

intermitente cruza por el pequeño valle en V mencionado a una distancia de unos 120 metros hacia el norte. Toda la planicie costera es inundable actualmente y dada la poca elevación del piso del abrigo rocoso con respecto al suelo del valle (menos de 40 cms.) es muy posible que parte del piso del abrigo sea inundado en épocas de crecientes.

En el lugar pudimos observar una moderada acumulación de conchas de moluscos marinos, principalmente de los géneros Strombus, Cittarium, Isognomon y Crassostrea.

Consideramos este sitio ofrece mucho potencial y entendemos que sondeos futuros puedan tal vez revelar su utilización como un recurso por parte de poblaciones de recolectores pre-cerámicos. Al igual que el sitio anteriormente descrito y designado Y-10; su ubicación como parte del Bosque Seco de Guánica y su proximidad a zonas de mangles y costa ofrece una oportunidad única para ayudar a resolver parte de los problemas cronológicos de estos grupos en Puerto Rico y dentro de la región, así como para la definición de patrones de asentamiento y el análisis de zonas de explotación ("Site Cathment").

GU-14 (Abrigo Rocos, Punta Ventana II)

El sitio GU-14 se encuentra ubicado al pie de una colina caliza, en el lado noroeste de un pequeño valle en forma de V (Estrata A, Fig. 2) a unos 650 metros al noreste del lugar geográfico conocido como Punta Ventana y 1700 metros hacia el sur sureste de la Central San Francisco, en el extremo sur de la planicie costera y valle inundable ("Flood plain") del Río Yauco, (coordenadas 073140-198794, cuadrángulo de Punta Verraco).

Dos tipos de suelo predominan en el sitio: la Arcilla Teresa (Te) y la Arcilla Lómica Roca Tuque (TuF), ambos suelos ya discutidos con relación a los sitios GU-13 y GU-16 respectivamente.

La vegetación en los alrededores del sitio es predominantemente xerofítica con árboles de almácigo, aroma, guayacán y otros.

El Río Yauco se encuentra actualmente a unos 2.2 kilómetros hacia el norte, en su punto más cercano. Una quebrada intermitente cruza por el pequeño valle mencionado a una distancia de unos 80 metros hacia el sur. La elevación del abrigo rocoso con respecto al suelo de la planicie costera (casi dos metros) nos indican que posiblemente el abrigo no fuera inundable.

El sitio consiste de dos partes, un abrigo rocoso en la pared del farallón calizo cuyas dimensiones son incluidas como Apéndice D y una acumulación moderada de conchas de moluscos marinos de diferentes géneros predominando Isognomon, Strombus, Codakia, Chama, Anadara y Cittarium, y un hueso de tortuga, localizados a unos 10 metros al frente (este) del abrigo.

Dentro del abrigo, y en sus paredes laterales, desde la misma entrada, fueron localizados aproximadamente 32 petroglifos, en su mayoría sumamente sencillos. El diseño más común corresponde a figuras o representaciones de caras humanas, observando en dos representaciones algún grado de complejidad. Se observó que algunas representaciones han sido vandalizadas. Recomendamos la protección inmediata y futuros trabajos para la preservación de estas manifestaciones artísticas que tradicionalmente han sido adjudicadas a grupos culturales agroalfareros. También entendemos que se hace necesario sondeos futuros en el área de acumulación de conchas inmediatamente al frente del abrigo rocoso, de manera que se pueda definir claramente su relación, si alguna, con el abrigo rocoso, como recurso utilizado por grupos de poblaciones agroalfareras (tal vez pre-cerámicas).

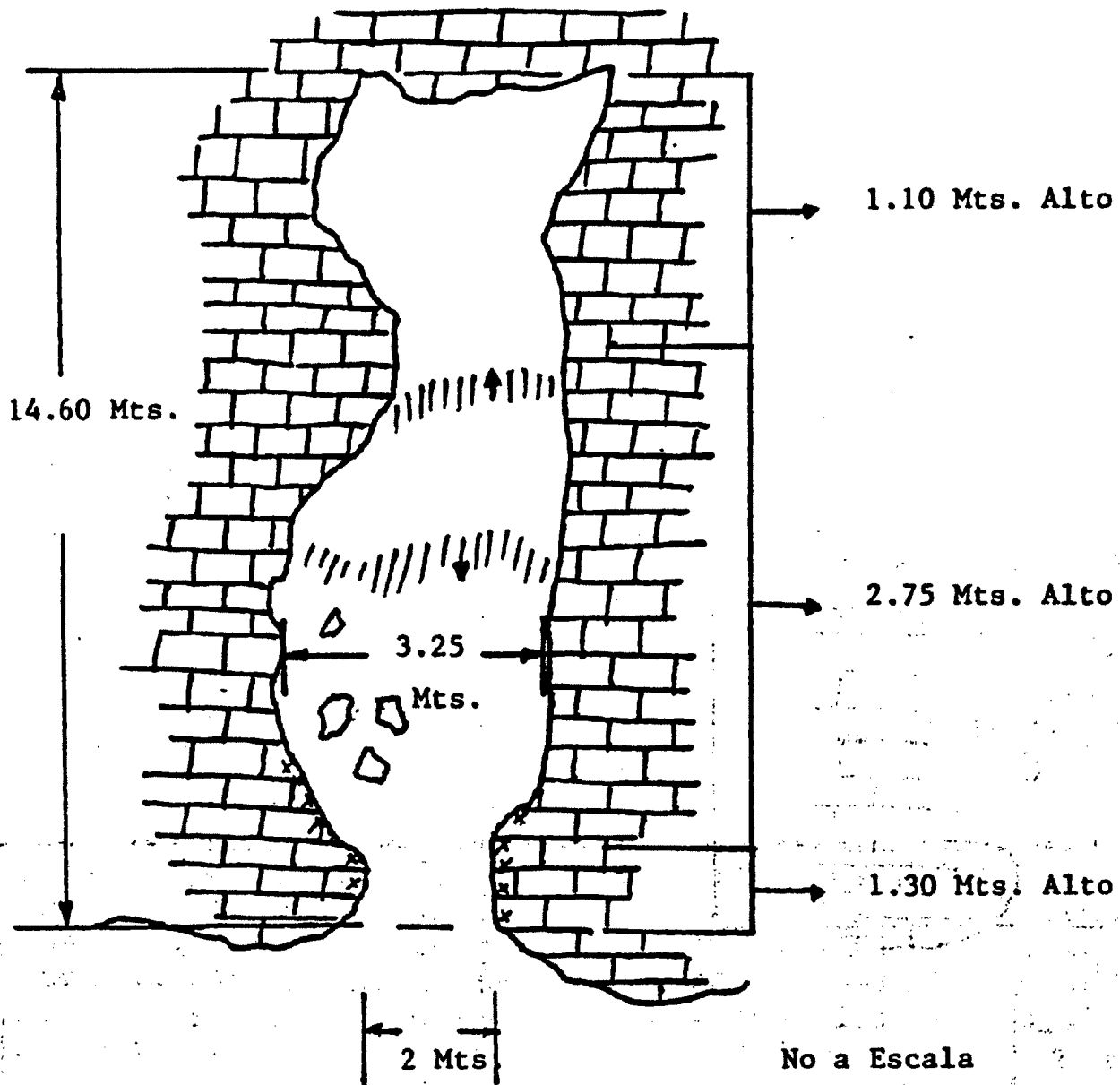
G-13 (Abrigo Rocosó Carenero I)

El sitio G-13 se encuentra ubicado al pie de la pared rocosa de un farallón calizo en el valle sumamente estrecho (lado oeste) de una quebrada intermitente, tributario menor del Río Yauco (Estrata A, Fig. 2), a unos 600 metros al norte de la intercepción de dicha quebrada intermitente con un camino de tierra que se conecta con la carretera P.R. 334, y a 1.5 kilómetros ligeramente al este del norte de la casa del guardabosques del Bosque Estatal de Guánica, en los terrenos de dicho bosque, en el Barrio Carenero del Municipio de Guánica (coordenadas 072579-198997, cuadrángulo de Punta Verraco).

El abrigo rocoso tiene un suelo mezclado con caliche y fragmentos de roca caliza (Lr, Carter, 1965, pág. 104) y en las inmediaciones predomina una vegetación xerofítica. Como nota adicional sobre la vegetación añadimos que pudimos constatar la presencia de una planta de interés antropológico en el estrecho valle: el marunguey (Zamia).

El abrigo rocoso está situado a unos tres metros sobre el nivel de la quebrada. Es de forma alargado, longitudinalmente paralelo a la quebrada con un largo de doce metros, un ancho de seis metros y una altura de tres metros, en medidas aproximadas. El abrigo es parte de un sistema de abrigos

VISTA TOPE



CROQUIS ILUSTRANDO EL ABRIGO ROCOSO
PUNTA VENTANA II (GU-14)

x x x Petroglifos

ANEJO F

**RESPUESTA DE WINDMAR A LOS COMENTARIOS PUBLICOS RECIBIDOS
POR EL SPVS ACERCA DEL OTORGAMIENTO DEL PERMISO DE TOMA
INCIDENTAL (*INCIDENTAL TAKE PERMIT*)**

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Re: WindMar response to public comment

Dear Mr. Muñiz,

I take this opportunity to respond to your letter of March 21. I hope that my timely response will expedite decision-making on the incidental take permit for the WindMar project.

Almost all of the issues raised by the public were, I believe, adequately covered in the Habitat Conservation Plan (HCP) and Environmental Assessment (EA). Therefore, I will keep my responses brief, in many cases referring to pages in these documents where more detailed responses can be found.

Since you have taken the trouble to list the principal issues, I will respond to your list, keeping in mind the actual comment or comments where each issue was expressed.

Cumulative effects of mortality on Brown Pelicans

According to a Population Viability Assessment (PVA; HCP Appendix XI), the main threat to the Puerto Rico/USVI Brown Pelican population is poor adult and juvenile survival. WindMar believes that this regrettable situation is probably directly related to the declining health of marine ecosystems (i.e., pelicans cannot find enough food in the sea, are malnourished, and cannot breed effectively or enough to sustain their population). According to the PVA, the pelican population will decrease rapidly and approach extinction in a few decades. Published data closely match the model's predictions, showing only a slightly slower decline.

The PVA models six scenarios whereby additional mortality is added as a result of collisions with wind turbines, both at incidental take levels 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 than 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 probably not biologically significant. In other words, the cumulative effects of incidental take on Brown Pelicans are meaningless in the face of ecosystem factors that are pushing the Puerto Rico/USVI pelican population to extinction.

To balance potential incidental take, our mitigation plan offers funding for the highest priority management recommendation to help the pelican – population research. Dr. Elphick's PVA tells us that managers need to pinpoint pelican survival rates, the factors that influence mortality, and how pelicans move between subpopulations in Puerto Rico and the USVI, in order to develop an effective conservation plan for the species. We believe, as do other scientists, that this research will have a significant cumulative beneficial effect for the entire Puerto Rico/USVI pelican population.

In Hawaii, FWS has recently issued an incidental take permit for two seabirds, the endangered Hawaiian Petrel and threatened Newell's Shearwater, whose nocturnal flight routes to breeding colonies may take them occasionally through a wind farm. Direct incidental take of 1.5 individuals per year per species for 20 years was deemed not to have a significant cumulative impact, in part because, as stated in the EA for that project, the take is very small relative to their estimated populations. In the case of the petrel, population estimates range from several thousand birds (on the order of the Caribbean Brown Pelican) to 34,000. Proposed mitigation measures are expected to more than offset the anticipated take and contribute to the species' recovery (visit <http://www.fws.gov/pacificislands/>).

Issued by FWS, the WindMar EA (pgs. 41-43) does discuss cumulative effects in general on the nightjar, pelican, and Roseate Tern. The EA states that cumulative effects on the Brown Pelican are not anticipated.

Relationship between proposed effects on nightjars and pelicans and jeopardy for the species

I believe this issue has been discussed adequately in the HCP (Section 7 Consultation, pgs. 66-69). In the case of the nightjar, the temporary loss of up to twelve male singing territories, with no significant indirect effects and no anticipated cumulative effects, should make no difference in an avian population that has been documented to be expanding. In the case of the pelican, as discussed in the previous section, WindMar hired a population biologist to model the effects of mortality at incidental take levels and higher levels on the pelican population. Based on the best available data, this analysis showed that the WindMar project would not affect the downward-trending pelican population in a biologically significant way. In other words, in neither case do the proposed effects themselves lead to a jeopardy outcome.

Indirect effects of the project to nightjars within the Guánica State Forest

Indirect effects of the project to nightjars were discussed in detail in the HCP (pgs. 71-73). The question here is: How would these effects relate specifically to nightjars within the Guánica State Forest?

Regarding modification of habitat conditions or loss of suitable nesting habitat, nightjar habitat in the Guánica State Forest (GSF) along the edge of the Ventana section may be influenced by the widening of roads to accomplish construction and the clearing of sites to erect wind turbines. But, WindMar documented an increase in the nightjar population at the border between the Ventana section and the GSF, when roads in Ventana were either reopened or established in order to gain access to the property and conduct a geotechnical study of the bedrock. In other words, limited habitat fragmentation in the Ventana section will likely improve habitat conditions for nightjars in the GSF whose territories abut the WindMar property. In any event, it will not degrade habitat conditions for the GSF nightjars.

The presence of operating wind turbines along the GSF border appears unlikely to affect nightjars in the GSF, or within the WindMar property for that matter. This is discussed on pages 57 and 58 of the HCP. But, the activity of constructing the WindMar project, with daily human presence and the operation of heavy equipment over a period of months, may displace nightjars temporarily near the border between the GSF and the Ventana section. Nevertheless, once construction has been completed, these birds are likely to resume their normal patterns.

It is unlikely that exotic plant species will invade the GSF as a result of the WindMar project, degrade habitat suitability, and increase the possibility of fires. The reasons for this are expressed on page 72 of the HCP. Regarding the fire threat, the roads in the Ventana section now serve as fire brakes and provide access to firefighters. This confers an indirect benefit to the GSF nightjar population. Regarding predators, for the reasons expressed on pages 72 and 73 of the HCP, the roads established in the Ventana section are unlikely to result in increased predation pressure on GSF nightjars.

Future expansion of wind energy facilities in Puerto Rico and possible effects on bird species

To our knowledge, the Government of Puerto Rico has made no forecasts with regard to wind energy's future on the island. This being the case, it is not possible at this time to predict how the industry will grow, or if it will grow. In other countries, once wind energy has been established, more projects generally follow. However, in at least two states in the U.S., no development has occurred after an initial project was constructed. It is likely that the WindMar project, if it is permitted, will be followed by others, although when those projects would be constructed is not known. These projects will likely be in coastal settings, on inland ridgelines, and, eventually, offshore. Given Puerto Rico's high quality wind resource and the rising cost of petroleum and natural gas,

it would not be surprising if the Government of Puerto Rico were to promote wind energy actively as a means of improving the island's economic competitiveness and quality of life, as well as of increasing energy independence. But, at this time, future wind-power development is uncertain.

How will this potential growth impact birds? A growing body of evidence demonstrates that wind energy's impact on birds is minor and not biologically significant. This point is covered in detail in the Phase I Avian Risk Assessment (HCP Appendix III). In Puerto Rico, a post-construction study of collision fatalities at the WindMar project will provide information on the number and type of fatalities that occur at a Puerto Rican site. This will help determine the biological significance and potential for cumulative impacts of turbine development on the island.

Lack of compliance with USFWS interim guidance for wind turbines

Normally, the FWS interim and voluntary guidance for wind farms is considered in the Phase I Avian Risk Assessment (HCP Appendix III). In WindMar's case, Dr. Paul Kerlinger conducted the Phase I prior to the issuance of the interim guidance. In essence, the Phase I fulfills the intent of the FWS guidance document and follows the scientifically validated recommendations to avoid or minimize impacts to birds and their habitats.

It is important to note that the FWS interim guidance is voluntary and was not reviewed outside FWS prior to issuance. Now, after two years of public comment, FWS is about to undertake a revision of the guidance per external reviewers' comments. While the WindMar project does not conform to every one of the voluntary guidelines or recommendations, we have conducted detailed studies on endangered species, flight-use, and other environmental aspects to arrive at a project design and a Habitat Conservation Plan that potentially will result in a net, long-term benefit to endangered species and other wildlife.

Even FWS is willing to support exceptions to the guidance in cases where the net project benefits outweigh the costs. For example, in Hawaii, FWS has recently issued an incidental take permit to a wind-energy project for the taking of up to two endangered Hawaiian Petrels, two threatened Newell's Shearwaters, three endangered Nene geese, and one endangered Hawaiian Hoary Bat per year. Please note that the take numbers used here for Hawaiian Petrel and Newell's Shearwater are different than what was quoted above because they include both direct and indirect take (visit <http://www.fws.gov/pacificislands/>).

Lack of appropriate and sufficient mitigation of incidental take

On the contrary, the mitigation plan presented in the HCP (pgs. 76-84) is appropriate and sufficient to mitigate the requested incidental take. This plan has been developed over the last three years in consultation with FWS. Its major feature, a conservation easement on 85% of the WindMar property, removes the threat of