

(JAC) JAC
9/18/06
RAC JAC
9/18/06

**Findings and Recommendation on Application by Windmar Renewable Energy, Inc.,
Guayanilla, Puerto Rico for an Incidental Take Permit for the
Puerto Rican Nightjar, Brown Pelican, and Roseate Tern**

I. Description of Proposal

Windmar Renewable Energy, Inc. (Applicant) seeks an incidental take permit (ITP) from the Fish and Wildlife Service (Service) pursuant to Section 10(a)(1)(B) of the Endangered Species Act of 1973 (Act), as amended. The Applicant proposes to erect twenty-five 1.65 MW wind turbines, that would generate 110,000,000 kWh of electricity annually, on Punta Verraco, Cerro Toro, and Punta Ventana, Guayanilla, Puerto Rico.

The Applicant anticipates that construction and operation of the proposed wind generation facilities may result in the incidental taking of the endangered Puerto Rican nightjar (*Caprimulgus noctitherus*), the endangered brown pelican (*Pelecanus occidentalis occidentalis*) and the threatened roseate tern (*Sterna dougallii dougallii*). The Applicant anticipates harm or harassment of these species which are covered by the Habitat Conservation Plan (HCP) due to 1) the permanent loss of 1.7 ha (4.3 acres) of nightjar habitat and temporary, construction-related loss of 10.5 ha (26.3 acres) of nightjar habitat; and 2) the potential mortality of brown pelicans and roseate terns from collisions with operating wind turbines.

II. Section 10(a)(2)(A) HCP Criteria - Analysis and Findings

1. Criterion – The impact to result from taking.

Findings – The Applicant’s HCP provides baseline information on the distribution of nightjar singing males (referred as “nightjar territories”) and mapped them in relation to proposed road and turbine construction. Incidental take of nightjars is expected to result only from the loss of nesting habitat. Brown pelican impacts were evaluated by studying flight patterns over the project site. The Applicant also evaluated the small amount of information available from a South American wind generation facility to estimate that pelicans may be taken at the rate of one pelican every five years. Roseate terns have not been observed on the project site, but historic records show them as possibly occurring near the site (cay located 600m south of Punta Verraco). For this reason, the Applicant requests a nominal amount of take authority (one per 20 years) for this species.

2. Criterion – The steps taken to minimize and mitigate such impacts and the funding that will be available to implement such steps.

Findings – The Applicant proposes to minimize and mitigate the anticipated incidental take of species covered by the HCP through the implementation of a number of measures. Take of the nightjar will be minimized by conducting construction and planned maintenance activities outside of the species’ nesting season. Take will also be minimized by the use of existing roads and trails throughout the project site, minimal

JAC
9/6/06
RAC
9/6/06

road improvement, minimal pad clearance, and fewer and larger turbines. The Applicant will paint rotors to increase their visibility to birds and employ measures to reduce transmission line impacts to birds. Impacts will be mitigated by restoring 2.6 ha (6.42 acres) of abandoned quarry to dry forest habitat, allowing vegetation to re-colonize most of the construction pad areas, restoring hydrology to 10 ha (24.7 acres) of mangroves, and conducting an on-site research and monitoring program. The Applicant also proposes to control predators on the project site to enhance nightjar nesting success, and to maintain certain roads as firebreaks. In addition, 245 ha (605.38 acres) of the project site will be placed under a conservation easement to conserve nightjar habitat in perpetuity.

The Applicant proposes to fund implementation of the HCP and provide the capital and annual operating budgets for the project, which include the costs of implementing the HCP and any associated permit. The total capital budget is estimated at \$50 million. The total annual operating budget is estimated at \$3 million. The real estate value of the Windmar property alone is presently estimated at \$20 million. We believe that these sources of revenue are sufficient to fully fund implementation of the Applicant's HCP and the conditions of any associated permit.

3. Criterion – Alternative actions to the take that were considered by the Applicant and reasons why such alternatives are not being utilized.

Findings – The Applicant considered four alternatives that would have avoided or reduced the effects of wind generation development on the site. One was a no-action alternative. There also was an alternative that contemplated sand and rock quarrying in certain sites, as well as two wind generation alternatives that contemplated a reduced number of turbines, or considered other sites. Unlike the proposed action, none of these alternatives would allow the Applicant to derive a significant income from the property, while at the same time, provide for long term conservation of listed species on the site.

4. Criterion – Other measures the Secretary may require as being necessary or appropriate for the purposes of the HCP.

Findings – The Service finds that no other measures are required in the HCP to implement its intent and purpose.

III. Public Comment – Analysis and Findings

A Notice of Availability was published in the Federal Register from January 6 through March 7, 2006, notifying the public of the availability of the Applicant's permit application and HCP, as well as of the Service's Environmental Assessment (EA). The Service received 16 requests for documents and 13 individual comments on the application.

Of the 13 comments received, only one favored the construction of the project. The

remaining 12 comments objected to Windmar's proposed generation facility for various reasons, which we present in this section. Only four comments provided specific comments on the project's environmental documents and the Applicant's HCP. We identified 21 issues raised by the comments received. Responses to these comments are presented below.

Comment 1: One comment suggested an alternative wind generation technology based on tethered, rotating balloons.

The Service is not aware of any active wind generation facilities that use tethered balloons, and is not aware of any information that would have led us to suggest this technology to the Applicant as an alternative that might reduce incidental take of listed species.

Comment 2: Twelve comments objected to permit issuance based on the potential adverse effects to listed species, particularly the take of threatened and endangered bird species.

In Puerto Rico, only two HCP/ITPs have been authorized or granted. Consequently, much of the general public, environmental groups and the scientific community are not familiar with the HCP/ITP concept and they may not realize that authorized take can occur when a permittee acts in compliance with a comprehensive conservation or mitigation plan.

The effects of the proposed wind generation facilities on the three covered species, as well as on other listed species that might occur in the project area, are considered in the Service's biological opinion (BO) prepared separately for this permit review. The conclusions of the BO concerning the covered species are incorporated in the section below on permit issuance criteria. The BO determined, among other things, that Windmar's proposed action would not likely have an adverse effect on other listed species that may occur in the project area.

Comment 3. Three comments expressed concerns regarding cumulative effects of mortality on brown pelicans.

Elphick and Ellis (2004) developed a population model for the pelicans in Puerto Rico and the U.S. Virgin Islands (USVI), and evaluated the possible long-term effects of the proposed project on the population. They identified poor adult and juvenile survival as the main current threat to this brown pelican population. Their finding is supported by data provided by Collazo et al. (1998) and Jimenez (2001). According to the proposed model, the pelican population will decrease rapidly and may approach extinction in 40 years. Published data shows a slightly slower decline. The model predicted population dynamics under six scenarios whereby additional mortality is added as a result of collisions with wind turbines, both at the anticipated incidental take level and at higher levels. The most likely incidental take scenario – where the affected pelicans come from

a local population centered in Guayanilla Bay – is not statistically different from the projected population decline without the Windmar project. In the other scenarios, the rate of the decline is slightly higher, but the difference is very small and is unlikely to be biologically significant. The Applicant's proposed mitigation plan includes the establishment of a \$100,000 grant for funding high priority research as well as management activities to minimize possible effects to pelicans. Management and research activities need to pinpoint pelican survival rates, the factors that influence mortality, and how pelicans move between subpopulations in Puerto Rico and the USVI.

The Service discussed cumulative effects on the EA and the BO and determined that cumulative effects on the brown pelican are not anticipated because the anticipated incidental take is very low and no collective effects (reduced reproduction, reduced nesting success, genetic diversity) are expected. The same determination was made for the roseate tern.

Comment 4. Three comments expressed concerns regarding the relationship between proposed effects on nightjars and pelicans and jeopardy for the species.

The Service's BO evaluated the status of the three species for which incidental take authority is sought, both throughout their entire distributions and within the action area, the environmental baseline, factors affecting species environment within the action area, and effects of the action, including direct, indirect effects and cumulative effects. We concluded that the proposed activity is not likely to jeopardize the continued existence of the Puerto Rican nightjar, the brown pelican, or the roseate tern. We determined that the habitat loss of 12.2 ha (30.14 acres) of nightjar habitat represents 0.1 percent of the suitable habitat available for the species in Puerto Rico (as estimated by Vilella and Zwank 1993a). Moreover, the Applicant's proposed mitigation will compensate for the effects by, among other measures, establishing a conservation easement on 245 ha (605.38 acres) of the project site and restoring at least 2.6 ha (6.42 acres) of a previous quarry with dry forest vegetation (suitable habitat for nightjars in the future).

We also concluded that the anticipated take of one pelican every 5 years, for a total of 8 pelicans in the 40-year operation of the project, would not significantly affect the population trend of the brown pelican throughout its distribution, considering that the species is abundant in the rest of the US and considered on its way to recovery. Moreover, the total level of anticipated take of brown pelicans in 40 years represents 1.3 percent of the pelicans estimated by Collazo et al. (1998). As to the roseate tern, we found that the anticipated take of one roseate tern every 20 years, for a total of two in 40 years, to be negligible.

Comment 5. One comment presented concerns regarding the indirect effects of the project on nightjars within the Guánica Commonwealth Forest.

Indirect effects of the project to nightjars were discussed in the EA and BO. The

anticipated indirect effects of the proposed project on nightjars consist of habitat modification and fragmentation related to the creation of open areas in the forested habitat. One of the main concerns that could result from these habitat changes is the possible increase in depredation by exotic species (cats, mongooses) in open trails. Based on biological characteristics of nightjars discussed by Vilella (1995), we have determined that these “edge” effects would extend up to 1 km (0.62 miles) within the continuous dry forest located in the Ventana area of the project. Considering the abundance and distribution of the species within the action area, which includes the 461 ha (1,139.11 acres) of the Guánica Commonwealth Forest, the timing of the Applicant’s proposed activities (outside of the nesting season), the size of the opened areas, and the methodology to clear vegetation we believe that the anticipated indirect effects are not significant in scale and will be appropriately compensated with the proposed mitigation plan, particularly the implementation of a predator control project throughout the project operation period.

Comment 5. Two comments were concerned about the future expansion of wind energy facilities in Puerto Rico and possible effects on bird species.

Currently, no other wind farms occur in Puerto Rico, and to our knowledge, the Commonwealth of Puerto Rico, has not developed a plan for additional wind farms to occur on the island. At this time, future wind-power development is uncertain in Puerto Rico. Although Erickson et al. (2001) established that collision with wind turbines is not the primary mortality cause of birds, monitoring of bird mortality will be conducted by the Applicant and the results are expected to assist us in better defining the biological significance, if any, of future wind projects on the island.

Comment 6. Three comments raised concerns regarding compliance with USFWS interim guidance for wind turbines.

The Service’s draft interim and voluntary guidance for wind farms was utilized as a reference to provide comments and suggestions to the Applicant for designing and implementing the Phase I Avian Risk Assessment (HCP Appendix III) and the minimization and mitigation plan. The final guidance was signed on May 13, 2003, but the risk assessment studies were initiated in 2002. The Phase I assessment fulfilled the intent of the Service’s guidance, however, and followed the scientifically validated recommendations to avoid or minimize impacts to birds and their habitats. The Applicant has conducted detailed studies on endangered species, flight-use, and other environmental aspects to arrive at a project design and HCP that we have determined would not significantly affect covered species and their habitats (as discussed in Service’s EA and BO). The proposed mitigation plan incorporated measures proposed by the voluntary guidance such as painting blades with particular patterns, among other measures, in order to lessen the likelihood of bird collisions.

Comment 7. Two comments expressed concerns regarding the lack of appropriate and sufficient mitigation of incidental take.

The Service concluded that the mitigation plan presented in the HCP (pgs. 76-84) is appropriate, and sufficient to mitigate the requested incidental take to maximum extent practicable (see Section IV.2 of this set of findings). The Applicant's plan was developed over the last three years in consultation with the Service. Its major feature, a conservation easement on 85 percent of the Windmar property, removes the threat of residential development (for which the property is zoned) on a parcel located adjacent to the Guánica Commonwealth Forest (GCF). The easement will, in effect, increase the size of the GCF by over 5 percent, functionally extending its eastern boundary to Guayanilla Bay, and buffering the GSF from potential future development to the east. It also protects in perpetuity over 200 ha (494.19 acres) of nightjar habitat. Protection of nightjar habitat on private lands is a principal recommendation in the recovery plan for the species. In addition, there are eight additional activities in the mitigation plan that avoid, minimize, mitigate, or compensate for project impacts on the nightjar.

With regard to the pelican, the plan includes five mitigation measures for the species. The prime feature of the mitigation plan is funding for population research, which is the highest priority management recommendation in the species recovery plan and in recent studies. Obtaining quantitative data about pelican survival rates, factors that influence mortality and how pelicans move between subpopulations in Puerto Rico and the USVI is essential in order to develop effective conservation measures for the species.

One comment mentioned that no mitigation measures have been proposed for the roseate tern. The plan does include, however, two measures to mitigate the anticipated take of roseate terns, although we consider the anticipated level of take to be minimal and discountable. These measures include the restoration of the mangrove area (nursery habitat for fish on which terns and pelicans feed) and the establishment of an environmental education program.

Comment 8. One comment claimed there would be adverse effects to wetlands within the property.

No adverse effects to freshwater or saltwater wetlands or other aquatic resources are anticipated. The site plan of the Windmar project does not cross any permanent rivers or streams. Ground water is sufficiently deep that it will not be affected by the project. The one mangrove swamp abutting the access causeway to the Verraco section is presently in a degraded condition. As part of Windmar's HCP, this mangrove swamp will be restored. Wetland areas within the property are included in the proposed conservation easement to be protected in perpetuity.

Comment 9. One comment raised issues related to Environmental Justice compliance.

As discussed in the EA, the Windmar project does not represent a source of environmental contamination that would impact adjacent communities. The Windmar project will use wind energy that avoids environmental contamination.

In addition, the Applicant proposes to permanently conserve 85 percent of a key coastal property in perpetuity. The Applicant also will provide access to the public to Ventana beach. Our EA includes information regarding Environmental Justice and discusses Guayanilla's unemployment rate of 27.3 percent. In Barrio Indio, the Guayanilla section closest to the Windmar project, the rate is about twice as high. The Windmar project may create a range of employment opportunities that will help to decrease these rates.

Comment 10. One comment asserted that the proposed action would result in significant effects to physical and biological resources at the project site.

The Applicant conducted baseline studies and appropriately characterized the physical and biological resources of the site and the manner in which the affected species, principally nightjars and pelicans, use the site. Experts were involved in the development of the HCP to appropriately address possible adverse effects and to suggest and develop measures to avoid, minimize and mitigate (to the maximum extent practicable) the effects of the proposed project. The Service has determined that the information obtained from the studies and the recommendations of the experts were appropriately used in quantifying project effects, calculating incidental take, and designing an appropriate mitigation plan. Additionally, the Service provided extensive technical assistance to the Applicant in meetings, site visits, phone conferences, letters and memoranda on the biological and ecological needs of the covered species and migratory birds, as well as on survey methodology, the determination of effects, avoidance, minimization and mitigation measures, and ITP application processes.

In our BO in which we evaluated the effects of the project on covered species, we determined that the project, as proposed, is not likely to jeopardize the continued existence of any of the three covered species. Furthermore, our EA concluded that the project, as proposed, will not have a significant effect on the physical and biological resources of the project site, nor on the surrounding environment.

Comment 11. One comment presented concerns regarding the effects of herbicides on fish and wildlife resources, including threatened and endangered species, within the property.

In its HCP, the Applicant proposes to use low concentrations of systemic, biodegradable herbicides, such as Round Up ©, to eliminate exotic grasses, particularly guinea grass, and discusses the fire risk these grasses pose. The potential incidence of guinea grass and other exotic grasses is expected to be low due to the proposed method to clear vegetation within the property. Therefore, Round Up © would be used sparingly. The Applicant has chosen to use Round Up ©, moreover, because it is biodegradable and breaks down quickly. Given the semiarid nature of the project site and lack of aquatic and wetland resources, it is highly unlikely that the limited use of any biodegradable herbicide will affect fish or wildlife resources, including threatened and endangered species. The use of Round Up © in National Wildlife Refuges is authorized by the Service.

Comment 12. Two comments expressed concerns regarding the possible effects of wind turbines on the human environment and health.

We are not aware of scientific studies demonstrating that noise related to wind energy projects cause health problems or diseases. There have been no scientifically documented cases of “wind turbine noise syndrome” to date, despite a twenty-plus year history of wind-power development in the U.S. and Europe.

According to the American Wind Energy Association (AWEA; visit http://www.awea.org/faq/tutorial/wwt_environment.html), noise was an issue with some early wind turbine designs. AWEA describes a modern wind turbine located 300 meters away as no noisier than the reading room of a library. Shadow flicker has been raised as a health issue, but it only occurs in high latitudes, where the sun at low angles can produce this effect. This effect is not possible in Guayanilla, given the project’s latitude, the orientation of the project and the distance of the nearest residences.

Comment 13. One comment reported the presence of monkeys north of Ventana beach and expressed concerns regarding possible effects of monkeys on nightjars resulting from the opening of roads.

The Service has not received information documenting monkeys at the project site. Extensive surveys and studies have been conducted in the project site since 2002 and monkeys have not been recorded. Continued monitoring and predation control efforts will be conducted at the project site, however, if monkeys are detected, the Applicant would seek to control them through the predator control program (HCP Reduction Measure #2, pg. 81).

Comment 14. Three comments questioned the appropriateness of studies conducted for the project.

Surveys and studies on threatened and endangered species as well as the Avian Risk Assessment were conducted to establish baseline information and to develop the project HCP. All study needs and procedures were identified throughout scoping meetings and consultations with Service biologists. The design of these studies included input from local experts. The Service reviewed the study reports and the Applicant’s HCP and determined that the surveys and studies were appropriately conducted.

Furthermore, results from some of the studies were utilized to identify additional studies. For example, a Phase I Avian Risk Assessment (HCP Appendix III) conducted by Dr. Paul Kerlinger identified the need for additional research on the yellow-headed blackbird, Puerto Rican nightjar, and brown pelican and other birds that might experience collision risk from the wind turbines. In the case of the blackbird, Dr. Kerlinger consulted with Service biologist Marelisa Rivera to design an appropriate study (HCP Appendix VII). For the nightjar, at the recommendation of Ms. Rivera, Dr. Kerlinger consulted with Dr. Francisco Vilella, who provided significant input (HCP Appendices V). In the case of

the flight-use study for pelicans and other birds, Dr. Kerlinger received input from Service biologist Jorge Saliva (HCP Appendix VIII and HCP pgs. 38-46). All of the studies that were recommended as a result of the Phase I Avian Risk Assessment were implemented with the Service's changes in experimental design where appropriate.

Additional studies were conducted to survey *Anolis cooki*, reptiles, amphibians, bats, and plants. Studies were designed and implemented in consultation with the Service and the Department of Natural and Environmental Resources of Puerto Rico (DNER). These studies were conducted by recognized local and U.S. experts. The Applicant also contracted for the development of a population model for brown pelicans.

The Service did not consider surveys of West Indian whistling Duck or the Puerto Rican crested toad necessary. None of these species have been documented present within the project site.

Comment 15. One comment presented concerns regarding the estimations of the amount of habitat affected by turbine erection, roadway enlargement, construction of new roads, and road maximum slope implications.

The habitat calculations and information presented in the HCP under the section "Determination of Proposed Activities" (pgs. 48-56) and summarized in Table 9 were corroborated by the Service. Estimates were based on information provided by a wind turbine manufacturer. The Service reviewed two previous drafts of the Applicant's HCP and considered that the estimates of affected habitat were underestimated. The estimates were revised upward in the final version of the HCP to allow for additional project needs during construction. The Applicant's goal is to construct the project with less habitat impact than the final calculations indicate.

The comment made a point regarding the area needed for rotor assembly. Figure 5 in HCP Appendix 10 shows that the turbine is constructed on the ground. The total area of the rectangle including the rotor (4,700 m² [50,592 ft²]) does not have to be cleared. By clearing corridors for the rotor blades, and not clearing the lateral areas, this impact can be limited to 2,000 m² (21,528.5 ft²) or less. The comment made reference to information published by the organization Wind Watch, which claims that the average clearing per turbine at three Northeast U.S. sites is 1.2-1.6 ha (3-4 acres). The three sites mentioned by the comment are significantly different from the Windmar site and cannot be used for comparisons. Two of the sites had active logging programs, and the other site had numerous quarries.

Regarding possible effects to habitat in slopes, the project site plan (HCP Figure 8, EA pg. 16) shows that all wind turbines will be constructed in fairly level areas. Access to these areas is also fairly level, except in one case, the road up to the Ventana section.

Comment 16. One comment presented concerns regarding the relation of rotor failure rates to habitat impact.

The HCP covers rotor replacement on page 55. Rotors may be replaced blade by blade while on the nacelle. This requires a small crane and a rear-wheel-steer trailer, both of which can travel along 5-m (16.4 ft) wide roads. The crane requires a 100 m² (1,076.4 ft²) work area at the turbine base. The trailer is parked on the adjacent access road.

If rotor replacement needs to take place more often than at 20-year intervals, the habitat disturbance would, nonetheless, be small in scale and measures to avoid and minimize possible effects to nightjars would be implemented.

Comment 17. One comment presented information regarding collision risks of birds.

The commentor quoted a mortality rate of 4-7 birds per turbine per year at Northeast U.S. wind farms. Based on information provided by the Applicant, this rate is for all types of birds. Most of these fatalities, however, are night-migrating songbirds, a function of the migration traffic that passes over the Northeast region, and the fact that these birds are far more numerous than other types of birds. Very few raptors have been recorded in mortality studies in the Midwest and Eastern U.S., and fatality rates have not been biologically significant for raptors or other birds.

The discussion in the HCP (pgs. 63-64) did not focus on total bird fatality. Instead, it tried to relate flight-use with mortality for the only group of large soaring birds that has been well studied – raptors. Since the pelican is a large soaring bird, and that was the only information available, the Applicant used the studies with caveats.

The Phase I Avian Risk Assessment (HCP Appendix III) looked at nocturnal migration over Puerto Rico, found it to be relatively low (much lower than the Northeast U.S.), and found that nocturnal migrants would be at low collision risk with the Windmar project. This being the case, total bird mortality at the Windmar site can be expected to be lower, probably much lower, than the rates reported for the Midwestern and Eastern U.S.

Comment 18. One comment was concerned about displacement effects on nightjars.

The Phase I Avian Risk Assessment (HCP Appendix III) noted that displacement impacts are an issue with open-country birds, such as prairie-chickens, Upland Sandpipers, and Grasshopper Sparrows. Based on the information provided, these impacts have not been demonstrated in forest birds.

Regarding displacement effects on nightjars, the HCP addresses this matter on pages 57 and 58. The comment stated that 548.6 m (1,800-foot) setbacks from turbines have been recommended by the FWS. We are not aware of this type of recommendation; however, it may apply to species living in other types of habitats (prairie-chickens, Lesser, Greater, Sage Grouse, etc.). Changes in distribution of singing males within the action area resulting from habitat modification may occur, and this was discussed in the indirect effects section of the Service BO. We believe that indirect effects, cumulatively with the

other anticipated effects, would not result in significant effects to the nightjar within the action area.

Comment 19. One comment discussed bat mortality rates from Appalachian ridges during fall migration.

The information on bats included in the EA and the HCP came from Thomas (2004). He mentioned that the population at the Project site is low and mainly composed of nectar and fruit-eating species that forage mainly below the forest canopy and that bat migration in Puerto Rico is very limited or nonexistent. This suggests that mortality to bats is not likely to be on the order claimed by the commentor. A geotechnical study conducted by the Applicant concluded that the bedrock underlying the Windmar project site is Ponce limestone, a hard, erosion-resistant rock that rarely produces caves. This bedrock extends through most of the Guánica State Forest and adjacent upland areas. Given this substrate, no significant bat hibernacula are expected to occur in the Project vicinity.

Comment 20. One comment expressed concerns regarding the project mortality studies.

The mortality study protocol presented in the HCP (HCP Appendix XIII) is the industry standard and has been validated via peer review and publication in scientific journals (e.g., Wildlife Society Bulletin). An initial 26 searches per year are proposed, but the Applicant is willing to consider increasing this to 52 (weekly), subject to the results of a carcass-removal and scavenging study. Although searches out to 60 m (196.8 ft) are probably adequate, if a pattern emerges that indicates that carcasses may be thrown farther, the Applicant is willing to adapt the methodology to extend the search beyond 60 m (196.8 ft). Based on information provided by the Applicant, in other projects, the mean distance at which carcasses have been found from the base of turbines has been less than 40 m for both birds and bats.

The mortality study protocol calls for the establishment of an independent Technical Advisory Committee to oversee the process, with one representative from the Service and one from another wildlife agency or conservation organization.

Comment 21. Two comments alleged that a road not delineated in the HCP had been prematurely constructed on the Applicant's property for use in the proposed project and that this construction had affected cultural resources and wetlands.

The comments alleged that the road was constructed along the bottom of the bluffs at Punta Verraco and that construction was "unauthorized." They also alleged that the Applicant had filled wetlands, and destroyed an important archaeological site.

The route and purpose of the new road was investigated by the Service in cooperation with the Applicant. The Applicant provided a map of the road and a copy of the local permit for the construction of the road. The Service received information demonstrating that the road was built as part of a Commonwealth Court sanctioned agreement. The

purpose for the road is to provide public access to Ventana beach that avoids transiting the Tropical Fruit orchards.

The Service, including our cultural resources and biological staff, reviewed this information, plus a field inspection was conducted by the Service on April 6, 2006. The Service confirmed that the road was constructed as a requirement of a legal settlement, that it lies on the property of Tropical Fruit (although it was constructed by the Applicant), and that it was constructed independently of any requirements or proposals in the HCP. We have no reason to doubt that the road identified by the commentors is a lawful project that did not cause incidental take of any listed species, did not affect existing cultural resources, and did not result in adverse effects to wetlands. The road in question is completely independent of the Applicant's HCP and unrelated to the wind farm project presented in the HCP. The road is not a federal action, and none of the information we collected in order to respond to the commentors on this issue has been considered in making our permit decision.

IV. Section 10(a)(2)(B) Permit Issuance Criteria – Analysis and Findings

1. Criterion - The taking will be incidental.

Findings – The Applicant proposes wind generation facilities for the purpose of generating electricity for the Commonwealth government. The Service has no reason to believe that the proposed project would be unlawful. At the Commonwealth level, the project proponents are the Puerto Rico Department of Natural and Environmental Resources, and the Puerto Rico Energy Department. The Service finds that any take of listed species caused by Windmar's construction and operation would be incidental to lawful activities.

2. Criterion - The Applicant will, to the maximum extent practicable, minimize and mitigate the impacts of the taking.

Findings - The Service finds that the Applicant has developed an adequate HCP pursuant to the ITP requirements provided in the Act and implementing regulations. The Applicant has designed measures to minimize and mitigate the impacts of construction and operation of the proposed wind power generation facilities on the covered species. These measures include:

1. Clear vegetation outside of the nightjar nesting season. To avoid impacts to nightjars from construction activities, the Applicant will clear the vegetation outside of the nightjar nesting season, except in emergency situations. Should an emergency situation arise that necessitates the clearing of vegetation during the nesting season, the Applicant will use experienced and qualified biologists to search for nightjar nests before any clearing activity is conducted. In the event a nest is found, the Applicant will avoid it by relocating the road or construction

area or by delaying the activity until the nightjar fledges its young.

2. Use existing roads. For the installation of the twenty-five 1.65 MW turbines, the Applicant is required to construct and maintain approximately 10.1 km (6.18 miles) of roads. The Applicant has sited the project, however, to take advantage of 8.7 km (5.4 miles) of existing roads. The use of existing roads will decrease the project's road construction impacts to nightjar habitat by 37 percent.
3. Use fewer and larger turbines. The Applicant has analyzed a number of turbine options, ranging from 600 KW to 3.0 MW machines. While the smaller machines are proven performers, the use of such machines would require more turbines (e.g., sixty-six 900 KW turbines would be required) and a greater area of roads and turbine construction areas. The use of smaller turbines would affect more nightjar habitat. They would also pose a greater challenge to brown pelicans and roseate terns, as more rotor blades in use would increase the rotor-hazard, cross-sectional area throughout the project site.
4. Clear vegetation in a way that allows it to recover. The Applicant will clear new roads and the turbine construction areas in a way that would allow dry forest vegetation to recover, using small to midsize bulldozers to scrape the vegetation at the surface and leaving the rootstalks intact. The coppice pattern of growth of many dry forest trees on the site reveal that the vegetation can recover. Based on information provided by the Applicant, large sections of this dry forest have been cut back to ground level more than once during the 200 years when this area was utilized by the sugar industry. Allowing vegetation to re-grow on road edges, turning areas, staging areas, turbine construction areas, and rotor construction areas would result in the recovery 87 percent of the total construction impact to the dry forest habitat.
5. Paint rotor blades to make them more visible to birds. Research appears to demonstrate that when the distal end of one rotor blade is painted with a visible pattern, birds are more likely to avoid the rotor. The Applicant will implement the most effective technique promoting bird avoidance and paint one or both blades per turbine.
6. Establish a predator control program. The Applicant will institute a permanent program to trap mongoose, rats, and feral animals on the site to decrease predation pressure on the nightjars, the dry forest lizard (*Anolis cooki*), and other native animals. Trap lines will be maintained and checked regularly by staff researchers.
7. Establish roads as fire brakes. The Applicant will maintain access roads to the wind turbines as fire brakes to decrease the threat of fire to the nightjar and its habitat.

8. Implement Avian Power Line Interaction Committee (APLIC) guidelines. The Applicant will bury all electrical transmission lines on the site out to PR-335, where they will run aboveground along existing transmission line poles to the Puerto Rico Electric Power Authority (PREPA) substation. APLIC guidelines mostly apply to situations where there are a large number of larger raptors or other birds that could be electrocuted or collide with lines. For example, ducks, eagles, grebes, and similar birds are quite susceptible if lines go over a marsh or river. Although this is not the case at the Project site, the Applicant will fit aerial transmission lines with flight diverters in any situation where there may be an electrocution or collision risk for large birds. The Applicant will insulate lines at the poles and make sure that phase to phase and phase to ground contact cannot be made by birds, such as turkey vultures (*Cathartes aura*). The Applicant will also space lines to avoid phase to phase contact.
9. Establish a conservation easement on 245 ha (612.5 acres) of the project site. The Applicant will grant a conservation easement that protects 85 percent of the project site in perpetuity. The easement is being drafted in accordance with a law approved on December 27, 2001, by the Legislature of the Commonwealth of Puerto Rico (Law Number 183, Puerto Rico Conservation Law). The easement will be offered to a qualifying non-profit organization.
10. Restore at least 2.6 ha (6.5 acres) of the 3.1 ha (7.8 acres) of the previous Texaco quarry at the base of Punta Verraco with dry forest vegetation. This activity will restore 21 percent of the dry forest lost due to construction impacts. When combined with the dry forest recovered by allowing the road margins and turbine construction areas to grow back, the total restoration of dry forest habitat will amount to 13.2 ha (33 acres) or 108 percent of the habitat impacted by the project. This restoration will fill in a key habitat gap at the base of the Verraco peninsula, allowing nightjars to establish territories in an area that may be presently too fragmented for viable territories to be established. This restoration may allow for two or more additional nightjar territories, once dry forest with a good structure has been established.
11. Restore a 10-hectare (25 acres) mangrove area by improving drainage. The Applicant will restore this mangrove area impacted by the construction of the causeway to Punta Verraco and subsequent silting in of its culverts. The restoration activity consists of the construction of a series of bridges, or the addition of a number of large culverts, along the causeway to reestablish tidal flushing of the ecosystem. The Applicant will also collect black mangrove (*Avicennia nitida*) seedlings and plant them in the mud, speeding restoration and likely improving foraging resources for the endangered brown pelican and threatened roseate tern.
12. Support brown pelican research. The Applicant will provide a \$100,000 grant to develop a pelican research program.

13. Establish an environmental education program. The Applicant will educate visitors about renewable energy and the plants and wildlife of southwest Puerto Rico. The Applicant will control site access, schedule visiting hours, and lead visitors on regularly scheduled tours. The Applicant will produce a brochure to be handed out in schools, community centers, and hotels. The Applicant will also finance environmental education projects in surrounding communities. One priority project will be to educate residents and tourists about the marine environment and the measures required to improve its health. This project will focus on the plight of the brown pelican. In addition, the Applicant will provide facilities at the Ventana beach area for local visitors. This will include, among other facilities, an informational kiosk with environmental education.

The Service has determined that the biological value of the proposed mitigation package is considerable. Most significantly, the Applicant has minimized the impacts to nightjar territories and proposes a conservation easement to protect 245 ha (605.38 acres) of the property in perpetuity. The majority of the project site (210 ha [518.9 acres]) constitutes nightjar habitat and the rest of the lands consist of mangroves, salt flats and beaches. This mitigation represents 82.8 percent of the dry forest on site and is 17 times the 12.2 ha (30.14 acres) direct impact to dry forest by the proposed construction. Conservation of dry forest by private land owners is a major goal in the nightjar recovery plan.

To compensate for the 12.2 ha (30.14 acres) of dry forest directly affected by construction, the Applicant will restore 13.2 ha (33.0 acres) on-site. This would result in a net increase of 8 percent in dry forest habitat that is potential new habitat for the nightjar. Only 1.7 ha (4.2 acres) of dry forest will be permanently affected by construction. The loss of the 1.7 ha (4.2 acres) would be outweighed by the restoration of at least 2.6 ha (6.42 acres) of the abandoned Texaco quarry. Furthermore, by closing this habitat gap between Punta Verraco and Cerro Toro, up to 4 new nightjars singing territories could be occupied.

Funding for pelican research is essential. The species recovery plan and researchers contracted by the Applicant have identified a need for research to better understand population dynamics of brown pelicans in the Caribbean. The mangrove restoration proposed by the Applicant would improve the health of Guayanilla Bay and the amount of available fish nursery habitat. This would benefit the brown pelican, roseate tern, and other seabird populations. Moreover, the Applicant will implement measures to diminish the likelihood of brown pelicans, roseate terns, and other seabirds colliding with the rotors.

We believe that the Applicant has proposed measures that minimize and mitigate the impacts of anticipated taking to the maximum extent practicable.

3. Criterion - The Applicant will ensure that adequate funding for the ITP and procedures to deal with unforeseen circumstances will be provided.

Findings – The Applicant has committed to make annual appropriations necessary to implement the provisions of the HCP in three phases budgeted as follows (in 2004 dollars):

Phase I, Construction (Year 1) \$300,000 (includes construction of research station, improvement of water flow in mangrove area, development of water-delivery system for habitat restoration, and purchase of essential equipment)

Phase II, Restoration (Years 1-5) \$200,000/year (includes staff and materials for habitat restoration, monitoring, predator-control, and education activities)

Phase III, Maintenance (Years 6-40) \$100,000/year (includes staff and materials for habitat restoration, monitoring, predator-control, and education activities)

Given the proposed permit term of 40 years, the effects that natural stochastic events may have on the level of impacts and effectiveness of the proposed minimization and minimization measures, and the complexities of the proposed action as they relate to other planned beach management actions, it is likely that unforeseen circumstances will occur that necessitate modifications to the implementation of the HCP. Within the constraints provided under the Service's No Surprises Policy, the Applicant has committed to work with the Service to address these unforeseen circumstances. As proposed in the HCP, the Applicant has provided reasonable assurances that they will deal with unforeseen circumstances.

4. Criterion - The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

Findings - The wording of this criterion is identical to the "jeopardy" definition under the section 7 regulations (50 CFR 402.02), which defined the term "jeopardize the continued existence of" as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." As a result, issuance of this section 10(a)(1)(B) permit was reviewed by the Service under section 7 of the Act. In the biological opinion, which is attached hereto and incorporated herein by reference, the Service concluded that issuance of the incidental take permits is not likely to jeopardize the continued existence of the Puerto Rican nightjar, brown pelican, or roseate tern.

5. Criterion - Additional measures as required by the Director of the Service will be implemented.

Findings - The HCP has incorporated all elements necessary for issuance of a section

10(a)(1)(B) permit. These elements are addressed elsewhere in this recommendation memorandum.

6. Criterion - The Director of the Service has received the necessary assurances that the plan will be implemented.

Findings – Any permit issued in this matter would only be effective when the mitigation measures have been carried out in accordance with the special conditions of the permit. Failure to perform the obligation outlined by the conditions of the section 10(a)(1)(B) permit may be grounds for suspension or revocation of the permit.

V. General Permit Issuance Criteria – Analysis and Findings

The Service has no evidence that the Permit application should be denied on the basis of criteria and conditions set forth in 50 CFR 13.21(b)-(c). During the HCP planning period and prior to submittal of the final application, however, an incident occurred that had the potential to adversely affect the Applicant's ability to meet criterion 13.21(b)(1) (whether an applicant has been assessed a civil penalty or convicted of any criminal provision of any statute or regulation related to the activities included in their application) as well as criterion 13.21(c)(1) (violation of Federal wildlife laws). This incident involved the clearing of overgrown roads on the Applicant's property.

The Applicant presented his proposal to the Service in November 2001. After subsequent planning and negotiation, the Applicant submitted a draft HCP to the Service on January 16, 2004. An aerial survey by Service staff on April 1, 2004, and again on April 7, 2004, revealed, however, that overgrown roads on the Applicant's property had been cleared of vegetation and that some earth grading had occurred. These activities, which were part of the proposed project, were conducted prior to our determination of whether to issue a permit to the Applicant. The land clearing and grading activities could have resulted in incidental take of nightjars during their nesting season.

The matter was referred to the Service's Law Enforcement division for investigation. After making field inspections in collaboration with Service biologists, and interviewing the Applicant, Law Enforcement found insufficient evidence of unlawful take to warrant referring the matter for the imposition of civil penalties or criminal prosecution to the Department of Justice. The Applicant was not convicted or fined, so he was not in jeopardy of failing to meet any penalties or other settlements. We have no basis upon which to find that the Applicant fails to meet the general issuance criteria 13.21(b)(1) and (c)(1) and, therefore, find that these criteria have been met.

VI. National Environmental Policy Act – Analysis and Findings

Issuance of the ITP will result in the authorization of take of Puerto Rican nightjar, brown pelican, and roseate tern associated with construction and operation of a wind generation facility at Guayanilla, Puerto Rico. The issuance of the Permit would be predicated on

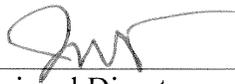
the full implementation of the Applicant's HCP and compliance with all other requirements for ITP issuance, including the terms of the permit. The Applicant modified drafts of the HCP based on pre-application consultations with the Service and provided mitigation and minimization measures for incidental take associated with the proposed wind generation facilities.

Our evaluation of the direct, indirect, and cumulative impacts in the EA indicates that ITP issuance would not have a significant effect on the human environment. The total effects from ITP issuance would not cause permanent and irreversible changes in the current state of the physical and biological beach environment, infrastructure, societal issues, economics, aesthetics, or public health and safety and, therefore, not affect the sustainability of the human environment. The incremental impact of the proposed action, when added to past, present, and reasonably foreseeable future actions, will not be significant to the human environment.

VI. Recommendations on Issuance of Permit

Based on our findings with respect to the permit application, environmental assessment, and HCP, the Service recommends issuance of the section 10(a)(1)(B) incidental take permit, TE104073-0, for take of Puerto Rican nightjar, brown pelican, and roseate tern, due to the construction and operation of a 25-turbine wind generation facility in Guayanilla, Puerto Rico. Within the spirit and intent of the Council of Environmental Quality's regulations for the implementation of the National Environmental Policy Act of 1969 (as amended) and other statutes, orders, and policies that protect fish and wildlife resources, I have determined a finding of no significant impact for this project. I have also determined that this application meets the issuance criteria found in section 10(a)(2)(B) of the ESA.

Submittal:

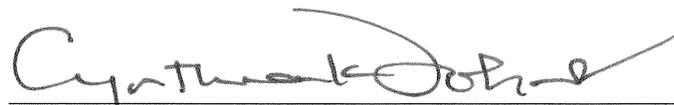
ACT


Assistant Regional Director,
Ecological Services

9/8/00

Date

Concurrence:



Deputy Regional Director,
Southeast Region,
Fish and Wildlife Service

9/8/00

Date