786	Ft. Defiance	AZ	86504
AZ	Lorenzo	Isaac	Jr	President	Navajo Nation, Shonto Chapter	P.O. Box 7800	Shonto	AZ	86054
AZ	Raymond	Castillo		President	Navajo Nation, St. Michael Chapter	P.O. Box 829	St. Michael	AZ	86511
AZ	Andrew	Simpson		President	Navajo Nation, Steamboat Chapter	P.O. Box 117	Ganado	AZ	86505
AZ	Lena	Clark		President	Navajo Nation, Sweetwater Chapter	P.O. Box 105	Teecnospos	AZ	86514
AZ	Roy	Kady		President	Navajo Nation, Teec Nos Pos Chapter	P.O. Box 209	Teec Nos Pos	AZ	86514
AZ	Susie	Wauneka		President	Navajo Nation, Teesto Chapter	P.O. Box 7166	Winslow	AZ	86047
AZ	Max	Goldtooth	Sr	President	Navajo Nation, Toh Nanees Dizi Chapter	P.O. Box 727	Tuba City	AZ	86045
AZ	Freddie	Howard		President	Navajo Nation, Tolani Lake Chapter	P.O. Box HC61-SR-Box 3001	Winslow	AZ	86047
AZ	Chester	Claw		President	Navajo Nation, Tonalea Chapter	P.O. Box 207	Tonalea	AZ	86044

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
AZ	Zane	James		President	Navajo Nation, Tsaile/Wheatfields Chapter	P.O. Box 667	Tsaile	AZ	86556
AZ	Harrison	Kee		President	Navajo Nation, Tselani/Cottonwood Chapter	P.O. Box 1139	Chinle	AZ	86503
AZ	George	Denezpi		President	Navajo Nation, Whippoorwill Chapter	P.O. Box 279	Pinon	AZ	86510
AZ	Bennie	Hanley	Sr	President	Navajo Nation, White Cone Chapter	P.O. Box 338	Indian Wells	AZ	86031
AZ	Lyle	Baldwin		President	Navajo Nation, Wide Ruins Chapter	P.O. Box 208	Chambers	AZ	86502
AZ	Peter	Yucupicio		Chairperson	Pascua Yaqui Tribal Council	7474 S. Camino de Oeste	Tucson	AZ	85746
AZ	Diane	Enos		President	Salt River Pima-Maricopa Indian Community Council	10005 E. Osborn	Scottsdale	AZ	85256
AZ	Terry	Rambler		Chairperson	San Carlos Tribal Council	P.O. Box 0	San Carlos	AZ	85550
AZ	Evelyn	James		President	San Juan Southern Paiute Council	P.O. Box 882	Tonaea	AZ	86044
AZ	Ned	Norris	Jr.	Chairman	Tohono O'odham Nation	P.O. Box 837	Sells	AZ	85634
AZ	Ivan	Smith		Chairman	Tonto Apache Tribal Council	Tonto Apache Reservation #30	Payson	AZ	85541
AZ	Ronnie	Lupe		Chairman	White Mountain Apache Tribe	P.O. Box 700	Whiteriver	AZ	85941
AZ	David	Kwail		Chairman	Yavapai-Apache Nation Tribal Council	2400 W. Datsi Rd.	Camp Verde	AZ	86322
AZ	Ernest	Jones	Sr.	President	Yavapai-Prescott Board of Directors	530 E. Merritt Street	Prescott	AZ	86301-2038
CA	Richard	Milanovich		Chairman	Agua Caliente Band of Cahuilla Indians	5401 Dinah Shore Dr.	Palm Springs	CA	92264
CA	Phillip	Del Rosa		Chairman	Alturas Rancheria	P.O. Box 340	Alturas	CA	96101
CA	Mary Ann	Green		Chairperson	Augustine Band of Mission Indians	P.O. Box 846	Coachella	CA	92236
CA	Edwin	Romero		Chairman	Barona Group of the Capitan Grande	1095 Barona Rd	Lakeside	CA	92040
CA	Leonard	Bowman		Chairman	Bear River Band of Rohnerville Rancheria	27 Bear River Drive	Loleta	CA	95551
CA	Bill	Salque		Chairman	Benton Paiute Reservation	567 Yellow Jacket Rd	Benton	CA	93512

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
CA	James	Edwards		Chairman	Berry Creek Rancheria	5 Tyme Way	Oroville	CA	95966
CA	Virgil	Moorehead		Chairman	Big Lagoon Rancheria	P.O. Drawer 3060	Trinidad	CA	95570
CA	Virgil	Moose		Chairperson	Big Pine Paiute Tribe of the Owens Valley	P.O. Box 700	Big Pine	CA	93513
CA	Elizabeth	Kipp		Chairperson	Big Sandy Rancheria of Mono Indians	P.O. Box 337	Auberry	CA	93602
CA	Valentino	Jack		Chairperson	Big Valley Rancheria of Pomo Indians	2726 Mission Rancheria Road	Lakeport	CA	95453
CA	William	Vega		Chairman	Bishop Paiute Tribe	50 Tu Su Lane	Bishop	CA	93514
CA	Joseph	Sam		Chairperson	Bridgeport Indian Colony	P.O. Box 37	Bridgeport	CA	93517
CA	Rhonda L.	Morningstar Pope		Chairperson	Buena Vista Rancheria	P.O. Box 162283	Sacramento	CA	95816
CA	David	Roosevelt		Chairman	Cabazon Band of Cahuilla Mission Indians	84-245 Indio Springs Drive	Indio	CA	92203
CA	Cristy	Nelson		Chairperson	Cahto Tribal Executive Committee	P.O. Box 1239	Laytonville	CA	95454
CA	Luther	Salgado	Jr.	Chairman	Cahuilla Band of Mission Indians	P.O. Box 391760	Anza	CA	92539-1760
CA	Silvia	Burley		Chairperson	California Valley Miwok Tribe	10601 Escondido Place	Stockton	CA	95212
CA	Monique	La Chappa		Chairperson	Campo Band of Mission Indians	36190 Church Road, Suite 1	Campo	CA	91906
CA	Cherie	Rhoades		Chairperson	Cedarville Rancheria	300 West 1st St.	Alturas	CA	96101
CA	Charles	Wood		Chairman	Chemehuevi Tribal Council	P.O. Box 1976	Havasu Lake	CA	92363
CA	Lloyd	Mathieson		Chairman	Chicken Ranch Rancheria	P.O. Box 1159	Jamestown	CA	95327
CA	Patricia	Hermosillo		Chairperson	Cloverdale Rancheria	555 S. Cloverdale Blvd., Suite 1	Cloverdale	CA	95425
CA	Robert	Marquez		Chairman	Cold Springs Rancheria	P.O. Box 209	Tollhouse	CA	93667
CA	Daniel	Gomez		Chairman	Colusa Rancheria	3730 Highway 45	Colusa	CA	95932
CA	Charlie	Wright		Chairman	Cortina Rancheria	P.O. Box 1630	Williams	CA	95987
CA	John	Feliz	Jr.	Chairman	Coyote Valley Reservation	P.O. Box 39	Redwood Valley	CA	95470
CA	Harvey	Hopkins		Chairman	Dry Creek Rancheria	P.O. Box 607	Geyserville	CA	95441
CA	Geraldine	Johnson		Chairman	Elem Indian Colony	P.O. Box 989	Clearlake Oaks	CA	95423
CA	Dale A.	Miller		Chairman	Elk Valley Rancheria	2332 Howland Hill Road	Crescent City	CA	95531

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
CA	Glenda	Nelson		Chairwoman	Enterprise Rancheria	2133 Montevista Avenue	Oroville	CA	95966
CA	Robert	Pinto	Sr.	Chairman	Ewiiaapaayp Band of Kumeyaay Indians	4054 Willows Rd	Alpine	CA	91901
CA	Greg	Sarris		Chairman	Federated Indians of Graton Rancheria	6400 Redwood Dr. Suite 300	Rohnert Park	CA	95928
CA	Bernard	Pollard		Chairman	Fort Bidwell Reservation	P.O. Box 129	Fort Bidwell	CA	96112
CA	Israel	Naylor		Chairman	Fort Independence Indian Reservation	P.O. Box 67	Independence	CA	93526
CA	Timothy	Williams		Chairman	Fort Mojave Tribal Council	500 Merriman Avenue	Needles	CA	92363
CA	Kyle	Self		Chairperson	Greenville Rancheria	P.O. Box 279	Greenville	CA	95947
CA	Ronald	Kirk		Chairman	Grindstone Rancheria	P.O. Box 63	Elk Creek	CA	95939
CA	Merlene	Sanchez		Chairwoman	Guidiville Rancheria	P.O. Box 339	Talmage	CA	95481
CA	Sherry	Treppa		Chairperson	Habematolel Pomo of Upper Lake	P.O. Box 516	Upper Lake	CA	95485
CA	Leonard	Masten	J+	Chairman	Hoopa Valley Tribal Council	P.O. Box 1348	Hoopa	CA	95546
CA	Shawn	Pady		Chairman	Hopland Reservation	3000 Shanel Road	Hopland	CA	95449
CA	Rebecca	Osuna		Chairperson	Inaja-Cosmit Reservation	2005 S. Escondido Blvd.	Escondido	CA	92025
CA	Johnny	Jamerson		Acting Chairman	Ione Band of Miwok Indians	P.O. Box 699	Plymouth	CA	95669-0699
CA	Margaret	Dalton		Chairperson	Jackson Rancheria	P.O. Box 1090	Jackson	CA	95642
CA	Kenneth	Meza	Sr.	Chairman	Jamul Indian Village	P.O. Box 612	Jamul	CA	91935
CA	Arch	Super		Chairman	Karuk Tribe of California	P.O. Box 1016	Happy Camp	CA	96039
CA	Larriann	Musick		Chairperson	La Jolla Band of Luiseño Indians	22000 Highway 76	Pauma Valley	CA	92061
CA	Gwendolyn	Parada		Chairperson	La Posta Band of Mission Indians	P.O. Box 1120	Boulevard	CA	91905
CA	Richard	Button		Chairperson	Lone Pine Paiute Shoshone Reservation	P.O. Box 747	Lone Pine	CA	93545
CA	Shane	Chapparosa		Spokesperson	Los Coyotes Band of Cahuilla & Cupeno Indians	P.O. Box 189	Warner Springs	CA	92086
CA	Daniel	Beltran		Chairman	Lower Lake Rancheria	P.O. Box 3162	Santa Rosa	CA	95402
CA	Marjorie	Mejia		Chairperson	Lytton Rancheria	1300 N. Dutton, Suite A	Santa Rosa	CA	95401
CA	Nelson	Pinola		Chairman	Manchester - Point Arena Band of Pomo Indians	P.O. Box 623	Point Arena	CA	95468
CA	Leroy J.	Elliott		Chairman	Manzanita Band of Mission Indians	P.O. Box 1302	Boulevard	CA	91905

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
CA	Dennis	Ramirez		Chairman	Mechoopda Indian Tribe of the Chico Rancheria	125 Mission Ranch Blvd.	Chico	CA	95926
CA	Mark	Romero		Chairman	Mesa Grande Band of Mission Indians	P.O. Box 270	Santa Ysbel	CA	92070
CA	Carl	Rivera		Chairman	Middletown Rancheria	P.O. Box 1035	Middletown	CA	95461
CA	Gary	Archuleta		Chairman	Mooretown Rancheria	1 Alverda Drive	Oroville	CA	95966
CA	Robert	Martin		Chairman	Morongo Band of Mission Indians	11581 Potrero Road	Banning	CA	92220
CA	Dave	Singleton			Native American Heritage Commission	915 Capitol Mall, Room 364	Sacramento	CA	95814
CA	Kurt	Russo			Native American Land Conservancy	NALC P.O. Box 3074	Indio	CA	92202-3074
CA	Judy E.	Fink		Chairperson	North Fork Rancheria	P.O. Box 929	North Fork	CA	93643-0929
CA	Robert	Smith		Chairman	Pala Band of Mission Indians	35008 Pala Temecula Road	Pala	CA	92059
CA	Everett	Freeman		Chairman	Paskenta Band of Nomlaki Indians	P.O. Box 398	Orland	CA	95963
CA	Randall	Majel		Chairman	Pauma/Yuima Band of Mission Indians	P.O. Box 369	Pauma Valley	CA	92061
CA	Mark	Macarro		Chairman	Pechanga Band of Mission Indians	P.O. Box 1477	Temecula	CA	92593
CA	Reggie	Lewis		Chairman	Picayune Rancheria of Chukchansi Indians	46575 Road 417	Coarsegold	CA	93614
CA	Leona	Williams		Chairperson	Pinoleville Reservation	500 Pinoleville Road, Suite A	Ukiah	CA	95482-7121
CA	Juan	Venegas		Chairperson	Pit River Tribal Council	36970 Park Avenue	Burney	CA	96013
CA	Salvador	Rosales		Chairman	Potter Valley Tribe	2251 South State Street	Ukiah	CA	95482
CA	Harold	Bennett		Chairman	Quartz Valley Reservation	13601 Quartz Valley Road	Fort Jones	CA	96032
CA	Joseph	Hamilton		Chairman	Ramona Band of Mission Indians	P.O. Box 391372	Anza	CA	92539
CA	Jason	Hart		Chairman	Redding Rancheria	2000 Redding Rancheria Road	Redding	CA	96001
CA	Elizabeth	Hansen		Chairperson	Redwood Valley Reservation	3250 Road I	Redwood Valley	CA	95470

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
CA	Rick R.	Dowd		President	Resighini Rancheria	P.O. Box 529	Klamath	CA	95548
CA	Frederick	Mazzetti		Chairman	Rincon Band of Mission Indians	P.O. Box 68	Valley Center	CA	92082
CA	Tracey	Avila		Chairperson	Robinson Rancheria	P.O. Box 428	Nice	CA	95464
CA	Kenneth	Wright		President	Round Valley Reservation	77826 Covelo Road	Covelo	CA	95428-9552
CA	Marshall	McKay		Chairman	Rumsey Rancheria	P.O. Box 18	Brooks	CA	95606
CA	James	Ramos		Chairman	San Manuel Band of Mission Indians	P.O. Box 266	Patton	CA	92369
CA	Allen E.	Lawson		Spokesman	San Pasqual Band of Mission Indians	P.O. Box 365	Valley Center	CA	92082
CA	Mayme	Estrada		Manager	Santa Rosa Band of Mission Indians	P.O. Box 609	Hemet	CA	92546
CA	Ruben	Barrios		Chairman	Santa Rosa Rancheria	P.O. Box 8	Lemoore	CA	93245
CA	Vincent	Armenta		Chairman	Santa Ynez Band of Mission Indians	P.O. Box 517	Santa Ynez	CA	93460
CA	Virgil	Perez		Chairman	Santa Ysabel Band of Diegueno Indians	P.O. Box 130	Santa Ysabel	CA	92070
CA	Donald	Arnold		Chairman	Scotts Valley Rancheria	301 Industrial Avenue	Lakeport	CA	95453
CA	Michael	Fitzgerral		Chairman	Sherwood Valley Rancheria	190 Sherwood Hill Drive	Willits	CA	95490
CA	Nicholas H.	Fonseca		Chairman	Shingle Springs Rancheria	P.O. Box 1340	Shingle Springs	CA	95682
CA	Kara L.	Miller		Chairperson	Smith River Rancheria	140 Rowdy Creek Road	Smith River	CA	95567
CA	Robert	Salgado	Sr.	Chairman	Soboba Band of Luiseño Indians	P.O. Box 487	San Jacinto	CA	92581
CA	Ralph	Sepulveda		Chairman	Stewarts Point Rancheria	3535 Industrial Drive, Suite B-2	Santa Rosa	CA	95403
CA	Stacy	Dixon		Chairman	Susanville Indian Rancheria	745 Joaquin St.	Susanville	CA	96130
CA	Daniel J.	Tucker		Spokesman	Sycuan Band of the Kumeyaay Nation	5459 Sycuan	El Cajon	CA	92019
CA	Leanne	Walker-Grant		Chairperson	Table Mountain Rancheria	P.O. Box 410	Friant	CA	93626
CA	George	Gholson		Chair	Timbisha Shoshone Tribe	1349 Rocking W Drive	Bishop	CA	93514
CA	Mary "Maxine"	Resvaloso		Chairman	Torres-Martinez Desert Cahuilla Indians	P.O. Box 1160	Thermal	CA	92274
CA	Garth	Sundberg	Sr.	Chairman	Trinidad Rancheria	P.O. Box 630	Trinidad	CA	95570
CA	Ryan	Garfield		Chairperson	Tule River Reservation	P.O. Box 589	Porterville	CA	93258

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
CA	Kevin	Day		Chairman	Tuolumne Rancheria	P.O. Box 699	Tuolumne	CA	95379
CA	Darrell	Mike		Spokesman	Twenty-Nine Palms Band of Mission Indians	46-200 Harrison Place	Coachella	CA	92236
CA	David	Keyser		President	United Auburn Indian Community	10720 Indian Hills Road	Auburn	CA	95603
CA	Anthony	Pico		Chairman	Viejas Band of Mission Indians	P.O. Box 908	Alpine	CA	91903-0908
CA	Theodore E.	Hernandez		Chairperson	Wiyot Tribe	1000 Wiyot Drive	Loleta	CA	95551
CA	DeAnn	Roberts		Chairperson	Woodfords Community Council	96 Washoe Blvd.	Markleeville	CA	96120
CA	Thomas P.	O'Rourke		Chairperson	Yurok Tribe	P.O. Box 1027	Klamath	CA	95548
CO	Pearl E.	Casias		Chairman	Southern Ute Tribe	P.O. Box 737	Ignacio	CO	81137
CO	Gary	Hayse		Chairman	Ute Mountain Ute Tribe	P.O. Box 248	Towaoc	CO	81334-0248
DC	Bambi	Kraus		President	National Association of Tribal Historic Preservation Officers	P.O. Box 19189	Washington	DC	20036
ID	Alonzo A.	Coby		Chairman	Shoshone-Bannock Tribes	Fort Hall Business Council	Fort Hall	ID	83203-0306
MT	Willie	Sharp		Chairman	Blackfeet Tribal Business Council	P.O. Box 850	Browning	MT	59417
MT	John Chance	Houle		Chairman	Chippewa Cree Business Committee	RR 1, P.O. Box 544	Box Elder	MT	59521
MT	James	Steele	Jr.	Chairman	Confederated Salish & Kootenai Tribes, Tribal Council	Box 278	Pablo	MT	59855
MT	Carl	Venne		Chairman	Crow Tribal Council	P.O Box 159	Crow Agency	MT	59022
MT	Julia	Doney		President	Fort Belknap Community Council	RR 1, Box 66	Harlem	MT	59526
MT	A.T.	Stafne		Chairman	Fort Peck Tribal Executive Board	P.O. Box 1027	Poplar	MT	59255
MT	Leroy	Spang		Chairman	Northern Cheyenne Tribal Council	P.O. Box 128	Lame Deer	MT	59043
ND	Ron	His Horse is Thunder		Chairman	Standing Rock Sioux Tribal Council	P.O. Box D	Fort Yates	ND	58538
NM	Joe	Garcia		Chairman	All Indian Pueblo Council	2101 12th St., NW	Albuquerque	NM	87103
NM	Mike	Miller		Executive Director	Eight Northern Indian Pueblos Council	P.O. Box 969	San Juan Pueblo	NM	87566
NM	Roger	Madalena		Chairman	Five Sandoval Indian Pueblos	1043 Highway 313	Bernalillo	NM	87004

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
NM	Levi	Pesata		President	Jicarilla Apache Nation	P.O. Box 507	Dulce	NM	87528
NM	Mark R.	Chino		President	Mescalero Apache Tribe	P.O. Box 227	Mescalero	NM	88340
NM	Notah	Barney		President	Navajo Nation, Bahastl'ah (Twin Lakes) Chapter	P.O. Box 4424	Yatahey	NM	87375
NM	Scott	Apachito		President	Navajo Nation, Alamo Chapter	P.O. Box 827	Magdalena	NM	87825
NM	Isabell	Morgan		President	Navajo Nation, Baahaali Chapter	P.O. Box 6118	Gallup	NM	87305
NM	Cecil	Lewis	Jr.	President	Navajo Nation, Baca/Prewitt Chapter	P.O. Box 562	Prewitt	NM	87045
NM	Benjamin	Benally		President	Navajo Nation, Becenti Chapter	P.O. Box 708	Crownpoint	NM	87313
NM	George	Kelly	Jr.	President	Navajo Nation, Beclabito Chapter	Beclabito Trading Post	Shiprock	NM	87420
NM	Fernie	Yazzie		President	Navajo Nation, Casamero Lake Chapter	P.O. Box 549	Prewitt	NM	87045
NM	Jess	Kirwin	Sr.	President	Navajo Nation, Chichiltah Chapter	P.O. Box 1436	Gallup	NM	87305
NM	Johnny	Henry		President	Navajo Nation, Churchrock Chapter	P.O. Box 549	Churchrock	NM	87311
NM	Samuel	Sage		President	Navajo Nation, Counselor Chapter	P.O. Box 209	Counselor	NM	87018
NM	Chavez	John		President	Navajo Nation, Coyote Canyon Chapter	P.O. Box 257	Brimhall	NM	87310
NM	McGarrett	Pablo		President	Navajo Nation, Crownpoint Chapter	P.O. Box 336	Crownpoint	NM	87313
NM	Mae	Mallahan		President	Navajo Nation, Crystal Chapter	P.O. Box 775	Navajo	NM	87328
NM	Elizabeth	Harrison		President	Navajo Nation, Gadii'ahi/To'koi Chapter	P.O. Box 1318	Shiprock	NM	87420
NM	Ben	Woody	Jr.	President	Navajo Nation, Huerfano Chapter	P.O. Box 968	Bloomfield	NM	87413
NM	Dorothy	Rogers		President	Navajo Nation, Iyanbito Chapter	P.O. Box 498	Fort Wingate	NM	87316
NM	Tony	Padilla	Jr.	President	Navajo Nation, Lake Valley Chapter	P.O. Box 190	Crownpoint	NM	87313
NM	George S.	Jim		President	Navajo Nation, Little Water Chapter	P.O. Box 1898	Crownpoint	NM	87313
NM	Milton	Davidson		President	Navajo Nation, Manuelito Chapter, HCR 57	P.O. Box 9069	Gallup	NM	87301

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
NM	Anthony	Begay		President	Navajo Nation, Mariano Lake Chapter	P.O. Box 164	Smith Lake	NM	87365
NM	Anselm	Bitsoi		President	Navajo Nation, Mexican Springs Chapter	P.O. Box 93	Mexican Springs	NM	87320
NM	Ervin	Chavez		President	Navajo Nation, Nageezi Chapter	P.O. Box 100	Nageezi	NM	87037
NM	Tony	Padilla		President	Navajo Nation, Nahodishgish Chapter	P.O. Box 369	Crownpoint	NM	87313
NM	Hoskie	Bryant		President	Navajo Nation, Naschitti Chapter	Drawer D	Sheep Springs	NM	87364
NM	Lucinda	Bennally		President	Navajo Nation, Nenahnezad Chapter	P.O. Box 438	Fruitland	NM	87416
NM	Donna	Bennally		President	Navajo Nation, Newcomb Chapter	P.O. Box 7982	Newcomb	NM	87455
NM	Roger	Toledo		President	Navajo Nation, Ojo Encino Chapter	HCR 79 Box 1500	Cuba	NM	87013
NM	Anselm	Morgan		President	Navajo Nation, Pinedale Chapter	P.O. Box 3	Churchrock	NM	87311
NM	Frank Chee	Willetto	Sr.	President	Navajo Nation, Pueblo Pintado Chapter	HCR 79 Box 3026	Cuba	NM	87013
NM	Alfred	Barney		President	Navajo Nation, Red Lake #18 Chapter	P.O. Box 130	Navajo	NM	87328
NM	Martha	Tom		President	Navajo Nation, Red Rock Chapter	P.O. Box 2548	Gallup	NM	87301
NM	Tulley	Haswood		President	Navajo Nation, Rock Springs Chapter	P.O. Box 4608	Yatahey	NM	87375
NM	Rickie	Nez		President	Navajo Nation, San Juan Chapter	P.O. Box 1636	Fruitland	NM	87416
NM	Eddie	Mike		President	Navajo Nation, Sanostee Chapter	P.O. Box 219	Sanostee	NM	87461-0219
NM	Tommy	Sandman		President	Navajo Nation, Sheep Springs Chapter	P.O. Drawer 1	Sheep Springs	NM	87364
NM	William	Lee		President	Navajo Nation, Shiprock Chapter	P.O. Box 3810	Shiprock	NM	87420
NM	Bobby J.	Willie		President	Navajo Nation, Smith Lake Chapter	P.O. Box 60	Smith Lake	NM	87365
NM	Johnny	Johnson		President	Navajo Nation, Standing Rock Chapter	P.O. Box 247	Crownpoint	NM	87313
NM	Valeen	Galvan		President	Navajo Nation, Thoreau Chapter	P.O. Box 899	Thoreau	NM	87323

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
NM	Wilson R.	Benally		President	Navajo Nation, Tiis Tsoh Sikaad Chapter	P.O. Box 7359	Newcomb	NM	87455
NM	Stanley	Hardy		President	Navajo Nation, Toadlena/Two Grey Hills Chapter	P.O. Box 7950	Newcomb	NM	87455
NM	Edwin J.	Begay		President	Navajo Nation, Tohatchi Chapter	P.O. Box 1236	Tohatchi	NM	87325
NM	Joe L.	Cayadito	Jr.	President	Navajo Nation, Torreon Chapter	P.O. Box 1024	Cuba	NM	87013
NM	David	Lee		President	Navajo Nation, Tsayatoh Chapter	P.O. Box 86	Mentmore	NM	87319
NM	Charlie	Jones	Jr.	President	Navajo Nation, Tse Daa K'aan Chapter	P.O. Box 1288	Shiprock	NM	87420
NM	Leroy	Lee		President	Navajo Nation, Upper Fruitland Chapter	P.O. Box 1257	Fruitland	NM	87416
NM	Lucinda	Henry		President	Navajo Nation, White Rock Chapter	P.O. Box 660	Crownpoint	NM	87313
NM	Andrew	Jim		President	Navajo Nation, Whitehorse Lake Chapter	HCR 79 Box 4069	Cuba	NM	87013
NM	Ron	Lovato		Governor	Ohkay Owingeh	P.O. Box 1099	San Juan Pueblo	NM	87566
NM	Randall	Vicente		Governor	Pueblo of Acoma	P.O. Box 309	Acoma	NM	87034
NM	Robert B.	Pecos		Governor	Pueblo of Cochiti	P.O. Box 70	Cochiti	NM	87072
NM	Frank E.	Lujan		Governor	Pueblo of Isleta	P.O. Box 1270	Isleta	NM	87022
NM	Michael	Toledo	Jr.	Governor	Pueblo of Jemez	P.O. Box 100	Jemez Pueblo	NM	87024
NM	Richard B.	Luarkie		Governor	Pueblo of Laguna	P.O. Box 194	Laguna	NM	87026
NM	Ernest	Mirabal		Governor	Pueblo of Nambe	Route 1, Box 117-BB	Santa Fe	NM	87501
NM	Gerald	Nailor		Governor	Pueblo of Picuris	P.O. Box 127	Penasco	NM	87553
NM	George	Rivera		Governor	Pueblo of Pojoaque	7800 Cities of Gold Road	Santa Fe	NM	87506
NM	Raymond	Sandoval	Jr.	Governor	Pueblo of San Felipe	P.O. Box 4339	San Felipe Pueblo	NM	87001
NM	Perry	Martinez		Governor	Pueblo of San Ildefonso	Route 5, Box 315-A	Santa Fe	NM	87501
NM	Malcolm	Montoya		Governor	Pueblo of Sandia	481 Sandia Loop	Bernalillo	NM	87004
NM	Lawrence	Montoya		Governor	Pueblo of Santa Ana	2 Dove Road	Santa Ana Pueblo	NM	87004
NM	Walter	Dasheno		Governor	Pueblo of Santa Clara	P.O. Box 580	Espanola	NM	87532
NM	Tony	Tortalita		Governor	Pueblo of Santo Domingo	P.O. Box 99	Santo Domingo Pueblo	NM	87052

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
NM	Nelson	Cordova		Governor	Pueblo of Taos	P.O. Box 1846	Taos	NM	87571
NM	Mark	Mitchell		Governor	Pueblo of Tesuque	RR 42, Box 360-T	Santa Fe	NM	87506-2632
NM	Marcellus	Medina		Governor	Pueblo of Zia	135 Capitol Square Drive	Zia Pueblo	NM	87053-6013
NM	Arlen P.	Quetawki, Sr.		Governor	Pueblo of Zuni	P.O. Box 339	Zuni	NM	87327
NM	Roger	Martinez		President	Ramah Navajo Chapter	Route 2, Box 13	Ramah	NM	87321
NM	Tony	Secatero		President	Tohajiilee Navajo Chapter	P.O. Box 3398	Tohajiilee	NM	87026
NV	Michael	Price		Chairman	Battle Mountain Band Council	37 Mountain View Drive	Battle Mountain	NV	89820
NV	Chad	Malone		Chairman	Carson Community Council	2900 S. Curry Street	Carson City	NV	89703
NV	L. Mark	Kizer		Chairman	Dresslerville Community Council	1585 Watasheamu Rd.	Gardnerville	NV	89460-7457
NV	Virginia	Sanchez		Chairperson	Duckwater Tribal Council	P.O. Box 140068	Duckwater	NV	89314
NV	Gerald	Temoke		Chairman	Elko Band Council	1745 Silver Eagle Drive	Elko	NV	89801
NV	Alvin S.	Marques		Chairman	Ely Shoshone Tribe	16 Shoshone Circle	Ely	NV	89301
NV	Alvin	Moyle		Chairman	Fallon Paiute Shoshone Tribal Business Council	565 Rio Vista Road	Fallon	NV	89406-9159
NV	Billy A.	Bell		Chairperson	Fort McDermitt Tribal Council	P.O. Box 457	McDermitt	NV	89421
NV	Albin	Moyle		President	Inter-Tribal Council of Nevada	680 Greenbrae Drive	Sparks	NV	89431
NV	Tania	Means		Chairperson	Las Vegas Tribal Council	Number One Paiute Drive	Las Vegas	NV	89106
NV	Victor	Mann		Chairman	Lovelock Tribal Council	P.O. Box 878	Lovelock	NV	89419
NV	William	Anderson		Chairman	Moapa Business Council	P.O. Box 340	Moapa	NV	89025-0340
NV	Eddie	Jim		Tribal Chair	Pahrump Paiute Tribe	P.O. Box 951	Pahrump	NV	89041
NV	Richard	Arnold		Tribal Chair	Pahrump Paiute Tribe	P.O. Box 3411	Pahrump	NV	89041
NV	Mervin	Wright	Jr.	Chairman	Pyramid Lake Paiute Tribal Council	P.O. Box 256	Nixon	NV	89424
NV	Arlan D.	Melendez		Chairman	Reno-Sparks Tribal Council	98 Colony Road	Reno	NV	89502
NV	Robert C.	Bear		Chairman	Shoshone-Paiute Business Council (Duck Valley)	P.O. Box 219	Owyhee	NV	89832
NV	Sim	Malotte		Chairman	South Fork Band Council	Box B-13	Lee	NV	89829

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
NV	Wanda	Batchelor		Chairwoman	Stewart Community Council c/o Washoe Tribe of Nevada/California	919 Highway 395 South	Gardnerville	NV	89410
NV	Warner	Barlese		Chairman	Summit Lake Paiute Tribal Council	1708 H. St.	Sparks	NV	89431-4337
NV	Brian	Cassadore		Chairman	Te-Moak Tribe of Western Shoshone Tribal Council	525 Sunset Street	Elko	NV	89801
NV	Melanie	McFalls		Chairperson	Walker River Paiute Tribal Council	P.O. Box 220	Schurz	NV	89427
NV	Wanda	Batchelor		Chairwoman	Washoe Tribal Council	919 Highway 395 South	Gardnerville	NV	89410
NV	Paula	Salazar		Chairperson	Wells Band Council	P.O. Box 809	Wells	NV	89835
NV	Linda	Ayer		Chairman	Winnemucca Tribal Council	P.O. Box 1370	Winnemucca	NV	89446
NV	Elwood L.	Emm		Chairman	Yerington Paiute Tribe	171 Campbell Lane	Yerington	NV	89447
NV	David W.	Smith		Vice-Chairman	Yomba Tribal Council	HC61, Box 6275	Austin	NV	89310
OK	Alonzo	Chalepah		Tribal Chairman	Apache Tribe of Oklahoma	P.O. Box 1220	Anadarko	OK	73005
OK	Darrell	Flyingman		Chairman	Cheyenne-Arapaho Tribes of Oklahoma	P.O. Box 38	Concho	OK	73022
OK	Michael	Burgess		Chairman	Comanche Nation	P.O. Box 908	Lawton	OK	73502
OK	Jeff	Houser		Chairman	Fort Sill Apache Tribe of Oklahoma	Route 2, Box 121	Apache	OK	73006
OK	Ronald "Dawes"	Twohatchet		Chairman	Kiowa Tribe of Oklahoma	P.O. Box 369	Carnegie	OK	73015
SD	Joseph	Brings Plenty		Chairman	Cheyenne River Lakota Sioux Tribe	P.O Box 590	Eagle Butte	SD	57625
SD	Brandon	Sazue	Sr.	Chairman	Crow Creek Sioux Tribal Council	P.O. Box 50	Fort Thompson	SD	57339
SD	Michael	Jandreau		Chairman	Lower Brule Sioux Tribal Council	187 Oyate Circle	Lower Brule	SD	57548
SD	Theresa	Two Bulls		President	Oglala Sioux Tribal Council	P.O. Box 2070	Pine Ridge	SD	57770
SD	Rodney	Bordeaux		President	Rosebud Sioux Tribal Council	P.O. Box 430	Rosebud	SD	57570
SD	Michael	Selvage		Chairman	Sisseton-Wahpeton Sioux Tribe	P.O. Box 509	Agency Village	SD	57262
SD	Robert	Cournoyer		Chairman	Yankton Sioux Tribe	P.O. Box 248	Marty	SD	57361-0248
TX	Frank	Paiz		Governor	Ysleta del Sur Pueblo	P.O Box 17579 - Ysleta Station	El Paso	TX	79917

Expr1000	First	Last	Suffix	Title	Organization	Address	City	State	Zip
UT	Rupert	Steele		Chairman	Goshute Business Council	P.O. Box 6104	Ibapah	UT	84034
UT	John	Billie		President	Navajo Nation, Aneth Chapter	P.O. Box 430	Montezuma Creek	UT	84534
UT	James	Black		President	Navajo Nation, Oljato Chapter	P.O. Box 360455	Monument Valley	UT	84531
UT	Herman	Farley		President	Navajo Nation, Red Mesa Chapter	P.O. Box 422	Montezuma Creek	UT	84534
UT	Clarence	Rockwell		Executive Director	Navajo Utah Commission	P.O. Box 570	Montezuma Creek	UT	84534
UT	Gwen	Davis		Chairman	Northwestern Band of Shoshone Nation	707 N. Main St	Brigham City	UT	84302
UT	Jeanine	Borchardt		Chairperson	Paiute Indian Tribe of Utah Tribal Council	440 N. Paiute Drive	Cedar City	UT	84720-2613
UT	Alex	Shepherd		Chairman	Paiute Indian Tribe of Utah, Cedar Band	440 N. Paiute Drive	Cedar City	UT	87420-2613
UT	Anthonia	Tom		Chairwoman	Paiute Indian Tribe of Utah, Indian Peak Band	440 N. Paiute Drive	Cedar City	UT	84720
UT	Phil	Pikyavit		Chairman	Paiute Indian Tribe of Utah, Kanosh Band	P.O. Box 101	Kanosh	UT	84637
UT	Cyndi	Charles		Chairwoman	Paiute Indian Tribe of Utah, Koosharem Band	223 East 575 North	Cedar City	UT	84720
UT	Charlotte	Lomeli		Chairwoman	Paiute Indian Tribe of Utah, Shivwits Band	6060 West 3650 North	Ivins	UT	84738
UT	Lori	Bear		Chairperson, Executive Committee	Skull Valley Band of Goshute Indians General Council	P.O. Box 448	Grantsville	UT	84029
UT	Richard	Jenks		Chairman	Ute Indian Tribe	P.O. Box 190	Ft. Duchesne	UT	84026
UT	Leona	Eyetoo		Councilwoman	White Mesa Ute Tribe	P.O. Box 7096	Blanding	UT	84511
WY	Mike	Lajeunesse		Chairman	Eastern Shoshone Business Council	P.O. Box 217	Fort Washakie	WY	82514
WY	Kim	Harjo		Madam Chair	Northern Arapaho Business Council	P.O. Box 396	Fort Washakie	WY	82514

K.1.3 Bureau of Land Management Instruction Memorandum 2012-032

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
http://www.blm.gov/
December 1, 2011

In Reply Refer To:
2800, 8160 (310) P

EMS TRANSMISSION 12/06/2011
Instruction Memorandum No. 2012-032
Expires: 09/30/2013

To: State Directors (Arizona, California, Colorado, Nevada, New Mexico, and Utah)

From: Director

Subject: Native American Consultation and Section 106 Compliance for the Solar Energy Program Described in Solar Programmatic Environmental Impact Statement

Program Area: Rights-of-Way Management, Solar Energy, Cultural Resources, and Tribal Consultation.

Purpose: This Instruction Memorandum (IM) establishes the schedule, procedures, and responsibilities for ongoing Native American consultation in connection with the completion of the Programmatic Environmental Impact Statement (PEIS) for the solar energy program. It also transmits a revised Draft Programmatic Agreement (PA) governing the Bureau of Land Management (BLM) solar energy program's compliance with Section 106 of the National Historic Preservation Act. The revised Draft PA is attached for review and comment.

Policy/Action: This IM requires follow-up actions to continue and strengthen BLM government-to-government consultation with Indian tribes regarding completion of the Solar PEIS. Such consultation has been underway since 2008. Field Offices are directed to take additional steps to assure that tribes understand how their input is being taken into account in the finalization of the Solar PEIS and how tribal consultation will continue when we receive project-specific solar applications following execution of the Solar PEIS Record of Decision (ROD). The National Renewable Energy Coordination Office (WO-301) is distributing the Supplement to the Draft Solar PEIS (Supplement) along with a Question and Answer Fact Sheet to all federally recognized Indian tribes (Attachment 1). The Fact Sheet describes procedures that we will follow to ensure that the solar energy program meets the BLM's responsibilities for tribal consultation and historic preservation.

On February 15, 2011, the Draft PEIS and a Draft PA were provided to all federally recognized Indian tribes in the states listed above, the six State Historic Preservation Officers in those states, the Advisory Council on Historic Preservation, and other interested parties for comment.

Based on their suggestions, we prepared a revised Draft PA (Attachment 2) which is also being distributed with the Supplement for further review and comment.

<u>Native American Consultation—State, District, and Field Office Responsibilities</u>
The State Directors of California and Nevada, through the appropriate District Manager or Field Manager, will contact those tribes that provided extensive, written comments on the Draft Solar PEIS. We have provided copies of these written tribal comments to the California and Nevada State Offices. California will contact the Quechan Indian Nation, the San Manuel Band of Mission Indians, the Soboba Band of Luiseno Indians, and the Big Pine Paiute Tribe of the Owens Valley. Nevada will contact the Duckwater Shoshone Tribe, the Pahrump Paiute Tribe, the Summit Lake Paiute Tribe, and the Washoe Tribe of Nevada and California.

The BLM offices will request a face-to-face meeting with each of these tribes for the purposes of:

- Reviewing the tribe's comments and concerns;
- Explaining the purpose and content of the Supplement to the Draft Solar PEIS;

- Discussing the procedures enumerated within the Question and Answer Fact Sheet;
- Explaining projected timeframes and procedures for finalizing the Solar PEIS; and
- Reviewing proposed Section 106 consultation procedures contained within the revised Draft PA.

Line officers in the six solar states will also contact those tribes with the closest historical and/or cultural ties to the Solar Energy Zones (SEZ) being carried forward in the Supplement. The BLM will offer to meet if so desired by these tribes. In situations where larger numbers of tribes have ties to a given SEZ, groups of tribes may be invited to attend meetings held in a central location. At such meetings, topics will include the contents of the Supplement; the consultation procedures described within the Question and Answer Fact Sheet; projected timeframes and procedures for finalizing the Solar PEIS; procedures for tribal consultation when we receive and consider project-specific solar applications under the provisions of the Solar PEIS; and proposed Section 106 consultation procedures contained within the revised Draft PA.

<u>Native American Consultation—Washington Office Responsibilities</u>
Concurrent with public release of the Supplement, WO-301 mailed the Supplement, the Question and Answer Fact Sheet, and the revised Draft PA to tribes. Recipient tribes included those that provided comments on the Draft Solar PEIS, those with cultural and/or historical ties to the proposed SEZs, and those with cultural and/or historical ties to lands subject to solar development through the variance process. This correspondence (Attachment 3) addresses government-to-government consultation. It also explains how tribal concerns will be addressed as the PEIS is completed and how the BLM intends to consult further with tribes when we receive and consider project-specific solar applications under the provisions of the Solar PEIS.

As part of the Solar PEIS analysis, WO-301 awarded an ethnographic contract to identify traditional cultural properties and sacred sites in selected SEZs and produce ethnographic overviews for designated tribes in Nevada and Utah.

In the correspondence discussed above, WO-301 has asked other tribes if they wish to share similar concerns or issues before the Solar PEIS and ROD are finalized

After the ROD is signed, WO-301 will write to all tribes describing how we considered tribal input in reaching a final decision. Opportunities for further tribal consultation when the BLM receives new solar applications will be outlined.

<u>Section 106 Compliance</u>
The February 15, 2011 Draft PA has been revised to reflect detailed critiques provided by the Advisory Council on Historic Preservation, the Arizona State Historic Preservation Officer, the Nevada State Historic Preservation Officer, and the National Trust for Historic Preservation.

The State Directors of all six states included in the Solar PEIS will review the revised Draft PA and provide comments on its adequacy and clarity. Suggestions that would improve the efficiency of the Section 106 process would be appreciated.

Consultations with the Signatory and Concurring Parties are ongoing, and a Final PA will be executed before the Solar PEIS ROD is signed.

Timeframe: This IM is effective upon issuance.

Appropriate line officers in California and Nevada must initiate contact with the eight tribes that provided detailed written comments on the Draft Solar PEIS within 30 days.

Appropriate line officers in the States of Arizona, California, Colorado, Nevada, New Mexico, and Utah must contact those tribes with the closest historical and/or cultural ties to SEZs within 60 days.

All six State Directors must provide written comments on the revised Draft PA by January 27, 2012.

WO-301 must receive copies of the administrative record documenting all written contacts, telephone calls, meetings, and presentations to tribes made in response to this IM by March 1, 2012. This will ensure that the Final Solar PEIS fully takes into account the tribal issues and concerns expressed through this government-to-government consultation.

Budget Impact: Implementation of this IM will have some budget impact since additional work is required to arrange and participate in face-to-face meetings with tribes, document such meetings, and prepare any correspondence to tribes.

Background: In response to the Energy Policy Act of 2005 (Public Law 109-58) and Secretarial Order 3285A1, the BLM has proposed a national solar energy program to further its ability to meet the requirements for facilitating solar energy development on BLM-administered lands. The Solar PEIS is analyzing and defining such a program. The actions required by this IM and its attachments will demonstrate an ongoing commitment to consult with Indian tribes and give full consideration to the effects of solar energy development upon historic resources.

These policies will strengthen the BLM's efforts to comply with the requirements of Section 106 of the National Historic Preservation Act and the National Environmental Policy Act. In addition, these policies may avoid or reduce controversy related to the proposed actions called for in the Solar PEIS modified preferred alternative.

Manual/Handbook Sections Affected: This IM does not affect any manual/handbook sections. It is intended for use in accordance with BLM Manual 8120 and Handbook H-8120-1.

Coordination: The BLM State Offices of the six solar states reviewed and provided suggestions for improving the tribal consultation procedure document prior to its finalization. The revised Draft PA was coordinated with the Office of the Solicitor. The Renewable Resources and Planning (WO-200) and Minerals and Realty Management (WO-300) directorates coordinated revisions to this IM and all its attachments.

Contact: If there are any questions concerning this IM, please contact Ed Roberson, Assistant Director, Renewable Resources and Planning, 202-208-4896; Mike Nedd, Assistant Director, Minerals and Realty Management, 202-208-4201; or Stephen Fosberg, Solar PEIS Project Archeologist, 828-693-9310 or sfosberg@blm.gov.

Signed by:
Mike Pool
Acting, Director

Authenticated by:
Robert M. Williams
Division of IRM Governance,WO-560

3 Attachments
1 – Question and Answer Fact Sheet (11 pp)
2 – Draft Solar Programmatic Agreement (17 pp)
3 – Letter to Tribes (4 pp)

This page intentionally left blank.

K.2 UPDATE TO CULTURAL RESOURCE CONSULTATION

This section provides detailed information updating the status of compliance with Section 106 of the National Historic Preservation Act (NHPA) and consultation on cultural resources for the Solar PEIS, including the Solar Programmatic Agreement (Solar PA). The information presented in this update to Section K.2 for the Final Solar PEIS supplements, but does not replace, the information provided in the corresponding Section K.2 in the Draft Solar PEIS. The information herein post-dates the release of the Draft Solar PEIS and is therefore a continuation of consultation activities that have occurred since December 2010.

K.2.1 Introduction

Initial correspondence regarding Section 106 consultation was provided in Appendix K of the Draft Solar PEIS and is not repeated in this Final Solar PEIS. Comments on the Draft Solar PEIS have been provided to the BLM from the Arizona and California State Historic Preservation Offices (SHPOs) and the Advisory Council on Historic Preservation (ACHP) and are addressed in Volume 7 of this Final Solar PEIS (Comments and Responses).

The BLM continues to coordinate and solicit input from the SHPOs in each of the six states in the study area as well as the ACHP in accordance with the NHPA regarding development of a Solar PA governing BLM compliance with Section 106 of NHPA for the Solar Energy Program. The Solar PA specifies how the BLM will continue its consultation with SHPOs, tribes, and the ACHP in order to meet its Section 106 responsibilities for future solar energy projects. This approach for meeting an agency's Section 106 compliance obligations is authorized in Title 36 of the *Code of Federal Regulations* in 36 CFR 800.4(b)(2) and 36 CFR 800.14(b)(3).

Affected federally recognized tribes and the National Trust for Historic Preservation (NTHP) have been invited to be "concurring parties" on the Solar PA. A Draft Solar PA was distributed in February 2011. A Revised Draft Solar PA was prepared based on comments and concerns received from the various parties and distributed in October 2011 for an additional round of comments. A third version of the Solar PA (Version 2.5) was provided to the consulting parties for review beginning in April 2012. A fourth version of the Solar PA (Version 2.7) was circulated for additional comments on May 30, 2012; feedback was provided in mid-June. Additional re-drafts are underway, and the BLM intends to execute a final version of the Solar PA by the time the Record of Decision (ROD) is signed by the end of September 2012. No drafts of the Solar PA have been included in the Draft Solar PEIS, the Supplement to the Draft Solar PEIS, or in this Final Solar PEIS. Correspondence and meeting notes related to drafts of the Solar PA and review comments from SHPOs, ACHP, Indian tribes, and concurring parties will be maintained as part of the administrative record but will not be included in this appendix. Once the Solar PA is finalized, it will be available on the project Web site at http://solareis.anl.gov.

In addition, since the release of the Draft Solar PEIS, the National PA of 1997 was updated. A copy of the 2012 National PA among the BLM, ACHP, and National Council of SHPOs is included in Section K.2.2 of this Final Solar PEIS for reference.

K.2.2 National Programmatic Agreement of 2012

PROGRAMMATIC AGREEMENT
AMONG
THE BUREAU OF LAND MANAGEMENT,
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND
THE NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS
REGARDING
THE MANNER IN WHICH THE BLM WILL MEET ITS RESPONSIBILITIES
UNDER THE NATIONAL HISTORIC PRESERVATION ACT

Preamble

Bureau of Land Management. The Bureau of Land Management (BLM), consistent with its authorities and responsibilities under the Federal Land Policy and Management Act of 1976 (FLPMA), is charged with managing public lands principally located in the states of Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, and Wyoming in a manner that will "protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values," and "that will provide for outdoor recreation and human occupancy and use."

The BLM also has specific responsibilities and authorities to consider, plan for, protect, and enhance historic properties and other resources that may be affected by its actions, in compliance with the National Environmental Policy Act (NEPA), the National Historic Preservation Act of 1966 (NHPA) and implementing regulations of Section 106 of the NHPA at 36 CFR part 800, the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, the Historic Sites Act of 1935, the Antiquities Act, the American Indian Religious Freedom Act, the Religious Freedom Restoration Act, Executive Order (EO) 13007 ("Indian Sacred Sites"), EO 13287 ("Preserve America"), EO 13175 ("Consultation and Coordination with Indian Tribal Governments"), and related authorities.

In carrying out its responsibilities specific to the NHPA, the BLM has: (1) developed policies and procedures through its directives system (BLM Manual Sections 8100-8170); (2) executed a national programmatic agreement (PA) in 1997 to help guide the BLM's planning and decision making as it affects historic properties as defined in the NHPA; and (3) assembled a cadre of cultural heritage specialists to advise the BLM's managers and to implement cultural heritage policies consistent with the BLM's statutory authorities.

State Historic Preservation Officers. State Historic Preservation Officers (SHPO) are represented by the National Conference of State Historic Preservation Officers (NCSHPO) for the purpose of negotiating and executing this agreement, and have responsibilities under state law as well as under Section 101(b) of the NHPA that include:

- "advise and assist as appropriate, Federal and State agencies and local governments in carrying out their historic preservation responsibilities;"
- "maintain inventories" of historic properties in cooperation with Federal and state agencies; and

1

- "consult with the appropriate Federal agencies in accordance with [the NHPA] on Federal undertakings that may affect historic properties, and the content and sufficiency of any plans developed to protect, manage, or to reduce or mitigate harm to such properties."

In addition, under Section 110(a)(2)(D) and Section 110(a)(2)(E) of the NHPA, Federal agencies are required to consult with the SHPO to identify and evaluate historic properties for listing in the National Register of Historic Places (National Register), and on the development and implementation of agreements regarding the means by which adverse effects on such properties will be considered.

In certain cases, others may be authorized to act in the place of the SHPO. Where the Secretary of the Interior has approved an Indian tribe's preservation program pursuant to Section 101(d)(2) of the NHPA, a Tribal Historic Preservation Officer (THPO) may perform some or all SHPO functions with respect to tribal lands, defined as all lands within the exterior boundaries of any Indian reservation and all dependent Indian communities, consistent with 36 CFR 800.16(x). A certified local government acting through the chief local elected official may fulfill some SHPO-delegated functions, where the Secretary has certified the local government pursuant to Section 101(c)(1) of the NHPA, and its actions apply to lands in its jurisdiction. Pursuant to the regulations implementing Section 106 of the NHPA (36 CFR 800.3(c)(4)), the Advisory Council on Historic Preservation (ACHP) may at times act in lieu of the SHPO.

Advisory Council on Historic Preservation. The ACHP has the responsibility to: (1) administer the process implementing Sections 106, 110(f), and 111(a) of the NHPA; (2) to comment with regard to Federal undertakings subject to review under Sections 106, 110(f), and 111(a) of the NHPA in accordance with its implementing regulations (36 CFR part 800); and (3) "review the policies and programs of Federal agencies and recommend to such agencies methods to improve the effectiveness, coordination, and consistency of those policies and programs with the policies and programs carried out" under Section 202(a)(6) of the NHPA.

Indian Tribes. This agreement is entered into pursuant to the NHPA, which specifically requires that agencies consult with federally recognized tribes as defined in that Act so that these Indian tribes may: (1) identify their concerns about historic properties, including those of traditional religious and cultural significance to them; (2) advise agencies on the identification and evaluation of historic properties; (3) articulate their views on the potential effects of an undertaking; and (4) participate in resolving adverse effects. The BLM consults with Indian tribes on a government-to-government basis consistent with the Department of the Interior's tribal consultation policy. While the BLM may initiate consultation under multiple authorities at one time, this agreement governs compliance with the NHPA and in no way supersedes the BLM's other treaty, trust, and consultation responsibilities to Indian tribes under multiple other authorities.

Consulting Parties. Consulting parties include representatives of local governments, applicants, and certain individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties (36 CFR 800.2(c)(3-5)). In consultation with the SHPO/THPO, the BLM shall identify consulting parties and invite them to participate in consultation and shall consider all written requests of individuals and organizations to participate as consulting parties (36 CFR 800.3(f)).

The Public. The views of the public are essential to informed Federal decision-making, and the BLM shall seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties. The BLM must also provide the public with information about an undertaking and seek public comment and input (36 CFR 800.2(d)). Pursuant to 36 CFR 800.2(d)(3), the BLM may use its agency procedures as contained in the BLM-SHPO protocols or BLM NEPA procedures to involve the public.

The BLM, NCSHPO, and the ACHP—in consultation with Indian tribes and interested parties—now wish to ensure that the BLM will organize its programs to operate efficiently, effectively, according to the spirit and intent of Section 106 of the NHPA, and in a manner consistent with 36 CFR Part 800. The parties also wish to ensure that the BLM will integrate its historic preservation planning and management decisions with other policy and program requirements to the maximum extent. The BLM, the SHPOs, and the ACHP desire and intend, in the public interest, to streamline and simplify procedural requirements, reduce unnecessary paperwork, and emphasize the common goal of planning for and managing historic properties under the BLM's jurisdiction and control.

Basis for Agreement

Proceeding from these responsibilities, goals, and objectives, the parties acknowledge the following basis for agreement:

WHEREAS the BLM's management of lands and mineral resources may affect historic properties as defined by the NHPA; and

WHEREAS, among other things, the BLM's historic preservation program, established in response to Section 110(a)(2) of the NHPA and related authorities provides a systematic basis for: (1) identifying, evaluating, and nominating historic properties under the BLM's jurisdiction or control to the National Register of Historic Places (National Register); (2) managing and maintaining properties listed in or eligible for the National Register in a way that considers the preservation of their archaeological, historical, architectural, and cultural values and the avoidance of adverse effects in consultation with Indian tribes, local governments, consulting parties, and the interested public; and (3) giving special consideration to the preservation of such values in the case of properties designated as having national significance; and

WHEREAS the BLM's program is also intended to ensure that the bureau's preservation-related activities will be carried out in consultation with Indian tribes, other Federal agencies, local governments, consulting parties, and the interested public; and

WHEREAS the BLM's program also is intended to: (1) ensure that the bureau's procedures for compliance with Section 106 of the NHPA are consistent with current regulations issued by the ACHP pursuant to Section 211 of the NHPA (36 CFR part 800, "Protection of Historic Properties"); (2) provide a process for the identification and evaluation of historic properties for listing in the National Register and the development and implementation of agreements, in consultation with SHPOs, Indian tribes, local governments, consulting parties, and the interested public, as appropriate, regarding the means by which adverse effects on such properties will be considered and resolved; and

WHEREAS the BLM recognizes that the 1997 PA and resulting internal BLM formal guidance do not incorporate the current 36 CFR Part 800 definition of "adverse effect" and role of "consulting parties" in the NHPA Section 106 process, and the BLM will initiate revision of the relevant manual sections upon execution of this agreement; and

WHEREAS individual SHPOs, particularly those in states containing a high percentage of public land under the BLM's jurisdiction and control, have a great interest in forming a cooperative relationship with the BLM to facilitate a more effective and efficient Section 106 consultation process, and promote activities of mutual interest, and;

WHEREAS the BLM acknowledges that Indian tribes possess special expertise in assessing the eligibility of historic properties that may possess religious and cultural significance to them in accordance with 36 CFR Part 800.4(c)(1), and;

WHEREAS the BLM's programs benefit from consultation with Indian tribes in BLM's identification and management of properties of religious and cultural significance and will ensure that its NHPA Section 106 procedures recognize the interests of Indian tribes in historic properties potentially affected by BLM decisions and afford tribes participation in the process leading up to a BLM decision, in accordance with 36 CFR Part 800; and

WHEREAS this agreement will not apply to proposed BLM undertakings located on or affecting historic properties on tribal lands, with respect to which the BLM will comply with the regular Section 106 process under 36 CFR 800.3 through 800.7, the process under 36 CFR 800.8(c), or an applicable program alternative under 36 CFR 800.14, and;

WHEREAS, for undertakings not on tribal lands, the BLM employs the basic principles of government-to-government consultation with Indian tribes under cultural resources authorities including the NHPA as reflected in this PA; and consults with the tribal representatives designated by the tribal governments for the purpose of identifying properties of religious and cultural significance that may be eligible for listing on the National Register and to understand tribal concerns; and

WHEREAS Indian tribes, especially those whose present or ancestral lands are located in areas where the BLM has surface or subsurface management responsibilities, may enter into formal or informal agreements with the BLM regarding consultation procedures under the NHPA Section 106 and that some tribes may want to form a cooperative relationship with the BLM in a manner consistent with the purposes of this agreement to achieve a more effective and efficient Section 106 consultation process; and

WHEREAS the parties intend that efficiencies in the NHPA Section 106 process, realized through this agreement, will enable the BLM, SHPO, and ACHP staffs to devote a larger percentage of their time and energies to proactive work, including: (1) analysis and synthesis of data accumulated through decades of Section 106 compliance; (2) historic property identification where information is needed, not just in reaction to proposed undertakings; (3) long-term preservation planning; (4) National Register nominations; (5) planning- and priority-based historic resource management; (6) creative public education and interpretation; (7) more efficient and effective BLM, SHPO, tribal, and ACHP coordination, including program monitoring and dispute resolution; and (8) other activities that will contribute to readily recognizable tribal and public benefits; and

WHEREAS the BLM has consulted with the Indian tribes and the interested public regarding ways to ensure that the BLM's planning and management will be more fully integrated and consistent with the above authorities, requirements, and objectives;

NOW, THEREFORE, the BLM, the ACHP, and the NCSHPO mutually agree that the BLM, consistent with the provisions of Component 1 of this PA below, will meet its responsibilities under the NHPA through this agreement as provided for in 36 CFR 800.14(b), rather than by following the procedure set forth in 36 CFR 800.3 through 800.7. The BLM will integrate the manner in which it meets its historic preservation responsibilities as fully as possible with its other responsibilities for land-use planning and resource management under FLPMA, National Environmental Policy Act (NEPA), other statutory authorities, and executive orders and policies.

The BLM shall ensure that the following components are carried out:

Components of Agreement

1. Applicability

This agreement supersedes the 1997 PA. Existing state-specific BLM-SHPO protocols under the 1997 agreement will remain in effect until the respective BLM state director executes a successor BLM-SHPO protocol with each state per Component 6 of this agreement or until terminated. No existing informal and formal agreements between the BLM and an Indian tribe or tribes will be altered by this agreement. Any state not operating under a BLM-SHPO protocol will operate under 36 CFR 800.3 through 800.7, 36 CFR 800.8(c), or an applicable program alternative under 36 CFR 800.14.

2. BLM Consultation Responsibilities with SHPOs and the ACHP under this Agreement

a. This agreement encourages:

(1) BLM state directors and SHPOs to develop mutually agreed upon two-party BLM-SHPO protocols regulating their relationship and how consultation will take place;

(2) BLM state directors and SHPOs to establish streamlined (as opposed to case-by-case) consultation on evaluation of cultural resources for National Register eligibility and for no-historic-properties-affected, no-adverse-effect, and adverse-effect determinations when BLM and SHPO reach agreement on resolving the adverse effect(s);

(3) BLM state directors to make a schedule of pending actions, including land exchanges, available to the public and Indian tribes on a regular basis;

(4) BLM state directors to contact on a regular basis Indian tribes affected by undertakings within his or her jurisdiction and develop tribe-specific procedures for tribal consultation; and

(5) BLM state directors to use phased identification and evaluation as described in 36 CFR 800.4(b)(2) as a strategy for meeting the BLM's NHPA Section 106 responsibility for programs implemented through a phased decision making process beginning with land use planning designations that may affect large land areas. A phased compliance process requires that the bureau demonstrate that it has taken some steps to take into account the effect of the undertaking on potentially eligible sites in each phase, and that until a reasonable effort has been made to identify all potentially eligible sites, the bureau retains the ability to modify the project, if

necessary, e.g., through no-surface-occupancy or other stipulations, or specific permit restrictions or covenants.

b. This agreement requires:

(1) the BLM to follow the process at 36 CFR 800.3 through 800.7, 36 CFR 800.8(c), or another applicable program alternative under 36 CFR 800.14, for undertakings within any state that does not have a BLM-SHPO protocol under this agreement and for undertakings on or affecting tribal lands;

(2) the BLM to consult with the relevant SHPO, Indian tribes (see Component 6.c), and other consulting parties for all undertakings that will adversely affect properties that are eligible for listing in the National Register, and for the development of any procedures such as project-specific PAs;

(3) the BLM to invite the ACHP to participate in consultation when undertakings meet the thresholds in Component 5 of this agreement; and

(4) the BLM to follow the process at 36 CFR 800.6(b)(2) or 800.14(b) to resolve adverse effects whenever the ACHP formally participates in the resolution of adverse effects for an undertaking.

3. Operation of the BLM's Preservation Board

a. The BLM Director will maintain a Preservation Board to advise the BLM Director, assistant directors, state directors, and district and field office managers in the development and implementation of the BLM's policies and procedures for NHPA implementation.

b. The Preservation Board will be chaired by the BLM's Federal Preservation Officer (FPO) designated under Section 110(c) of the NHPA, and will include a professionally qualified Deputy Preservation Officer (DPO) from each state office and the BLM national Tribal Coordinator as ex officio members. Field management will be represented by at least four line managers (i.e., officials who are authorized by the Director's or state directors' delegation to make land-use decisions). Field office cultural resource specialists will be represented by two members. Line manager and field office cultural resource specialist positions will be term positions.

c. The Preservation Board will perform primary staff work and make recommendations to the BLM Director and state directors concerning policies and procedures (Component 4 below), bureau-wide policy implementation (Component 4 below), training (Component 7 below), certification and decertification of district or field offices (Component 9 below), monitoring of district and field offices' historic preservation programs (Component 10 below), and responses to public inquiries (Component 10 below).

d. In addition, the Preservation Board shall meet with the ACHP and NCSHPO on a regular basis. In coordination with individual BLM DPO(s) and/or BLM Tribal Coordinator(s), as appropriate, the Preservation Board will address formal communications it receives from the ACHP and the NCSHPO, individual SHPOs, local governments, preservation and professional associations, individual tribes, and other tribal entities that have identified themselves to the Board as interested parties, regarding recurrent problems or concerns with state, regional, or national practice, and will otherwise seek to create opportunities to advance the purposes of this agreement.

4. Cultural Resource Management Procedures for Consideration of the Effects of the BLM's Undertakings on Historic Properties

As required by the NHPA Section 106 process and this agreement, the field manager—with the assistance of qualified professional staff and in consultation with the SHPO according to the process in the BLM-SHPO protocol, and with Indian tribes and consulting parties—identifies, evaluates, and assesses effects of the BLM's proposed actions on historic properties. This Component sets out the alternative framework, which, at a minimum, must be reflected in BLM-SHPO protocols or reflected with respect to individual projects utilizing this agreement to comply with Section 106.

a. Consultation with Indian tribes and the SHPO at the outset of land use planning is a vital part of identification and management of historic properties. Involving tribal governments and SHPOs closely at this level of resource consideration will greatly facilitate coordination and consultation at later stages of planning and project development and will afford the best opportunity to foresee and avoid potential conflicts between BLM-authorized land uses and significant historic properties. District and Field office managers will seek information in accordance with BLM land use planning and environmental review processes and the tribal consultation policies outlined in Section f of Component 4 below, from Indian tribes and other parties likely to have knowledge of or concerns with historic properties in the area to:

(1) Identify properties of religious and cultural significance that may be eligible for listing in the National Register of Historic Places;

(2) Understand tribal and other parties' concerns sufficiently to better understand the effects that potential future Federal undertakings might have on eligible properties; and

(3) Consider comments provided in making decisions on the land use plan, and notify consulted parties of the relevant final land use planning decisions.

b. Prior to initiating or authorizing a proposed action that meets the definition of "undertaking" in 36 CFR 800.16(y) and is a type of activity that generically has the potential to cause effects to historic properties (with the assumption that historic properties are present), the responsible district or field office manager shall:

(1) Determine the undertaking's area of potential effects;

(2) Review existing information on historic properties potentially affected by the undertaking, including documentation of previous tribal consultation;

(3) Seek information in accordance with BLM land use planning and environmental review processes from Indian tribes and other parties likely to have knowledge of or concerns with historic properties, particularly properties of traditional religious and cultural significance, in the area;

(4) Determine the need for further actions, such as field surveys and predictive modeling to identify historic properties in the area;

(5) Make a reasonable and good faith effort to identify historic properties that may be affected by the undertaking as described in 36 CFR 800.4(b)(1); and

(6) Determine if any properties within the area of potential effect, including properties of traditional religious and cultural significance to an Indian tribe, meet one or more eligibility criteria specified in 36 CFR 60.4 (association with events; association with lives of significant persons; embodiment of distinctive characteristics of a type, period, or method of construction or possessing high artistic value; have yielded or are likely to yield important data), while acknowledging that a formal determination of eligibility may be requested from the Keeper of the National Register pursuant to 36 CFR 800.4(c)(2) and 36 CFR part 63.

(i) If the BLM field manager determines, consistent with the process in the State's BLM-SHPO protocol, that a property does not meet the eligibility criteria in 36 CFR 60.4, he or she will provide documentation to the SHPO according to the reporting schedule in the State's BLM-SHPO protocol, and the property shall be considered not eligible for listing in the National Register and therefore not subject to further consideration under Section 106 and this PA.

(ii) If the field manager determines, consistent with the process in the State's BLM-SHPO protocol, that a property meets one or more eligibility criteria in 36 CFR 60.4, the property shall be considered eligible for listing in the National Register for purposes of complying with Section 106 of the NHPA and this PA (i.e., an "historic property").

c. The field manager, upon determining that National Register-listed or eligible historic properties may be affected by an undertaking, shall determine whether those properties may be affected, giving consideration to the views of the interested public and any consulting parties, including, but not limited to Indian tribes.

(1) If the field manager finds that the undertaking will not affect those characteristics of the property that qualify it for listing in the National Register, the field manager will document this finding, proceed with the undertaking, and provide documentation of "no historic property affected" to the SHPO in accordance with the reporting schedule specified in the State's BLM-SHPO protocol.

(2) If the field manager finds that the undertaking may affect those characteristics of the property that qualify it for listing in the National Register, the field manager will apply the Criteria of Adverse Effect to determine whether the proposed undertaking may alter, directly or indirectly, those characteristics in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR 800.5(a)(1)) and will document this finding. If the field manager finds that the effect is not to be adverse or the undertaking is modified to avoid adverse effects, per 36 CFR 800.5(b), and does not meet the threshold for case-by-case review in the State's BLM-SHPO protocol or the threshold for ACHP notification, the field manager will document this finding, proceed with the undertaking, and report it to the SHPO according to the BLM-SHPO protocol.

d. When a proposed agency decision or undertaking meets the threshold for case-by-case review in accordance with the BLM-SHPO protocol and/or the threshold for ACHP notification as specified in this PA (see Component 5), the field manager shall consult with the SHPO to determine the specific process to be followed in that case including, as appropriate:

(1) Additional actions necessary to identify historic properties;

(2) National Register-listed or eligible historic properties affected by the undertaking;

(3) Effects the undertaking would have on National Register-listed or eligible historic properties; and

(4) Methods for avoiding, minimizing, or mitigating adverse effects.

e. If the field manager finds the effect to be adverse and decides to proceed with the undertaking, he or she shall make a reasonable and good faith effort to avoid, minimize, or mitigate adverse effects to the most reasonable and fitting extent, in consultation with the SHPO, Indian tribes, and other consulting parties, considering the nature of the effects and the characteristics and qualities that lend the property its significance.

f. The special legal status of tribal governments requires that the BLM's official interactions with them, including consultation, will be carried out in accordance with government-to-government procedures to ensure that tribal participation occurs pursuant to the statutory and regulatory directives in Sections 101(d)(6) and 110(a)(2)(E) of the NHPA and 36 CFR 800.2(c)(2). Consistent with those directives and Department of the Interior tribal consultation policy, the BLM will consult with the tribal government's official designee in accordance with the following policies.

(1) BLM State directors, and district and field office managers, as appropriate, shall represent the United States in government-to-government meetings with Indian tribes.

(2) District and/or field managers shall establish working relationships with tribal officials comparable to their working relationships with State and local government officials.

(3) District and/or field managers and staffs shall recognize that traditional tribal practices and beliefs are an important, living part of our Nation's heritage and seek to avoid to the degree possible under existing law and regulation their potential disruption as a consequence of a proposed BLM land use decision.

(4) District and/or field managers and staffs shall protect from disclosure to the public sensitive and confidential information about traditional tribal practices and beliefs, and the locations with which they are associated, to the greatest degree possible under law and regulation. District and field offices shall maintain the confidentiality of sacred sites to the degree possible under existing law and regulation.

(5) District and/or field managers and staffs shall consider and consult with Indian tribes regarding whether a proposed undertaking may inhibit or destroy tribal access to public lands for the purposes of religious use and other traditional uses, such as gathering natural resources, and, shall, consistent with Executive Order 13007, seek to accommodate access to and ceremonial use of sacred sites, as well as avoid unnecessary interference with or adverse effects to traditional religious and cultural properties.

(6) District and/or field managers and staffs shall consult with affected Indian tribes to identify and consider tribal concerns related to the identification and management of historic properties in BLM land use planning and decision-making, and shall document all consultation efforts.

(7) District and/or field managers and staffs shall ensure that information on tribal religious and cultural issues receives good faith consideration during decision-making, and that, to the extent consistent with the law, BLM decisions do not substantially burden the pursuit of traditional religious and cultural practices.

5. Thresholds for ACHP Notification

a. The BLM procedures will identify specific circumstances and conditions that, when met, call for the ACHP's notification.

b. At a minimum, the BLM will request the ACHP's participation in the following classes of undertakings:

(1) nonroutine interstate and/or interagency projects or programs;

(2) undertakings adversely affecting National Historic Landmarks;

(3) undertakings that the BLM determines to be highly controversial; and

(4) undertakings that will have an adverse effect and with respect to which disputes cannot be resolved through formal agreement between BLM-SHPO, such as a memorandum of agreement.

c. The development and approval of program alternatives, including project-specific PAs, will follow the process under 36 CFR 800.14.

d. The ACHP reserves the right to participate, on its own initiative or at the request of the SHPO, an Indian tribe, a local government, an applicant or other consulting party, in any proceeding taking place in fulfillment of the BLM's NHPA Section 106 responsibilities under the regulations, this agreement, or BLM-SHPO protocols, in a manner consistent with its role under 36 CFR Part 800 and the criteria under Appendix A of 36 CFR Part 800 and will notify the responsible BLM state director, and/or district or field office manager and the Director when it decides to participate.

6. Cooperation and Enhanced Communication

This section establishes how the BLM will implement the alternate process afforded by Component 4 above with respect to potential and/or existing BLM-SHPO protocols. It also establishes how the BLM will develop cooperation and enhanced communication with the States and with Indian tribes potentially affected by BLM undertakings.

a. Information on the Web. The BLM will ensure the following information is available on the national BLM web site and will widely publicize this availability:

(1) copy of this revised agreement;

(2) reference copy of the existing BLM internal guidance, including Manual Sections and Manual Handbooks related to "Cultural Resource Management;"

(3) copy of existing BLM-SHPO protocols under the 1997 agreement, used by the BLM within an individual state office's jurisdiction;

(4) current list of Preservation Board members;

(5) list of BLM DPOs and BLM tribal contacts for each state office;

(6) map of each state showing BLM district and field office boundaries;

(7) annual BLM Washington Office reports; and

(8) BLM's Preserve America Section 3 report.

b. BLM-SHPO Protocols

Within 12 months of execution of this agreement, each BLM state director or his/her designee will meet with each relevant SHPO to review and consider the need for changes in the BLM-SHPO protocol for that state to meet the minimum requirements specified in this component and notify the ACHP of the results of their review. The state director may request ACHP assistance in identifying specific changes needed in the State's BLM-SHPO protocol prior to the state director initiating any changes associated with implementation of this agreement. BLM-SHPO protocols determined to require revision must be changed within 24 months of the date of this agreement.

The SHPO or BLM state director may ask the NCSHPO, the Preservation Board, and/or the ACHP to assist at any stage in revising BLM-SHPO protocols. The Preservation Board and the ACHP will be kept informed of the progress of protocol review and revision, and the BLM state office will provide the ACHP an opportunity to review and comment on revised protocols before execution. The state director will also provide the Preservation Board, ACHP, and NCSHPO with an information copy of any signed revision and post it on the BLM web site for that state.

Recognizing that BLM-SHPO protocols implement this agreement, any revisions to BLM-SHPO protocols that alter the process for complying with Section 106 specified in this agreement and any BLM-SHPO protocol that was executed or last revised 10 or more years prior to the date of this agreement, will be subject to consultation requirements as set forth in 36 CFR 800.14, including, in particular, the tribal consultation requirements under 36 CFR 800.14(f).

At a minimum, BLM-SHPO protocols will incorporate the framework outlined in Component 4 of this agreement and address the following:

(1) a means for making a schedule of pending undertakings, including land transfers, available to the public and Indian tribes on a regular basis

(2) a commitment to fulfill tribal consultation obligations;

(3) the manner in which public participation is addressed for protocol-guided compliance processes;

(4) the manner in which the involvement of consulting parties is addressed for protocol-guided compliance processes;

(5) data sharing, including information resource management development, support and security–at a minimum annual transmittal of all site forms and project reports;

(6) data synthesis, including geographical and/or topical priorities for reducing the backlog of un-synthesized site location and report information, and data quality improvement;

(7) public education and community involvement in preservation;

(8) preservation planning;

(9) cooperative stewardship;

(10) agreement as to the types of properties for which BLM may determine ineligibility without seeking SHPO agreement. Eligibility determinations regarding possible traditional cultural properties will continue to require SHPO agreement and consultation with tribes.

(11) agreement as to types of undertakings and classes of affected properties that will trigger case-by-case review, including all undertakings that will have an adverse effect on historic properties, as well as any development of alternative procedures such as project-specific PAs, and how this review will proceed, consistent with Component 4 above;

(12) manner in which the BLM will ensure that appropriate professional expertise will be obtained or made available for specific types of undertakings or historic properties;

(13) provisions for resolving disagreements and amending or terminating the BLM-SHPO protocol;

(14) circumstances under which the BLM and/or SHPO may choose to operate under 36 CFR 800.3 through 800.7 in place of the BLM-SHPO protocol;

(15) the substance and format of supplemental information to the BLM annual report that the state director will prepare in satisfaction of Component 10b of this agreement and the manner in which the report will be made available to affected Indian tribes and the public via the state BLM website. Supplemental information shall include information on BLM actions relative to undertakings and classes of affected properties that did not trigger case-by-case review; and

(16) training of a new manager or archaeologist with Section 106 responsibilities in a state that operates under this PA within 90 days of his or her report date in the procedures outlined in the PA and appropriate BLM-SHPO protocol.

c. BLM-Tribal Relations

BLM shall consult with Indian tribes on individual undertakings in the context of an ongoing government-to-government relationship sustained through regular periodic meetings supplemented by additional undertaking-specific consultation. Within 12 months following execution of this agreement, each state director will have begun contacting Indian tribes that are affected by BLM undertakings within his or her jurisdiction on a regular basis for the purpose of initiating a discussion about ways in which BLM and each Indian tribe can foster better communication. This discussion between the appropriate BLM and tribal representatives is an opportunity to establish effective methods for meeting tribal consultation requirements regarding identification and evaluation of historic properties, including traditional cultural properties, and for the resolution of adverse effects of undertakings. This process should be carried out in coordination with other state directors, as appropriate, and should seek to:

(1) identify geographic areas, types of historic properties, and undertakings of concern to Indian tribes;

(2) identify confidentiality issues;

(3) answer questions on the existing BLM-SHPO protocol;

(4) provide a tribal point of contact for the state office and each district and field office within his or her jurisdiction;

(5) develop a process for providing information and schedules of pending actions, including land exchanges, permits, and approvals on a regular basis; and

(6) offer Indian tribes the opportunity to establish a formal ongoing relationship through an agreement for conducting the consultation required under the NHPA Section 106 within the framework of the BLM's government-to-government relationship with Indian tribes and other authorities.

d. The state director, will seek, as appropriate, the active participation of SHPOs, Indian tribes, and the interested public in BLM land-use planning and associated resource management activities consistent with section 202 of FLPMA, 43 U.S.C. § 1712, and implementing regulations at 43 CFR 1610.2. This participation will be sought so that historic preservation considerations may influence large-scale decisions and inform the analysis of cumulative effects of more routine decisions, before the BLM makes key commitments and its management options are limited.

e. If deemed helpful and appropriate by the Indian tribe and the BLM, the BLM will seek to establish agreements and/or other formalized working arrangements with Indian tribes, relative to identifying undertakings, identifying properties, evaluating properties, determining effects, and protecting historic properties. All existing project and special purpose agreements with Indian tribes will function normally according to their terms.

f. When potentially relevant to the purposes and terms of this agreement, the BLM FPO will forward to the ACHP and the NCSHPO, in a manner that allows for consultation at their request, information concerning the following:

(1) major policy initiatives;

(2) proposals for new BLM regulations;

(3) proposals for organizational change potentially affecting relationships addressed in this agreement;

(4) the Administration's budget proposal for BLM historic preservation activities, following its submittal to Congress;

(5) relevant training opportunities; and

(6) long range planning and regional planning schedules.

7. BLM Staff Training Program

The BLM will maintain an internal training program to: (a) instruct BLM line managers and cultural heritage specialists on the policies underlying and embodied in this agreement, including tribal consultation and state specific BLM-SHPO protocol implementation; and (b) enhance skills and knowledge of other BLM personnel involved with "Heritage Resource Management" activities, including land use planning and resource management staffs. In cooperation with the ACHP and NCSHPO, the BLM may identify partners, as appropriate, to assist in developing training programs. The BLM may seek the active participation of Indian tribes and individual SHPOs in training sessions.

8. Professional Development

a. The DPOs, in consultation with supervising line managers and cultural heritage specialists in their state, will document each district and field office's preservation professional staffing capabilities in their annual report to the SHPO. Documentation will include any recommended limitations on the nature and extent of authorized functions. Where a field manager's immediate staff does not possess the necessary qualifications to perform specialized preservation functions (e.g., historical architecture, historical landscape architecture, ethnography), the field manager will seek specialized expertise from outside the immediate staff.

b. The DPOs may request that the Preservation Board assist the supervising line manager and the cultural heritage specialist in assessing the manager's needs for special skills not presently available on the immediate staff, and the specialist's opportunities for professional development and career enhancement through training, details, part-time graduate education, and other means.

9. District or Field Office Certification and Decertification

a. The Preservation Board, in coordination with the appropriate DPO, SHPO, and the ACHP, and with consideration of tribal comments, may choose to review the status of a district or field office's certification to employ BLM-SHPO protocols developed pursuant to this agreement; or the district or field manager, the state director, the ACHP, or the SHPO, may request that the Preservation Board initiate a review of a district or field office's certification.

b. If a review is being conducted, the FPO, appropriate DPO(s), SHPO(s), the ACHP, and the Preservation Board will participate in the review, and the BLM may consider including other legitimate affected parties as participants in the review, as appropriate.

(1) If a district or field office is found not to have maintained the basis for its certification (e.g., lacks the professional capability needed to carry out these policies and procedures, or is proceeding in contravention of its BLM-SHPO protocol or BLM internal guidance), and the office's manager has not voluntarily suspended participation under this agreement, the Preservation Board will recommend that the state director decertify the district or field office. If a suspended or decertified district or field office is found to have restored the basis for certification, the Preservation Board will recommend that the state director recertify the district or field office.

(2) A state director may ask the Director to review the Preservation Board's decertification recommendation, in which case the Director may request the ACHP's participation in the review.

(3) The Preservation Board will notify the appropriate SHPO(s), the ACHP, and the review requestor, of the findings of the review, including any recommended changes to the certification status of the office.

(4) When a district or field office is suspended or decertified, the district or field manager will follow the procedures of 36 CFR 800.3 through 800.7, or 36 CFR 800.8(c), or an applicable program alternative under 36 CFR 800.14, to comply with Section 106.

c. If the Preservation Board receives a request to perform a review and decides not to conduct the review, it will provide a response to the requester, including the rationale for its decision.

10. Accountability Measures

a. It will be the Preservation Board's duty in accordance with Component 3.c and 3.d above to foster consistency and conformity with BLM policies and procedures. Where problems with implementation are found, it will be the Preservation Board's duty to move promptly toward effecting correction of the problems, in coordination with the individual DPO.

b. Each state director will prepare an annual report in consultation with the appropriate SHPO(s), outlining the preservation activities conducted under this agreement. The annual report will be consistent with the BLM's annual Washington Office reporting requirements, and will include supplemental information agreed upon by the BLM and SHPO. The state reports will be made available to the public via the BLM state web sites, and BLM will notify the ACHP of their availability via email.

c. Annually, each state director that maintains a BLM-SHPO protocol pursuant to this agreement or his/her designee will meet with the SHPO to review the implementation of that BLM-SHPO protocol.

d. The Preservation Board or the BLM Washington Office, in consultation with the ACHP and SHPOs, may select one or more certified state, district, or field offices for a detailed field review of this agreement's implementation. The FPO and the appropriate DPO(s), SHPO(s), and the ACHP will participate in the review and may include other parties as appropriate. Findings and recommendations based on this field review will be provided to the participants, the Director, the state director, and the Preservation Board for appropriate action.

e. The FPO and DPOs will prepare responses to public inquiries for the signature of the Director or a state director regarding inquiries about the BLM's exercise of its authorities and responsibilities under this agreement, such as the identification, evaluation, and management of resources. Responses will include establishing the facts of the situation and, where needed, recommendations to the Director or state director for corrections or revisions in a practice or procedure.

f. Each meeting of the Preservation Board will be documented by a report. The Preservation Board will post a copy of each report on the national BLM web site.

11. Reviewing and Changing the Agreement

a. The signatories to this agreement may agree to revise or amend it at any time. Changes that would affect the opportunity for public participation or tribal consultation will be subject to public notice and tribal consultation. An amendment will go into effect when signed by all the signatories.

b. Should any signatory to this agreement object to any matter related to its implementation, the signatories will meet to attempt to resolve the objection. If a signatory determines that such objection cannot be resolved, BLM will:

1. Forward all documentation relevant to the dispute, including the BLM's proposed resolution, to the other signatories. The signatories shall provide BLM with their response to the BLM's proposed resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, BLM shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the signatories, and provide them with a copy of this written response. BLM will then proceed according to its final decision.

2. If the signatories do not provide their advice regarding the dispute within the thirty (30) day time period, BLM may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, BLM shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories to the agreement, and provide them with a copy of such written response.

3. BLM 's responsibility to carry out all other actions subject to the terms of this agreement that are not the subject of the dispute remain unchanged.

c. Any signatory to this agreement may terminate it by providing 90 days notice to the other signatory, provided that the signatory will meet during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, all state-specific BLM-SHPO protocols developed under the authority of this agreement and/or the 1997 PA will be terminated, and the BLM will comply with Section 106 through the process in 36 CFR 800.3 through 800.7, or 36 CFR 800.8(c), or an applicable program alternative under 36 CFR 800.14.

d. Within 1 year of the execution of this agreement and every 2 years thereafter, the signatories to this agreement will meet to review its implementation.

e. Specific references to 36 CFR Part 800 are to the regulations that became effective on August 5, 2004. Generic references to 36 CFR Part 800 in this agreement may be read in the future as referencing the version that is in effect at the time of reading.

f. This agreement will be in effect for a period of 10 years from the date of execution, with an option for renewal in 2-year increments with agreement of its signatories.

Affirmation

The signatures below represent the affirmation of the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers that successful execution of the Components of this agreement will satisfy the BLM's obligations under Section 106 and serve as partial satisfaction of the BLM's obligations under Sections 110(f) and 111(a) of the National Historic Preservation Act.

Robert V. Abbey
Director, Bureau of Land Management

2-9-12
Date

John M. Fowler
Executive Director, Advisory Council on Historic Preservation

2/9/12
Date

Ruth Pierpont
President, National Conference of State Historic Preservation Officers

2/9/12
Date

APPENDIX L:

UPDATE TO GIS DATA SOURCES AND METHODOLOGY

This page intentionally left blank.

APPENDIX L:

UPDATE TO GIS DATA SOURCES AND METHODOLOGY

Appendix L of the Draft *Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States* (Solar PEIS) presented information about the geospatial data and the geographic information system (GIS) methodology used in the Solar PEIS analyses. The information presented in this update to Appendix L for the Final Solar PEIS summarizes, but does not replace, the information provided in the corresponding Appendix L in the Draft Solar PEIS.

Appendix L of the Draft Solar PEIS described the extent of the GIS analyses, data standards, and data sources and their limitations. In addition, it described the methods used to analyze potential effects, including detailed discussions of the environmental justice and visual resource impact analyses. Information describing the main GIS platform and other GIS technologies that were used was included.

This page intentionally left blank.

APPENDIX M:

UPDATE TO METHODOLOGIES AND DATA SOURCES FOR THE ANALYSIS OF IMPACTS OF SOLAR ENERGY DEVELOPMENT ON RESOURCES

This page intentionally left blank.

APPENDIX M:

UPDATE TO METHODOLOGIES AND DATA SOURCES FOR THE ANALYSIS OF IMPACTS OF SOLAR ENERGY DEVELOPMENT ON RESOURCES

Appendix M of the Draft *Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States* (Solar PEIS) presented detailed information on the methodologies and data sources used to assess the potential environmental impacts of utility-scale solar energy development, mainly with a focus on assessing impacts from development in the proposed solar energy zones (SEZs). Appendix M of the Draft Solar PEIS included information about the general assumptions used in the analysis in addition to information about the scope, methodologies, and data sources used for each resource topic.

The information presented in this update to Appendix M for the Final Solar PEIS supplements, but does not replace, the information provided in the corresponding Appendix M in the Draft Solar PEIS. Section M.1 of this updated appendix presents new information with respect to the methodologies and data sources for the analysis of impacts on livestock grazing (Section M.4.1.2 of the Draft Solar PEIS). Section M.2 of this updated appendix presents new information about the methodology used for estimating noise levels at receptor locations (Section M.15.3 of the Draft Solar PEIS). Section M.3 of this updated appendix presents corrections to incorrect information on the soil resources impact assessment methodology (Section M.7.3 of the Draft Solar PEIS).

M.1 UPDATE TO SECTION M.4.1.2 OF THE DRAFT SOLAR PEIS ON LIVESTOCK GRAZING METHODOLOGY AND DATA SOURCES

The analysis of impacts on livestock grazing was based on a geographic information system (GIS) analysis of the number of grazing allotments within the SEZ, the acreage and annual grazing authorization of each allotment, and an assumption that the reduction in the animal unit months (AUMs)[1] of a particular allotment would be the same as the percentage of the public land that would be lost to solar development. This approach assumed that all lands within an allotment have the same value to a grazing operation, which in most instances is not correct. This approach was applied to make only a general assessment of the potential impact on individual livestock grazing operations at this programmatic level. The actual impact of a change in any grazing authorization would depend on several factors, including (1) how much of an allotment the permittee might lose to development; (2) how important the specific land lost is to the permittee's overall operation (i.e., considering such things as water developments, fencing, connectivity between pastures, etc.); (3) the actual amount of forage production that would be lost by the grazing permittee; and (4) an assessment of the likely economic impacts of any changes to the specific ranch operation. For the purposes of providing some larger-scale reference to the significance of the potential loss of AUMs within some SEZs, a comparison to the total livestock grazing authorization within the local Bureau of Land Management (BLM)

[1] One AUM is a unit of forage required to support one cow and her calf for one month.

field office was provided in the SEZ-specific analyses in Chapters 8 through 13 of the Draft Solar PEIS.

Economic impacts of the loss of grazing capacity must be determined at the allotment-specific level and were not attempted in this PEIS because assumptions needed to make that determination would be highly speculative. For most public land grazing operations, any loss of grazing capacity is an economic concern, but it is not possible to assess the extent of that specific impact at this programmatic level. For that reason, only a general assessment is made based on the projected loss of livestock AUMs. This assessment also does not consider potential impacts on management costs, the impacts of reducing the scale of an operation, or the impact on the value of specific ranches, including loss of value in private land and other grazing associated assets. While the potential to mitigate some loss of grazing capacity through provision of range improvements on remaining portions of allotments is generally discussed within individual SEZ sections, it was not possible to assign an estimate of AUMs that might be recovered, so the estimate of AUMs that might be lost is based solely on the assumed percentage loss of the allotment.

Sources of information for this analysis included the project-specific GIS system; the BLM GeoCommunicator Web site; the BLM Rangeland Administration System Web site, which provides detailed allotment-specific information; and communication with BLM range management staff.

M.2 UPDATE TO SECTION M.15.3 OF THE DRAFT SOLAR PEIS ON ESTIMATION OF NOISE LEVELS AT THE RECEPTORS

Some comments on the Draft Solar PEIS stated that sound propagation modeling integrating various sound attenuation mechanisms should have been used to evaluate noise impacts; however, the methodology used to estimate noise levels at receptor locations in the Draft and Final Solar PEIS did not employ a sound propagation model. Instead, for this programmatic-level assessment, noise levels were predicted considering only geometric spreading or geometric spreading combined with ground effects. Sound propagation modeling would require detailed source-, receptor-, and site-specific data. Until project-specific plans are available, insufficient data are available to conduct sound propagation modeling. The more simplified level of analysis conducted was appropriate for this programmatic-level assessment.

M.3 ERRATA TO APPENDIX M OF THE DRAFT SOLAR PEIS

Table M-1 presents corrections to material presented in Appendix M of the Draft Solar PEIS.

TABLE M-1 Errata to Appendix M of the Draft Solar PEIS

Section No.	Page No.	Line No.	Figure No.	Table No.	Correction
M.7.3	M-13	34–36			The sentence beginning on line 34 should read, “Because the types of solar projects to be developed and their footprints within the proposed SEZs are not currently known, the temporal/spatial extent of these ground-disturbing activities and soil-related impacts cannot be quantified in this PEIS.”
M.7.3	M-13	39–40			“National Resources Conservations Service” should be “Natural Resources Conservation Service”
M.7.3	M-14	2			“obtained” should be “considered”

This page intentionally left blank.

APPENDIX N:

UPDATE TO VIEWSHED MAPS FOR PROPOSED SOLAR ENERGY ZONES

This page intentionally left blank.

APPENDIX N:

UPDATE TO VIEWSHED MAPS FOR PROPOSED SOLAR ENERGY ZONES

N.1 INTRODUCTION

Appendix N of the Draft *Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States* (Solar PEIS) presented preliminary viewshed analyses to identify which lands surrounding the proposed solar energy zones (SEZs) would have views of solar facilities in at least some portion of the SEZ (see Appendix M for information on the assumptions and limitations of the methods used). For each SEZ, four viewshed analyses were conducted, assuming four different heights representative of project elements associated with potential solar energy technologies:

1. Photovoltaic (PV) and parabolic trough arrays (24.6 ft [7.5 m]);

2. Solar dishes and power blocks for concentrating solar power (CSP) technologies (38 ft [11.6 m]);

3. Transmission towers and short solar power towers (150 ft [45.7 m]); and

4. Tall solar power towers (650 ft [198.1 m]).

In this update to Appendix N for the Final Solar PEIS, revised viewshed maps are presented for the nine SEZs for which boundary changes were made subsequent to the Draft PEIS, including four separate maps for each SEZ corresponding to the representative solar technology heights evaluated in this PEIS. The information presented in this updated Appendix N for the Final Solar PEIS supplements, but does not replace, the information provided in the corresponding Appendix N of the Draft Solar PEIS.

Each viewshed map presented in this update shows which lands surrounding each SEZ would have at least partial visibility of facility components within the SEZ that would be likely to be as tall as or taller than the specified height for each viewshed analysis. The viewsheds for the remaining SEZs have not changed from those presented in the Draft Solar PEIS.

The viewshed maps indicate selected federal, state, and U.S. Department of the Interior (DOI) Bureau of Land Management (BLM)-designated sensitive visual resource areas within the 25-mi (40-km), 650-ft (198.1-m) viewshed for each SEZ, in order to show those portions of sensitive resource areas that could be subject to visual impacts associated with solar energy development within the SEZ. Each map also includes colored lines indicating distance zones that correspond to the BLM's Visual Resource Management (VRM) system-specified foreground middleground distance (5 mi [8 km]), background distance (15 mi [24 km]), and a 25-mi (40-km) distance zone, in order to indicate the effect of distance from the SEZ on impact levels.

The maps are organized alphabetically by state, and by SEZ within each state.

This page intentionally left blank.

N.2 VIEWSHED MAPS FOR ARIZONA SEZS

N.2.1 Viewshed Maps for the Proposed Brenda SEZ as Revised

This page intentionally left blank.

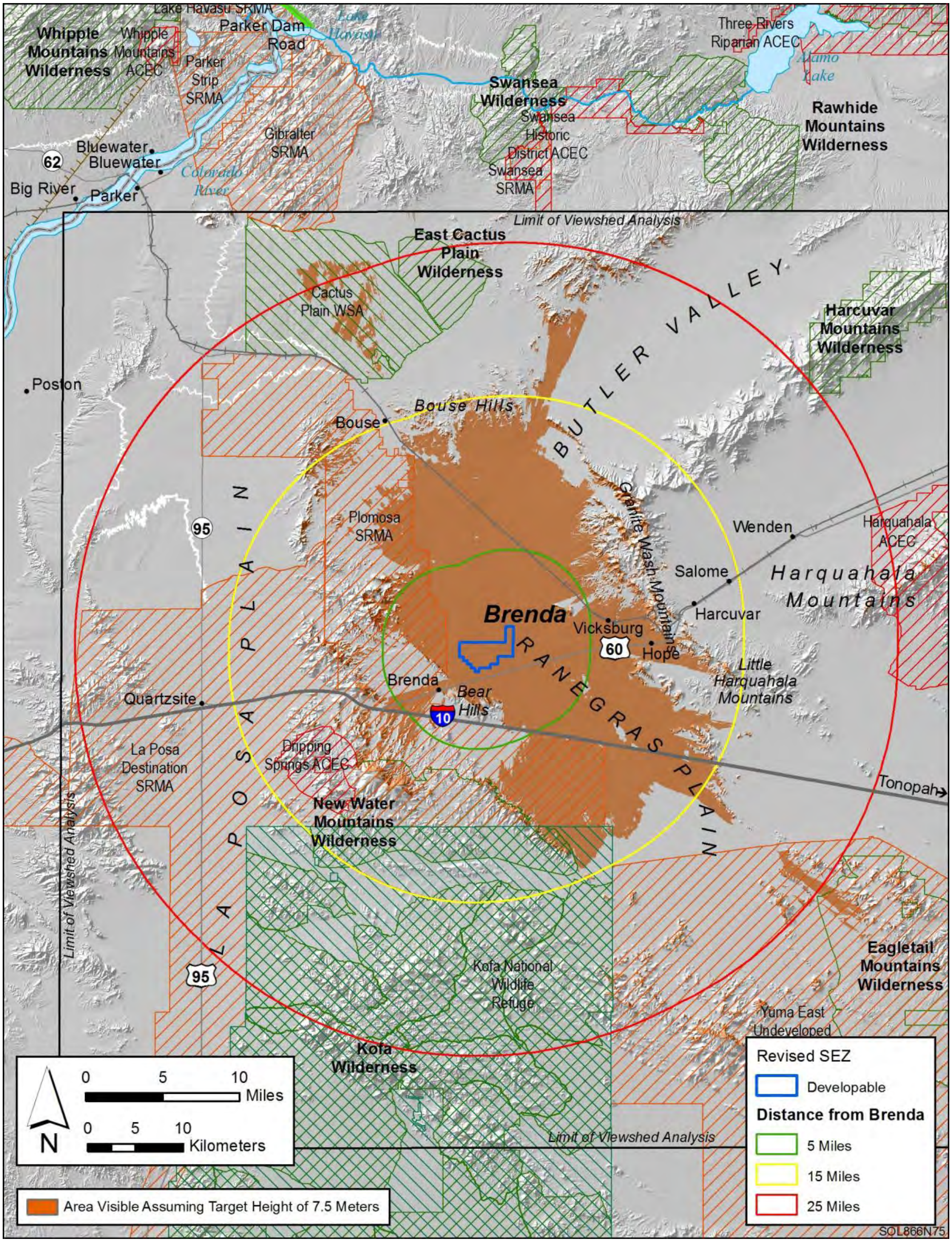


FIGURE N.2.1-1 Viewshed Analysis for the Proposed Brenda SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 24.6 ft (7.5 m)

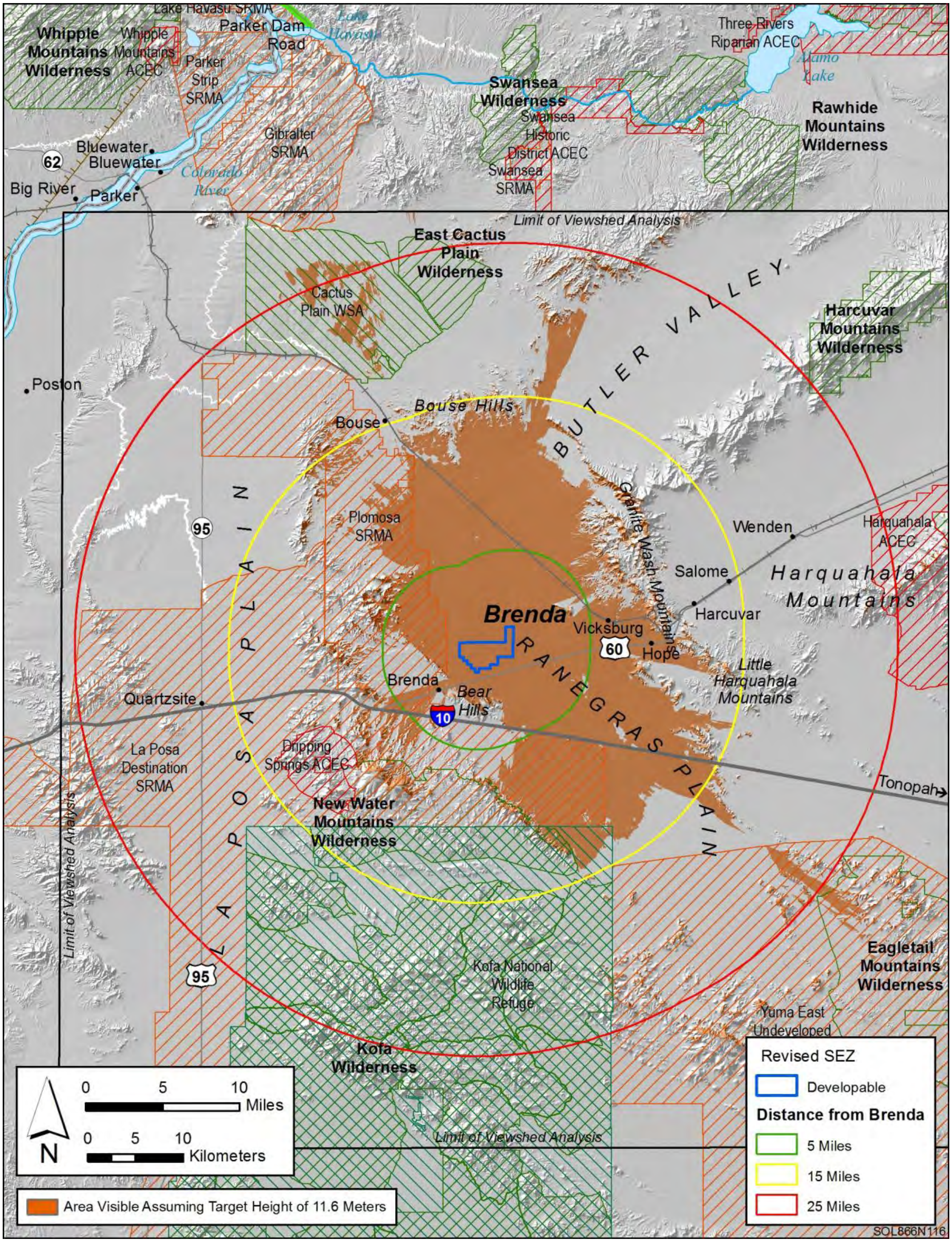


FIGURE N.2.1-2 Viewshed Analysis for the Proposed Brenda SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 38 ft (11.6 m)

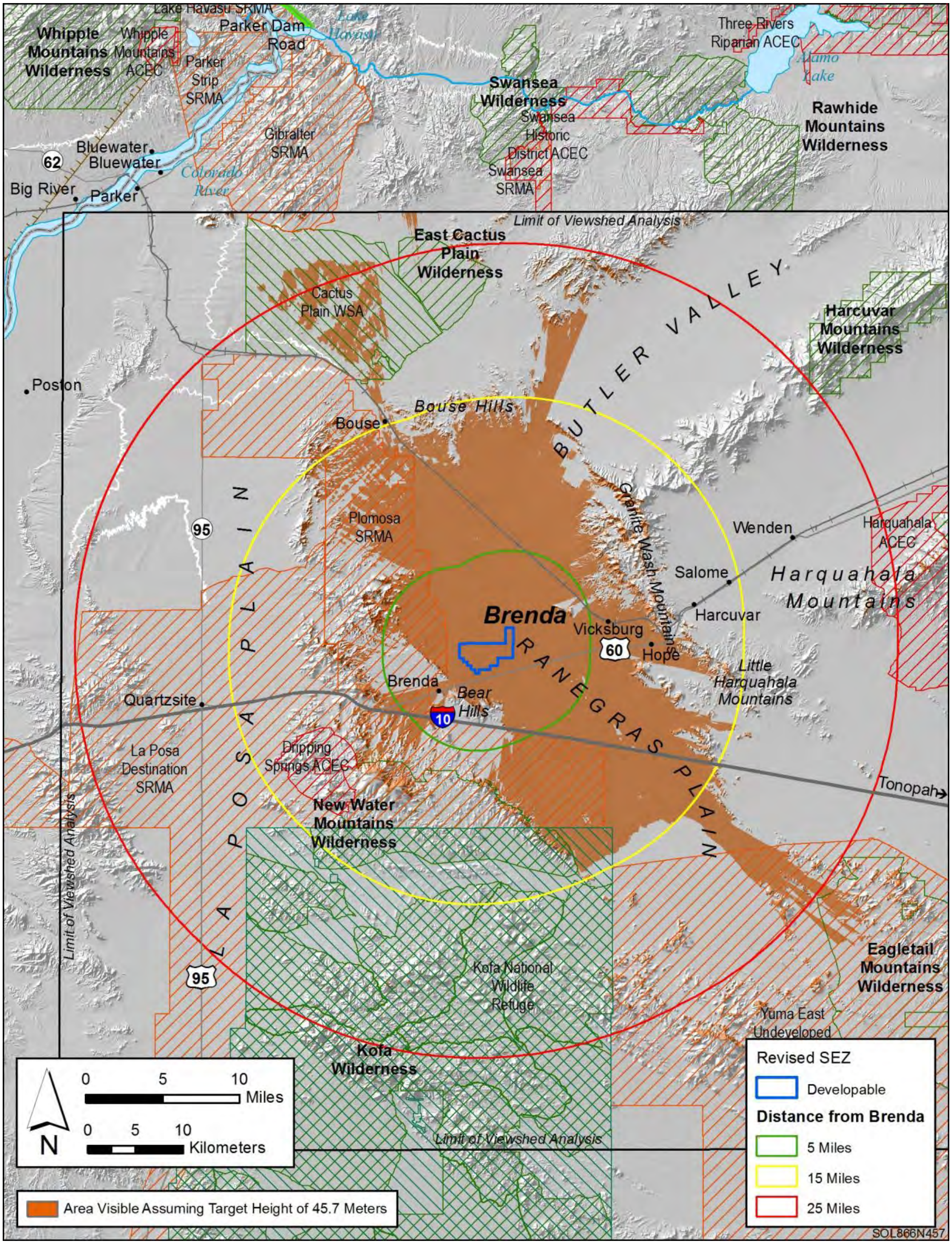


FIGURE N.2.1-3 Viewshed Analysis for the Proposed Brenda SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 150 ft (45.7 m)

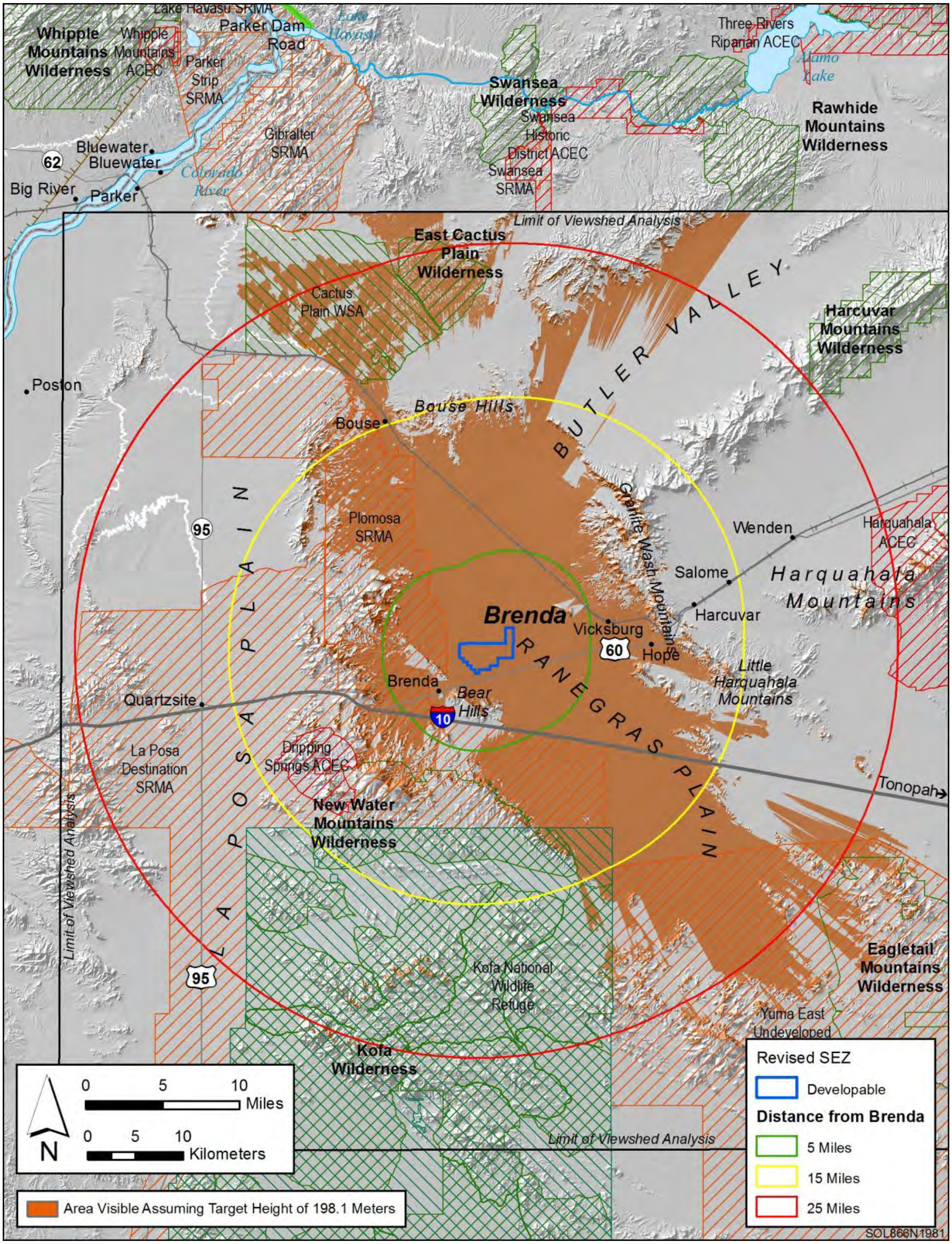


FIGURE N.2.1-4 Viewshed Analysis for the Proposed Brenda SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 650 ft (198.1 m)

N.3 VIEWSHED MAPS FOR CALIFORNIA SEZS

N.3.1 Viewshed Maps for the Proposed Riverside East SEZ as Revised

This page intentionally left blank.

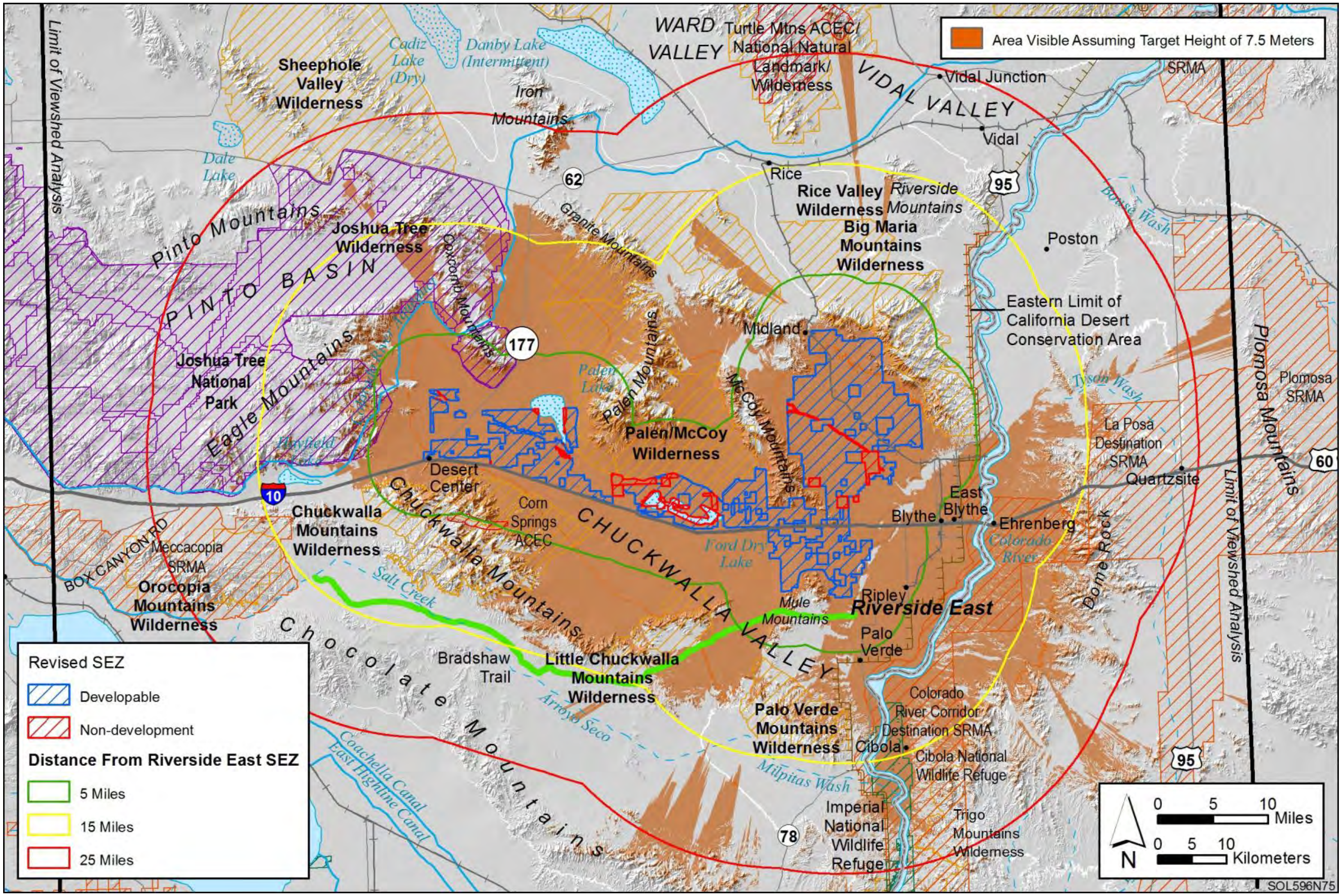


FIGURE N.3.1-1 Viewshed Analysis for the Proposed Riverside East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 24.6 ft (7.5 m)

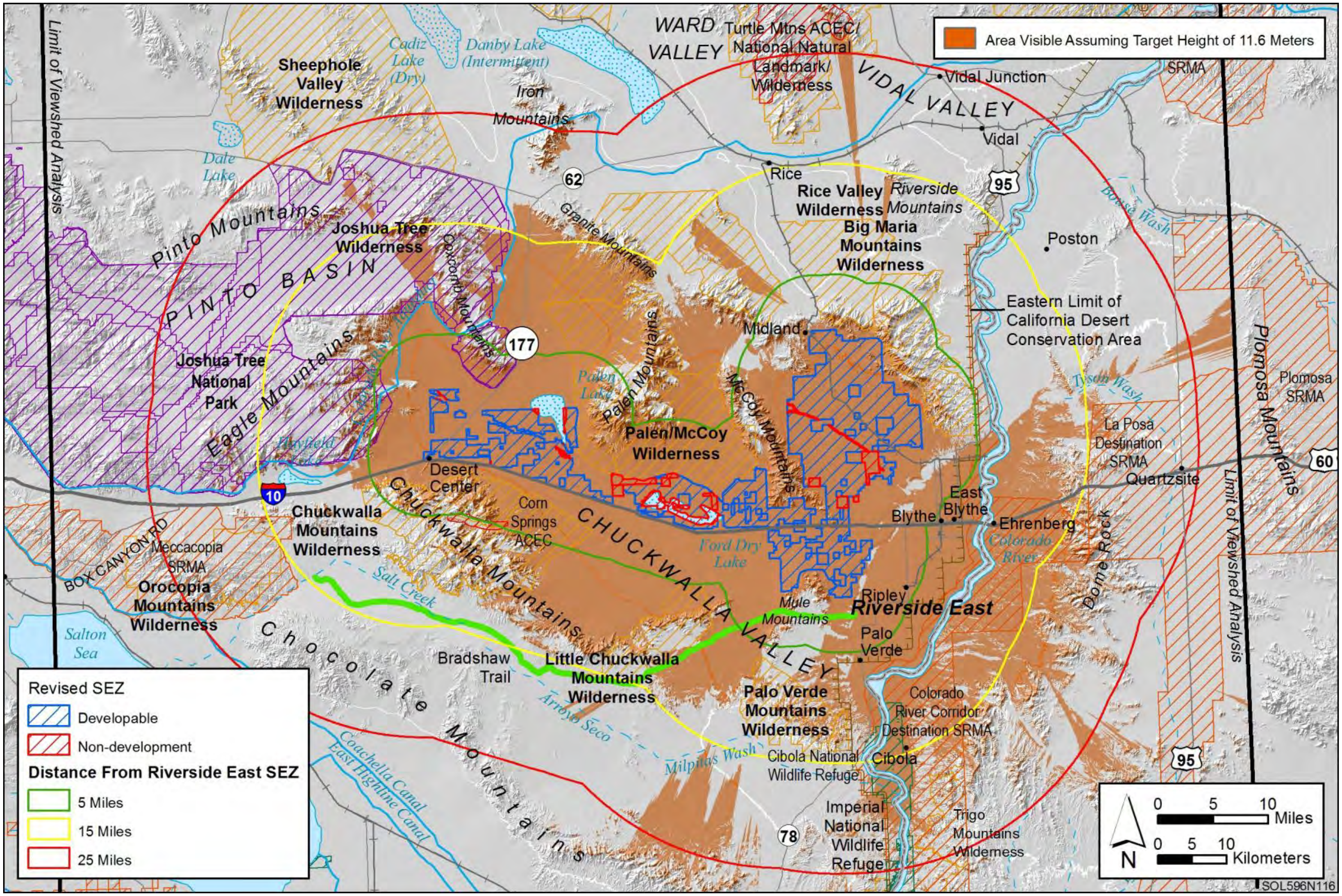


FIGURE N.3.1-2 Viewshed Analysis for the Proposed Riverside East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 38 ft (11.6 m)

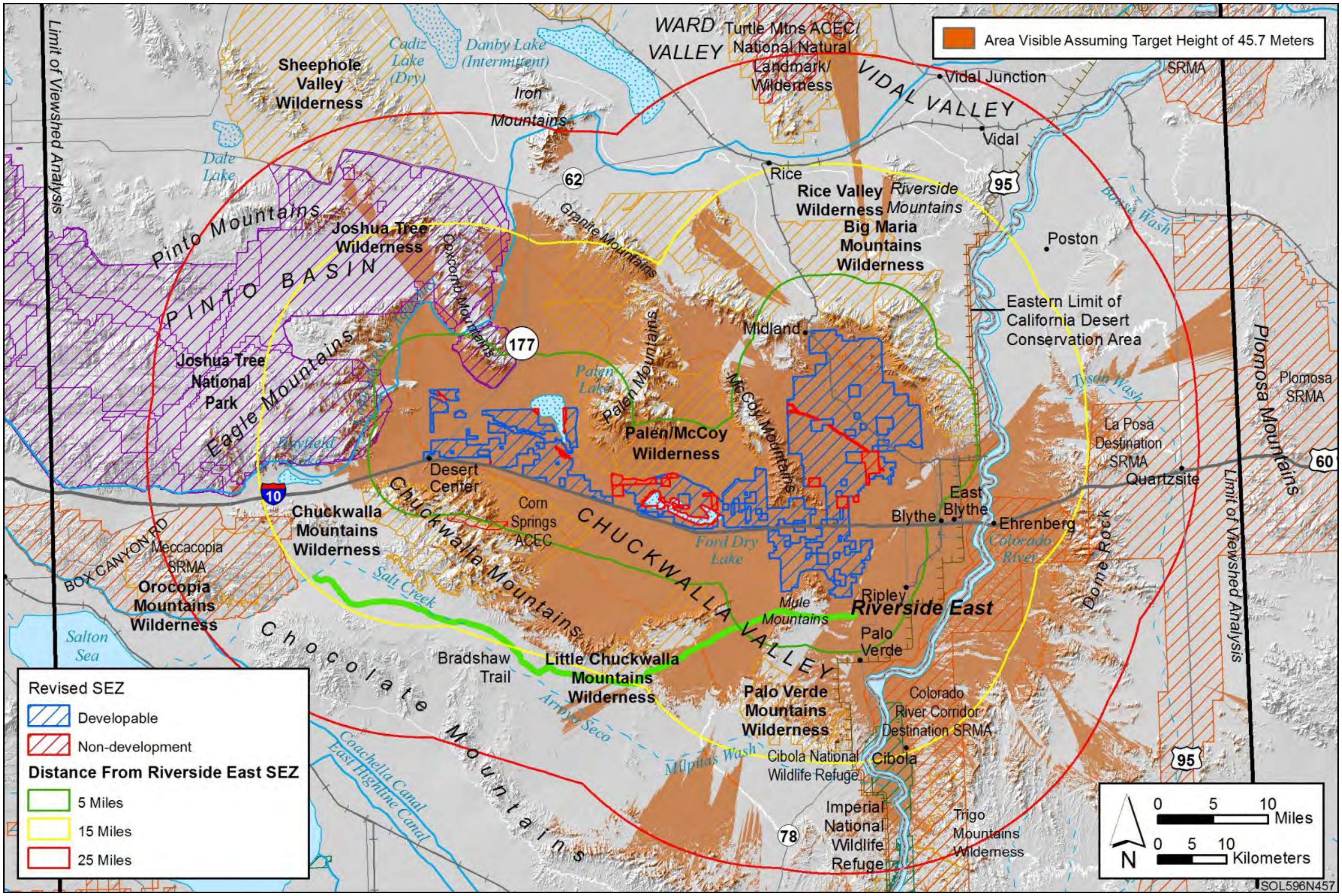


FIGURE N.3.1-3 Viewshed Analysis for the Proposed Riverside East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 150 ft (45.7 m)

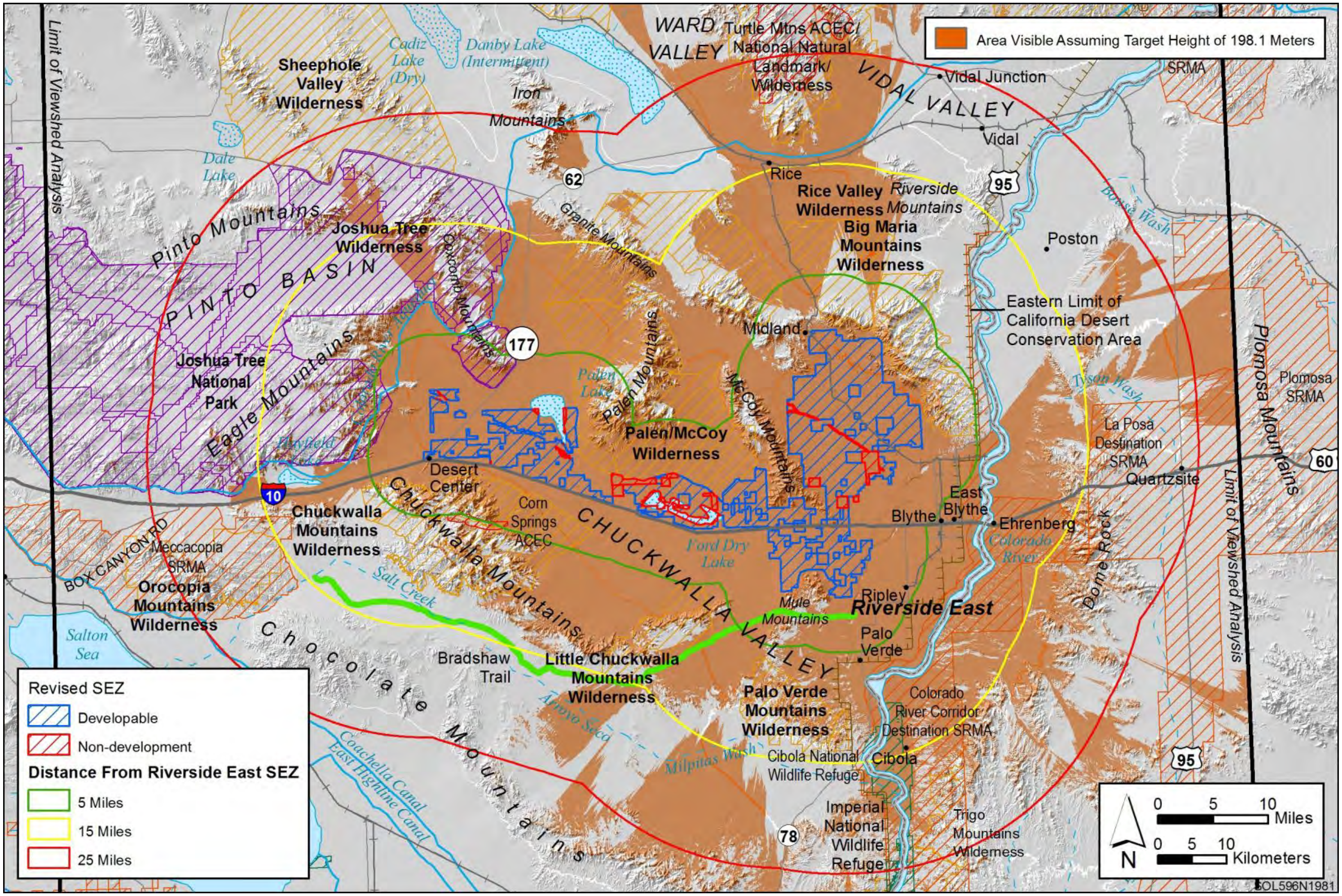


FIGURE N.3.1-4 Viewshed Analysis for the Proposed Riverside East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 650 ft (198.1 m)

N.4 VIEWSHED MAPS FOR COLORADO SEZS

N.4.1 Viewshed Maps for the Proposed De Tilla Gulch SEZ as Revised

This page intentionally left blank.

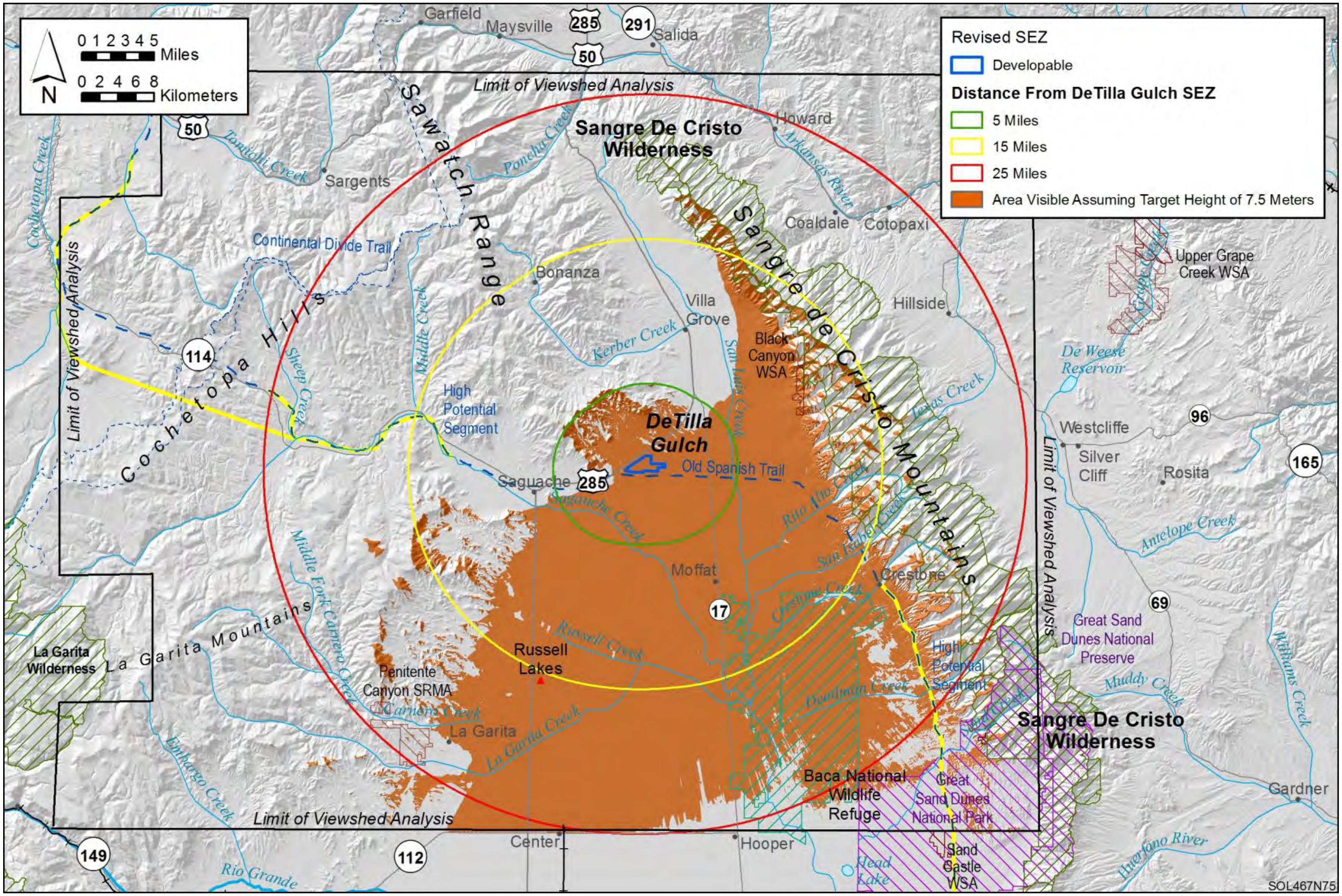


FIGURE N.4.1-1 Viewshed Analysis for the Proposed De Tilla Gulch SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 24.6 ft (7.5 m)

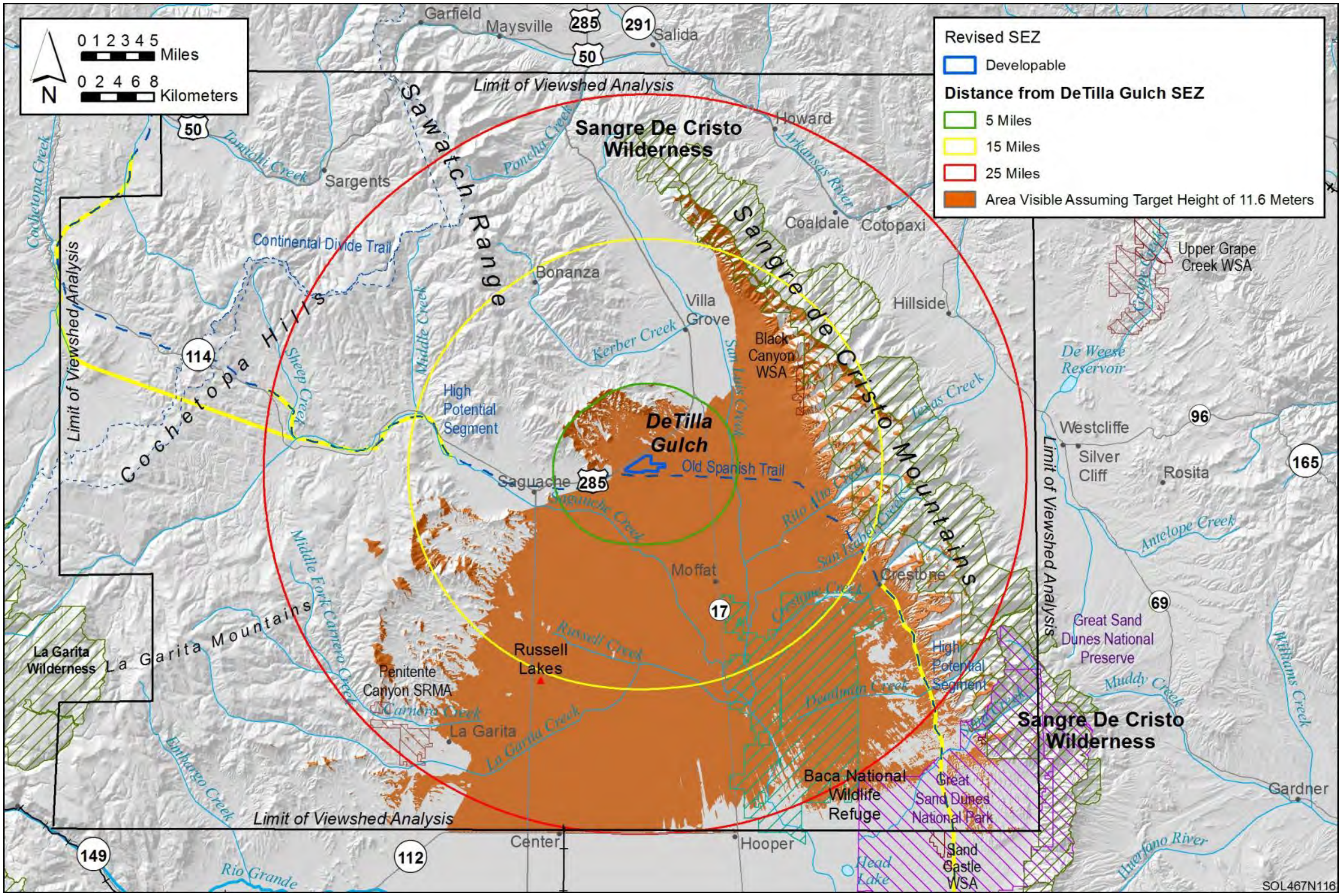


FIGURE N.4.1-2 Viewshed Analysis for the Proposed De Tilla Gulch SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 38 ft (11.6 m)

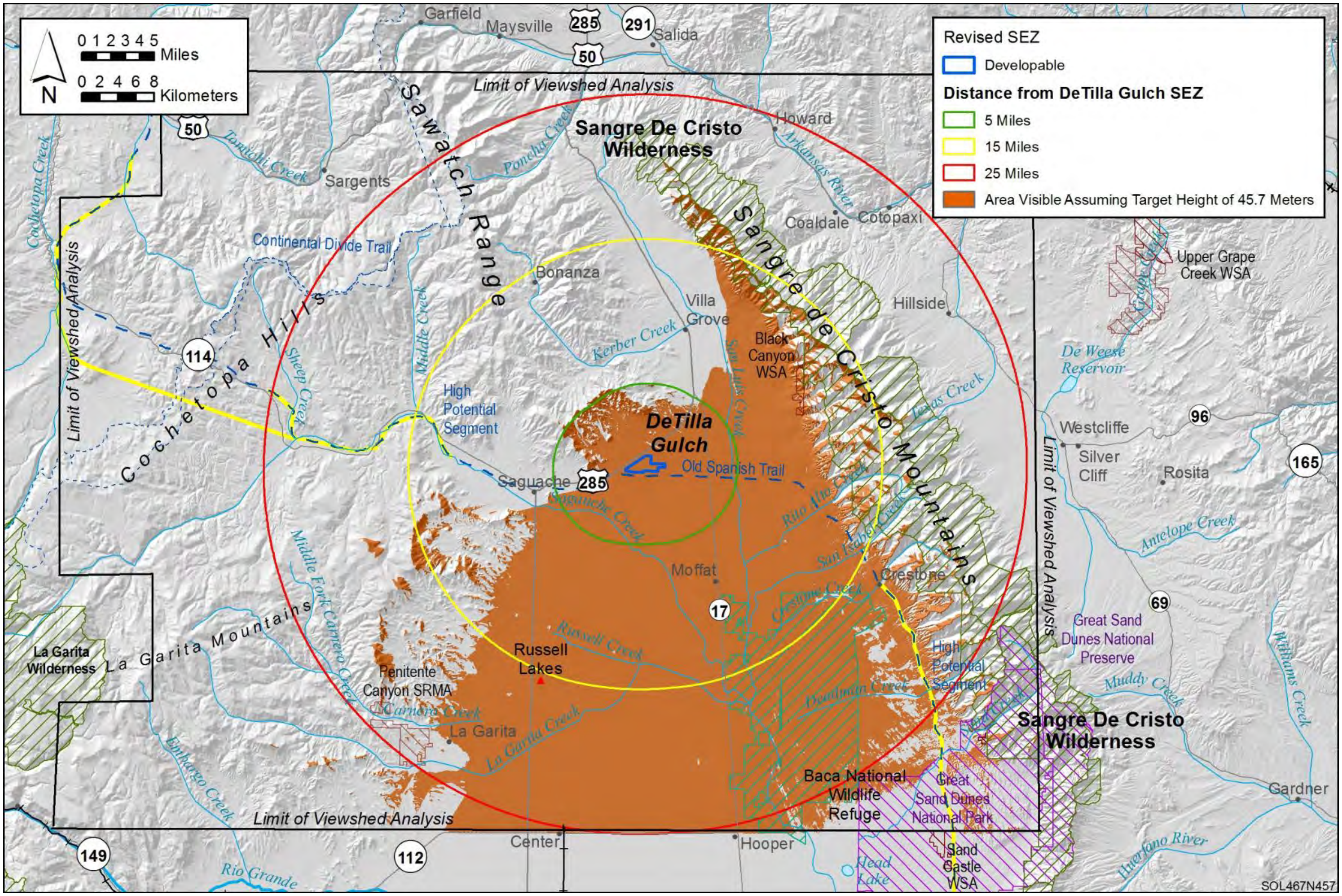


FIGURE N.4.1-3 Viewshed Analysis for the Proposed De Tilla Gulch SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 150 ft (45.7 m)

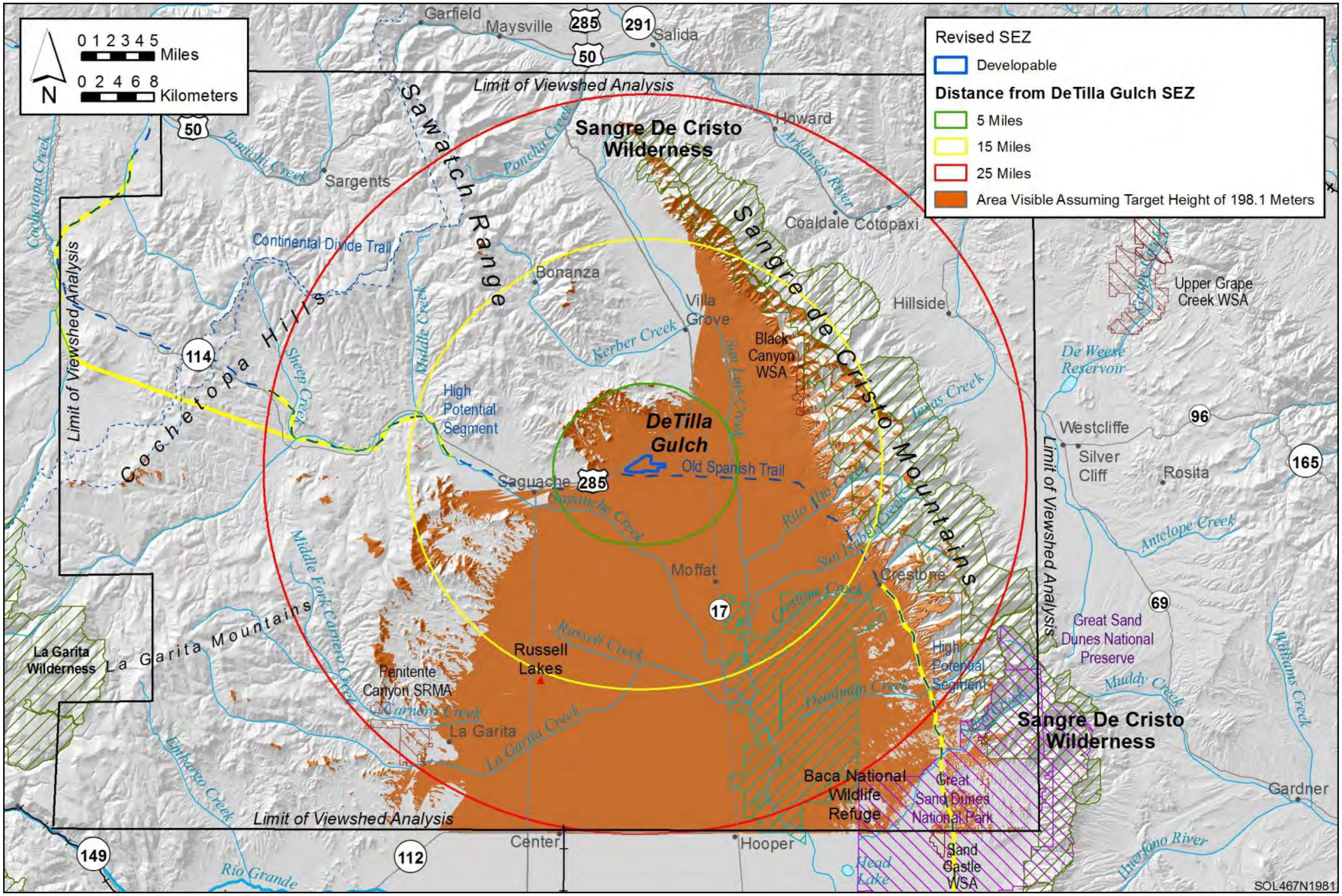


FIGURE N.4.1-4 Viewshed Analysis for the Proposed De Tilla Gulch SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 650 ft (198.1 m)

N.4.2 Viewshed Maps for the Proposed Fourmile East SEZ as Revised

This page intentionally left blank.

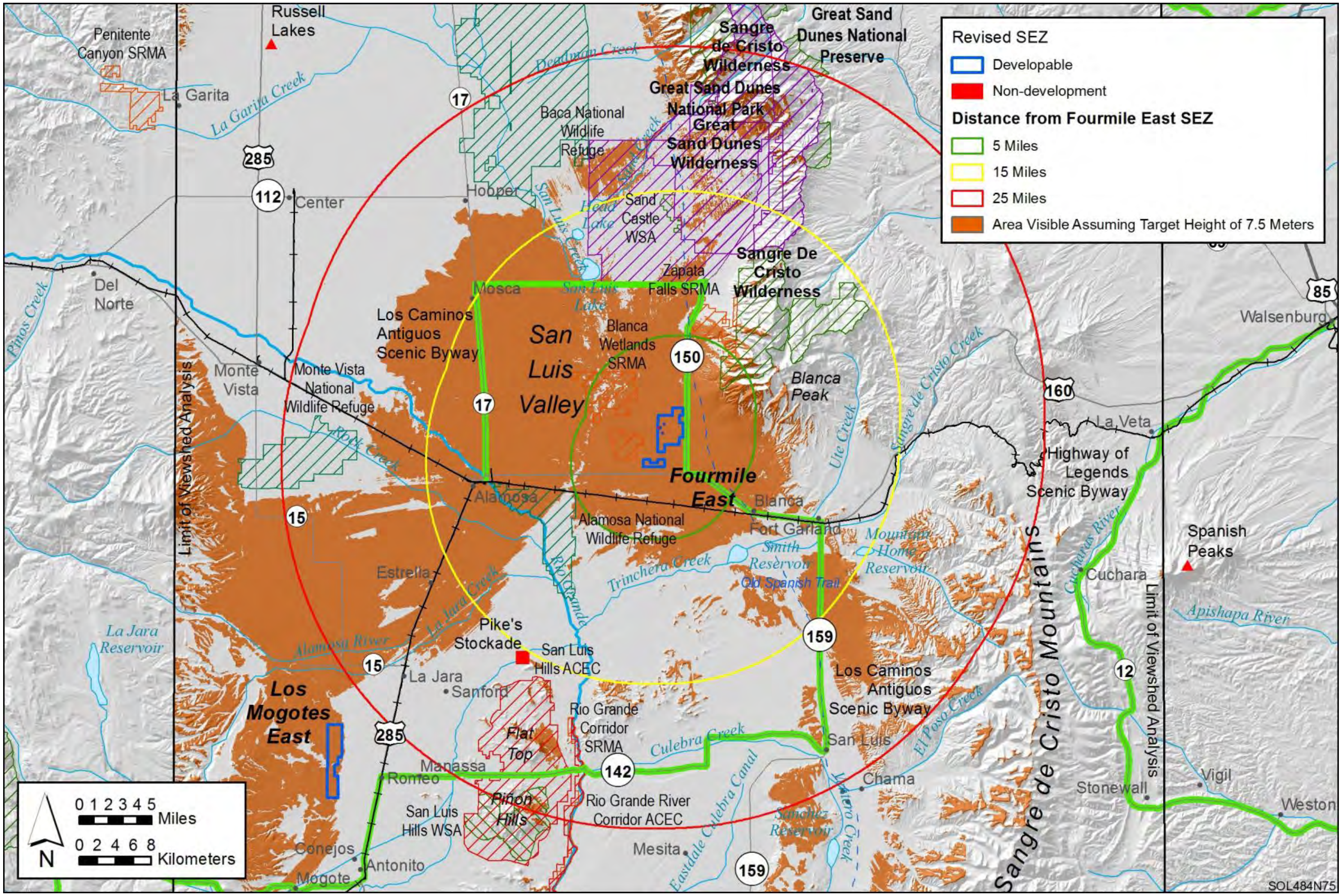


FIGURE N.4.2-1 Viewshed Analysis for the Proposed Fourmile East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 24.6 ft (7.5 m)

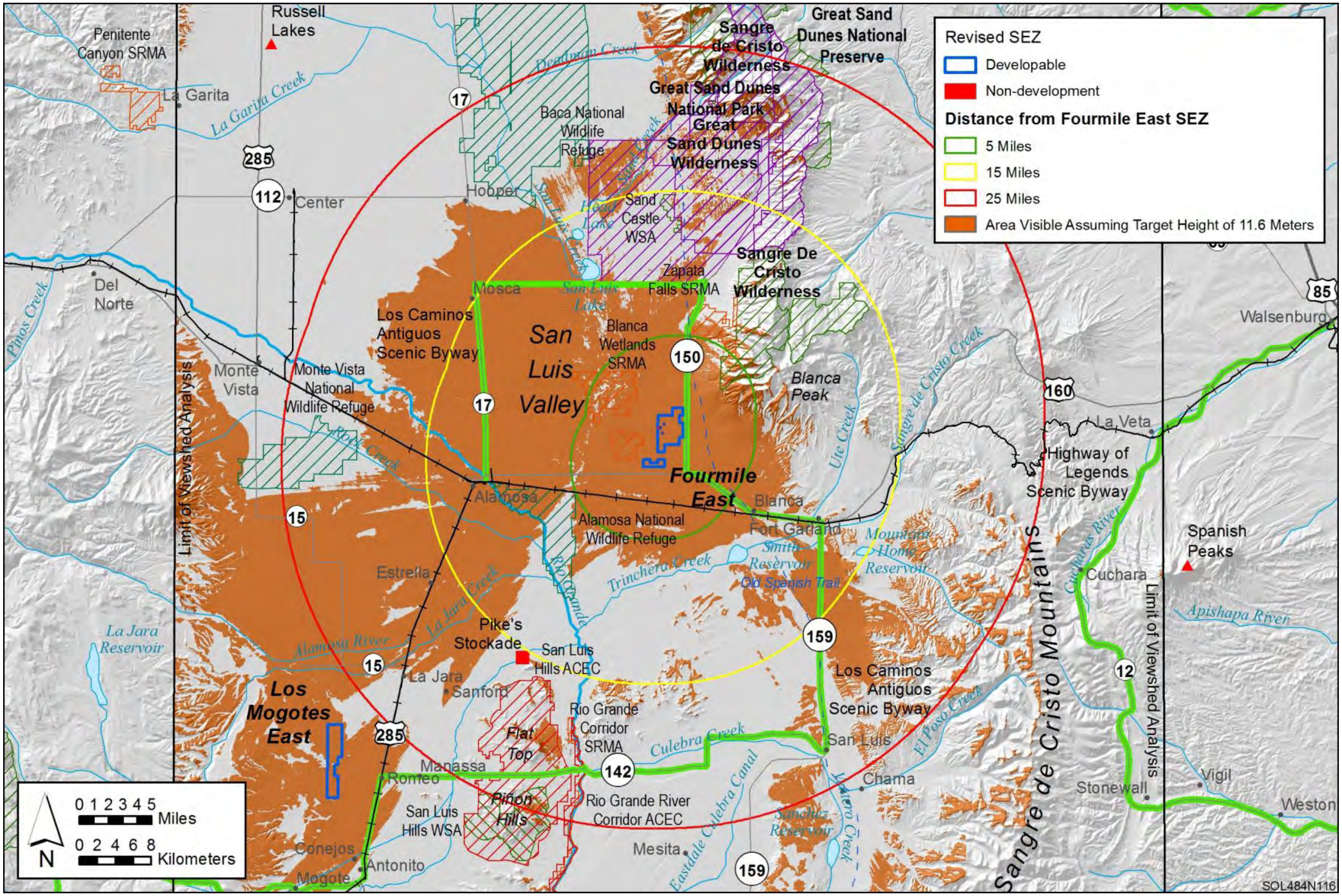


FIGURE N.4.2-2 Viewshed Analysis for the Proposed Fourmile East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 38 ft (11.6 m)

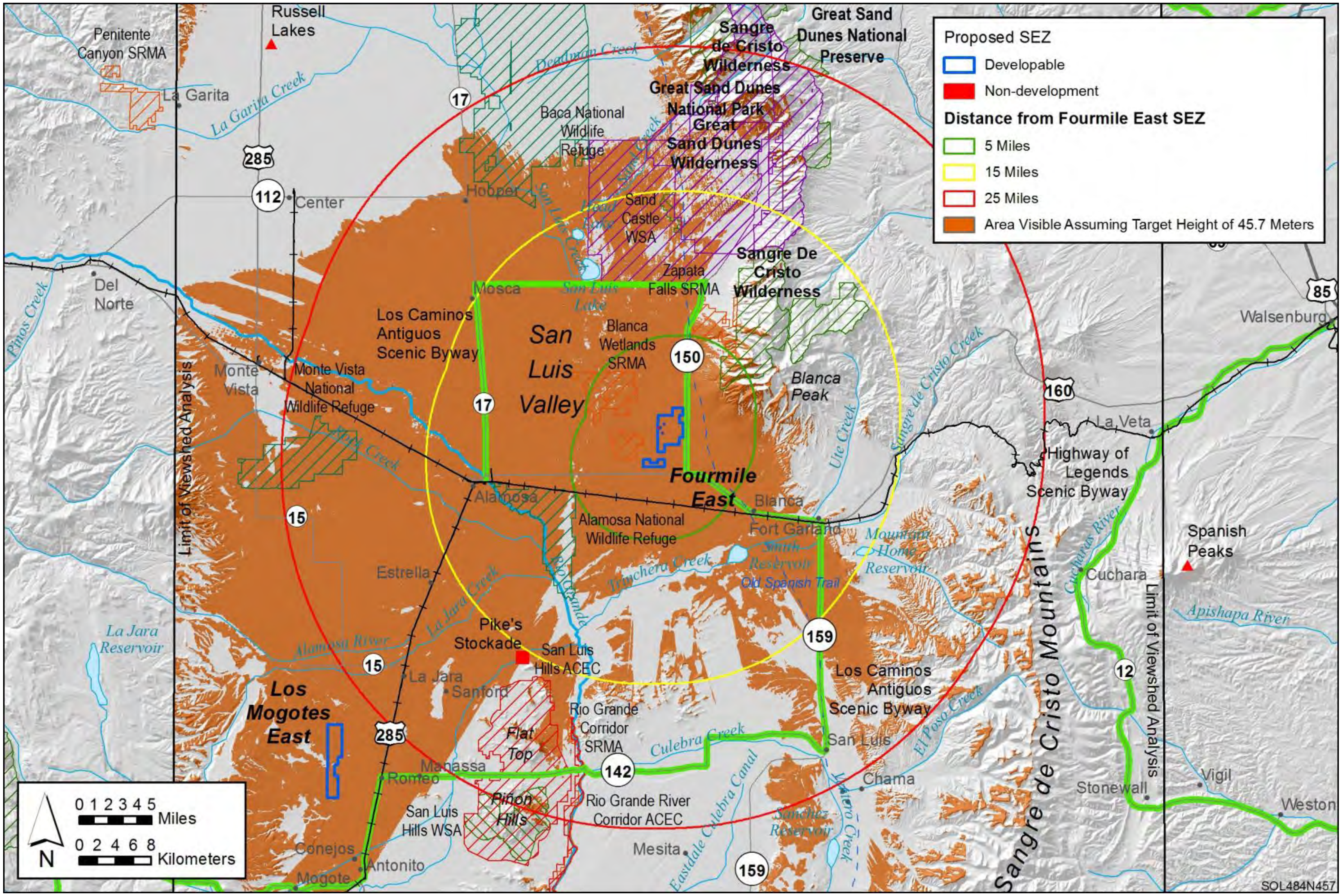


FIGURE N.4.2-3 Viewshed Analysis for the Proposed Fourmile East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 150 ft (45.7 m)

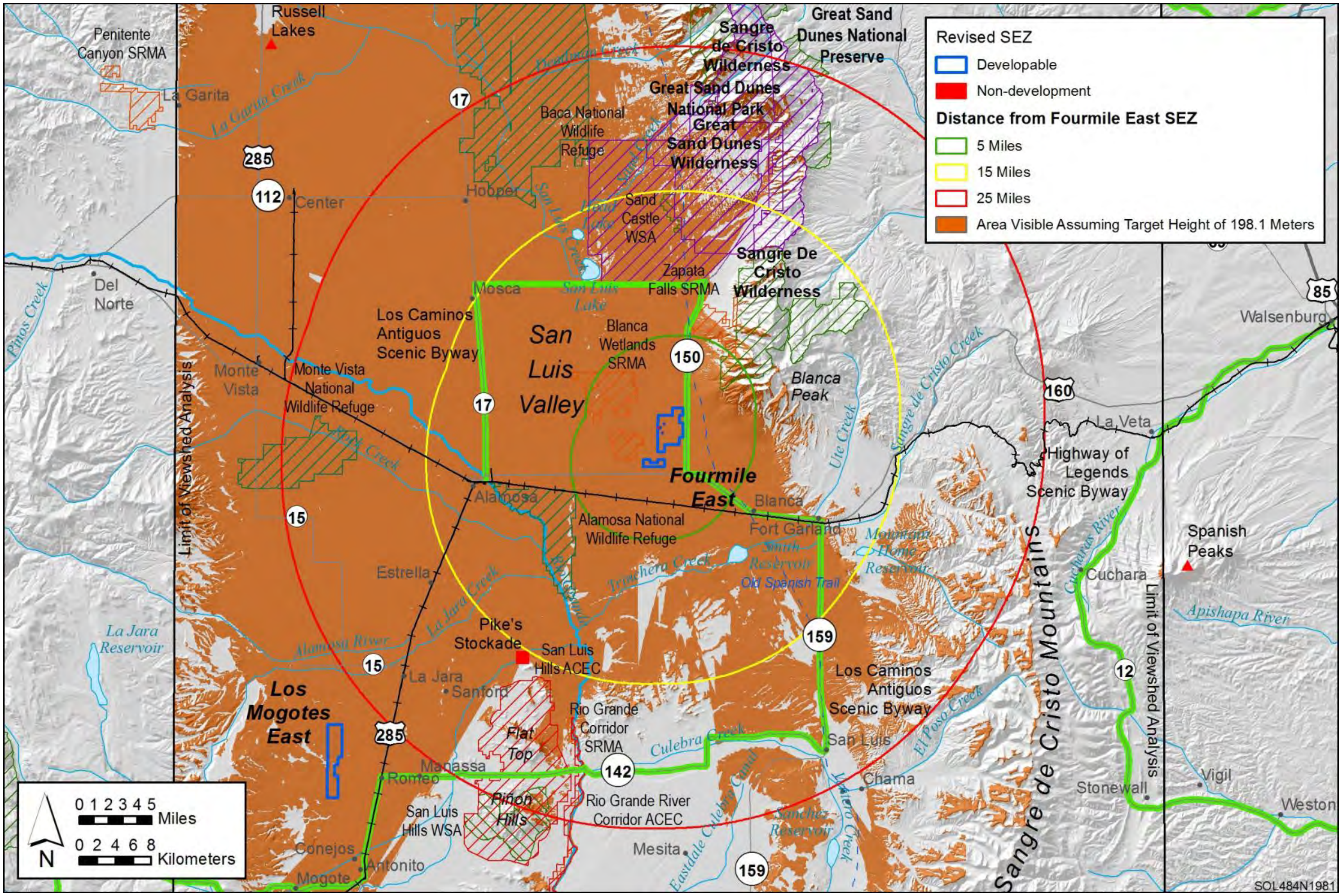


FIGURE N.4.2-4 Viewshed Analysis for the Proposed Fourmile East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 650 ft (198.1 m)

N.4.3 Viewshed Maps for the Proposed Los Mogotes East SEZ as Revised

This page intentionally left blank.

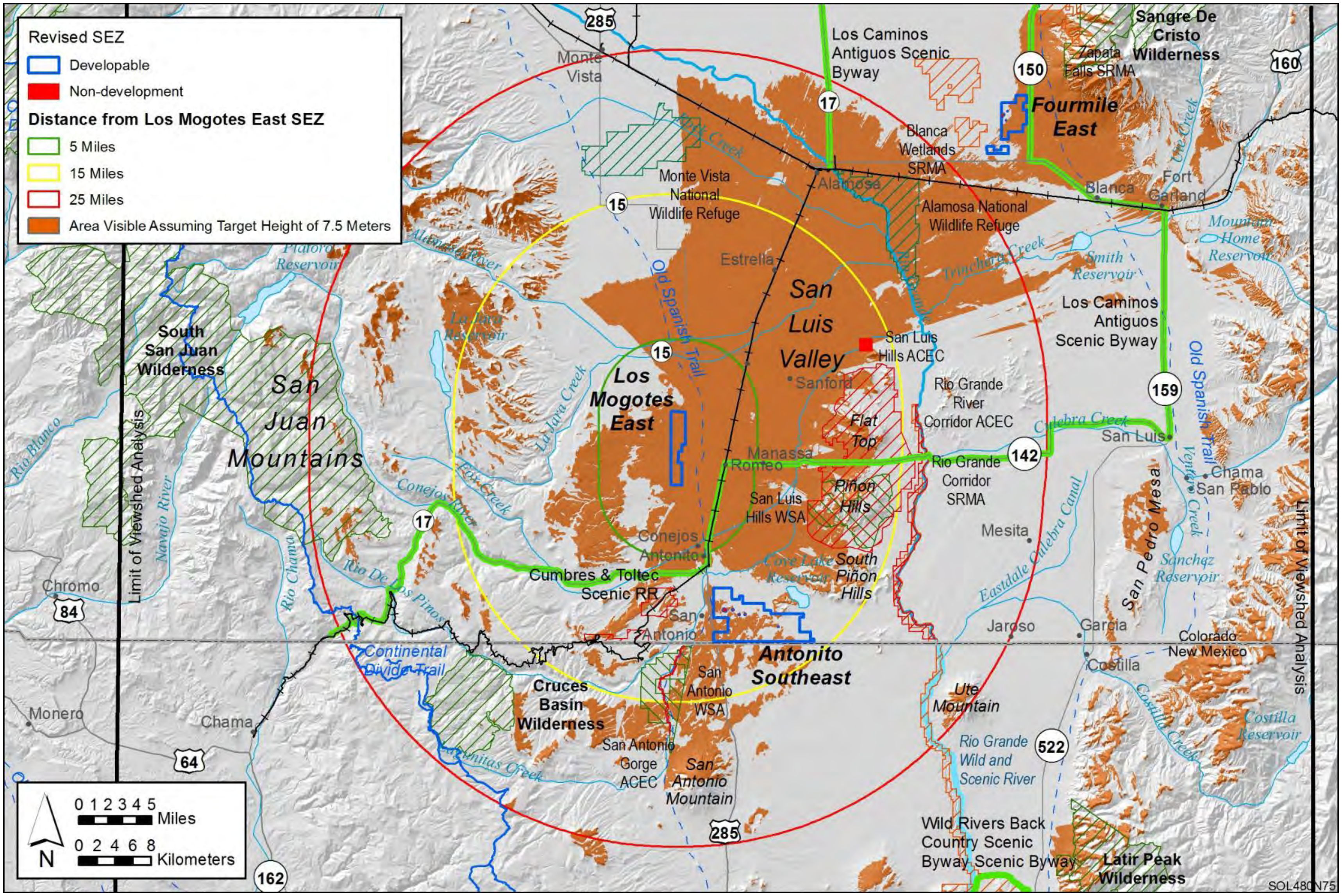


FIGURE N.4.3-1 Viewshed Analysis for the Proposed Los Mogotes East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 24.6 ft (7.5 m)

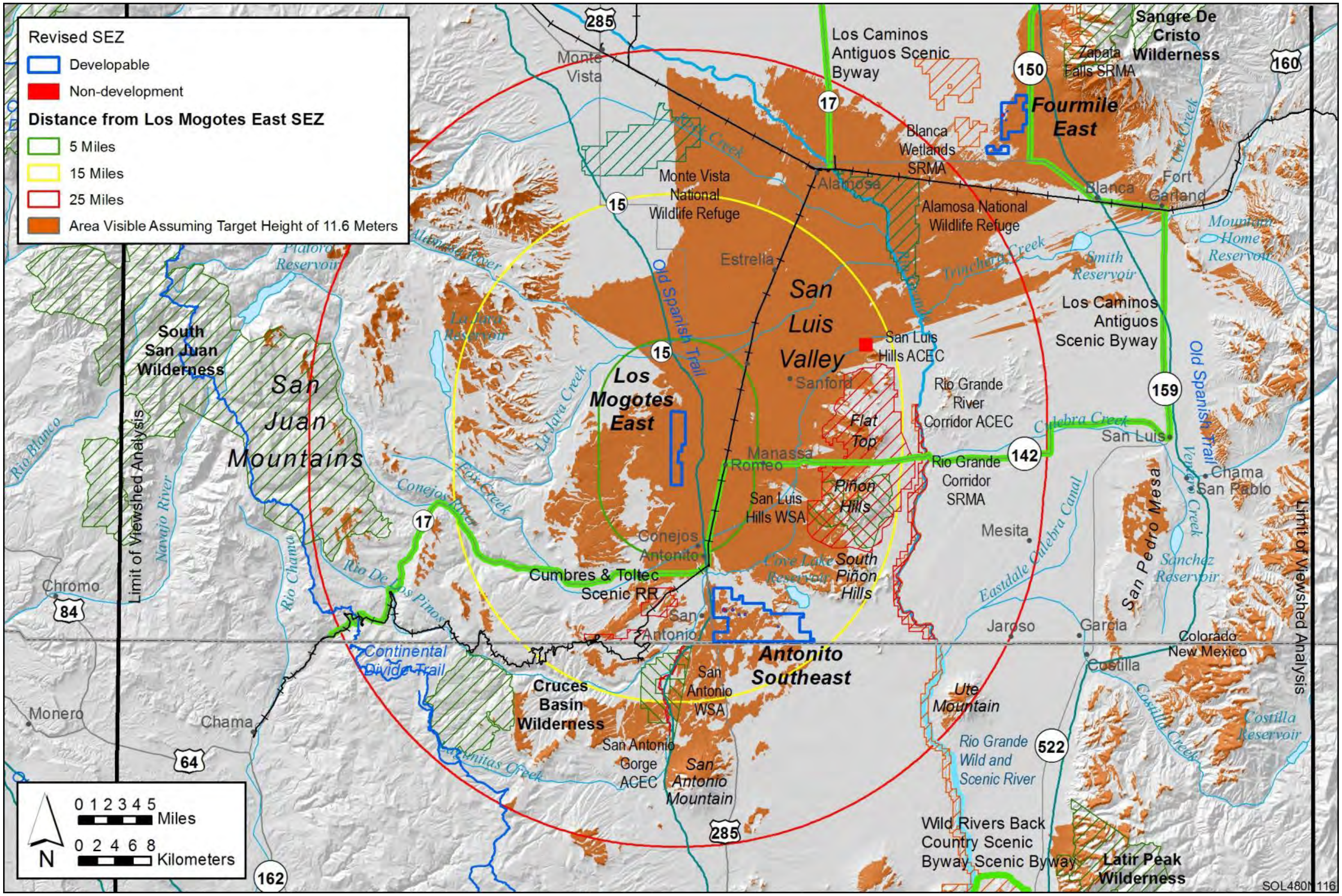


FIGURE N.4.3-2 Viewshed Analysis for the Proposed Los Mogotes East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 38 ft (11.6 m)

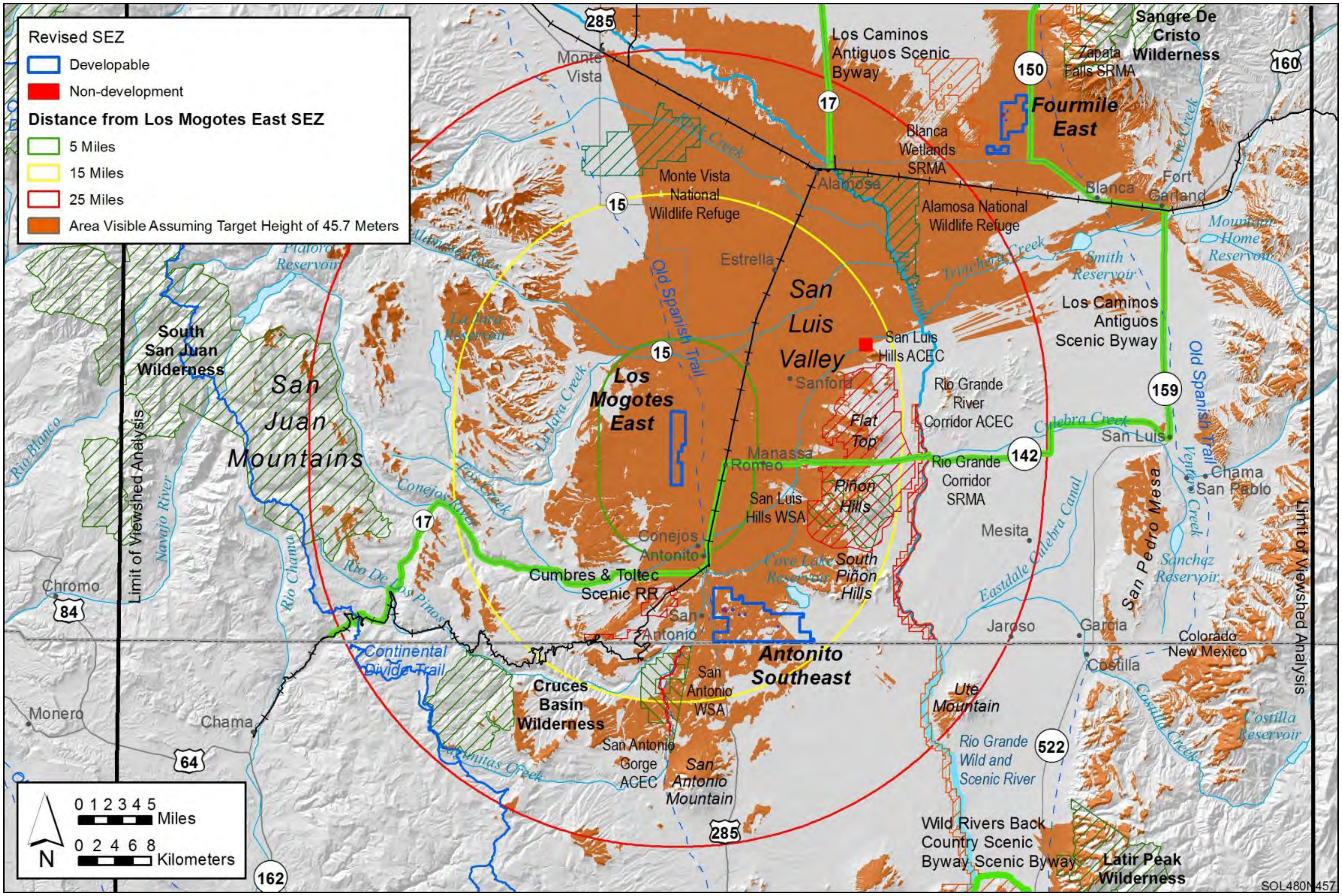


FIGURE N.4.3-3 Viewshed Analysis for the Proposed Los Mogotes East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 150 ft (45.7 m)

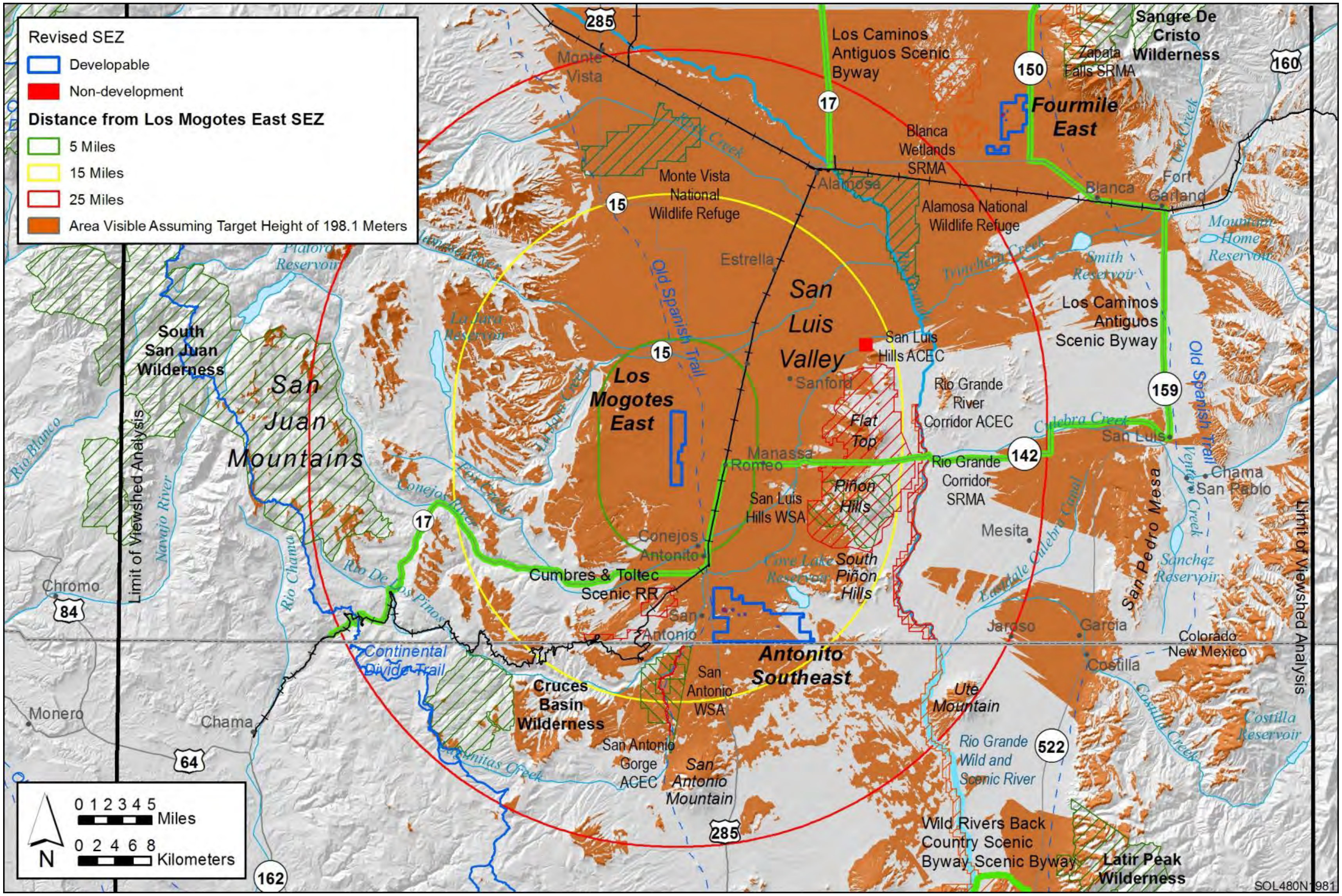


FIGURE N.4.3-4 Viewshed Analysis for the Proposed Los Mogotes East SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 650 ft (198.1 m)

N.5 VIEWSHED MAPS FOR NEVADA SEZS

N.5.1 Viewshed Maps for the Proposed Amargosa Valley SEZ as Revised

This page intentionally left blank.

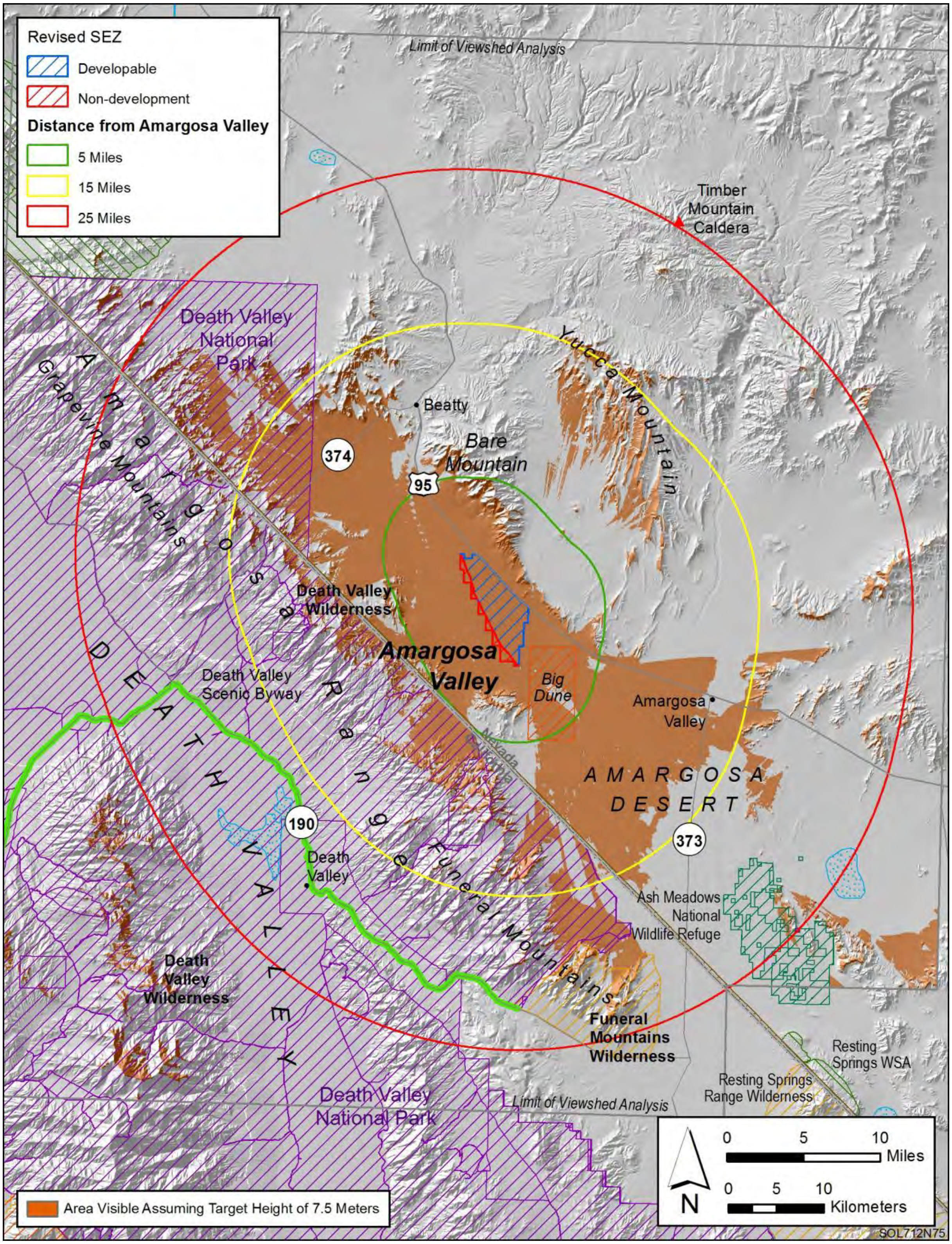


FIGURE N.5.1-1 Viewshed Analysis for the Proposed Amargosa Valley SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 24.6 ft (7.5 m)

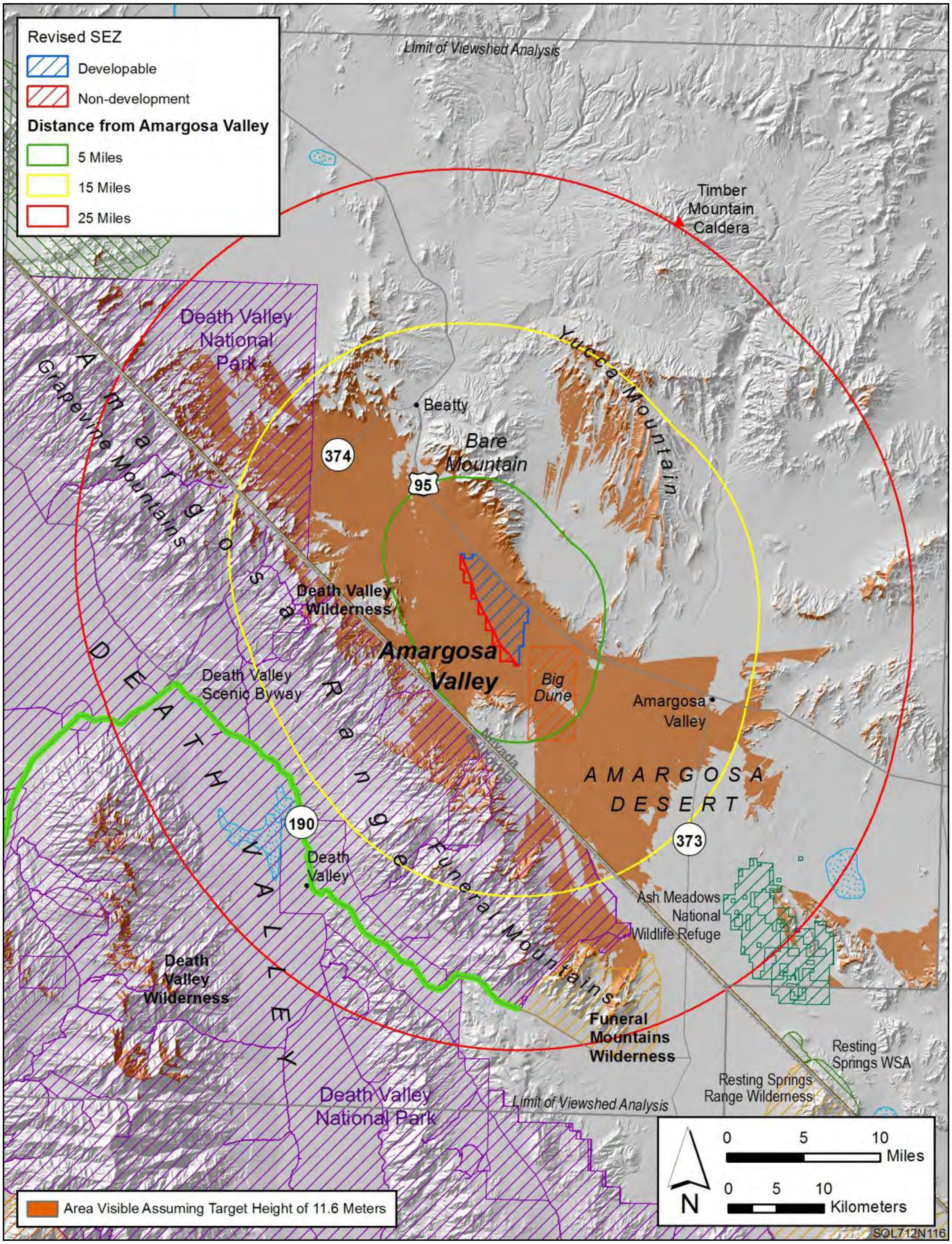


FIGURE N.5.1-2 Viewshed Analysis for the Proposed Amargosa Valley SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 38 ft (11.6 m)

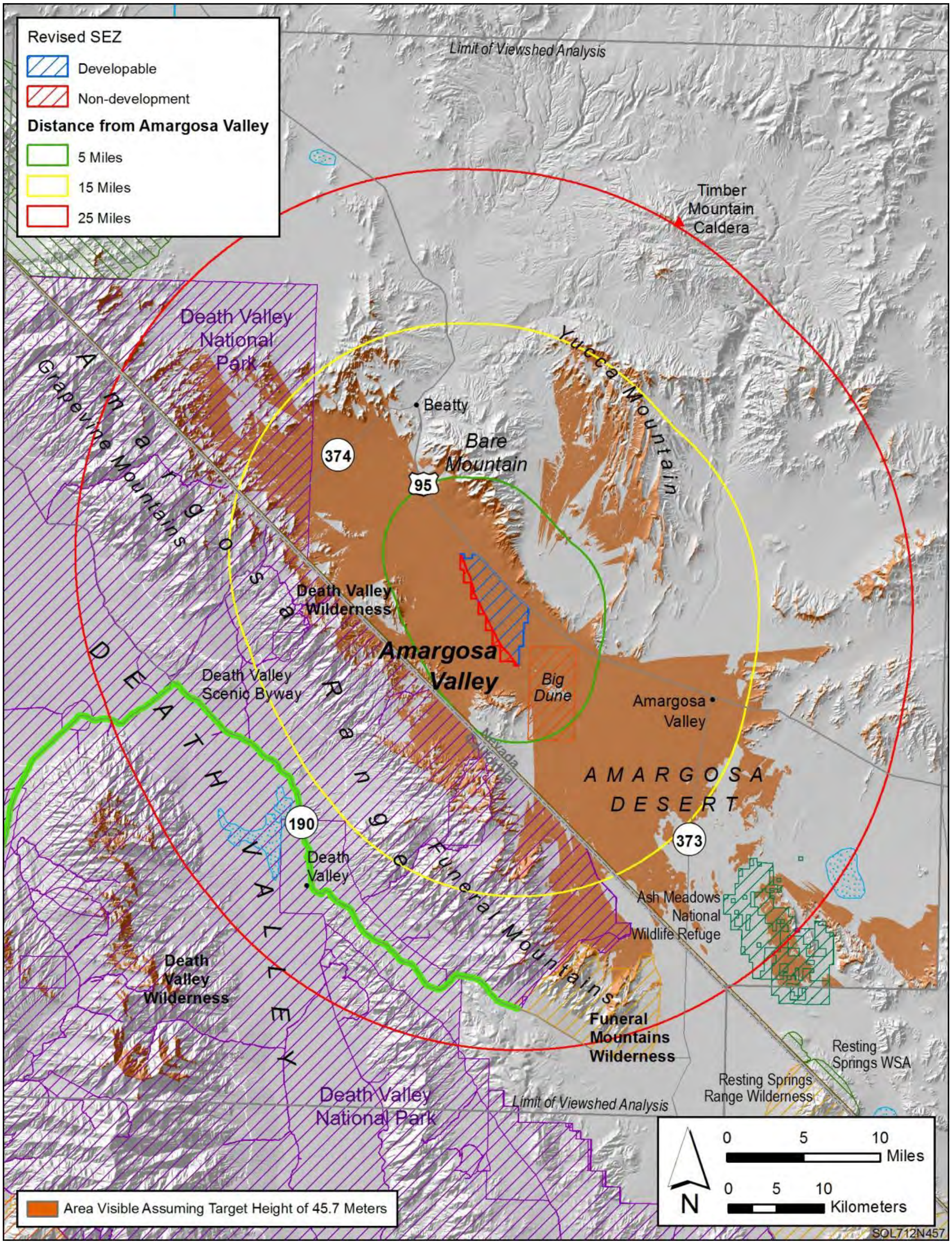


FIGURE N.5.1-3 Viewshed Analysis for the Proposed Amargosa Valley SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 150 ft (45.7 m)

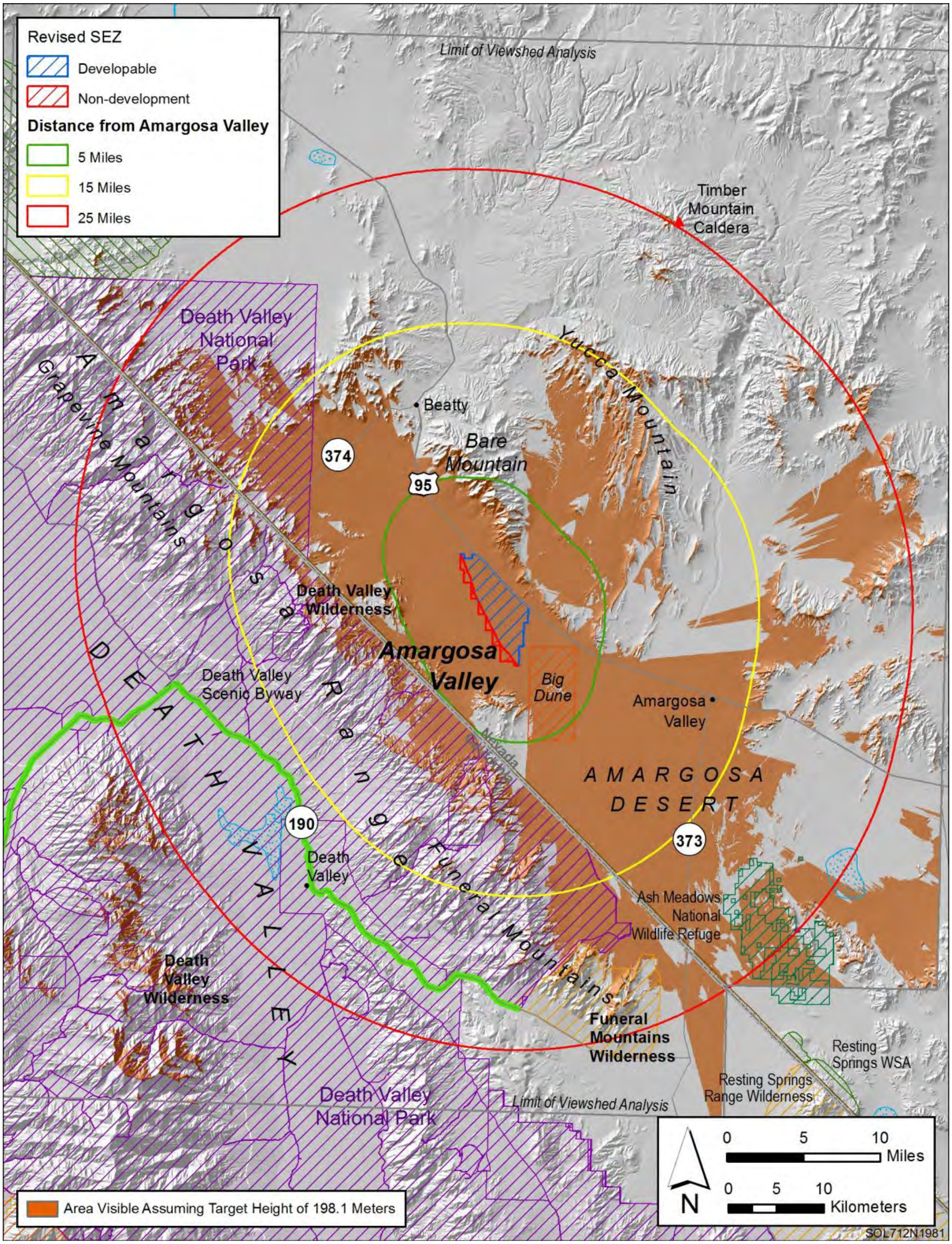


FIGURE N.5.1-4 Viewshed Analysis for the Proposed Amargosa Valley SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 650 ft (198.1 m)

N.5.2 Viewshed Maps for the Proposed Dry Lake SEZ as Revised

This page intentionally left blank.

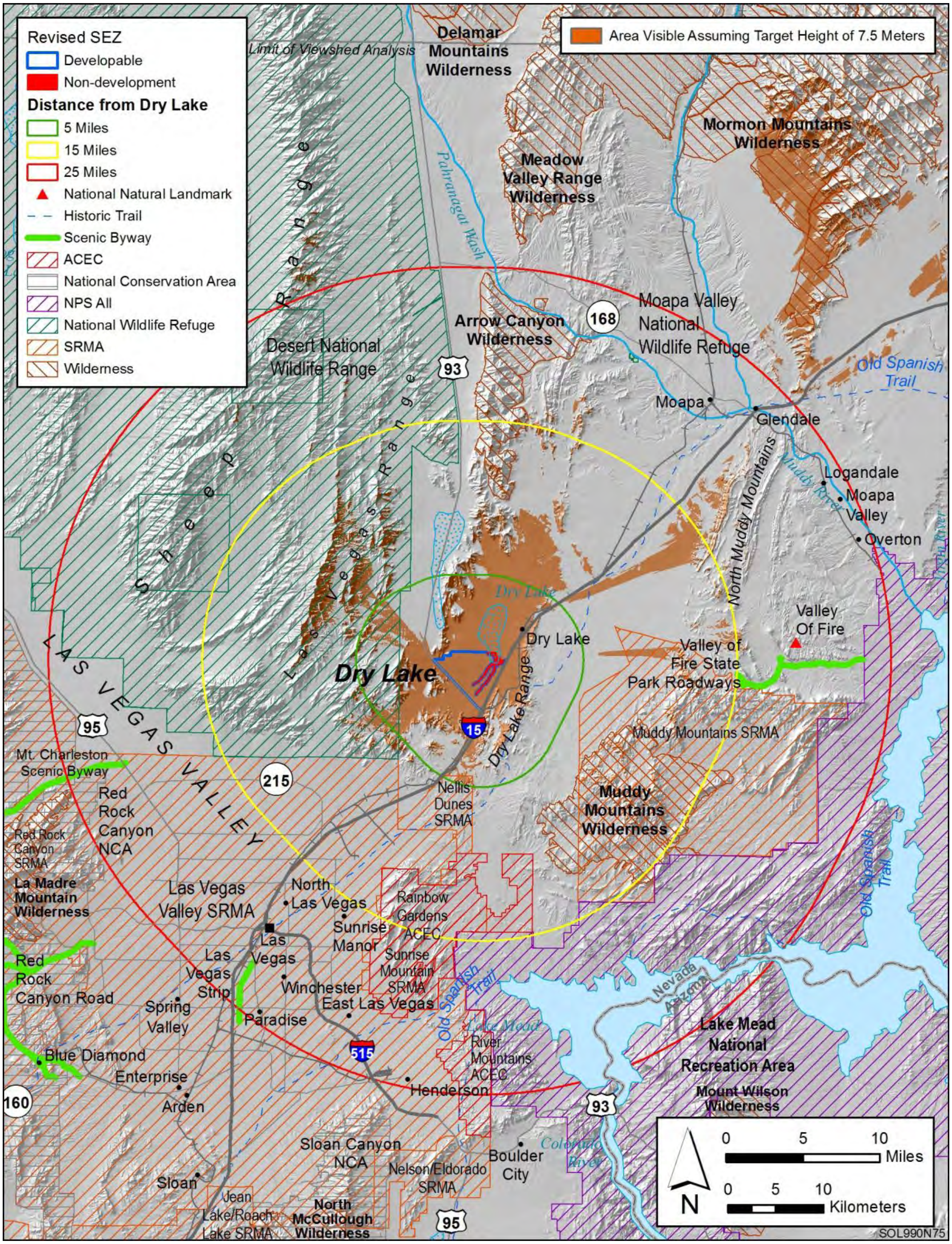


FIGURE N.5.2-1 Viewshed Analysis for the Proposed Dry Lake SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 24.6 ft (7.5 m)

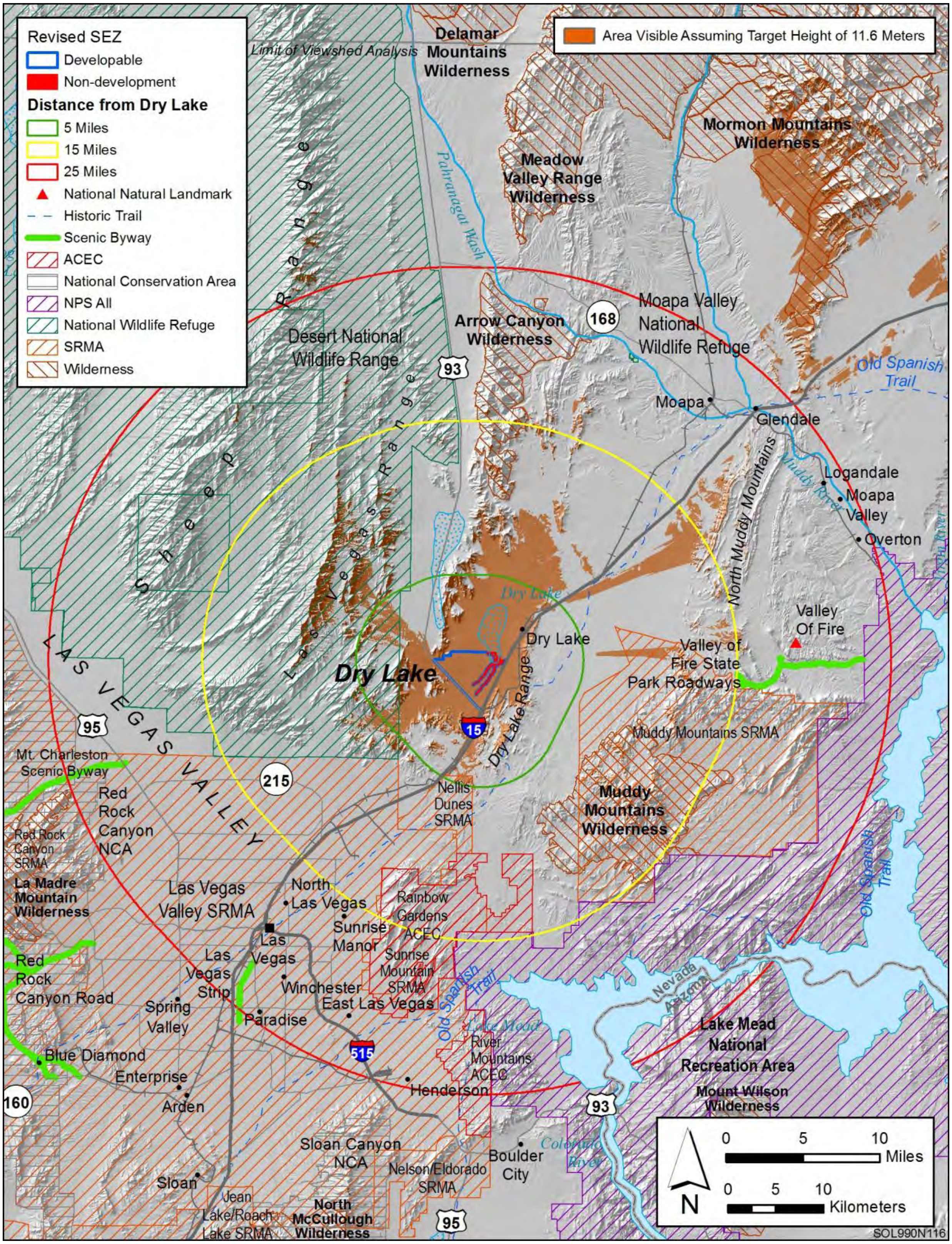


FIGURE N.5.2-2 Viewshed Analysis for the Proposed Dry Lake SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 38 ft (11.6 m)

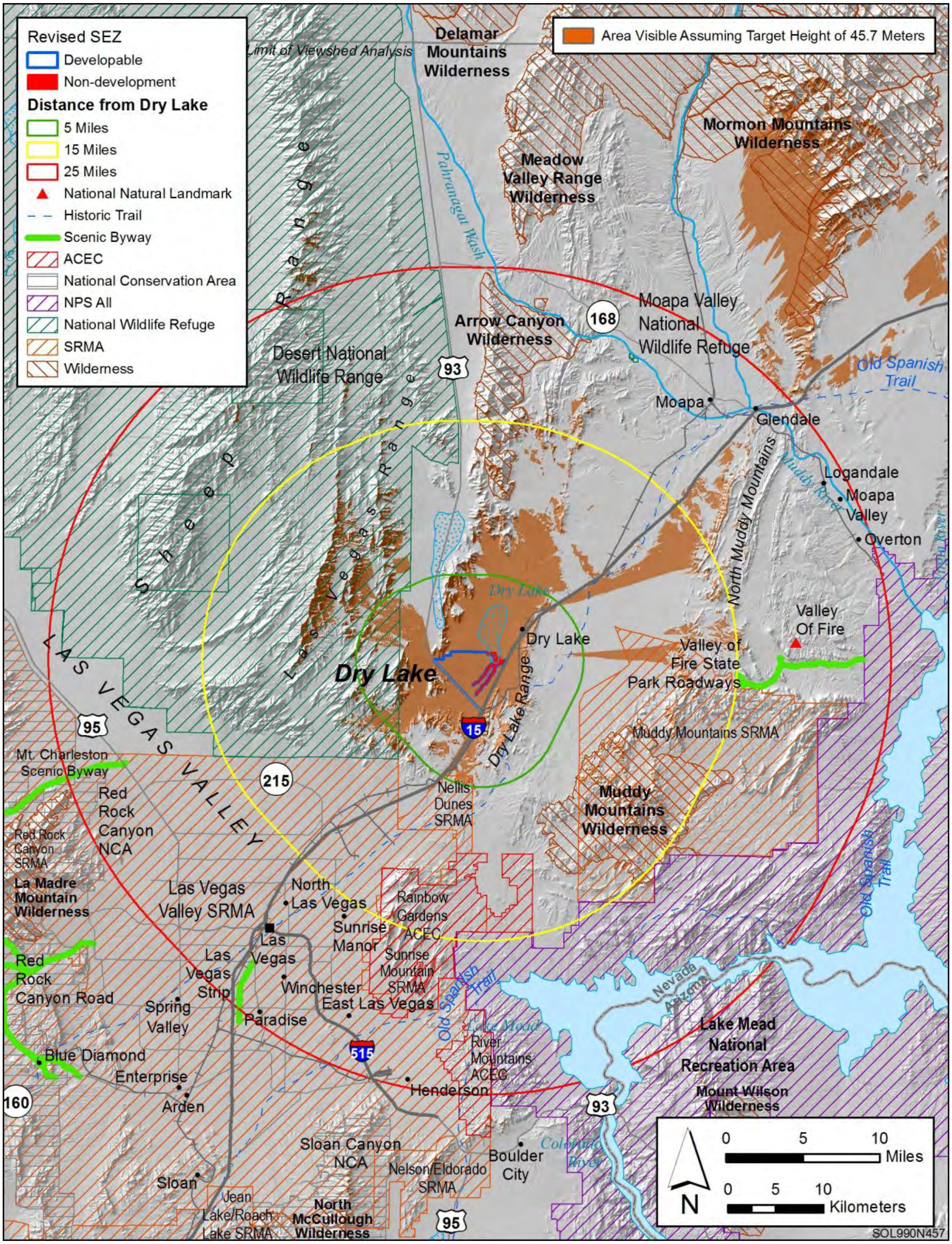


FIGURE N.5.2-3 Viewshed Analysis for the Proposed Dry Lake SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 150 ft (45.7 m)

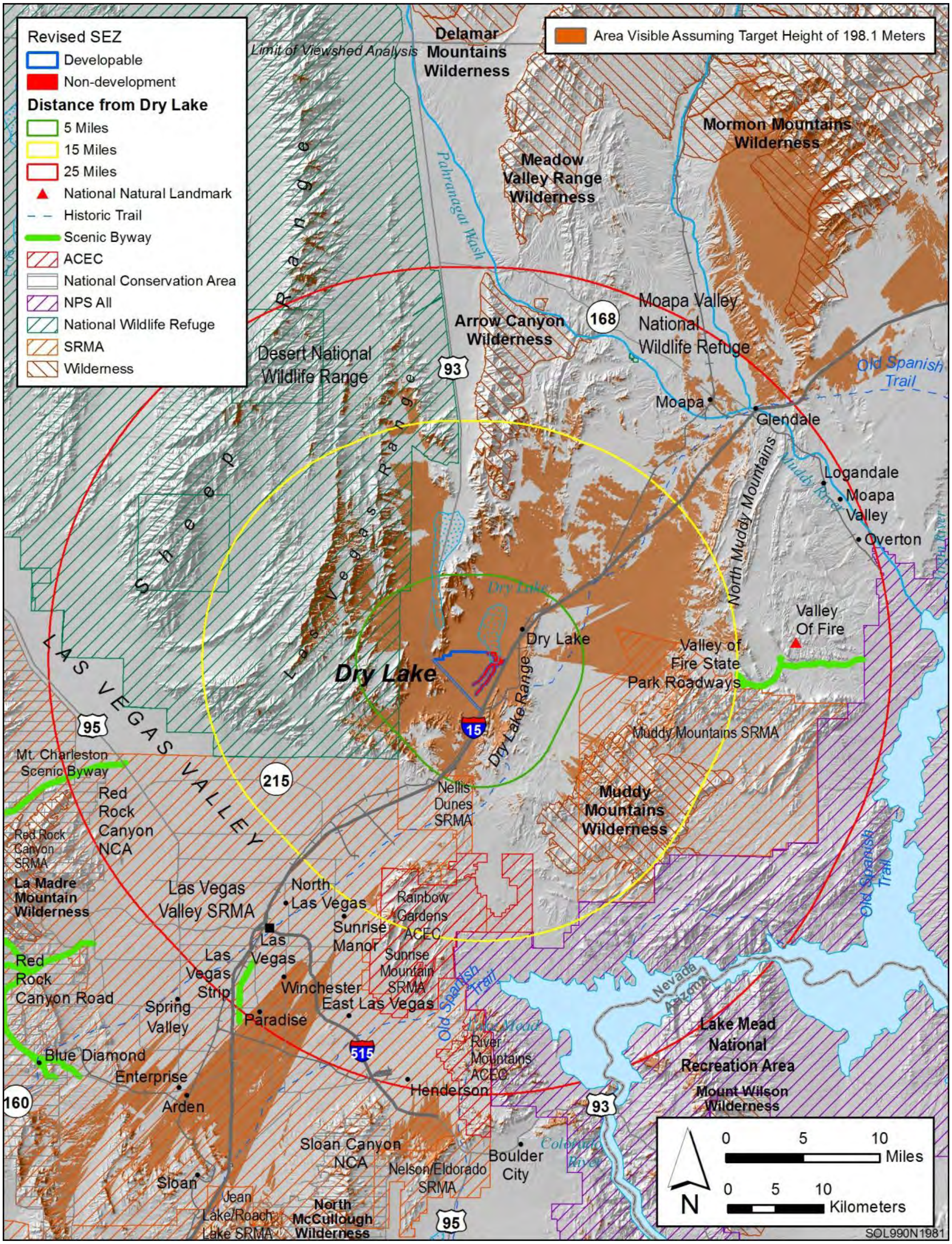


FIGURE N.5.2-4 Viewshed Analysis for the Proposed Dry Lake SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 650 ft (198.1 m)

N.5.3 Viewshed Maps for the Proposed Dry Lake Valley North SEZ as Revised

This page intentionally left blank.

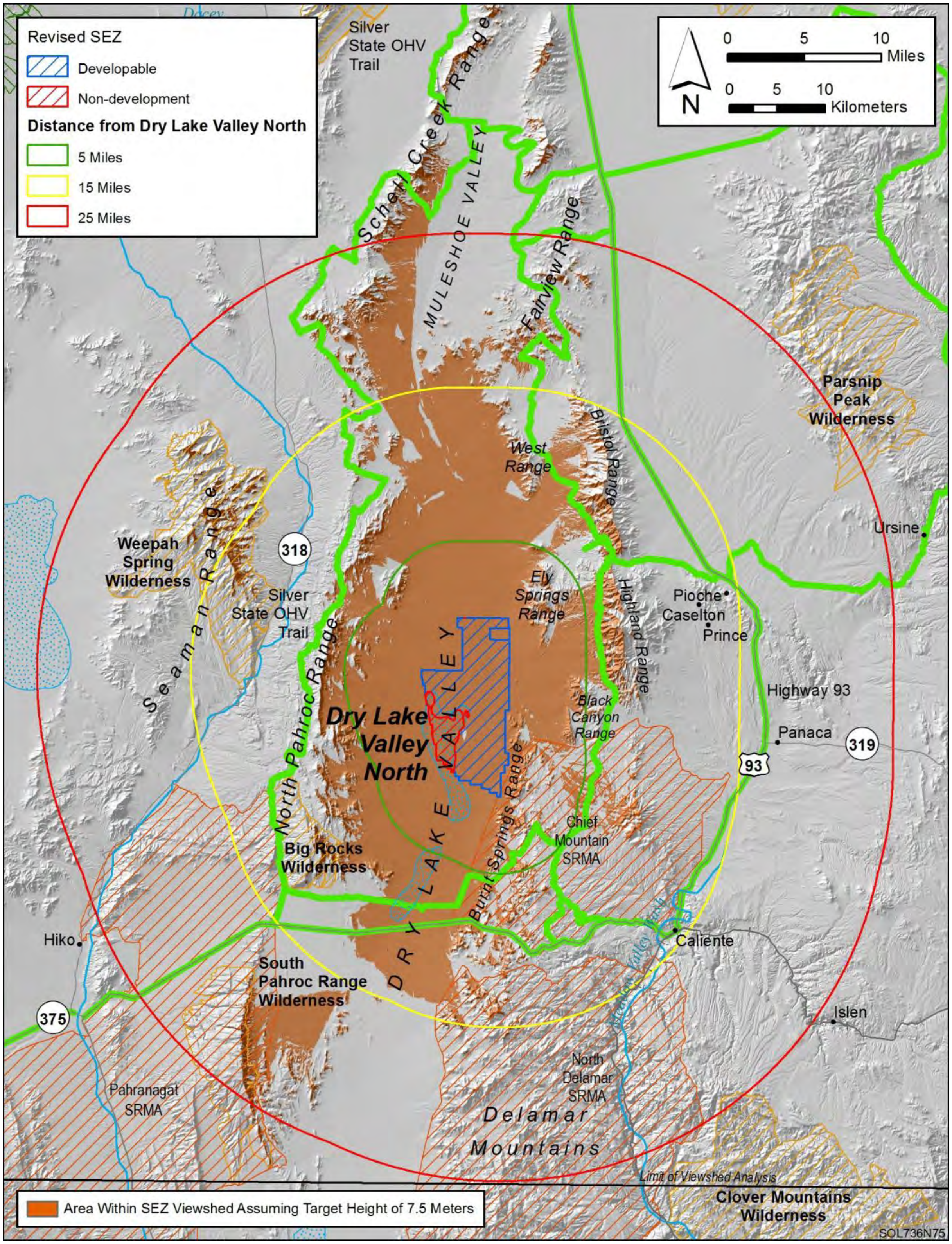


FIGURE N.5.3-1 Viewshed Analysis for the Proposed Dry Lake Valley North SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 24.6 ft (7.5 m)

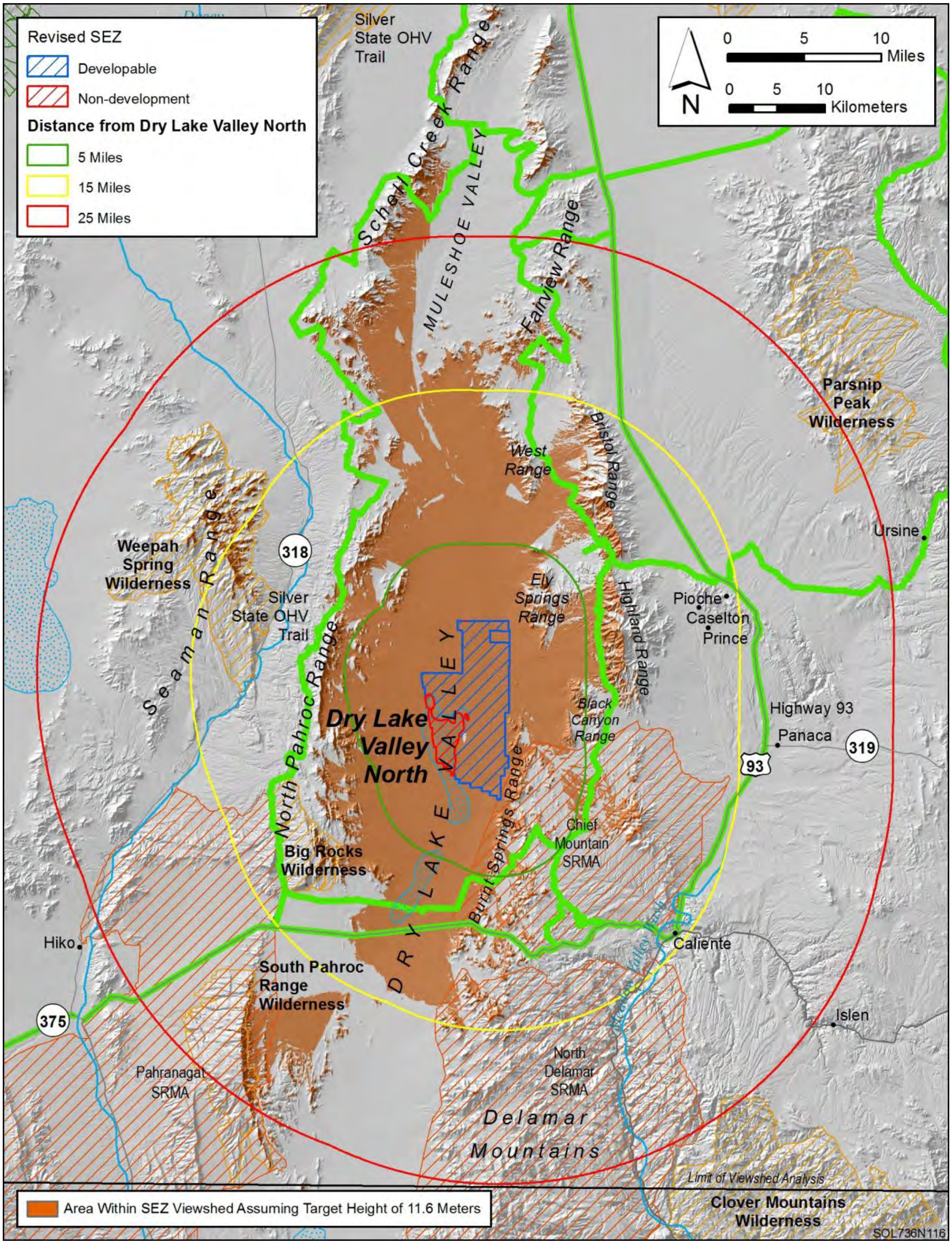


FIGURE N.5.3-2 Viewshed Analysis for the Proposed Dry Lake Valley North SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 38 ft (11.6 m)

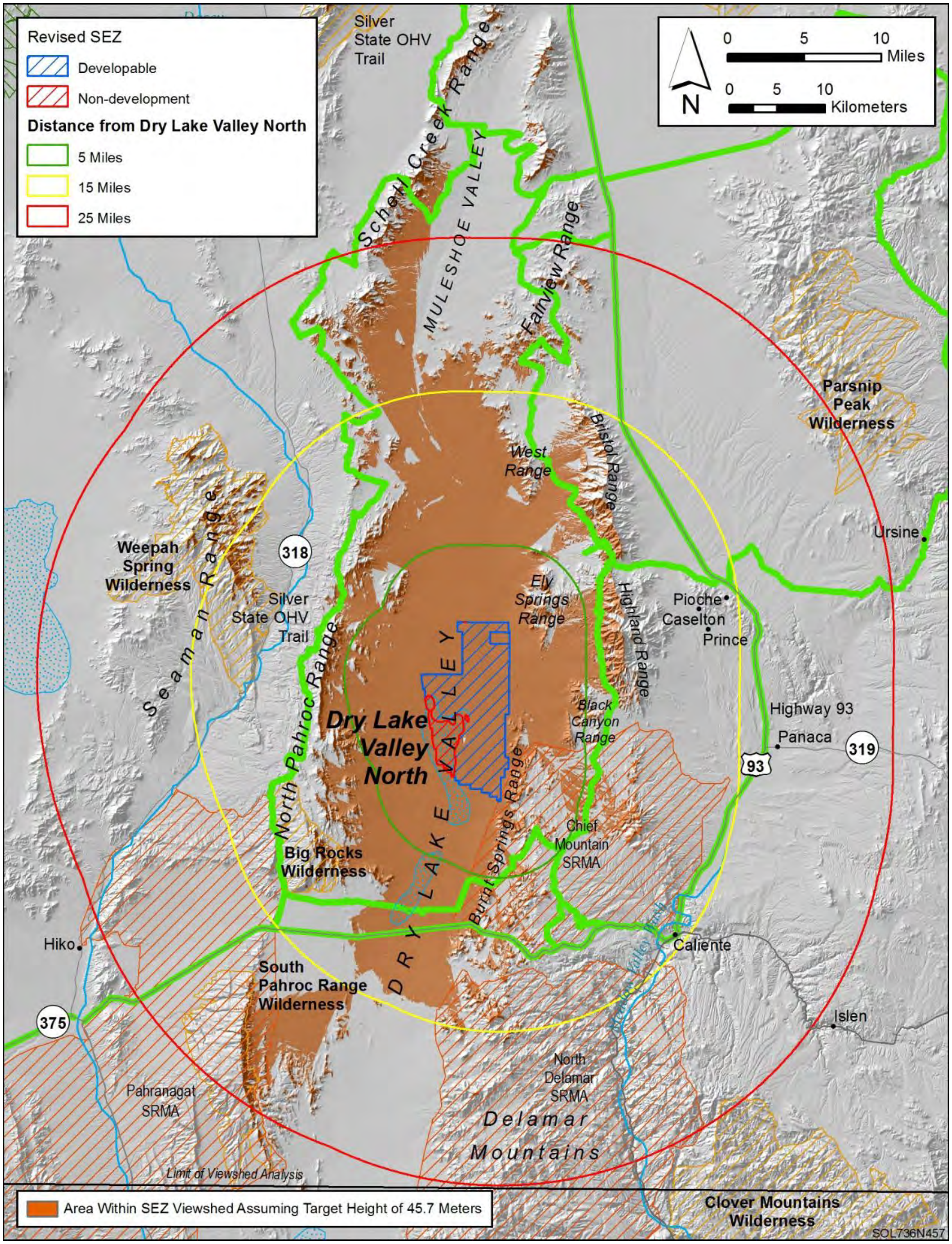


FIGURE N.5.3-3 Viewshed Analysis for the Proposed Dry Lake Valley North SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 150 ft (45.7 m)

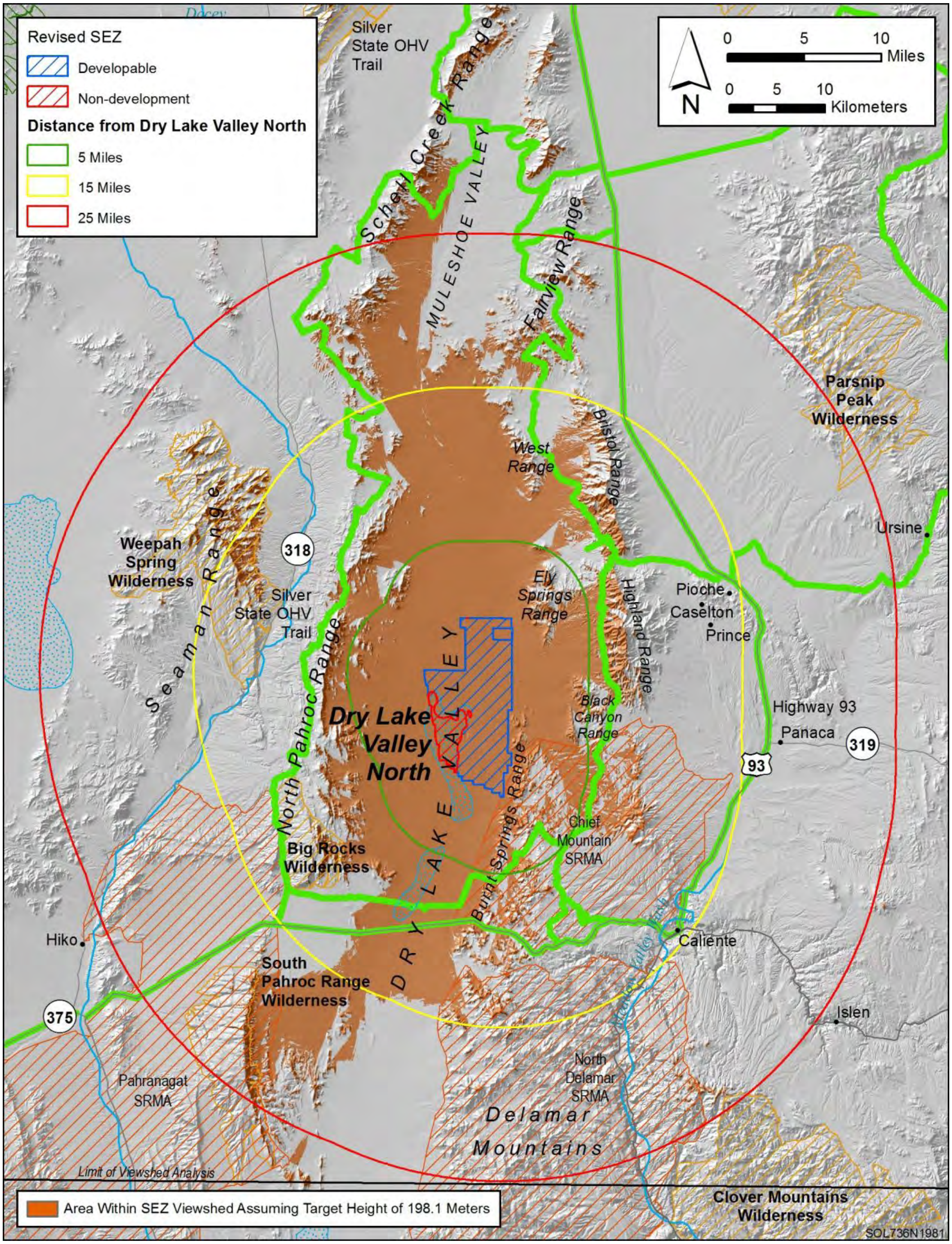


FIGURE N.5.3-4 Viewshed Analysis for the Proposed Dry Lake Valley North SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 650 ft (198.1 m)

N.6 VIEWSHED MAPS FOR NEW MEXICO SEZS

N.6.1 Viewshed Maps for the Proposed Afton SEZ as Revised

This page intentionally left blank.

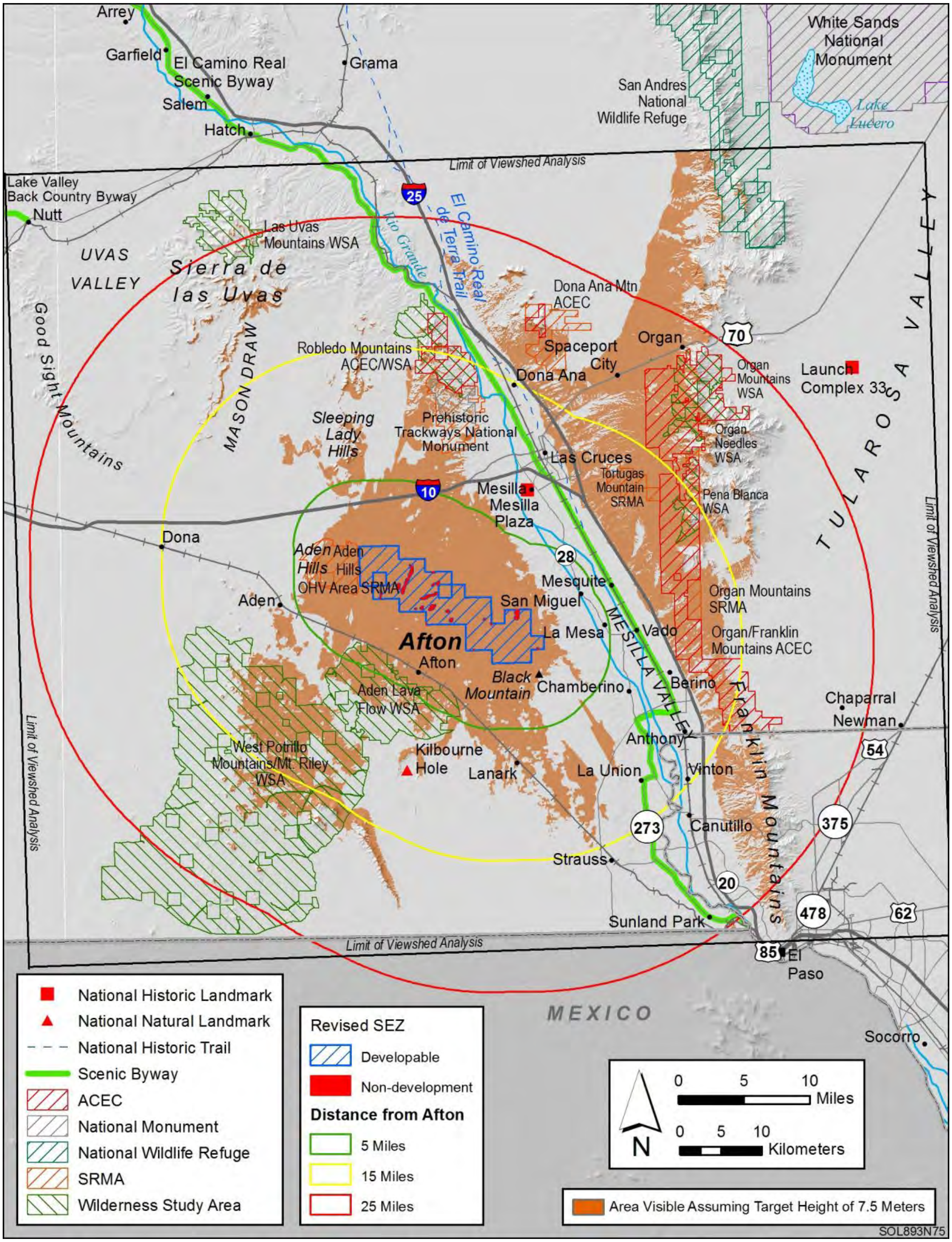


FIGURE N.6.1-1 Viewshed Analysis for the Proposed Afton SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 24.6 ft (7.5 m)

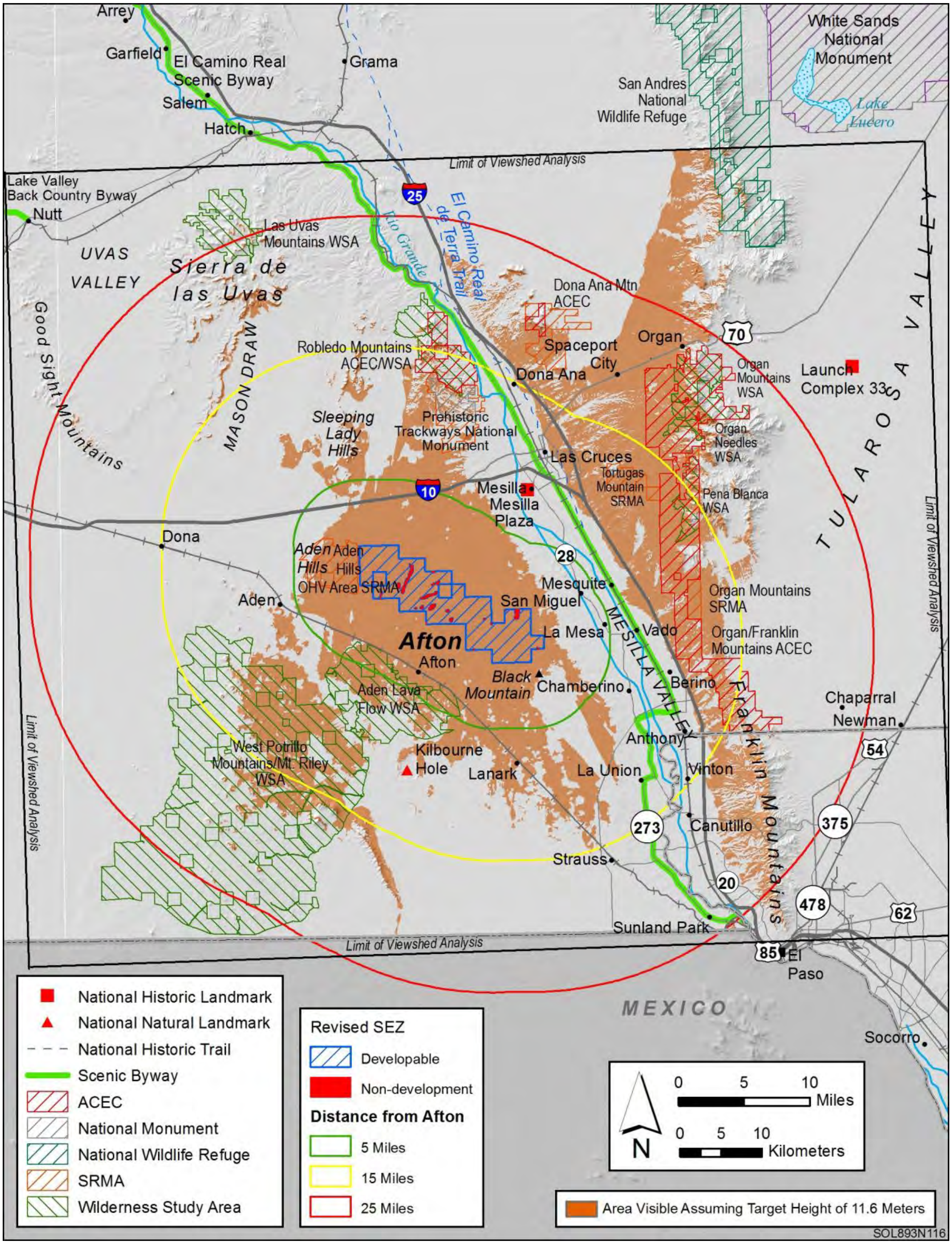


FIGURE N.6.1-2 Viewshed Analysis for the Proposed Afton SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 38 ft (11.6 m)

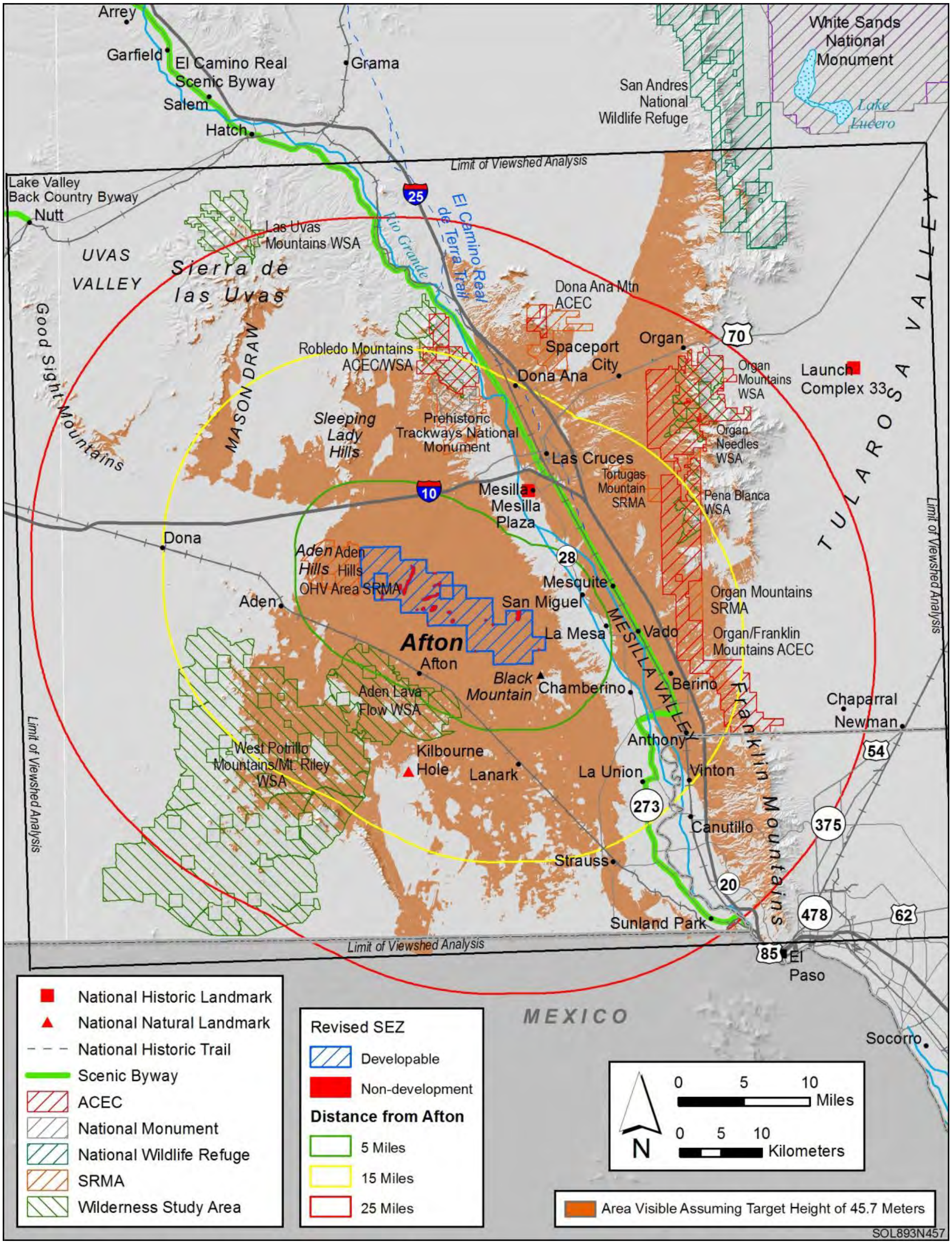


FIGURE N.6.1-3 Viewshed Analysis for the Proposed Afton SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 150 ft (45.7 m)

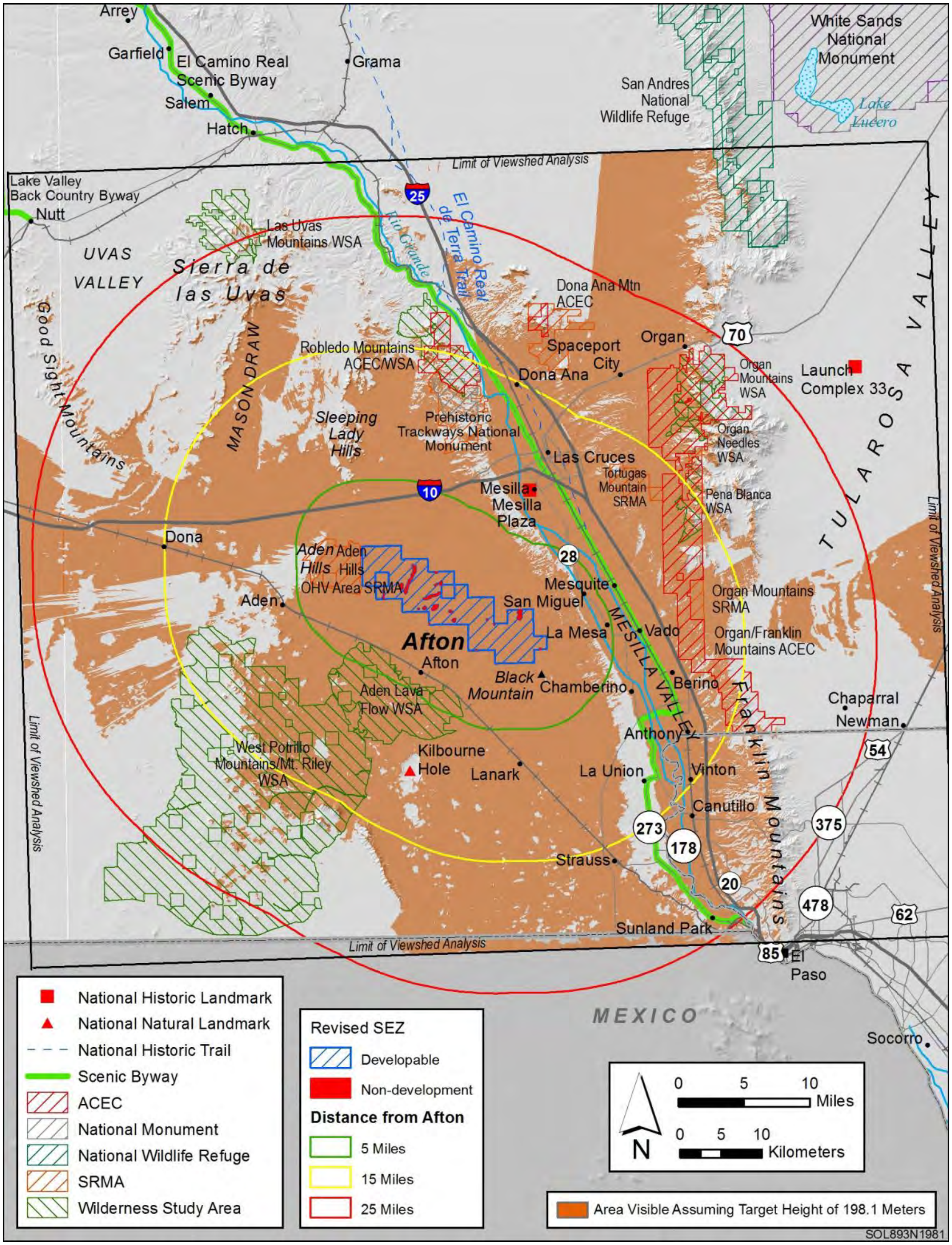


FIGURE N.6.1-4 Viewshed Analysis for the Proposed Afton SEZ as Revised and Sensitive Visual Resources on Surrounding Lands, Assuming a Solar Technology Height of 650 ft (198.1 m)

APPENDIX O:

INTERMITTENT/EPHEMERAL STREAM EVALUATION AND GROUNDWATER MODELING ANALYSES

This page intentionally left blank.

APPENDIX O:

INTERMITTENT/EPHEMERAL STREAM EVALUATION AND GROUNDWATER MODELING ANALYSES

This appendix presents the methodologies used for intermittent/ephemeral stream evaluations and groundwater modeling for the proposed solar energy zones (SEZs) presented in the Final *Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States* (Solar PEIS). This appendix presents new information that was not a part of the Draft Solar PEIS. The methods presented were used to develop the SEZ evaluations presented in Chapters 8 through 13 of the Final Solar PEIS.

O.1 INTERMITTENT/EPHEMERAL STREAM EVALUATION

The siting and construction of utility-scale solar energy facilities can disturb intermittent/ephemeral stream channels, which has the potential to negatively affect hydrologic and ecological processes within a basin. Regulation and management of intermittent/ephemeral streams is often piecemeal, typically falling under a spectrum of federal, state, and local programs that are often more focused on protecting perennial streams. Scientifically based guidelines for identifying intermittent/ephemeral stream reaches that are critical for maintaining hydrologic and ecologic processes are largely nonexistent. The purpose of this intermittent/ephemeral stream channel evaluation was to use available geospatial data pertaining to intermittent/ephemeral streams in order to provide a measure of stream channel sensitivity to disturbance within the vicinity of SEZs.

The analysis performed for the Draft Solar Programmatic Environmental Impact Statement (PEIS) (BLM and DOE 2010) involved identifying large, erosional features by using available flood hazards mapping, historical peak discharges, and aerial photographs. This approach identified intermittent/ephemeral features not suitable for development (based primarily on the likelihood of damaging floods and debris flows) to address flood conveyance and sediment transport functions of intermittent/ephemeral streams. Several of these flood-prone reaches and their associated riparian areas were identified as non-developmental areas as described in the Supplement to the Draft Solar PEIS (BLM and DOE 2011). This focus on large erosional and flood-prone intermittent/ephemeral streams primarily considered logistical constraints on development. Several commentors on both the Draft Solar PEIS and Supplement to the Draft PEIS expressed concerned about the disturbance to hydrologic and ecological processes such as providing and maintaining groundwater recharge, geomorphic landscape features, riparian vegetation, and wildlife habitats.

This appendix describes the analysis used in the Final Solar PEIS to quantify the sensitivity of intermittent/ephemeral stream channels to land disturbance activities with respect to their integral functions of flood conveyance, sediment transport, groundwater recharge, and supporting ecological habitats. The approach uses a scoring system based on landscape position, surficial geology, and soil characteristics that was applied to stream channel segments identified in the National Hydrography Dataset (NHD) (USGS 2012a). The overall goal of this analysis was to rate the sensitivity of stream reaches with respect to land disturbance. This analysis was performed to assist the U.S. Department of the Interior Bureau of Land Management (BLM) and regulators at the federal, state, and local level in issuing right-of-ways (ROWs) for solar development on public lands, applying best management practices, and in determining appropriate mitigation measures.

O.1.1 Methodology for Evaluating Intermittent/Ephemeral Streams

The intermittent/ephemeral stream evaluation used a scoring index-based approach, informed by geospatial data, to evaluate the sensitivity level to disturbance of three integral functions of intermittent/ephemeral streams. Available geospatial data were used to quantify landscape features associated with individual intermittent/ephemeral stream reaches, and for each integral function of intermittent/ephemeral streams, an index-score was assigned to individual stream reaches based on the landscape variables. The results group the intermittent/ephemeral channels in the study area around each SEZ into high, medium, and low sensitivity to disturbance categories. These categories are based on the sum of index scores calculated for the individual integral functions of flood conveyance, sediment transport, groundwater recharge, and supporting ecological habitats. Further details regarding the datasets and analyses used for this intermittent/ephemeral stream analysis are presented in the following sections.

O.1.1.1 Landscape Features

Three landscape features were used to quantify the physical setting of individual intermittent/ephemeral stream reaches, including (1) topographic setting, (2) surficial geology, and (3) soil-hydrologic characteristics.

O.1.1.1.1 Topographic Setting. The evaluation of the topographic setting for intermittent/ephemeral streams specifically addresses stream functionality relative to its position and elevation in a watershed. This analysis focused on the Basin and Range Physiographic Province characterized by narrow mountain ranges with desert valleys in between. Stream networks in the Basin and Range Physiographic Province can be generalized as several individual headwater streams at high elevations that converge to larger channels, which eventually spill out onto the valley, often forming depositional features such as alluvial fans along with the formation of braided and distributary channels. The piedmont corresponds to changes in slope, soil types, and vegetation between the mountain and valley regions, and the change in slope was chosen to quantify the mountain (high slopes), piedmont (intermediate slopes), and valley (low slopes) regions (Wilson and Guan 2004).

This analysis used a simplified conceptual model of landscape position by considering stream channels as belonging to mountain (containing headwater streams), piedmont (containing alluvial fan channels), or valley (containing single- and multi-thread intermittent/ephemeral channels) regions within a basin. The mountain, piedmont, and valley regions were categorized using 32–ft (10-m) resolution digital elevation model (DEM) data (USGS 2012b), and DEM data were clipped to Hydrologic Unit Code (HUC)10 watershed boundaries in the vicinity of each SEZ. This resulted in a study region for the intermittent/ephemeral stream evaluation to primarily include the valley bottom, piedmont regions, and mountain areas up to the high-elevation peak watershed divides.

DEM data represent the landscape as a grid of squares called pixels, with each pixel containing an elevation value averaged over the 32-ft by 32-ft (10-m by 10-m) grid cell. Slope, quantified as the maximum change in elevation among the adjacent eight pixels, was calculated by using the DEM in conjunction with a 3-pixel by 3-pixel focal moving filter. Slope values were binned into 100 classes by using an iterative self-organizing (ISO) clustering algorithm, which forms groups of pixels based on the similarity in pixel values via multiple iterations (Tou and Gonzalez 1974). Histograms of the pixel density (number of pixels in each binned-slope class divided by the total number of pixels in the study region) revealed a similar pattern among all the SEZs as shown in Figure O.1-1 for the Brenda SEZ. The histograms of pixel density by binned-slope classes all depicted a large peak between the 5th and 30th slope class that corresponded with valley regions. The large peaks decayed with increasing slope class until a second, smaller peak occurred between the 90th and 100th slope class that corresponded with mountain regions. Piedmont regions were identified by using a trial-and-error approach for several well-defined alluvial fan regions for each SEZ. These results suggested that the piedmont regions were defined by a window of 10 slope classes that began with the slope category corresponding to the pixel density value of 0.03 on the decaying limb of the histogram from the valley peak (see Figure O.1-1). Areas not identified as piedmont regions were classified as mountain or valley regions based on elevation, and intermittent/ephemeral stream reaches located in piedmont and valley regions were evaluated for their sensitivity to disturbance (mountain regions are excluded from solar energy development based on established siting criteria in this Final Solar PEIS).

O.1.1.1.2 Surficial Geology. Surficial geology maps have been shown to provide useful information on flooding history and hazards in desert regions (e.g., Robins et al. 2009). Surficial geology maps were obtained from the National Geologic Map Data base (USGS 2012c), and a total of 12 surficial geology units were identified for all the SEZ study regions (Table O.1-1).

O.1.1.1.3 Soil-Hydrologic Characteristics. The Soil Survey Geographic (SSURGO) database (NRCS 2012) was used to specify four metrics that quantify soil-hydrologic characteristics relevant to intermittent/ephemeral streams. The four soil-hydrologic metrics include flooding frequency, available water storage in the top 59 in. (150 cm) of soil, hydrologic group, and hydric class. The flooding frequency is the annual highest probability of a flood event expressed as a class of either none, very rare, rare, occasional, frequent, or very frequent. The available water storage is the amount of water (expressed as centimeters of water) that the top 59 in. (150 cm) of soil stores after drainage. The hydrologic group categorizes runoff potential among soil conditions into four groups (A, B, C, and D), with group A having low runoff potential and high infiltration potential, to group D having high runoff potential and low

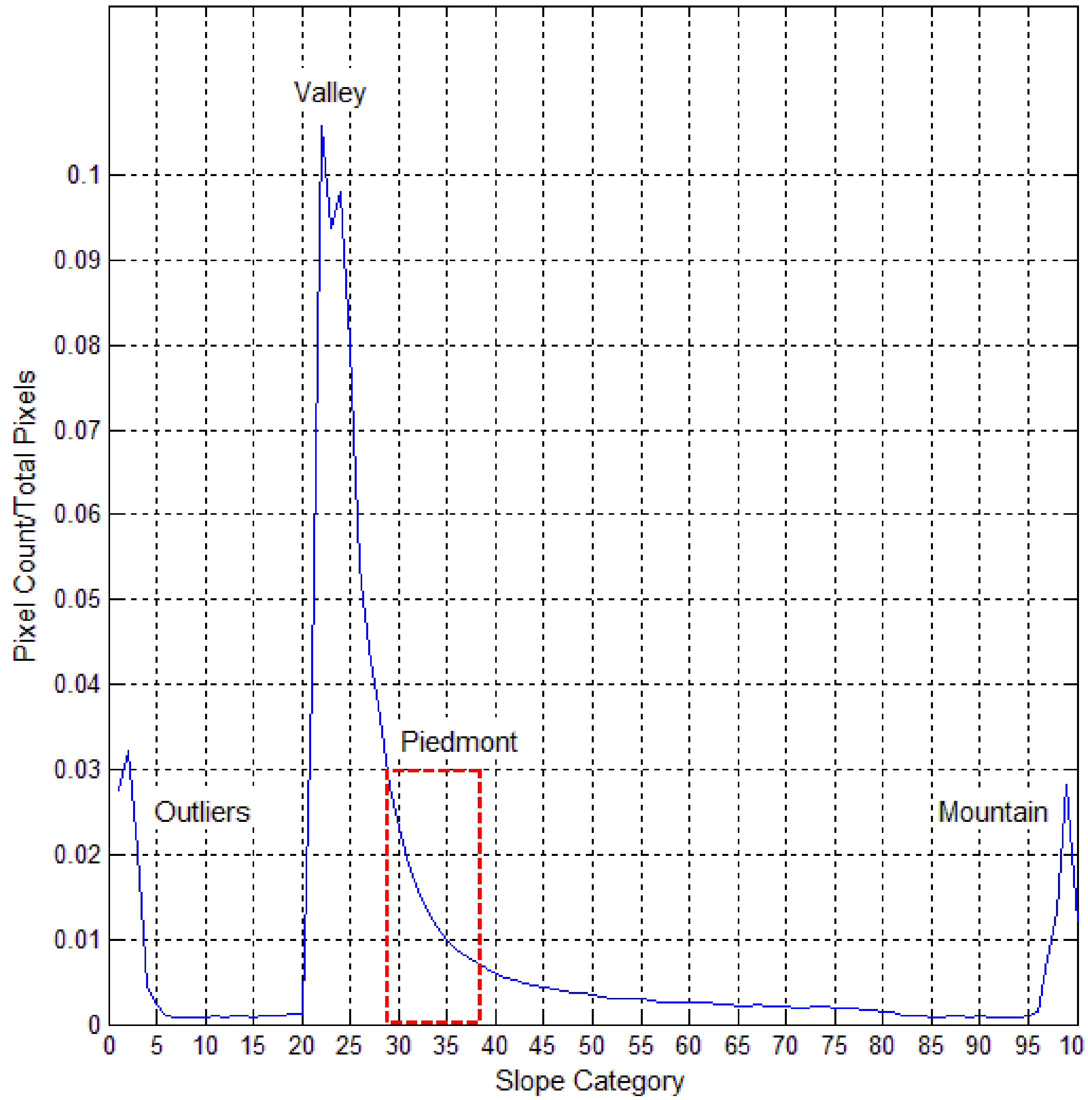


FIGURE O.1-1 Pixel Density (pixel count divided by total pixels) of Binned-Slope Classes for the Proposed Brenda SEZ (Note: Piedmont regions were quantified as areas binned within the 10 slope classes, starting with the slope class corresponding to a pixel density of 0.03.)

infiltration potential. The hydric class is a measure of the soil moisture conditions to support hydrophytic vegetation and can be classified as all hydric, partially hydric, or not hydric.

O.1.1.2 Scoring Index for Integral Functions of Intermittent/Ephemeral Streams

Intermittent/ephemeral streams perform a multitude of ecological and hydrologic functions in arid and semiarid regions (e.g., Levick et al. 2008). The ones considered for the intermittent/ephemeral stream evaluation included groundwater recharge, flood and sediment conveyance, and ecologic habitat value. Mapped flow lines of intermittent/ephemeral streams

TABLE O.1-1 Surficial Geology Units Identified in the Individual Study Regions for the Intermittent/Ephemeral Stream Evaluations

Surficial Geology Units
Alluvial sediments, thick
Playa sediments
Eolian sediments, mostly dune sand, thin
Eolian sediments, mostly loess, thin
Lacustrine sediments
Proglacial sediments, mostly fine grained, thin
Glacial till sediments, mostly sandy, thin
Residual materials developed in carbonate rocks, discontinuous
Residual materials developed in fine-grained sedimentary rocks
Residual materials developed in igneous and metamorphic rocks
Residual materials developed in sedimentary rocks, discontinuous
Volcanic rocks, basaltic and andesitic

identified in the NHD dataset were intersected with six metrics describing landscape characteristics that included topographic setting, surficial geology, and four metrics of soil-hydrologic characteristics. A scoring index was established for each of the three integral functions that gave a score ranging from 1 (very low sensitivity to disturbance) to 5 (very high sensitivity to disturbance) for each of the six landscape metrics. The score index values are shown in Table O.1-2 and were determined using best professional judgment from a team of researchers with specialties in hydrology, geology, ecology, and geospatial sciences.

A geographic information system (GIS)-based analysis was used to intersect the index scores associated with geospatial data describing the six landscape features with individual intermittent/ephemeral stream reach segments. The total sensitivity to disturbance was the sum of index scores for each of the three integral functions resulting in a maximum level of sensitivity to disturbance equal to 90 (6 landscape variables × 3 integral functions × a maximum index of 5). High, medium, and low sensitivity to disturbance groupings was determined from the range in values for all SEZs as a whole. The high sensitivity stream reaches had total index scores of greater than 60, medium sensitivity streams had total index scores between 50 and 60, and low sensitivity streams had total index scores of less than 50.

O.1.2 Example Intermittent/Ephemeral Stream Evaluation Results for Select SEZs

The intermittent/ephemeral stream evaluations for proposed SEZs that are presented in Chapters 8 through 13 of this Final Solar PEIS categorize stream reaches as having high, moderate, or low sensitivity to disturbance by using a total index score that combines the integral functions of groundwater recharge, food and sediment conveyance, and ecological habitat value. The following sections present results of the intermittent/ephemeral stream evaluation for four proposed SEZs—Riverside East, De Tilla Gulch, Amargosa, and Gold Point with emphasis on

TABLE O.1-2 Index Scores Pertaining to the Sensitivity to Disturbance of the Critical Functions of Intermittent/Ephemeral Streams Based on Landscape Characteristics

	Integral Functions of Stream Reaches		
Landscape Characteristics	Groundwater Recharge	Flood and Sediment Transport	Ecological Habitat
Topographic Setting			
Piedmont	4	4	3
Valley	2	3	4
Surficial Geology			
Alluvial sediments, thick	4	4	4
Playa sediments	1	2	4
Eolian sediments, mostly dune sand, thin	3	4	3
Eolian sediments, mostly loess, thin	2	4	3
Lacustrine sediments	1	2	4
Proglacial sediments, mostly fine grained, thin	2	3	3
Glacial till sediments, mostly sandy, thin	3	3	3
Residual materials; carbonate rocks, discontinuous	3	2	3
Residual materials; fine-grained sedimentary rocks	2	2	2
Residual materials; igneous and metamorphic rocks	2	2	2
Residual materials; sedimentary rocks, discontinuous	2	2	2
Volcanic rocks, basaltic and andesitic	3	1	2
Soil-Hydrologic: Flood Frequency			
None	1	1	1
Very rare	1	2	2
Rare	2	2	3
Occasional	3	3	4
Frequent	4	4	4
Very frequent	4	4	3
Soil-Hydrologic: Available Water Storage (150 cm)			
<10 cm[a]	3	3	4
>10 cm	2	2	4
Soil-Hydrologic: Hydrologic Group			
A	4	3	4
B	4	3	4
C	2	3	3
D	1	3	2
Soil-Hydrologic: Hydric Class			
All hydric	1	2	4
Partially hydric	3	3	4
Not hydric	4	4	2

[a] To convert cm to in., multiply by 0.3937.

examining the individual integral scores that make up the total index score. While the total index score is an overall evaluation of a stream reach's sensitivity to disturbance, this aggregate measure can mask the importance of the individual integral functions. For example, stream reaches with a high sensitivity to disturbance with respect to groundwater recharge may not be sensitive with respect to flood and sediment conveyance or for providing ecological habitat.

Results for each of the four SEZs highlight the variability in levels of sensitivity with respect to the three integral functions examined, as well as the total index score. As stated in Section O.1.1.2, the total index score of sensitivity to disturbance had a maximum value of 90, but for each individual integral function, the maximum level of sensitivity to disturbance was equal to 30 (6 landscape variables × a maximum index of 5). For each integral function of intermittent/ephemeral streams, the high sensitivity streams had total index scores of greater than 20, medium sensitivity streams had total index scores between 16 and 20, and low sensitivity streams had total index scores of less than 16.

O.1.2.1 Riverside East

The index scores for groundwater recharge, flood and sediment conveyance, and ecological habitat value all gave similar results as the total index score as shown in Figure O.1-2. The majority of the intermittent/ephemeral stream reaches in the study area had a moderate sensitivity to disturbance. The main differences among the index scores for the three integral functions are for stream reaches associated with McCoy Wash and the stream reaches draining the pass between the Palen Mountains and the McCoy Mountains. In these regions, the stream reaches scored as having low sensitivity with respect to groundwater recharge but moderate sensitivity to disturbance with respect to flood and sediment conveyance and ecological habitat value.

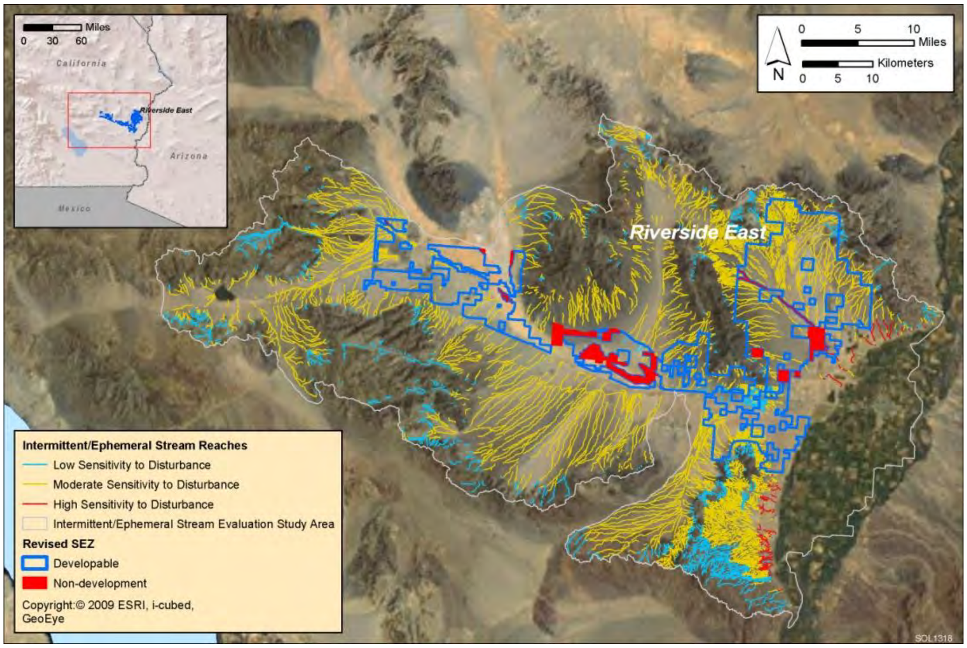
O.1.2.2 De Tilla Gulch

The total index scores suggest that several intermittent/ephemeral stream reaches with moderate sensitivity to disturbance drained from northwest to southeast in the vicinity of the SEZ (Figure O.1-3a). Index scores for groundwater recharge suggest that several of these reaches had high sensitivity to disturbance (Figure O.1-3b), which is consistent with previous studies in the vicinity of the SEZ and suggests that this region is an important groundwater recharge zone (see Section 10.2.9.1.2 of the Draft Solar PEIS). The effects of these sensitive reaches with respect to groundwater recharge were dampened by the lower index scores for flood and sediment conveyance (Figure O.1-3c) and ecological habitat value (Figure O.1-3d).

O.1.2.3 Amargosa Valley

The total index scores suggest that the majority of the intermittent/ephemeral stream reaches in the vicinity of the SEZ have moderate sensitivity to disturbance; channels associated

(a) Total Sensitivity to Disturbance



(b) Groundwater Recharge Sensitivity to Disturbance

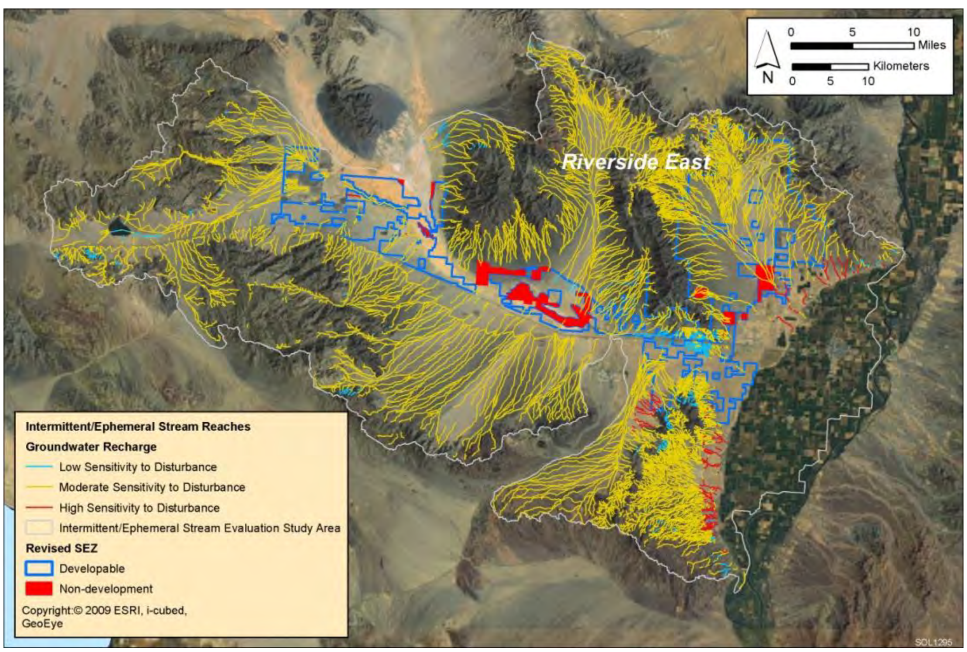
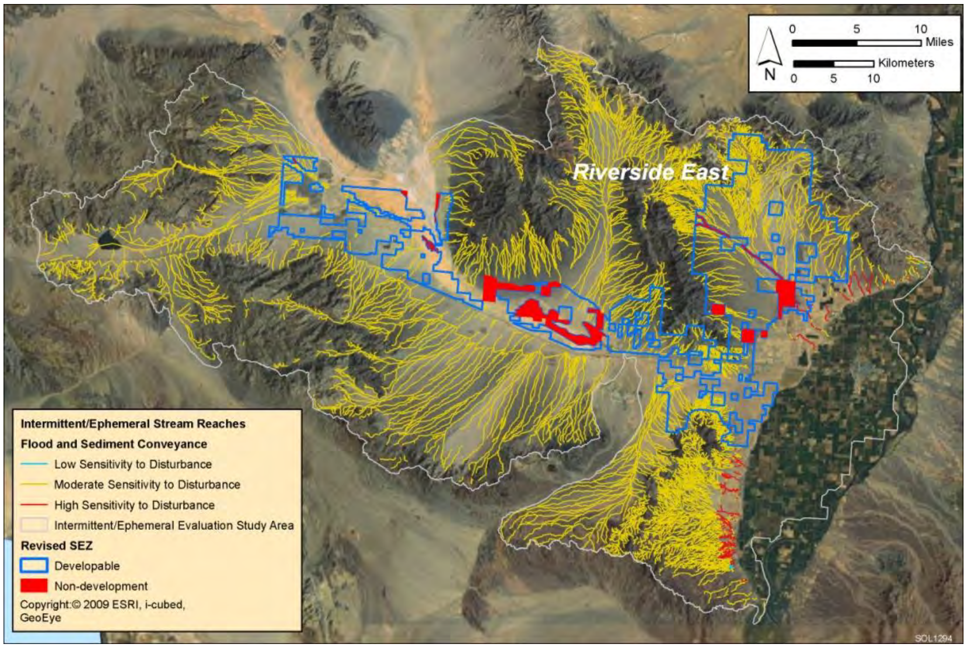


FIGURE O.1-2 Maps Showing Sensitivity to Disturbance of Intermittent/Ephemeral Streams in the Proposed Riverside East SEZ: (a) Total Sensitivity, (b) Groundwater Recharge Sensitivity, (c) Flood and Sediment Transport Sensitivity, and (d) Ecological Habitat Sensitivity

(c) Flood and Sediment Transport Sensitivity to Disturbance



(d) Ecological Habitat Sensitivity to Disturbance

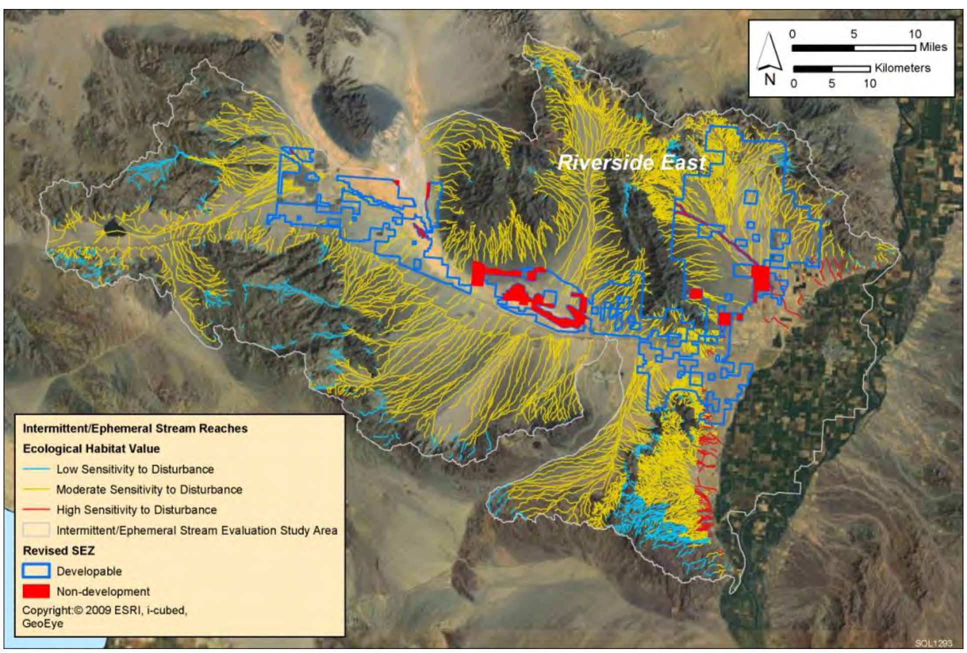
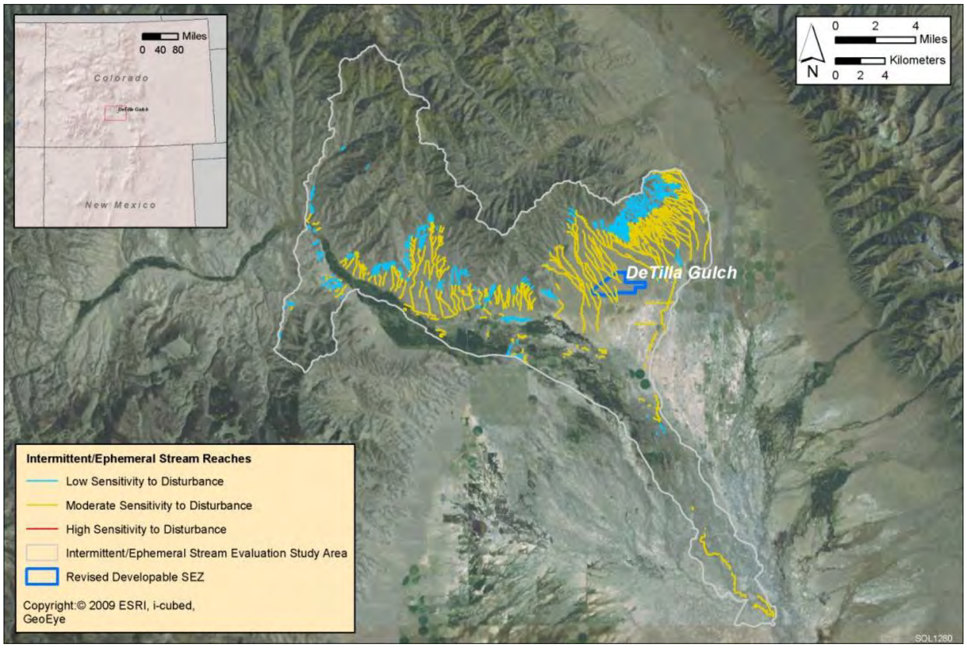


FIGURE O.1-2 (Cont.)

(a) Total Sensitivity to Disturbance



(b) Groundwater Recharge Sensitivity to Disturbance

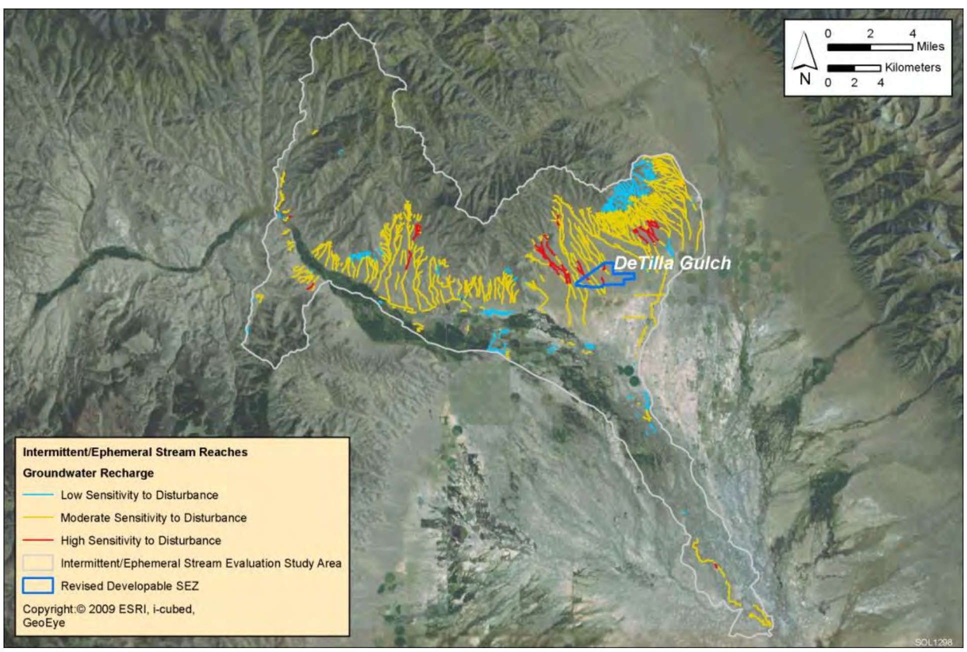
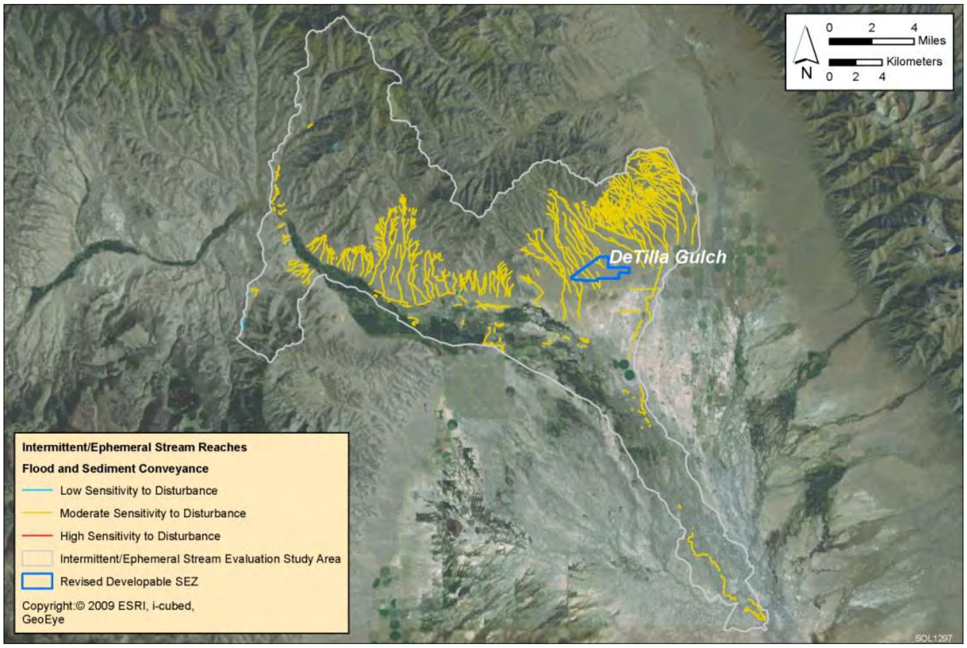


FIGURE O.1-3 Maps Showing Sensitivity to Disturbance of Intermittent/Ephemeral Streams in the Proposed De Tilla Gulch SEZ: (a) Total Sensitivity, (b) Groundwater Recharge Sensitivity, (c) Flood and Sediment Transport Sensitivity, and (d) Ecological Habitat Sensitivity

(c) Flood and Sediment Transport Sensitivity to Disturbance



(d) Ecological Habitat Sensitivity to Disturbance

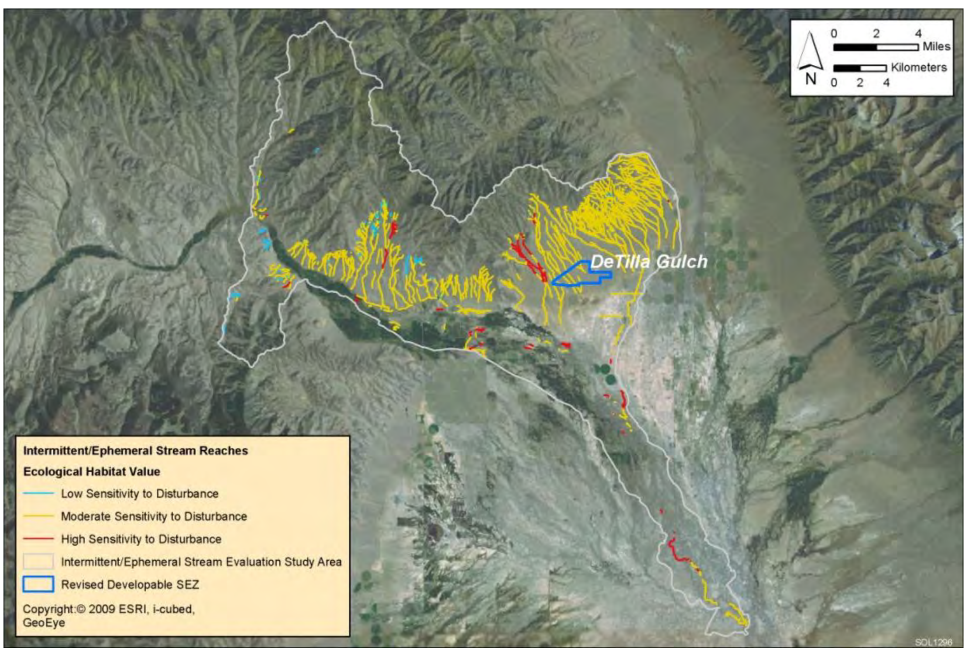


FIGURE O.1-3 (Cont.)

with the Amargosa River have high sensitivity to disturbance (Figure O.1-4a). Index scores for groundwater recharge suggest that several reaches draining the Bare Mountains to the north of the SEZ had high sensitivity to disturbance (Figure O.1-4b), but these reaches were only moderately sensitive with respect to flood and sediment conveyance (Figure O.1-4c) and ecological habitat value (Figure O.1-4d).

O.1.2.4 Gold Point

The total index scores suggest that the majority of the intermittent/ephemeral stream reaches in the vicinity of the SEZ have moderate sensitivity to disturbance (Figure O.1-5a). However, high sensitivity reaches differ among the individual index values for groundwater recharge (Figure O.1-5b), flood and sediment conveyance (Figure O.1-5c), and ecological habitat value (Figure O.1-5d).

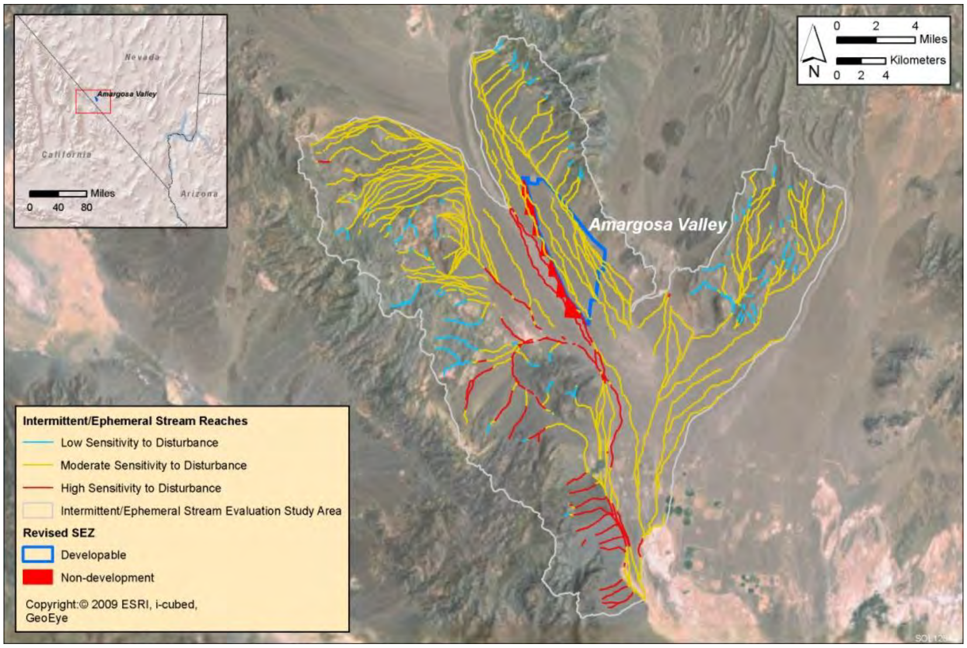
The results shown for the Riverside East, De Tilla Gulch, Amargosa Valley, and Gold Point SEZs suggest that the total index score of sensitivity to disturbance depicts an aggregate value of the index scores for individual functions pertaining to groundwater recharge, flood and sediment conveyance, and ecological habitat value. Depending upon the nature of specific environmental concerns at an SEZ, the total scores can dampen the sensitivity value relative to a particular integral function of concern. Of the examples presented in this section, sensitivity to disturbance pertaining to groundwater recharge has the greatest potential to be masked by lower sensitivities for flood and sediment conveyance and ecological habitat values.

O.2 GROUNDWATER ANALYSES

Groundwater was considered to be the primary water source to support construction and operation phases of utility-scale solar energy development. Groundwater withdrawals have the potential to lower groundwater surface elevations, which can affect groundwater flow patterns, other groundwater wells in the basin, surface water-groundwater connectivity, and groundwater-dependent vegetation and biota. The Draft Solar PEIS presented water use estimates for both construction and operation phases that were scaled according to the size of the facility (measured as its power production capacity in megawatts [MW]). The water use estimations were compared against reported hydrologic processes in the basin such as groundwater recharge, storage, and outflow, as well as current and historical groundwater pumping rates. In addition, current levels and temporal trends in groundwater surface elevations were used to infer groundwater conditions to the historical and existing groundwater pumping rates in the basin.

Several commentors suggested the need for more analyses pertaining to the impacts associated with potential groundwater withdrawals from utility-scale solar energy facilities. For this Final Solar PEIS, overall groundwater budget and one-dimensional groundwater modeling analyses were performed. These additional analyses were then used to compare water use estimates for the full build-out scenarios of the SEZs, with results and interpretations presented in Section 9, Water Resources, of the SEZ Chapters (Chapters 8–13). This section describes the

(a) Total Sensitivity to Disturbance



(b) Groundwater Recharge Sensitivity to Disturbance

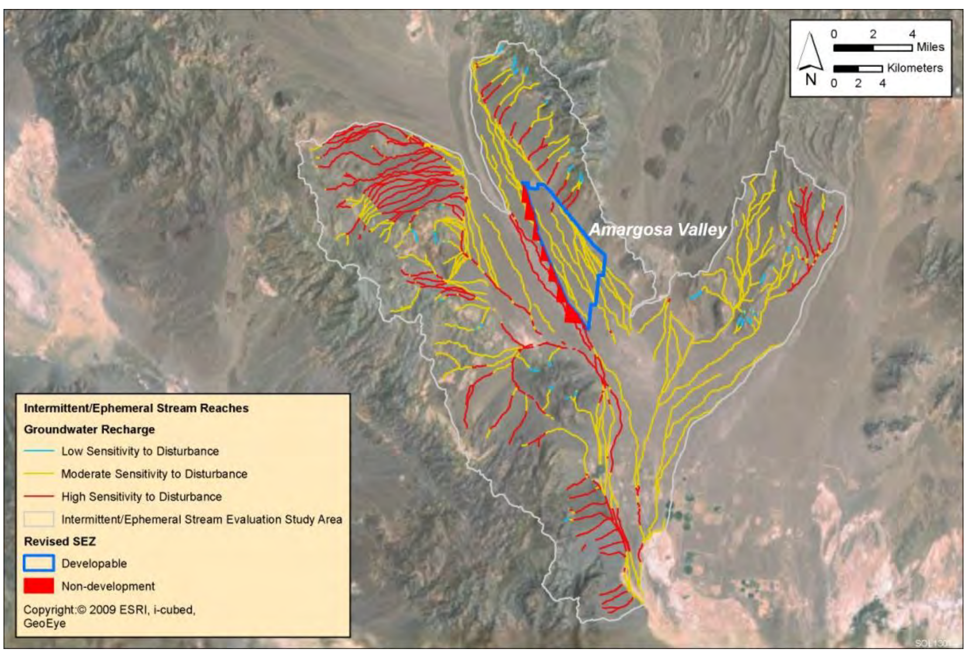
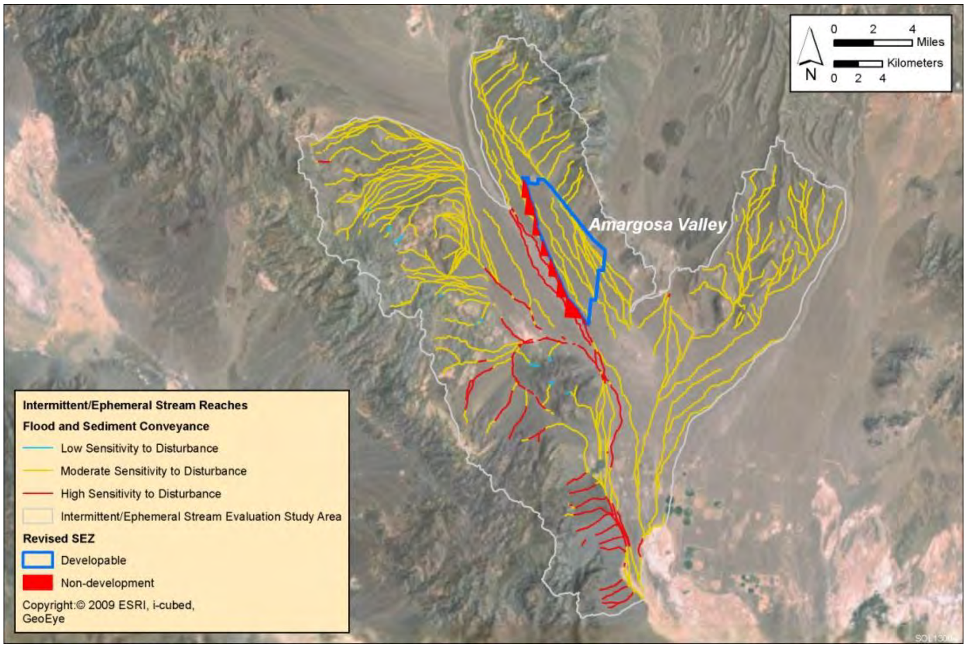


FIGURE O.1-4 Maps Showing Sensitivity to Disturbance of Intermittent/Ephemeral Streams in the Amargosa Valley SEZ: (a) Total Sensitivity, (b) Groundwater Recharge Sensitivity, (c) Flood and Sediment Transport Sensitivity, and (d) Ecological Habitat Sensitivity

(c) Flood and Sediment Transport Sensitivity to Disturbance



(d) Ecological Habitat Sensitivity to Disturbance

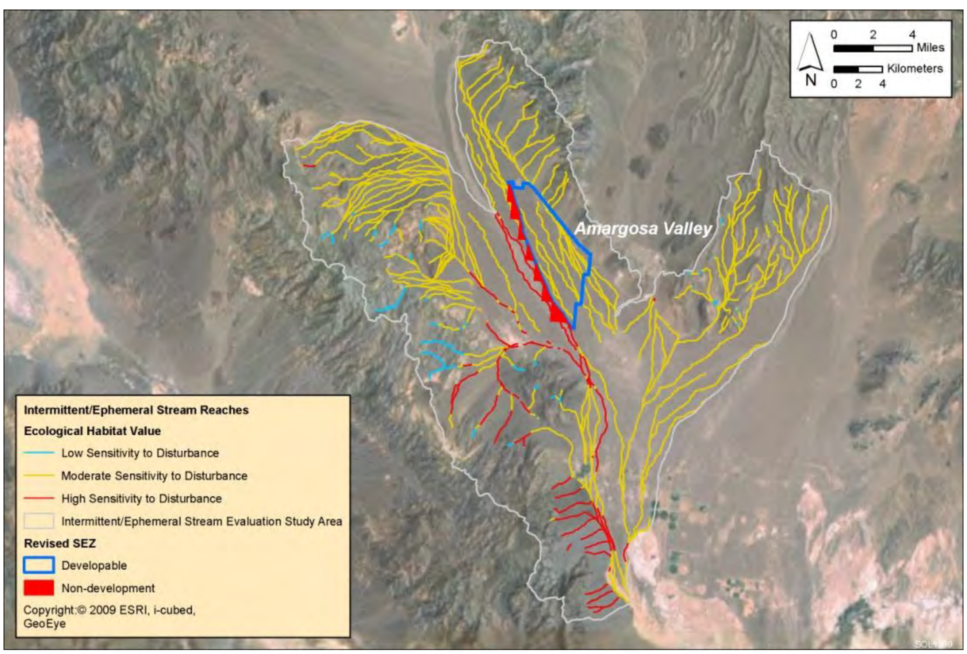
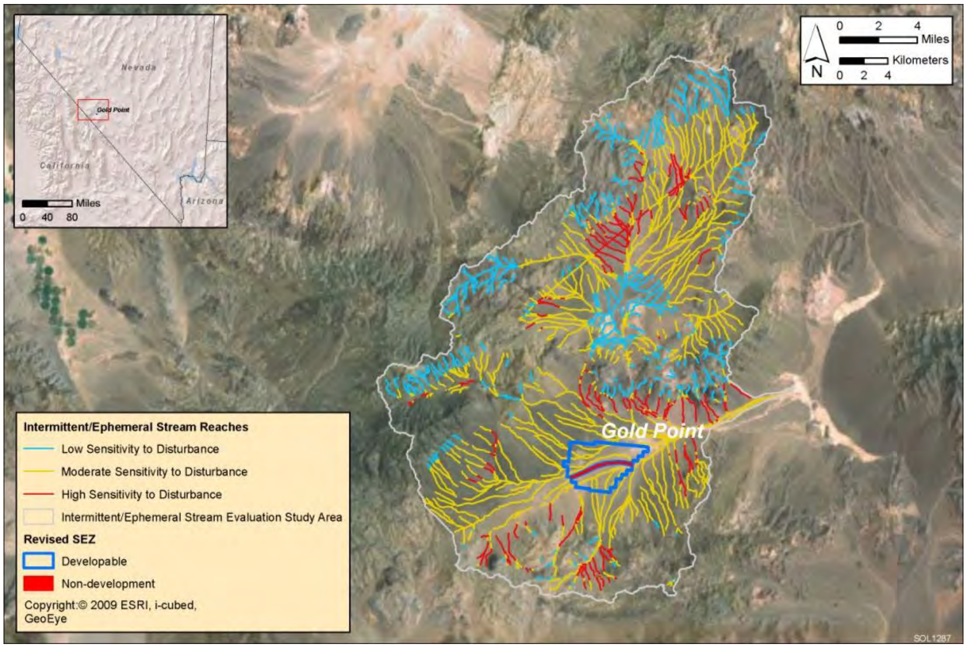


FIGURE O.1-4 (Cont.)

(a) Total Sensitivity to Disturbance



(b) Groundwater Recharge Sensitivity to Disturbance

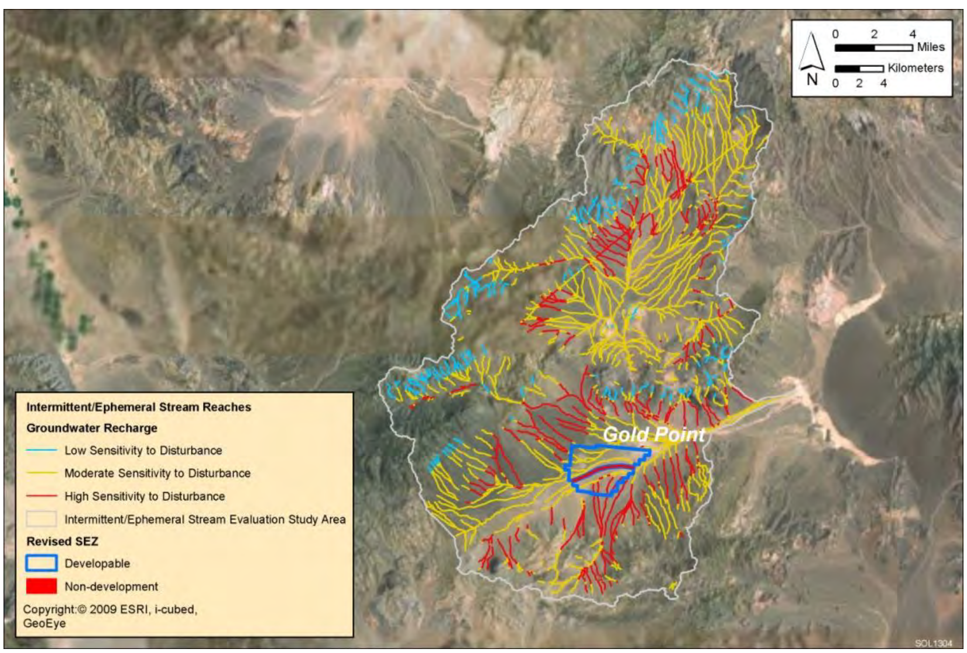
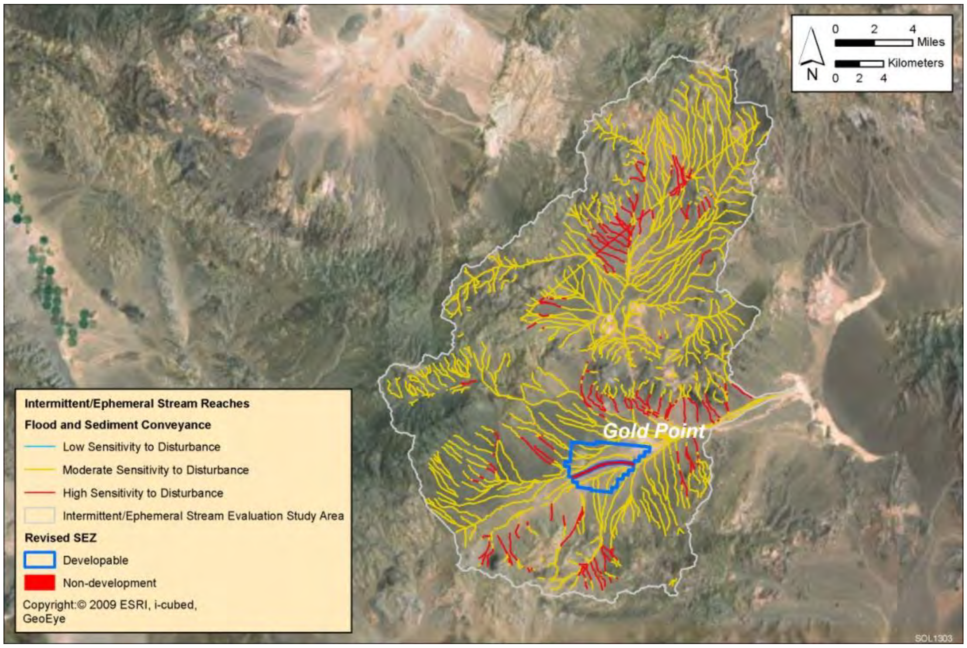


FIGURE O.1-5 Maps Showing Sensitivity to Disturbance of Intermittent/Ephemeral Streams in the Gold Point SEZ: (a) Total Sensitivity, (b) Groundwater Recharge Sensitivity, (c) Flood and Sediment Transport Sensitivity, and (d) Ecological Habitat Sensitivity

(c) Flood and Sediment Transport Sensitivity to Disturbance



(d) Ecological Habitat Sensitivity to Disturbance

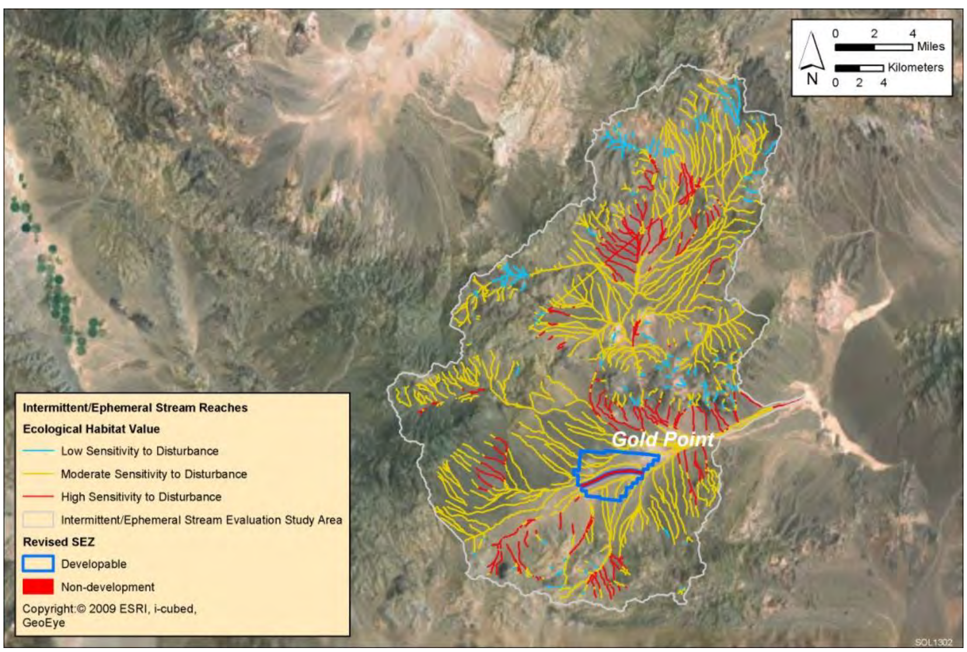


FIGURE O.1-5 (Cont.)

methods and assumptions used to assemble the groundwater budgets and perform the one-dimensional groundwater modeling efforts.

O.2.1 Groundwater Budget

A groundwater budget is a basin-scale examination of hydrologic processes contributing to the overall quantity of groundwater in a basin. Hydrologic input and output processes, along with storage, are the principle components of a groundwater budget.

Hydrologic input processes include recharge from snowmelt and precipitation via runoff and infiltration, as well as groundwater underflow from adjacent basins. Hydrologic output processes include evapotranspiration and groundwater underflow to adjacent basins. In addition to hydrologic processes, anthropogenic factors affect a groundwater budget. Groundwater pumping for a variety of purposes (e.g., potable supply, irrigation, and industrial) extracts groundwater from an aquifer. For certain water uses, a portion of groundwater that is extracted can act as groundwater inputs. For example, irrigation return flows are inputs to groundwater as excess irrigation applied to the surface infiltrates back to the groundwater reservoir.

Groundwater storage generally refers to the quantity of water stored in the saturated void spaces in aquifer material. Physical properties of water and the aquifer materials, as well as the geologic setting of the groundwater basin, all affect groundwater storage and how storage responds to factors such as groundwater pumping.

A variety of methods can be used to quantify various components of a groundwater budget that can be applied, including geophysical measurements, empirical analyses, and numerical modeling. The accuracy and applicability of these methods for quantifying a groundwater budget often depend upon the scale of interest, as well as site-specific considerations. The groundwater budgets presented for this Final Solar PEIS used information on groundwater budget components obtained from existing studies relevant to each SEZ. These individual studies used a variety of methods to quantify groundwater budget components; Table O.2-1 lists the sources of information for each SEZ.

O.2.2 One-Dimensional Groundwater Modeling

Groundwater budgeting allows for quantification of complex groundwater processes at the basin scale, but it ignores the temporal and spatial components of how groundwater withdrawals affect groundwater surface elevations, groundwater flow rates, and connectivity to surface water features such as streams, wetlands, playas, and riparian vegetation. A one-dimensional groundwater modeling analysis was performed to present a simplified depiction of the spatial and temporal effects of groundwater withdrawals at SEZs.

Groundwater pumping can cause drawdown of groundwater surface elevations in the vicinity of the well and farther away from the well, depending upon the magnitude of the groundwater pumping and properties of the aquifer. Methods to quantify the response of

TABLE O.2-1 Studies Used To Quantify Groundwater Budgets for Individual SEZs

SEZ	References
Brenda	ADWR 2011; Tillman et al. 2011
Gillespie	Freethey and Anderson 1986; Tillman et al. 2011
Imperial East	California Department of Water Resources (CDWR) (2004a); Loeltz et al. 1975; Tompson et al. 2008
Riverside East	BLM 2010a,b; CDWR 2004b,c; Metzger et al. 1973
Antonito Southeast	Colorado DWR 2004; Mayo et al. 2007; SLV Development Group 2007
De Tilla Gulch	Colorado DWR 2004; Mayo et al. 2007; SLV Development Group 2007
Fourmile East	Colorado DWR 2004; Mayo et al. 2007; SLV Development Group 2007
Los Mogotes East	Colorado DWR 2004; Mayo et al. 2007; SLV Development Group 2007
Afton	"West Mesa Well-Field," Creel et al. 1998; Frenzel and Khaeler 1992; Hawley and Kennedy 2004
Amargosa Valley	Burbey 1997; Nevada Department of Water Resources (NDWR) (2007); Stonestrom 2007
Dry Lake Valley North	Eakin 1963; Flint et al. 2004; NDWR 1971, 2008, 2010; SNWA 2008
Dry Lake	Burbey 1997; Rush 1968a
Gold Point	Rush 1968b; Scott et al. 1971
Millers	Flint et al. 2004; Rush and Schroer 1971
Escalante Valley	Burden 2011; Mower and Sandberg 1982
Milford Flats South	Burden 2011; Mower and Cordova 1974
Wah Wah Valley	Durbin and Loy 2010; Stephens 1974

groundwater surface elevations to pumping have been theoretically constructed for simplified representations of aquifers. One of the most commonly used methods is the Theis Equation, which quantifies the two-dimensional radial flow to a well that is induced by pumping. There are several analytical, numerical, and graphical methods to apply the Theis Equation (e.g., Freeze and Cherry 1979); for this analysis, the Theis Equation was represented as an infinite series according to the following:

$$ho - h = \frac{Q}{4\pi T}\,[-0.5772 - \ln u + u - u^2/(2\cdot 2!) + u^3/(3\cdot 3!) - u^4/(4\cdot 4!) + \cdots], \quad \text{(O-1)}$$

where u is a grouping term defined as

$$u = \frac{r^2 S}{4Tt}, \qquad \text{(O-2)}$$

and Q = constant pumping rate (L^3/T), h = hydraulic head at time t since pumping began (L), h_o = hydraulic head prior to pumping (L), r = radial distance from the pumping well to an observation well (L), T = aquifer transmissivity (L^2/T), and S = aquifer storativity (unitless).

Equations O-1 and O-2 quantify the distribution of hydraulic head with respect to the radial distance from the well. The hydraulic head is a measure of the groundwater's total potential energy at a point that is largely a function of its elevation and the pressure conditions in the aquifer. In general, for unconfined aquifer conditions (pressure is minimal) the hydraulic head is equal to the groundwater surface elevation. Confined aquifers have the potential to be under artesian conditions where pressure forces act such that the hydraulic head is larger than the groundwater surface elevation. Transmissivity and storativity are parameters that are used to represent a simplified conceptual model of the aquifer that contain values describing the aquifer's thickness, hydraulic conductivity, and specific storage. Details regarding these modeling parameters can be found in groundwater textbooks (e.g., Freeze and Cherry 1979).

Assumptions of the Theis method (Fetter 1988) include a constant pumping rate, Darcian flow, and instant release of water from storage. The aquifer is assumed to be homogenous, isotropic, of a constant thickness, of negligible slope, and of infinite extent. The pumping well and observation wells are assumed to penetrate the aquifer fully, and the pumping well's diameter is infinitesimal.

For this study, the drawdown to be evaluated occurs as a result of long-term pumping. The Jacob method acknowledges that when the u term of the Theis Equation (Equation O-1) is very small (e.g., time t is very large), the equation can be truncated after the first two terms (Fetter 1988) such that Equation O-1 becomes:

$$ho - h = \frac{2.3Q}{4\pi T} \log_{10}\left(\frac{2.25Tt}{Sr^2}\right). \qquad \text{(O-3)}$$

This step is valid when $u < 0.01$, and for most applications, is valid if $u < 0.1$ (Halford and Kuniansky 2002). In addition, the use of this Theis Equation modeling approach is generally applicable to long time intervals (Fetter 1988; Kruseman and DeRidder 2000), which is appropriate for examining the long-term pumping effects on groundwater from utility-scale solar energy facilities. The only modification to this analysis approach is that for examining long-term pumping effects on groundwater drawdown, the storage terms listed in Equations O-1 through O-3 should use the storage capacity for confined aquifers and the specific yield for unconfined aquifers (Fetter 1988).

For this project, a spreadsheet tool was developed to evaluate the drawdown at various distances from a pumping well at a long time duration using the Jacob method. The model relies on user input in consistent units to evaluate drawdown at various distances while also displaying u values to check the validity of the approach described in Equations O-1 through O-3. For each

SEZ, characteristics describing the transmissivity, storage properties, and aquifer depth obtained from many of the studies listed in Table O.2-1 were used. The primary inputs for this one-dimensional groundwater modeling analysis included average values for the aquifer thickness, specific yield or storage coefficient, and transmissivity, along with estimates of annualized pumping rates (high, medium, and low pumping scenarios were considered), which were described in Section 9, Water Resources, in the SEZ chapters (Chapters 8–13) in this Final Solar PEIS. Table O.2-2 presents statistics on the range of aquifer values and pumping rates that were analyzed for all the SEZs.

Because of the simplicity of the analytical approach, input values can be quickly and easily tested to estimate the effect of long-term pumping at various distances from a pumping well or pumping center. These estimates can be determined for best-guess and worst-case scenarios, based on the ranges of appropriate input values. The appropriateness of the simplifying assumptions, especially those related to the aquifer's spatial characteristics, must be considered carefully.

The input values describing aquifer characteristics were derived from available studies conducted in the groundwater basins of interest. It should be noted that aquifer conditions, particularly transmissivity, can vary quite substantially in a groundwater basin. Thus, the estimated groundwater drawdown levels described in the individual SEZ sections should be considered to be approximations, with potential for a high degree of variability with respect to the actual response of the groundwater system to imposed pumping from utility-scale solar energy facilities.

TABLE O.2-2 Range in Values of Aquifer Characteristics and Annualized Pumping Rates Considered for the One-Dimensional Groundwater Modeling Analyses

Aquifer Characteristic or Pumping Rate	Minimum	Maximum	Average	Standard Deviation	Median
Unconfined aquifers					
Thickness (ft)	100	6,560	1,178	1,514	1,000
Specific yield	0.03	0.24	0.14	0.07	0.15
Transmissivity (ft^2/d)	1,000	69,000	18,565	19,088	10,000
Confined aquifers					
Thickness (ft)	380	1,000	576	243	500
Storage coefficient	0.0000025	0.01	0.002	0.004	0.0000025
Transmissivity (ft^2/d)	7,500	38,000	21,100	12,492	25,000
Annualized pumping rates					
High (ac-ft/yr)[a]	854	24,083	7,510	6,883	4,892
Medium (ac-ft/yr)	122	8,449	1,425	2,029	697
Low (ac-ft/yr)	5	672	76	158	28

[a] To convert ac-ft to m^3, multiply by 1,234.

To give an example of how the one-dimensional groundwater modeling analysis responds to aquifer input conditions, the effect of altering storage terms and transmissivity were examined for the case where groundwater pumping was set to 7,500 ac-ft/yr (9.3 million m^3/yr) for 20 years and the aquifer thickness was set to 1,000 ft (305 m). Transmissivity and specific yield values were varied to represent the range in values shown in Table O.2-2, with estimated groundwater drawdown results shown in Figure O.2-1.

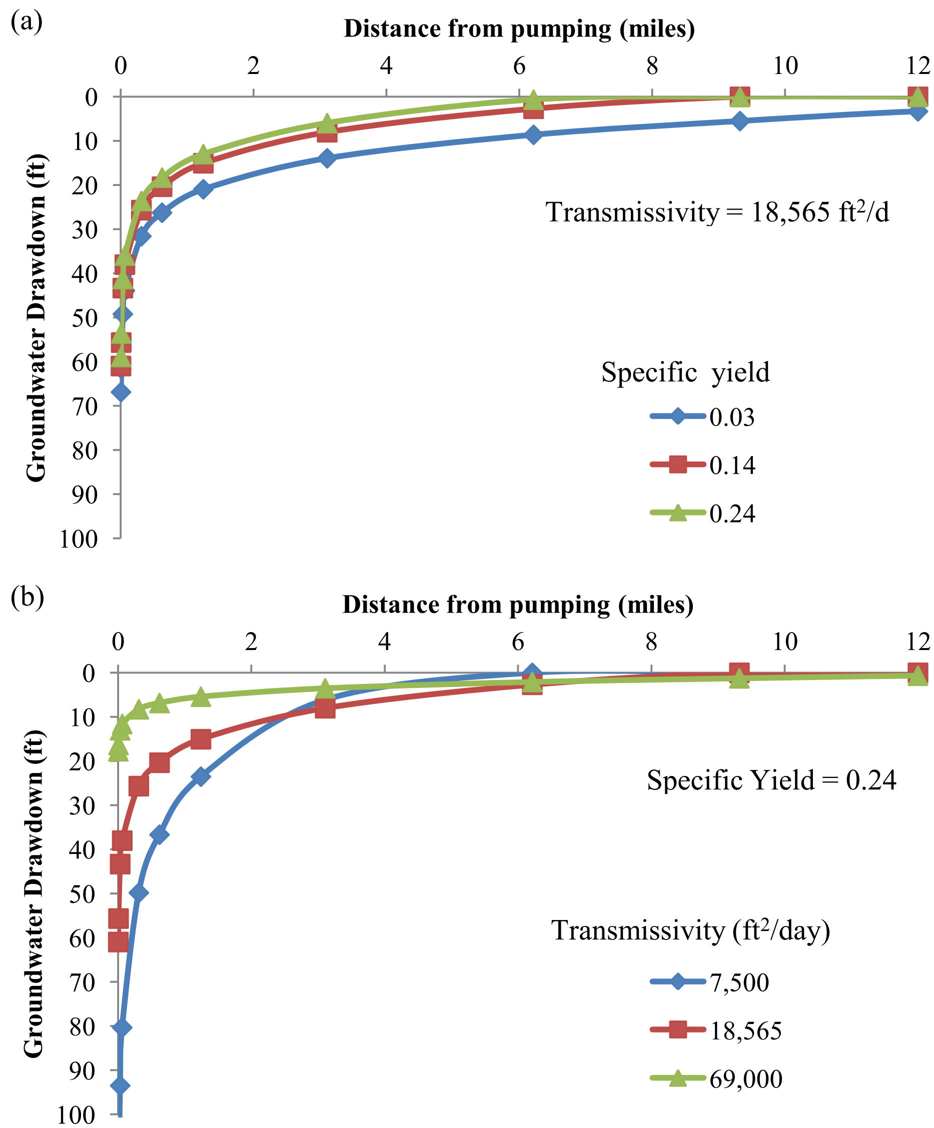


FIGURE O.2-1 Variation of Groundwater Drawdown Simulated for a Pumping Rate of 7,500 ac-ft/yr (9.3 million m^3/yr) for 20 Years, and Aquifer Thickness Set to 1,000 ft (305 m) for (a) Assuming a Range in Aquifer Storage Properties, and (b) Assuming a Range in Aquifer Transmissivity

Results of this analysis show that variability in aquifer storage properties does not vary groundwater drawdown near the pumping well, but that groundwater drawdown increases with decreasing values in specific yield farther away from the well (Figure O.2-1a). Variability in transmissivity showed a more pronounced response in groundwater drawdown. Lower transmissivity values result in an increased drawdown near the center of pumping; higher transmissivity values, however, have a greater effect of groundwater drawdown with distance away from the well (Figure O.2-1b).

O.3 REFERENCES

Note to Reader: This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

ADWR (Arizona Department of Water Resources), 2011, "Ranegras Plain Basin" Section 7.7 of *Arizona Water Atlas, Volume 7: Lower Colorado River Planning Area Water Atlas.* Available at http://www.azwater.gov/AzDWR/StatewidePlanning/WaterAtlas/LowerColoradoRiver/default.htm. Accessed April 9, 2012.

BLM (Bureau of Land Management), 2010a, *Plan Amendment/Final EIS for the Blythe Solar Power Project,* FES 10-41, DOI-BLM-CA-060-0010-0013-EIS, Aug.

BLM, 2010b, *Plan Amendment/Final EIS for the Genesis Solar Power Project*, FES 10-42, DOI-BLM-CA-060-0010-0015-EIS, Aug.

BLM and DOE (Bureau of Land Management and U.S. Department of Energy), 2010, *Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States*, DES 10-59, DOE/EIS-0403, Dec.

BLM and DOE, 2011, *Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States*, DES 11-49, DOE/EIS-0403D-S, Oct.

Burbey, T.J., 1997, *Hydrogeology and Potential for Ground-Water Development, Carbonate-Rock Aquifers, Southern Nevada and Southeastern California*, Water-Resources Investigations Report 95-4168, U.S. Geological Survey.

Burden, C.B., 2011, *Groundwater Conditions in Utah*, Cooperative Investigations Report No. 522011, U.S. Geological Survey, Utah Department of Natural Resources, Division of Water Rights, and Utah Department of Environmental Quality, Division of Water Quality. Available at http://ut.water.usgs.gov/publications/GW2011.pdf.

CDWR (California Department of Water Resources), 2004a, "Imperial Valley Groundwater Basin," *California's Groundwater*, *Bulletin 118*, Groundwater Basin 7-30.

CDWR, 2004b, “Chuckwalla Valley Groundwater Basin,” *California’s Groundwater*, *Bulletin 118,* Groundwater Basin 7-5.

CDWR, 2004c, “Palo Verde Mesa Groundwater Basin,” *California’s Groundwater*, *Bulletin 118*, Groundwater Basin 7-39.

Colorado DWR (Colorado Division of Water Resources), 2004, *Preliminary Draft: Rio Grande Decision Support System, Phase 4 Ground Water Model Documentation.* Available at http://cdss.state.co.us/Pages/CDSSHome.aspx.

Creel, B.J., et al., 1998, *Ground-Water Aquifer Sensitivity Assessment and Management Practices Evaluation for Pesticides in the Mesilla Valley of New Mexico*, WRRI Technical Completion Report No. 305.

Durbin, T., and K. Loy, 2010, *Simulation Results Report: Eastern Nevada-Western Utah Regional Groundwater Flow Model*, prepared for U.S. Department of the Interior. Available at http://www.blm.gov/ut/st/en/prog/more/doi_groundwater_modeling.html.

Eakin, T.E., 1963, *Ground-Water Appraisal of Dry Lake and Delamar Valleys, Lincoln County, Nevada, Ground-Water Resources—Reconnaissance Series Report 16*, U.S. Geological Survey.

Fetter, C.W., 1988, *Applied Hydrogeology*, 2nd edition, Merrill Publishing Company, Columbus, Ohio.

Flint, A.L., et al., 2004, “Fundamental Concepts of Recharge in the Desert Southwest: A Regional Modeling Perspective,” pages 159–184 in *Groundwater Recharge in a Desert Environment: The Southwestern United States*, J.F. Hogan et al. (editors), Water Science and Applications Series, Vol. 9, American Geophysical Union, Washington, D.C.

Freethey, G.W., and T.W. Anderson, 1986, *Predevelopment Hydrologic Conditions in the Alluvial Basins of Arizona and Adjacent Parts of California and New Mexico*, Hydrologic Investigations Atlas HA-664, U.S. Geological Survey.

Freeze, R.A., and J.A. Cherry, 1979, *Groundwater*, Prentice Hall, Inc., Englewood Cliffs, N.J.

Frenzel, P.F., and C.A. Khaeler, 1992, *Geohydrology and Simulation of Ground-Water Flow in the Mesilla Basin, Dona Ana County, New Mexico, and El Paso County, Texas*, Regional Aquifer-System Analysis—Southwest Alluvial Basins, New Mexico and Adjacent States, Professional Paper 1407-C, U.S. Geological Survey.

Halford, K.J., and E.L. Kuniansky, 2002, *Documentation of Spreadsheets for the Analysis of Aquifer-Test and Slug-Test Data*, Open-File Report 2002-197, U.S. Geological Survey.

Hawley, J.W., and J.F. Kennedy, 2004, *Creation of a Digital Hydrogeologic Framework Model of the Mesilla Basin and Southern Jornada Del Muerto Basin*, New Mexico Water Resource Research Institute Technical Completion Report No. 332.

Kruseman, G.P., and N.A. DeRidder, 2000, *Analysis and Evaluation of Pumping Test Data*, 2nd edition, ILRI Publication Series No. 47, International Institute for Land Reclamation and Improvement.

Levick, L.R., et al., 2008, *The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest*, EPA/600/R-08/134, ARS/233046, U.S. Environmental Protection Agency and U.S. Department of Agriculture/ Agricultural Research Service, Southwest Watershed Center, Nov.

Loeltz, O.J., et al., 1975, *Geohydrologic Reconnaissance of the Imperial Valley, California*, Professional Paper 486-K, U.S. Geological Survey.

Mayo, A.L., et al., 2007, "Groundwater Flow Patterns in the San Luis Valley, Colorado, USA Revisited: An Evaluation of Solute and Isotopic Data," *Hydrogeology Journal* 15:383–408.

Metzger, D.G., et al, 1973, *Geohydrology of the Parker-Blythe-Cibola Area, Arizona and California*, Water Resources of Lower Colorado River—Salton Sea Area Series, Professional Paper 486-G, U.S. Geological Survey.

Mower, R.W., and R.M. Cordova, 1974, *Water Resources of the Milford Area, Utah, with Emphasis on Groundwater*, Technical Publication No. 43, U.S. Geological Survey and State of Utah Department of Natural Resources, Division of Water Rights.

Mower, R.W. and G.W. Sandberg, 1982, *Hydrology of the Beryl–Enterprise Area, Escalante Desert, Utah, with Emphasis on Groundwater*, Technical Publication No. 73, U.S. Geological Survey and State of Utah Department of Natural Resources, Division of Water Rights.

NDWR (Nevada Department of Water Resources), 1971, *Water for Nevada 3: Nevada's Water Resources*, State of Nevada Water Planning Report, Oct.

NDWR, 2007, *State Engineer's Ruling 5750*, July 16. Available at http://water.nv.gov/ Orders&Rulings/Rulings/rulings_query.cfm.

NDWR, 2008, *Ruling 5875*, July 9. Available at http://water.nv.gov/Orders&Rulings/ 25Rulings/ruling.

NDWR, 2010, *Hydrographic Areas Summary for Basin 181, Dry Lake Valley*. Available at http://water.nv.gov/WaterPlanning/UGactive/index.cfm (Basin 181). Accessed May 3, 2010.

NRCS (Natural Resources Conservation Service), 2012, *Soil Survey Geographic Database (SSURGO)*, U.S. Department of Agriculture. Available at http://soildatamart.nrcs.usda.gov/. Accessed Jan. 16.

Robins, C.R., et al., 2009, "Comparison of Flood Hazard Assessment on Desert Piedmonts and Playas: A Case Study in Ivanpah Valley, Nevada," *Geomorphology* 103:520–532.

Rush, F.E., 1968a, *Water-Resources Appraisal of the Lower Moapa-Lake Mead Area, Clark County, Nevada*, Report 50, Water Resources-Reconnaissance Series, U.S. Geological Survey.

Rush, F.E., 1968b, *Water-Resources Appraisal of Clayton Valley-Stonewall Flat Area, Nevada and California*, Report 45, Water Resources-Reconnaissance Series, U.S. Geological Survey.

Rush, F.E., and C.V. Schroer, 1971, *Water Resources of Big Smoky Valley, Lander, Nye, and Esmeralda Counties, Nevada*, Water Resources Bulletin No. 41, State of Nevada Department of Conservation and Natural Resources, Division of Water Resources, and U.S. Department of the Interior, Geological Survey.

Scott, B.R., et al., 1971, *Nevada's Water Resources*, Report No. 3, Nevada State Engineer's Office.

SLV (San Luis Valley) Development Group, 2007*, Comprehensive Economic Development Strategy, Chapter F, Water Resources,* San Luis Valley Development Group, Alamosa, Colo.

SNWA (Southern Nevada Water Authority), 2008, *Baseline Characterization Report for Clark, Lincoln, and White Pine Counties Groundwater Development Project*, prepared in cooperation with the Bureau of Land Management.

Stephens, J.C., 1974, *Hydrologic Reconnaissance of the Wah Wah Valley Drainage Basin, Millard and Beaver Counties, Utah*, Technical Publication No. 47, U.S. Geological Survey and State of Utah Department of Natural Resources, Division of Water Rights.

Stonestrom, D.A., et al., 2007, "Focused Ground-Water Recharge in the Amargosa Desert Basin," Chapter E in *Ground-Water Recharge in the Arid and Semiarid Southwestern United States*, Professional Paper 1703, U.S. Geological Survey.

Tillman, F.D, et al., 2011, *Water Availability and Use Pilot: Methods Development for a Regional Assessment of Groundwater Availability, Southwest Alluvial Basins, Arizona*, Scientific Investigations Report 2011-5071, U.S. Geological Survey.

Tompson, A., et al., 2008, *Groundwater Availability within the Salton Sea Basin, Final Report,* LLNL-TR-400426, Lawrence Livermore National Laboratory. Available at http://www.usbr.gov/lc/region/saltnsea/SaltonSeaBasinGroundwater.pdf.

Tou, J.T., and R.C. Gonzalez, 1974, *Pattern Recognition Principles*, Addison-Wesley Publishing Company, Reading, Mass.

USGS (U.S. Geological Survey), 2012a, *National Hydrography Dataset (NHD)*. Available at http://nhd.usgs.gov/. Accessed Jan. 16.

USGS, 2012b, *National Elevation Dataset (NED)*. Available at http://ned.usgs.gov. Accessed Jan. 16.

USGS, 2012c, *National Geologic Map Database, Surficial Geology of the United States*. Available at http://ngmdb.usgs.gov/ngmdb/ngmdb_home.html.

Wilson, J.L., and H. Guan, 2004, "Mountain-Block Hydrology and Mountain-Front Recharge," in *Groundwater Recharge in a Desert Environment, The Southwestern United States*, F.M. Phillips et al. (editors), American Geophysical Union, Washington, D.C.