



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
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Honolulu, Hawaii 96850



In Reply Refer To:
2012-F-0140
2008-F-0033

FEB 01 2012

Ms. Melissa Rossiter
U.S. Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401

Subject: Formal Consultation for the Green Energy School Wind Turbine Project on Saipan, Commonwealth of the Northern Mariana Islands

Dear Ms. Rossiter:

This document represents the U.S. Fish and Wildlife Service's (Service) Biological Opinion on the proposed Green Energy School Project on Saipan in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C 1531 et seq.). This Biological Opinion addresses the potential impacts the Green Energy School Project on the endangered nightingale reed-warbler (*Acrocephalus luscini*a) and Mariana swiftlet (*Aerodramus bartschi*). Effects to the nightingale reed-warbler are addressed through the October 23, 2008, *Programmatic Biological Opinion Regarding the Reestablishment, Management, and Use of the Saipan Upland Mitigation Bank, Saipan* (2008-F-0033). Your request for formal consultation was received on January 9, 2012. An informal consultation addressing potential impacts to the endangered Mariana moorhen (*Gallinula chloropsis*) is found in Appendix 1.

The findings and recommendations in this consultation are based on: (1) your Biological Assessment received on January 9, 2012; (2) nightingale reed-warbler survey information from the Commonwealth of the Northern Mariana Islands (CNMI) Division of Fish and Wildlife; (3) prior technical assistance provided to the U.S. Department of Energy (DOE) on June 1, 2011 (2011-SL-0322) and in multiple emails and phone calls; (4) the October 23, 2008, *Programmatic Biological Opinion Regarding the Reestablishment, Management, and Use of the Saipan Upland Mitigation Bank, Saipan* (2008-F-0033) and; (5) other information available to us. A complete administrative record is on file in our office.

CONSULTATION HISTORY

January 9, 2012. We received all necessary information to initiate consultation.

January 5, 2012. A conference call was held between Rachel Rounds (Service), Peter Ashley and Melissa Rossiter (U.S. Department of Energy (DOE)), and Eileen Yoshinaka (Lockheed Martin, DOE contractor) to discuss and make minor changes to the Biological Assessment.

December 30, 2011. We received the Biological Assessment electronically from the DOE.

October 27, 2011. The CNMI Division of Fish and Wildlife sent a letter to the CNMI Energy Division stating they would assist with monitoring at Green Energy School Project sites.

October 13, 2011. DOE sent the Service a No-Effect Determination letter for installation of turbines on Tinian and at Garapan schools. A Biological Assessment will be written for the remainder of the Green Energy School Project sites.

October 11, 2011. The CNMI Energy Division wrote a letter to the CNMI Public School System and CNMI Division of Fish and Wildlife requesting assistance with implementation of the monitoring program for the proposed project.

October 6, 2011. Lee Perlow (CNMI Division of Fish and Wildlife) sent Rachel Rounds (Service) an email with comments regarding the Green Energy School Project and nightingale reed-warbler survey results.

October 4, 2011. A conference call occurred between Rachel Rounds (Service), Peter Ashley and Melissa Rossiter (DOE), Richard Seman and Lee Perlow, (CNMI Division of Fish and Wildlife), Chris Frying (N15 Architects), Vince Attao and Thelma Inos (CNMI Energy Division); and Eileen Yoshinaka (Lockheed Martin, DOE contractor). Rachel Rounds described the consultation process, preliminary effects determinations for each turbine location and species, the required monitoring program, and potential measures to offset take.

September 28, 2011. A phone call was held between Rachel Rounds (Service) and Peter Ashley (DOE) discussing working with local CNMI agencies (Energy Division and Public School System) on the consultation. Determined that consultation will need to be completed by January or early February for construction be completed by April, 2012.

September 27, 2011. Rachel Rounds (Service) wrote an email to Peter Ashley (DOE) describing future steps needed to complete the consultation.

September 26, 2011. Peter Ashley (DOE) sent an email to Rachel Rounds (Service) providing additional project information.

September 21, 2011. Rachel Rounds (Service) sent Peter Ashley and Melissa Rossiter (DOE) an email with comments on the draft Biological Assessment.

September 14, 2011. Peter Ashley (DOE) spoke with Jodi Charrier (Service) regarding an April 2012 deadline for turbine construction and installation.

September 9, 2011. Melissa Rossiter (DOE) sent Rachel Rounds (Service) a draft Biological Assessment for review.

June 1, 2011. The Service sent a species list to the DOE for the proposed Green Energy School Project.

May 26, 2011. The DOE sent a species list request to the Service for the Green Energy School Project.

May 25, 2011. Rachel Rounds (Service) sent an email to Kathy Iverson (DOE) with clarifications and further details on the information required to initiate consultation under section 7 of the ESA.

May 25, 2011. Lee Perlow (CNMI Division of Fish and Wildlife) sent Rachel Rounds (Service) an email with pictures of the turbine foundations at Saipan Southern High School and information about a local permit request for turbine installation.

May 9, 2011. Rachel Rounds (Service) sent Cathy Iverson (DOE) an email stating that installation of solar panels on school rooftops could proceed without further consultation.

April 13, 2011. Rachel Rounds (Service) sent an email to Cathy Iverson (DOE), Steve Blazek (DOE), and Melissa Rossiter (DOE) providing information on steps required for a section 7 consultation under the ESA.

March 30, 2011. Cathy Iverson (DOE) provided Rachel Rounds (Service) via email with a list of the 10 schools participating in the Green Energy School Project.

March 28, 2011. Rachel Rounds (Service) wrote Cathy Iverson (DOE) an email regarding the Green Energy Project on Saipan and asking whether a section 7 consultation had been completed for the proposed project.

March 25, 2011. Rachel Rounds (Service) sent an email to Faride Kraft (Office of Insular Affairs) trying to find a contact from DOE for the Green Energy School Project on Saipan.

March 25, 2011. Rachel Rounds (Service) sent an email to Chris Fryling (N15 Architects) asking if a section 7 consultation had been completed for the Green Energy School Project.

March 24, 2011. Rachel Rounds (Service) sent an email to Paul Radley (CNMI Division of Fish and Wildlife) asking if they had processed a permit request for construction of six wind turbines at Saipan Southern High School. Paul Radley responded that the CNMI Division of Fish and Wildlife had not processed a permit request for this project.

March 24, 2011. Rachel Rounds (Service) read an article in the Saipan Tribune (dated March 15, 2011) describing the installation of six turbines at Saipan Southern High School.

ACTION AREA

The action area includes the five schools on Saipan that will have wind turbines installed: Saipan Southern High School, Koblerville Elementary School, Kagman High School, Cha Cha Oceanview Junior High School, and Gregorio T. Camacho Elementary School. The action area includes each turbine location plus a radius of 50 meters around the 20 kilowatt (kW) turbines and 20 meters around the 2.4 kW turbines. The action area also includes a one hectare (ha) lot adjacent to the wind turbines that will be cleared at Saipan Southern High School.

DESCRIPTION OF THE PROPOSED ACTION

The DOE is providing funding to the CNMI through the State Energy Program under the America Recovery and Reinvestment Act of 2009 to develop renewable energy sources to improve reliability of energy supply and reduce energy costs in the CNMI. The CNMI will use a portion of their funding for the Green Energy School Project. The proposed project will install six 20-kW and four 2.4-kW wind turbines at the public schools on the island of Saipan.

Six Jacobs 20-kW wind turbines will be installed in an open maintained grass field between the Saipan Southern High School and Koblerville Elementary School in southern Saipan. The Jacobs turbines are monopole-mounted on 25 meter towers with a top mounted 9.5 meter rotor diameter turbine. These turbines are 29.1 meters tall at full blade extent and have a rotor swept area of 70 square meters.

One Skystream 2.4-kW turbine will be installed at four schools on Saipan (Koblerville Elementary School, Kagman High School, Cha Cha Oceanview Junior High School, and Gregorio T. Camacho Elementary School). The Skystream turbines are monopole-mounted with a tower height of 10 meters and a rotor diameter of 3.7 meters. The Skystream turbines are 39 feet tall at full blade extent and have a rotor swept area of 10 square meters.

At Kagman High School the turbine would be located on the north side of the school property on an existing disturbed or small grassy area. At Cha Cha Oceanview Junior High School the turbine would be located on the south side of the school property in a grass field. At Gregorio T. Camacho Elementary School the turbine would be placed in a large open field between the school and the ocean. At Koblerville Elementary the turbine will be installed adjacent to the six Jacobs 20-kW turbines.

No lighting will be installed on any of the towers. The operational lifespan of the wind turbines is estimated to be 20 years. If the turbines are still operational after 20 years the consultation will be reinitiated to address the additional time. Once the turbines are no longer operational, they will be removed.

The proposed project will also clear 1.0 ha of nightingale reed-warbler habitat in order to minimize the effects of wind turbines on nightingale reed-warblers at the Saipan Southern High School. Project activities include clearing vegetation and use of heavy equipment. Future activities may include construction of school facilities. Project impacts are assessed by determining the number of territories directly and indirectly affected by the action. For this

project, ESA responsibilities will be addressed by using one CNMI Government Credit in the Saipan Upland Mitigation Bank (SUMB) commensurate with the direct and indirect impacts associated with the project, and by implementing associated SUMB conservation measures.

Roles and Responsibilities

The DOE is funding the CNMI Green Energy School Project and therefore is the lead Federal agency for the consultation. The implementation and operation of the Green Energy School Project is the responsibility of the CNMI Public School System. The CNMI Public School System, along with other CNMI agencies and organizations, has agreed to assume responsibility for the long-term implementation and monitoring of the Green Energy School Project and will actively participate in implementation of conservation measures and terms and conditions described in this Biological Opinion.

Mortality Monitoring Plan

The Mortality Monitoring Plan (MMP) is provided as an Appendix to the Biological Assessment. The MMP describes the procedures, methods, and roles and responsibilities for monitoring potential wildlife fatalities during the operation of wind turbines at five schools on Saipan. The program will monitor wildlife mortality or injury at the 10 turbines proposed for Saipan Southern High School, Koblerville Elementary School, Kagman High School, Cha Cha Oceanview Junior High School, and Gregorio T. Camacho Elementary School.

The monitoring program will be implemented by the CNMI Public School System with technical assistance from the CNMI Division of Fish and Wildlife and the Service. The CNMI Division of Fish and Wildlife and the Service will provide advice and training to Public School System staff and students as appropriate. Because the wind turbines are located on school property, school custodial and maintenance personnel will also be included in monitoring training as they may be the only personnel available during summer vacation.

The initial MMP study duration will be two years. Monitoring will be conducted year-round. The area underneath the turbines will be searched for injured animals or carcasses and be completed for three to four consecutive days with three to four days between searches. This schedule may be adjusted to avoid periods of bad weather (i.e., rain and wind) that would impact searcher efficiency. This level of effort may be modified with the concurrence of the Service consistent with available resources within the CNMI Public School System to perform the monitoring.

The search radius around the towers will equal twice the tower height. For the 20 kW turbines the search radius would be 49 meters and 20 meters for the smaller 2.4 kW turbines. Because the turbines are located in open grass fields and in some cases near parking areas, downed wildlife should be relatively visible. However, some turbine locations are near the edge of open areas and part of the search area may include trees and shrubs and buildings.

Searches around the four Skystream 2.4 kW turbines will consist of either a series of concentric circular transects around the tower starting at the tower base or linear transects that cover a comparable area. The search areas may require modification to account for trees, shrubs, and buildings. If buildings are located within the search areas, the roofs will be scanned for downed

wildlife. Areas of trees and shrubs may be searched more efficiently separately from open areas using transects that best match vegetation characteristics. A transect of six meters wide will be walked, recording any injured wildlife or carcasses found. The width of transect will be adjusted based on visibility. Shorter vegetation, such as a mown field and parking areas, will allow increased visibility and wider transects. Surveyor flags or brightly colored towels can be placed on the outer edge of the transect to mark the area searched. The markers can be moved to the outer edge of the next transect and continued until the total area is searched. It is expected that searching the area around the small turbines should require no more than 10 to 20 minutes, possibly less time if groups of students are used. However, areas of trees and shrubs may require more search time because of the decreased visibility. Approximately 274 meters of transect would be walked for each small turbine.

The six 20 kW turbines at Southern Saipan High School are configured in a single row between the high school and the adjacent Koblerville Elementary School. Because of the linear configuration, linear transects three to six meters wide will be walked along each side of the turbines out to a distances of 48 meters. The transects will extend 48 meters beyond each end turbine in the row to include the entire area surrounding the row of turbines. Approximately 16 to 20 transects would be required to cover the entire area. Transect length will be determined by the spacing of the six turbines. Modification of transects may be required to adjust for trees and shrubs, buildings, and private property. Surveyor flags or brightly colored towels are suggested for marking the edge boundary of each successive transect to ensure that the entire area is searched.

Downed wildlife detection and processing

When downed wildlife is located a surveyor flag should immediately be placed at its location. Digital photos will be taken as soon as possible in case scavenging by ants or other insects or predation continues to degrade or remove the carcass. The CNMI Division of Fish and Wildlife will be immediately notified to come retrieve the carcass. If the CNMI Division of Fish and Wildlife is unable to come retrieve the carcass, the carcass will be collected in a sealable one-gallon freezer bag for later species identification using disposable gloves. The date, location, and assigned specimen number will be written in black marker on a stick-on mailing label that is affixed to the bag. Each specimen will be given a sequential number or letter that can be used to relate the subsequent identification of the specimen to the data recorded on the data sheet. Carcass specimens will be placed in a freezer or some sort of cold storage and then transferred to the CNMI Division of Fish and Wildlife for identification of species and if possible, age and sex. After positive species identification, the species name will be entered on the data sheet by CNMI Public School System staff. If injured wildlife is found, the CNMI Division of Fish and Wildlife will be contacted to receive the injured animal and transport it to a veterinary facility if necessary.

The position of the injured wildlife or carcass on the ground relative to the tower (i.e., direction and distance) will be noted. Any weather conditions that occurred between the previous survey and current survey that might impact visibility or flight will be recorded. This might include rain, fog, low clouds, or unusually strong winds. The data recorded by CNMI Public School System staff for each survey will include date, time, location, wind turbine type, surveyors, and unusual weather conditions since the last survey. For each carcass found, a sequential specimen

number will be assigned, species name (if identifiable), sex and age if identifiable, specimen condition (e.g., what body parts were found, etc.), distance from the nearest turbine tower, direction for turbine tower, and any additional notes.

The CNMI Public School system will prepare mortality monitoring kits for each school participating in the monitoring effort. The monitoring kits should will the following items:

1. Disposal gloves for handling carcasses
2. Surveyors flags or other means to mark the area surveyed and any carcasses found
3. Clipboard
4. Data sheets and survey log
5. One gallon sealable freezer bags and stick-on mailing labels
6. Pen and black marker
7. Compass (for estimating direction from tower)
8. Identification guides or pictures of common species

A survey log listing of dates and start/end times for each survey conducted will be kept with the monitoring kit to inform surveyors when the last survey was performed.

Reporting

The CNMI Public School System and Division of Fish and Wildlife will be responsible for reporting monitoring data to the Service. Any mortality of a threatened or endangered species will be reported immediately to the Service's Pacific Islands Fish and Wildlife Office. A Mortality Monitoring Program annual report will be prepared and submitted to the Service by December 31 of each year. For the first year, a report will also be submitted six months after turbine operation begins. This report will be used as the basis for evaluating the monitoring program and for making decisions regarding continuation of monitoring or modification of procedures.

Training

Volunteers, students and school staff will be trained to conduct mortality searches, record data, and handle carcasses. It is expected that local wildlife professionals with the CNMI Division of Fish and Wildlife or the Service, if available, will provide appropriate training to all monitoring personnel. Training will focus on how to perform searches, data recording, and protocols for safely handling carcasses. The initial training sessions can also be used to evaluate the best search routine for each site to account for different types of vegetation, buildings, or paved areas within the search area. Training should occur prior to turbine operation in the first year, and at the beginning of the school year for future years.

Conservation Measures

The following conservation measures, developed in coordination with the Service, will avoid or minimize effects to the nightingale reed-warbler and Mariana swiftlet. They are considered part of the project description. Any changes to, modifications of, or failure to implement these conservation measures may result in a need to reinitiate this consultation.

1. The CNMI government will donate one CNMI Government Credit in the Saipan Upland Mitigation Bank prior to any site disturbance at Saipan Southern High School. In

accordance with the Nightingale Reed-Warbler Programmatic Consultation and Saipan Upland Mitigation Bank Agreement and Addendum, the agreed-upon credit transfer will be as follows:

- a. Prior to the start of any vegetation clearing or earth-moving activities at the project site, the CNMI Public School System shall secure one CNMI Government Credit at the Saipan Upland Mitigation Bank that is intended to provide 1.75 nightingale reed warbler territories within the Bank boundary.
 - b. Upon written notification that the credit has been secured (i.e., a CNMI Government Transfer Document has been signed by all necessary authorities and copy has been sent to the Service), the Service will provide acknowledgement to the DOE and CNMI Public School System indicating the credit obligation has been fulfilled and on-site project activities may begin as outlined in the project description above and the remainder of the conservation measures listed below.
2. Clearing of vegetation adjacent to Saipan Southern High School will only occur between October through December or April through June, when nesting activity is not at its peak.
3. Adequate plastic construction fencing will be placed and maintained around any habitat that is to be avoided (including buffer areas and adjacent parcels) to prevent impacts to habitat from construction equipment and personnel.
4. All on-site construction personnel will receive instruction regarding the presence of listed species and the importance of avoiding and minimizing impacts to these species and their habitat.
5. The CNMI Public School System will ensure that no unauthorized take of nightingale reed-warbler or destruction of their habitat occurs. The CNMI Public School System and DOE will have the authority to stop all activities that may result in such take or destruction until appropriate corrective measures have been completed. The CNMI Public School System and DOE will be required to report immediately any unauthorized impacts to the Service and CNMI Division of Fish and Wildlife.
6. All construction equipment arriving from Guam will have proper brown treesnake (*Boiga irregularis*) inspection conducted by CNMI Customs or Quarantine personnel under established CNMI procedures. All on-site personnel will receive instruction to kill any brown treesnake and to contact the CNMI Division of Fish and Wildlife immediately upon a sighting.
7. A litter-control program will be implemented during construction. All tools, gear, and construction scrap will be removed upon completion of work in order to prevent the attraction of non-native pests (e.g., rats).
8. All workers will ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash from the project area are deposited in covered or closed trash containers. The

trash containers shall be removed from the project area and disposed of off-site at an approved landsite at the end of each working day.

9. No contamination (trash or debris disposal, non-native species introductions, attraction of non-native pests, etc.) of adjacent habitats will result from project-related activities.
10. No invasive plant species other than tangantangan (*Leucaena leucocephala*) shall be planted and every measure should be taken to ensure these species are not established on the property.
11. Studies have indicated that painting one blade black and the other two white increases the visible perception of the rotating blades (Hodos 2003). However, the actual effectiveness of the improved blade visibility in decreasing bird collision has not been well established yet. The CNMI Public School System and its contractor will ensure that, prior to erection and installation of the turbines, one blade will be painted black and two blades painted white in an effort to improve visibility during daylight hours.
12. Because suitable nightingale reed-warbler habitat exists around the project locations, annual surveys will be conducted adjacent to each school to determine whether reed-warblers have established territories near the project sites. Currently, the Southern Saipan High School is the only site with a known nightingale reed-warbler territory. Surveys will be conducted by qualified individuals from the CNMI Division of Fish and Wildlife. If nightingale reed-warblers are detected in the future near project locations, appropriate management actions will be cooperatively determined by the CNMI Public School System, CNMI Division of Fish and Wildlife, and the Service. Results of surveys will be shared with the Service.
13. The CNMI Public School System, in coordination with the CNMI Division of Fish and Wildlife, will implement predator control program at Mariana swiftlet caves on Saipan. Within six months of turbine operation, the CNMI Public School System and CNMI Division of Fish and Wildlife will work with the Service to develop and implement the predator control program.

STATUS AND ENVIRONMENTAL BASELINE OF THE SPECIES

Mariana swiftlet

Listing Status

The Mariana swiftlet was federally listed as endangered on August 27, 1984 (USFWS 1984). A five-year status review was completed in 2010 (USFWS 2010) and a recovery plan for the Mariana swiftlet was completed in 1991 (USFWS 1991b).

Historic and Current Distribution

The Mariana swiftlet is endemic to Guam and the four southern islands of the CNMI (Cruz et al. 2008, p. 233). A population also became established on Oahu, Hawaii, between 1962 and 1965 (Wiles and Woodside 1999, p. 57). Most historical information on the species comes from Guam, where it was reported as being common and the third most abundant species seen during roadside counts, but declined to approximately its current levels by the late 1970s (USFWS

1991b, p. 7). The total number of Mariana swiftlets occurring within its historical range is currently over 6,000 individuals and it currently occurs on Guam (in three known caves within the Naval Munitions Site), Aguiguan (in nine known caves), and Saipan (ten known caves), and is considered extirpated from Tinian and Rota (CNMI DFW 2010, pp. 45-46; Navy 2011, p. 4; USFWS 1991b, pp. 8, 13-14; Engbring et al. 1986, pp. 58-59). Long-term data from swiftlet surveys at 10 caves on Saipan shows that swiftlet numbers have been steadily increasing, to a total count of over 5,500 individuals in 2010 (CNMI DFW 2010).

Ecology and Life History

The Mariana swiftlet nests and roosts in limestone caves with the following characteristics: entrances typically a minimum of 2 m (6.2 ft) high; chambers with dark zones; and fresh air (USFWS 1991b, p. 2). Most birds leave their cave at dawn and return at sunset, but often return from foraging to roost in caves during the day. Swiftlets navigate through the darkest portions of caves using echolocation (Vogt and Williams 2004).

Mariana swiftlets capture prey while flying, and foraging has been observed to occur over a wide variety of habitat types, including cleared and forested areas, but they appear to favor ridge crests and open grassy savanna areas (USFWS 1991b, p. 6). Large flocks have been reported to form in the evening with birds congregating and feeding close to the ground until it is dark (Chantler and Driessens 1995, p. 130). Little data on foraging height is available for the Mariana swiftlet. Swiftlets have been observed foraging from ground level to well above the forest canopy (Rounds 2011, pers. com.). Swift species are primarily higher airspace feeders, though foraging declines above 100 meters (at least in Europe) as insect number decline significantly above this level (Chantler and Driessens 1995, p. 20; Chantler 1999, p. 402). Many tropical swift species will feed just over the forest canopy, and some swiftlets will feed under the canopy at dusk (Chantler and Driessens 1995, p. 20).

An analysis of swiftlet guano collected from occupied caves on Saipan found that the remains of flying ants (*Formicidae*) were common, as were the remains of beetles (*Coleoptera*) (Kershner et al. 2007). Kershner et al. (2007) speculated that Mariana swiftlets use a foraging strategy of seeking out pulses in insects and that such dense concentrations of prey could be important resources to swiftlets. Worldwide, swifts are opportunist feeders that will exploit swarms and hatching whenever possible (Chantler and Driessens 1995, p. 20).

Eggs are laid in cup-shaped nests made of moss and saliva attached to cave walls or ceilings. A single egg is laid, usually between January and July, which is incubated for approximately 23 days with fledging occurring after 47 days (Reichel et al. 2007). Both adults care for the nestling which is, on average, fed by each adult 1.8 times a day (Morton and Amidon 1996).

Threats to the Mariana Swiftlet

The restricted distribution of Mariana swiftlets, along with its small population size and dependence on caves, makes the species vulnerable to threats. The causes for the decline of Mariana swiftlets are mostly unknown, but human disturbance, predation, pesticides, and disease have all been hypothesized as having a role. Swiftlets have been documented to flush or fail to enter their caves when humans are near or within their caves (Wiles and Woodside 1999, pp. 57,

61). Swiftlet sensitivity to human presence has resulted in injuries to chicks and adults and could result in damage to eggs (Wiles and Woodside 1999, p. 61). Sources of human disturbance have included Japanese soldiers during World War II, guano mining, hunters, hikers, and vandalism.

While the introduction of brown treesnake is known to have caused the extirpation of many bird species in Guam and CNMI, it is not known whether it has significantly affected swiftlets. Brown treesnake predation on Mariana swiftlets is considered to be a regular event and only those birds able to find nest or roost sites on high, smooth walls and ceilings are able to avoid snake predation. In August, 2011, seven brown treesnakes were observed climbing the walls of the Mahlec cave on Guam (Mosher 2011, pers. com.). The use of pesticides such as DDT has been suspected of causing the decline of swiftlet populations on Guam (Diamond 1984, p. 452), but the concentrations of pesticide residues found in swiftlet guano have not supported this hypothesis (Grue 1985, p. 301). On Saipan, non-native cockroaches are known to destroy swiftlet nests by consuming the saliva that holds the nests to the walls or ceilings (Cruz et al. 2008, p. 242). Savidge (1986, p. 9) investigated the role of disease in the decline of birds on Guam and found that there is no evidence that it has played a significant role. The typhoons that frequently occur in the area may cause periodic declines in swiftlet populations, but are not expected to threaten the species as a whole since the species has survived numerous such events during its evolutionary history (USFWS 1991b, p. 22).

Conservation Needs

The primary threats to the species continue to be predation by the brown treesnake and disturbance at nesting caves. However, other introduced predators and introduced insect species also may have negative impacts to the species. Efforts to minimize disturbance and control snakes and other predators at some nesting colonies have been undertaken. However, additional efforts are needed to help recover the species.

Ongoing Conservation Actions

Brown treesnake trapping occurs at the three occupied swiftlet caves on Guam on the Naval Munitions Site. No predator trapping currently occurs at caves on Saipan or Aguiguan. Quarterly swiftlet departure counts are conducted on Saipan and Guam to monitor swiftlet population numbers.

Environmental Baseline

Swiftlets have been detected foraging over most areas of Saipan, though they are less frequently detected in urban areas (Marshall 2011, pers. comm.). Ten caves are known in Saipan, in the central portion of the island; however, swiftlets are regularly seen foraging in areas where no caves have been found. The nearest swiftlet cave to a proposed turbine location is 3,000 meters (1.8 mile) away (Table 2). No swiftlet surveys were completed for the proposed project, and the CNMI Division of Fish and Wildlife's Breeding Bird Survey data does not cover all the areas where turbines will be located. Island-wide surveys conducted by the Service and CNMI Division of Fish and Wildlife on established transects on Saipan detected swiftlets primarily in the central parts of the island, but swiftlets were also detected in the vicinity of all proposed turbines (USFWS 2008). Overall, there is limited information available on swiftlet presence at the proposed turbine locations.

Table 2. Approximate distance from project sites to a Mariana swiftlet cave

Project site	Closest known Mariana swiftlet cave	Distance (meters)
Saipan Southern High School and Koblerville Elementary School	Hourglass	7,000
Cha Cha Oceanview Junior High School	Tin Can	2,900
Kagman High School	Tin Can	3,000
Gregorio T. Camacho Elementary School	Japanese Tunnel	5,400

Nightingale reed-warbler

A complete Status of the Species for the nightingale reed-warbler can be found in the October 23, 2008, *Programmatic Biological Opinion Regarding the Reestablishment, Management, and Use of the Saipan Upland Mitigation Bank, Saipan* (2008-F-0033). The nightingale reed-warbler was federally listed as an endangered species in 1970 (Service 1970, p. 18321). No critical habitat has been designated for this species. The main threats currently facing the nightingale reed-warbler are: (1) habitat loss and degradation (*e.g.*, wetland destruction, upland forest conversion, habitat destruction by feral ungulates, and habitat degradation by non-native invasive plant species); (2) potential for the establishment of the brown treesnake on Saipan; and (3) predation by introduced animals such as rats (*Rattus* spp.), cats (*Felis catus*), and possibly monitor lizards (*Varanus indicus*). Island-wide surveys for the nightingale reed-warbler were completed on Saipan in 1982, 1997, and 2007 (Engbring et al. 1986, USFWS 1998a, Camp et al. 2009). These data indicate that nightingale reed-warbler populations on Saipan have declined by approximately 61 percent since 1982.

Environmental Baseline

Surveys conducted by the CNMI Division of Fish and Wildlife in the spring of 2010 indicate that one nightingale reed warbler territory is located adjacent to the proposed turbine location at Saipan Southern High School (Rounds 2011, pers. com.). The territory may contain an estimated one pair of adults and up to four juveniles. The CNMI Division of Fish and Wildlife conducted additional surveys at proposed Green Energy Project sites in October, 2011, and detected no nightingale reed-warblers at these locations (Perlow 2011, pers. com.).

EFFECTS OF THE ACTION

Mariana swiftlet

Foraging swiftlets fly within the height of the rotor-swept zones of both proposed turbine sizes, and therefore, a swiftlet could collide with a turbine blade and suffer injury or death. Two swift species and six swallow species, with similar foraging habitats to Mariana swiftlets, have been killed by turbines in Canada and the mainland United States (Erikson et al. 2001, p. 58 and 62; Stantec 2011, Table 3.5). There is very little information regarding the impacts of small turbines on birds. Barclay et al. (2007, p. 381) looked at data from multiple wind farms and found that the height of turbine had no effect on bird fatalities per turbine. Anderson (2008, p. 5) reported that surveys under a small turbine (37 meter tower height) in Pennsylvania for 1.5 year found one avian mortality in the search area.

There is some evidence from the mainland United States that insects may be attracted to turbines. Kunz et al. (2007, p. 318) report that some flying insects may be attracted to the heat produced by nacelles. Some insects are attracted to the tallest structure in a landscape in a phenomenon known as “hill-topping” (Cryan and Barclay 2009, p. 1335). Horn et al. (2008, p. 127) found that the level of insectivorous bat activity at turbines could be predicted by the level of insect activity around a turbine, and suggested that bats may be attracted to insects at turbines. Rydell et al. (2010, p. 823) found that mortality of bats at wind turbines may be connected to accumulations of migrating insects at turbine towers. Long et al. (2010, p. 323) found that the common turbine color white was most attractive to insects. Aggregations of insects around turbines could serve as learned and consistent food sources (Cryan and Barclay 2009, p. 1335).

The research on insect attraction to turbines has focused on insectivorous bats. It is still not clear how and when insects are attracted to turbines, and whether this would affect swiftlet behavior. Swiftlets are believed to seek out dense concentration of insects (Kershner et al. 2007, p. 21) so it is possible if insects were attracted to the proposed turbines that swiftlets would approach the turbines to forage.

Due to the distribution of swiftlets around the island, their foraging heights and pattern, and the potential for insects to be attracted to turbines, we cannot discount the potential for swiftlets to collide with the proposed wind turbines. However, collision rates are likely to be low given that none of the proposed turbine locations is located near a swiftlet cave or near preferred swiftlet foraging areas of ridge crests and open grassy savanna areas. We do not expect more than four adult swiftlets to collide with a proposed turbine over the 20-year lifespan of the project. If a swiftlet dies after a collision with a wind turbine there is the possibility for indirect take of a swiftlet egg or nestling. The adult swiftlet lost to direct take could have been tending to an egg or nestling. The loss of this adult would then also likely lead to the loss of an egg or nestling. Loss of an egg or nestling would be indirect take attributable to the proposed project. Both adults attend nests and feed nestlings, swiftlets can breed year-round, and parental attendance after fledging is minimal (Morton and Amidon 1996, p. 9). In a worst case scenario, each adult swiftlet killed by a turbine could have been tending a nest which would then fail as a result of loss of the adult. Therefore, for each adult taken by a turbine there is the potential for take of one nest (one egg or one nestling).

Nightingale reed-warbler

Nightingale reed-warblers may be affected by turbine operation and vegetation clearing. Turbine operation could cause direct mortality or injury to reed-warblers that collide with rotating turbine blades. Tangantangan dominated forested areas with potential nightingale reed-warbler habitat are found adjacent to proposed turbine locations. Within forested areas, nightingale reed-warblers primarily are found skulking below the canopy (USFWS 1998b). Reed-warblers have a body type suited for maneuvering in dense vegetation, and are usually concealed in thick vegetation making them difficult to detect except via sound (USFWS 1998b). However, numerous passerine species have been killed by wind turbine operations. Information on mortality for similar species is difficult as no *Acrocephalus* species are present on the United States mainland where turbine monitoring reports are available.

There is currently only one occupied nightingale reed-warbler territory adjacent to a proposed wind turbine location. Habitat for this territory will be cleared as part of the proposed project to minimize the chance of collision. It is possible that over the 20-year lifespan of the project reed-warblers could move into some of the forested areas adjacent to the proposed turbines. Reed-warblers are declining on Saipan (Camp et al. 2009) reducing the risk that an area adjacent to the turbines will become occupied.

Given that there are currently no nightingale reed-warblers using habitats adjacent to the proposed wind turbines (except for the territory that will be cleared), the infrequency of nightingale reed-warblers flying in open areas, and the small rotor-swept-zone of the turbine blades, it is unlikely that a nightingale reed-warbler flight path would pass directly into the rotor-swept-zone of a proposed turbine and result in a collision.

Evaluation under Programmatic Consultation

Due to vegetation clearing of the one occupied adjacent territory, one nightingale reed warbler territory will be subject to direct impacts including habitat loss, fragmentation and degradation. Indirect impacts to this territory and potential adjacent territories include increased noise during clearing and increased risk of non-native invasive species. Project impacts are assessed by determining the number of territories directly and indirectly affected by the action. For this action, ESA responsibilities will be addressed by using one CNMI Government Credit in the Saipan Upland Mitigation Bank commensurate with the direct and indirect impacts associated with the project, and by implementing conservation measures.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future non-Federal actions that are reasonably certain to occur within the area of action subject to consultation. Future Federal actions will be subject to the consultation requirements established in section 7 of the ESA and, therefore, are not considered cumulative for the proposed action. Within the action area, the only non-Federal actions would be locally-funded educational activities, recreational sports, or school construction projects. Because the action area consists primarily of mowed lawns, buildings, and paved areas, there are unlikely to be any future actions that would affect listed species within the action area.

CONCLUSION

The Service anticipates that the direct and indirect effects of the proposed action will result in take of the Mariana swiftlet in the form of death or injury and take of the nightingale reed-warbler in the form of harassment. For the nightingale reed-warbler, the Service has determined that the proposed action conforms with the Programmatic Biological Opinion based upon the nature of the action and the incorporation of avoidance, minimization, and offsetting measures as described in that document. Additionally, the status, baseline, and potential project impacts are current and consistent with those evaluated within the Programmatic Biological Opinion.

Population numbers for the Mariana swiftlet on Saipan have been steadily increasing over the last 10 years (CNMI DFW 2010). The loss of four adult Mariana swiftlets and four nests will

not change the overall trajectory of Mariana swiftlet population numbers. After reviewing the current status, the environmental baseline, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that implementation of the proposed action discussed herein is not likely to jeopardize the continued existence of the nightingale reed-warbler or Mariana swiftlet.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations promulgated pursuant to section 4(d) of the ESA prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2) of the ESA, taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

Based on the proposed project description and the analysis of the effects of the proposed action provided above, the Service anticipates that the installation of operation of the 10 wind turbines on Saipan may cause take of Mariana swiftlet and nightingale reed-warbler. The breakdown of potential annual take for each activity is as follows:

1. The Service estimates that up to four Mariana swiftlets and four Mariana swiftlet nests (1 egg or nestling) may be taken as a result of the proposed project.
2. The Service is tracking the loss of the nightingale reed-warbler and its habitat permitted under the Programmatic Biological Opinion, and we evaluate each project to ensure that continued implementation will not result in unacceptable effects to the listed species. Actions of the proposed project may result in direct effects to one territory of the endangered nightingale reed-warbler. The conservation measures appropriate to avoid, minimize and offset project impacts as identified in the Programmatic Biological Opinion have been included within the project description above. However, it is still possible that a nest could be destroyed when reed-warbler habitat is cleared.

Effect of the Take

Mariana swiftlet

The Service has determined that this level of anticipated take is not likely to jeopardize the continued existence of the Mariana swiftlet.

Nightingale reed-warbler

The level of Incidental Take (i.e., direct effects to a portion of one territory resulting in harassment of up to two adults and up to four juveniles) anticipated from this project is authorized and accounted for within the Programmatic Biological Opinion and will not jeopardize the survival or recovery of the nightingale reed-warbler. No additional Terms and Conditions are necessary due to the conservation measures incorporated within the project description above.

Reasonable and Prudent Measures

The reasonable and prudent measures given below, with their implementing terms and conditions, are designed to minimize the impacts of incidental take that might otherwise result from the proposed actions. If, during the course of the action, the level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review the reasonable and prudent measures provided. In addition, the action that caused the taking must cease; the action agency must immediately provide an explanation of the causes of the taking; and must review with the Service the need for possible modification of the reasonable and prudent measures. The following reasonable and prudent measures are necessary and appropriate to minimize the effect of take on Mariana swiftlet.

1. The DOE and CNMI Public School System shall minimize the potential for harassment, harm, or mortality of Mariana swiftlets.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Service and any subsequent project applicant, must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

The following terms and conditions implement reasonable and prudent measure number one.

- 1(a) All CNMI Public School System maintenance crews and janitors at the five schools will be trained in carcass detection and the Mortality Monitoring Program.
- 1(b) The CNMI Public School System will provide the Service with the name and contact information for one person at each Public School System school with a wind turbine who is lead for each year for the Mortality Monitoring Program.
- 1(c) An annual report for the Mortality Monitoring Program will be prepared and submitted to the Service and the CNMI Division of Fish and Wildlife by December 31 of each year. In addition, an initial report will be submitted six months after turbine operation begins.
- 1(d) Dead Mariana swiftlets found under a wind turbine will be collected by and given to the CNMI Division of Fish and Wildlife to send to Dr. Thierry M. Work at the National Wildlife Health Center, Honolulu Field Station (U.S. Geological Survey-

Biological Resources Discipline) for a necropsy. The method of shipment and preservation will be determined in coordination with Dr. Work.

- 1(e) The CNMI Public School System will notify the CNMI Division of Fish and Wildlife and the Service of all wildlife mortalities found under the turbines.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authority to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has been defined as suggestions from the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's 7(a)(1) responsibilities for these species.

1. The CNMI Public School System should conduct scavenger removal trials to determine the rate that scavengers might be removing carcasses from beneath the turbines. The Service's Pacific Island Fish and Wildlife Office can help with setting up this program.
2. The CNMI Public School System should conduct search efficiency trials to determine if the monitoring program is detecting all carcasses beneath the turbines. The Service's Pacific Island Fish and Wildlife Office can help with setting up this program.
3. The CNMI Public School System should set up a web-based database where data from surveys at all schools can be entered to avoid loss of data and to provide a means to monitoring whether surveys are being performed.
4. The CNMI Public School System should put up signs around the turbines requesting that all wildlife injuries or mortalities be reported to the responsible school officials.

REINITIATION-CLOSING STATEMENT

This concludes formal consultation on this action. As required in 50 CFR § 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operation causing such take must cease pending reinitiation.

As stated in the Conclusion (above), the Service's finding of non-jeopardy is based in large part on the conservation measures. Should there be a failure to carry out any or all of the described measures, or if the measures are not effective, or if these measures are modified in any way without Service coordination, reinitiation of consultation will be required. If you have any questions regarding this Biological Opinion, please contact Rachel Rounds at (808) 792-9400.

Sincerely,

A handwritten signature in black ink, appearing to read 'Loyal Mehrhoff', with a long horizontal flourish extending to the right.

Loyal Mehrhoff
Field Supervisor

10/18

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Appendix 1. Not Likely to Adversely Affect Determination for the Mariana common moorhen

This Appendix is in response to your request for our concurrence with your determination that the Green Energy School Project, as described above, will not adversely affect the endangered Mariana common moorhen (*Gallinula chloropus*). The findings and recommendations in this consultation are based on: (1) your Biological Assessment dated December 30, 2011; and (2) other information available to us. A complete administrative record is on file in our office. This response is in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*).

The Mariana common moorhen was federally listed as an endangered species in 1984 (USFWS 1984). The recovery plan for the Mariana common moorhen was finalized in 1991 (USFWS 1991a, 55 pp.). A five-year status review completed in 2009 determined that the Mariana common moorhen still meets the definition of endangered (USFWS 2009, p. 9).

The Mariana common moorhen is currently found on Saipan, Tinian, Rota, and Guam. The Mariana common moorhen is believed to be extirpated from Pagan due to the volcanic eruption in May, 1981, and destruction of vegetation by feral ungulates (Stinson et al. 1991, pp. 41–42). In 2004, it was estimated that there were approximately 90 Mariana common moorhen on Guam, 154 on Saipan, 41 on Tinian, and only two individuals on Rota (Takano and Haig 2004a, p. 247 (Table 9)). On Guam, the number of Mariana common moorhens has recently decreased at the Fena Valley Reservoir potentially due to the loss of *Hydrilla verticillata*, a wetland plant used as a nesting substrate, as a result of eutrophication of the lake after a typhoon (Brooke and Grimm 2008, p. 2). While it is possible that the Fena Reservoir birds moved to other wetlands and the Guam population has not declined overall, comprehensive surveys on Guam would be needed to determine the impact of the loss of habitat at Fena Lake to the overall population. Moorhen surveys are conducted by the CNMI Division of Fish and Wildlife at 22 wetland sites on Saipan. Data from these surveys shows that population numbers were stable on Saipan from 2007-2010 (CNMI DFW 2010).

The Mariana common moorhen prefers wetlands with diverse, non-persistent, emergent vegetation containing deep and shallow water areas with equal areas of vegetation cover and open water (Ritter and Savidge 1999, p. 286; Stinson et al. 1991, p. 39). Primary habitats (as defined in the recovery plan) include: Agana marsh, Fena Valley reservoir, and the Naval Station Marsh, Guam; Lake Hagoi on Tinian; and Lake Susupe, Puntan Muchot, and Garapan wetlands on Saipan (USFWS 1991a, pp. 4–16). Several secondary wetland habitats were identified on Guam and Saipan; only one secondary wetland (Magpo) on Tinian was considered important for the recovery of the species (USFWS 1991a, pp. 4–16).

Mariana common moorhens feed on plant and animal matter in or near wetlands (USFWS 1991a). Seale (1901, p. 31) found grass, insects, and larvae in the stomachs of the Mariana common moorhen on Guam. Pratt et al. (1987, p. 128) reported that Mariana common moorhen eat mollusks and plants. Little is known about the reproduction of the Mariana common

moorhen (USFWS 1991a, p. 17). Nests have been constructed in *Scirpus litoralis*, *Panicum muticum*, and *Cyperus* spp. (Ritter 1994, p. 128; USFWS 1996, p. 7). Birds often nest multiple times in a year and juveniles from early broods are known to stay on their natal territory and help rear siblings from later broods (Ritter 1994, p. 130; Takano 2003, pp. 4–5).

Takano and Haag (2004b, p. 659) found that most radio-tagged moorhens on Guam and Saipan remained at capture sites during the dry season but moved between sites during the wet season. Moorhens tended to move alone (and not in pairs) and during the night. Two adult moorhens moved from Saipan to Tinian. Rallidae family species tend to migrate at night and fly at low altitudes (Taylor 1996, p. 113 and 134).

Currently, the main two threats to the Mariana common moorhen are: (1) loss and degradation of wetland habitat, including filling, alteration of hydrology, invasion of habitat by non-native plants, and unrestricted grazing of domestic and feral ungulates; and 2) predation by introduced species (USFWS 1991a, p. 19; USFWS 1996, pp. 11–12).

Only interim recovery objectives were identified in the recovery plan due to a lack of data necessary to fully understand the needs of viable populations of this species (USFWS 1991a, p. 21). The primary task is to promote the survival of the species by providing stable, productive habitat throughout the historical Mariana common moorhen range. This entails 1) securing and managing all primary habitats to maximize the habitat conditions; 2) maintaining the secondary habitats as wetlands or creating new wetlands for those that are lost; and 3) minimizing mortality from predation, poaching, and other factors including human disturbance.

Environmental baseline

In 2001, an island-wide survey produced an estimate of 154 Mariana moorhens on Saipan (Takano and Haag 2004a, p. 245). The CNMI Division of Fish and Wildlife conducts quarterly surveys at 22 wetlands on Saipan. From 2007 to 2010 the total number of moorhens detected at these sites has remained stable between 70 to 80 moorhens per survey (CNMI DFW 2010, p. 44). There are no wetlands or other moorhen habitat located at the project sites.

Not Likely to Adversely Affect: Mariana common moorhen

Mariana common moorhen wetland habitats are found scattered throughout Saipan, but are primarily located in the central and south of the island. Takano and Haag (2004b, p. 659) documented that moorhens move between wetland sites, primarily during the wet season. However, moorhen flight paths and flight heights are unknown.

The closest known Mariana common moorhen habitat to each turbine site is shown in Table 1. Cha Cha and Kagman schools are not on any direct flight paths between wetlands or known moorhen sites. There are National Wetland Inventory mapped wetlands north and south of Gregorio school (but not on a direct path) but it is unknown if these wetlands are still present or occupied by moorhens. Based on aerial photos it appears these wetlands may be filled in with *Phragmites karka* and unsuitable moorhen habitat. There are no records of moorhens at these sites as of 2004 (Takano and Haig 2004a, p. 247; USFWS 1991a, p. 11).

Table 1. Approximate distance from project sites to Mariana common moorhen habitat

Project site	Closest known Mariana common moorhen habitat	Distance (meters)
Saipan Southern High School and Koblerville Elementary School	Coral Ocean Point Golf Course ponds	1,100
Cha Cha Oceanview Junior High School	Lau Lau Bay Golf Course ponds	350
Kagman High School	Lau Lau Bay Golf Course ponds	950
Gregorio T. Camacho Elementary School	Nikko wetland	400

We have determined it is discountable that a Mariana common moorhen would pass through the rotor-swept-zone of the proposed turbines given the small number of moorhens on Saipan, the distance from the proposed turbines to wetland habitats, the infrequency of moorhens flying between wetlands, and the small rotor-swept-zone of the turbine blades.

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