

Southwest Marine Specialist; Cabo Rojo Watershed Pollution Threat Analysis for Potential BMPs & Pilot Project

*Final Report
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Submitted to:

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1 PROJECT SUMMARY

The southwestern portion of Puerto Rico is one of the most popular sites for ecotourism and outdoor activities in the island. The beaches in Cabo Rojo and Guánica are among the most visited by locals and tourists in Puerto Rico, making the proper management of these coastal zones essential for the preservation of ecosystems and local economies. This project focuses on optimizing management practices and gathering management recommendations from the community and stakeholders in Guánica and Cabo Rojo.

The main objectives of this project were to provide support to the Puerto Rico Department of Natural and Environmental Resources (DNER) in the management of the Guánica Dry Forest and its marine reserve, and to update the Cabo Rojo Watershed Management Plan. The Guánica marine reserve harbors important populations of endangered marine life, but public awareness and information of the area is lacking. This project provided valuable information on public use of the reserve which will help optimize management practices. Additionally, an updated Community Watershed Management Action Plan for Cabo Rojo was developed, and a small-scale demonstrative pilot best management practice project in the area was implemented. This final report details the tasks and the work completed.

2 PROJECT TASKS

The following includes descriptions of the project tasks completed during the project period. Tables 1 – 3 summarizes these tasks.

Table 1. Southwest Marine Specialist Years 1 & 2

TASK #	TASK DESCRIPTION	DELIVERABLE	PERIOD
1	Advertise and contract the Southwest Marine Specialist Position for the GSF	<ul style="list-style-type: none"> - Advertise in social media and among stakeholders - Sign 2-year contract with selected candidate 	Months 1 & 2 after Contract is signed
2	Support PR-DNER and PDC in management efforts	<ul style="list-style-type: none"> - Kick-off meeting with Guánica State Forest Manager and Biologist. - Develop Work Plan - Day to day management tasks under the GSF - Gather community members to obtain recommendations for the management of the Marine Reserve. - Create mailing list 	Months 3-24
3	Marine Protected Area Day	Coordinate and conduct outreach & education event	Months 15-20

Table 2. Year 1. CRW Pollution Threat Analysis for Potential BMPs

TASK #	TASK DESCRIPTION	DELIVERABLE	PERIOD
1	Kick-off Meeting	Work Plan	Month 1 after Contract is signed
2	CRW Pollutant Threat Analysis Site Visits	Targeted Potential Working Sites	Months 2-3
3	CRW Recommended Integrated Management Actions	Potential list of BMP's Projects for: - Stormwater Treatment - Erosion and Sediment Control - Nutrient Reduction	Months 4-9
4	Draft Final Document	Complete list of Recommended Integrated Watershed Management Actions for the CRW	Month 10-12

Table 3. Year 2. CRW BMP Demonstrative Pilot Project

TASK #	TASK DESCRIPTION	DELIVERABLE	PERIOD
1	Kick-off Meeting	Work Plan	Month 13
2	Environmental Compliance & Permitting	Environmental Compliance Approval	Months 14-15
3	BMP Implementation	Purchase of materials to implement recommended BMPs for selected Pilot Project	Months 15-20
4	Maintenance & Follow up visits	Certify functionality of implemented BMPs	Months 21-23
5	Final Report	Final Report	Months 24

2.1 SOUTHWEST MARINE SPECIALIST & CRW KICK-OFF

Completed. The Southwest Marine Specialist (SMS) position for the Guánica Marine Reserve Extension was advertised and a candidate was selected and hired. The Cabo Rojo Watershed (CRW) kick-off meeting and work plan for year 1 (Image 1) was completed. Additionally, the work plan for year 1 for the Guánica State Forest (GSF) Marine Reserve was developed. The work plan can be found in Appendix A.

2.2 Southwest Marine Specialist Year 1 Project Support

Completed. A series of meetings with the SMS and GSF Manager were completed in July 2021. Additionally, a mailing list of community members and stakeholders of the Marine Reserve was created. Background information for educational material was compiled, and brochures and other educational material was developed. All the material was discussed and approved in a meeting with Darien López (Puerto Rico Department of Natural and Environmental Resources), Guillermo Plaza (PDC), and PDC personnel. The mailing list (Image 2), educational materials (Images 3 and 4) and a marine use survey (Image 5) can be found in Appendix B.

2.3 CRW POLLUTANT THREAT ANALYSIS

Completed. To complete the CRW Pollutant Threat Analysis, PDC held meetings with representatives of the Cabo Rojo Municipality. These meetings resulted in recommendations of sites for the pollutant threat analysis. First the project team evaluated these sites using GIS and satellite imagery. After this initial assessment, the team completed field visits to potential water monitoring sites in the CRW to corroborate they were

adequate for the sampling methodology. From June 14 to June 16, 2022, the project team conducted the Illicit Discharge Detection and Elimination (IDDE) and sampled 21 sites in the CRW. Based on data from our sampling sites, the watershed has high levels of fecal coliforms (e.g., *Escherichia coli*), optical brighteners, and chlorophyll which indicate high levels of nutrients, sewage, and grey waters in these sites (Figure 8). Additionally, a historical water quality data (2009-2020) analysis and a Water Quality Index was developed by data analyst Jaime Calderín for the Guanajibo Watershed, an interactive publication of this product can be found in the following link: <https://public.tableau.com/app/profile/jaime7881/viz/RioGuanajiboWatershedWaterQualityAnalysis2009-2020/HydrologicUnit21010003MS?publish=yes>.

Overall, water pollution issues throughout the watershed are related to stormwater and wastewater management issues. Additionally, multiple stakeholders are concerned by the heavy use of herbicides to maintain green public areas by government and private parties and the potential effects these may have on water quality. In the upper Guanajibo watershed, erosion issues associated to agriculture and dirt roads are more common and additional funding should be directed to monitor these areas using an appropriate approach. Furthermore, watershed management actions designed to mitigate the effects of natural hazards should also be thoroughly analyzed. More information can be found in the [Cabo Rojo Watershed Pollution Threat Analysis](#).

2.4 RECOMMENDED CRW INTEGRATED MANAGEMENT ACTIONS DOCUMENT

Completed. The project team developed a document with recommended CRW integrated management actions. To develop a list of recommended actions, the project team

conducted an initial evaluation of potential sites within the CRW using GIS layers and satellite images. This was followed by field assessments to corroborate the sites identified using GIS.

A total of 86 sites were identified by PDC as having potential for BMP implementation. Of these, 41 were classified as Soil Stabilization (SS), two (2) as Pollution Prevention (PP), five (5) as Nutrient Reduction (NR), and 38 as Stormwater Treatment (SWT). The sites were distributed along the whole CRW. The majority of the identified SWT projects are parking spaces, which can reduce land-based sources of pollution (LBSP) without compromising the functionality of the parking space. The five recommended NR projects are all located on private lands and can target pollution hotspots. Many soil stabilization projects were identified, due to the elevated numbers of dirt roads within the CRW. These are in agricultural lands and in near coastal areas and are primarily used for off-roading with all-terrain vehicles and other types of offroad vehicles. The project team also recommends outreach to community members to educate the public on how control pollution sources. An in-depth explanation of the sites identified can be found in the *Cabo Rojo Watershed Pollution Threat Analysis*.

2.5 SMS PROGRESS REPORT FOR YEAR 1

Completed. During the first year, the Southwest Marine Specialist supported the DNER efforts in the Guánica State Forest (GSF) and its Marine Extension (ME). During this year, the SMS collaborated with DNER personnel on:

- Conducting water quality monitoring efforts

- Visiting Aurora Cay to evaluate the damages recreational infrastructure had after ongoing earthquakes
- Conducting surveys to recreational fishers in the area
- Placing recorders in the artificial ponds in the forest to corroborate the presence of *Peltophryne lemur*
- Identifying GPS points near coral reefs, seagrass beds, and areas frequented by manatees for a potential expansion of the ME
- Participating in beach cleaning efforts (Image 9)
- Conducting an aquatic diversity census (Table 5).

In addition, the SMS generated a mailing list of stakeholders of the GSF and ME for future references (Appendix B). Educational material was developed to be distributed to visitors, as the project team identified a lack of public knowledge on the extent of protected areas and the species present. This material will be used in outreach efforts during the *Día Nacional de la Reserva Marina del Bosque Seco de Guánica*. The project team is coordinating with Darien López, community leaders, and the Guánica Municipality. The promotion generated by the project team for this activity can be found in Appendix B.

2.6 SMS YEAR II PROJECT SUPPORT

Completed. The project team supported DNER personnel in the management of the Guánica State Forest and its marine extension (ME). The project team helped organize a community outreach event with the DNER, the Municipality of Guánica, and community leaders. Additionally, the project team conducted surveys to visitors of the Guánica ME.

2.7 CRW YEAR II KICK OFF MEETING

Completed. The project team has been in constant communication with DNER personnel and the proposed workplan for Year 2 was updated. On June 29, 2022, Maria Vega (DNER), Robert Viqueira Ríos (PDC), and Norman Maldonado Benitez (PDC) met to discuss the project progress and upcoming tasks. The updated workplan can be found in Appendix A.

2.8 ENVIRONMENTAL COMPLIANCE & PERMITTING

Completed. After evaluating the demonstrative project site in Villa Taína alongside DNER personnel, the project team initiated a consultation and compliance process. PDC personnel engaged and initiated a conversation with the Villa Taína administration and residents. During this process, the project team visited and evaluated the areas various times and recommended establishing a demonstrative raingarden project in the area. The project team received authorization from the Villa Taína administration to carry out this project in the upland zone of their complex (Appendix E). This demonstrative project was to be carried out in the above-ground area of the Villa Taína road. Additionally, the proposed raingarden was outside of the terrestrial maritime zone and no heavy machinery, excavation, or construction work was necessary to complete it. Nonetheless, the project team completed an initial consultation with the USFWS IPaC Species List (PC 2022-0075380) (Appendix E). Based on PDC's experience working in ecologically sensitive areas, the determination was made that the project would not have significant negative impacts on federally listed species. On the contrary, the project team is certain the demonstrative raingarden will have significant benefits for the flora and fauna of the area. Especially since the work was to be carried out above-ground and outside of the terrestrial maritime zone.

2.9 BEST MANAGEMENT PRACTICE IMPLEMENTATION

Completed. A demonstrative soil stabilization and stormwater project was completed in Villa Taína, Boquerón, PR. The project team created a raingarden in the upland zone near the Villa Taína parking area. In addition, a reforestation was completed including native plant species such as *Stahlia monosperma*, *Tabebuia heterophylla*, *Cordia rickseckeri*, *Coccoloba uvifera*, and *Thespesia populnea*. A total of 239 trees were planted by the project team. Finally, hydroseeding was also completed by the project team with the objective of stabilizing the soil and further reducing the potential sediment transport to the shore. Photos of the completed project can be found in Appendix E.

2.10 SMS: PRELIMINARY PROGRESS REPORT FOR YEAR 2

Completed. During the first 7 months of the second year, the PDC Southwest Marine Specialist continued supporting the DNER efforts in the GSF and its marine extension. During this year, PDC personnel collaborated with DNER personnel on

- Coordinating an educational activity in the Marine Extension
- Continuing the surveys in the area to identify the uses the ME has
- Conducting beach cleaning efforts (Appendix D)
- Supporting the DNER personnel in the preparation of educational material of the reserve

In addition, the project team updated the mailing list of stakeholders of the GSF and ME for future references (Appendix B). Additionally, educational material to be distributed to visitors was generated, as the project team identified a lack of public knowledge on the extent of protected areas and the species present. This material was distributed during the

Día Nacional de la Reserva Marina del Bosque Seco de Guánica the project team coordinated with Darien López (DNER), community leaders, and the Guánica Municipality. During the activity, the project team had categories for men, women, and children to promote family participation. PDC and the DNER prepared gift bags and certificates for the winners of each category. Photographs of this activity and the register sheet are in Appendix D.

2.11 MAINTENANCE & FOLLOW UP VISITS

Completed. The project team validated the demonstrative project completed in Villa Taína. The area was visited during rainfall events to confirm its effectiveness. No problems were encountered during this period and the practices were confirmed to be functioning as intended. PDC personnel completed irrigation on the planted trees and the hydroseeding. Photographs of these activities are in Appendix F.

2.12 SMS PROGRESS REPORT FOR YEAR II

Completed. During the final months of the second year, the project team completed an analysis of the survey data. A total of 51 surveys were completed by visitors to the GSF. The data shows 35% of surveyed people did not know that the GSF has a marine extension (Figure 1). Additionally, most surveyed people fall between the ages of 50-59 (15 people), followed by the ages of 30-39 (12 people) (Figure 2). In addition, 63% of surveyed people do not support the creation of a 'No take zone' (NTZ) (Figure 5). However, some people surveyed recommended designating Gilligan's Island as an NTZ.

For those that were surveyed, the main priorities for the GSF were security and the management of solid waste, with 19 (37%) and 10 (19%) votes respectively (Figure 4). Additionally, six people believed that wastewater management should be a priority. The least voted aspects were the control of acoustic pollution and marine traffic management, which did not receive any votes. Security was voted as mostly being deficient in the GSF, as well as the facilities and infrastructure (Figure 3). Wastewater management was rated as very efficient with 15 votes.

Beaches in the area are frequently visited by tourists and PDC's data shows the main reason surveyed people visited the GSF ME was for recreational purposes (64%). This was followed by gastronomic tourism (12%), and studies (12%). Of these visitors, almost half (49%) visit the area weekly and some monthly (18%) (Figure 7). The economic importance of the area's natural resources cannot be undermined. However, proper management is essential for the preservation of its ecological, cultural, and economic importance.

Based on the surveys, preventative patrols and security is recommended to be a priority for the DNER. Additionally, the management of trash and waste should be prioritized for the GSF. Finally, updating infrastructure (boat ramps, boardwalks, etc.) was also identified as a priority for surveyed users. Graphs and data can be found in Appendix B.

3 COSTS

This progress report covers all tasks in Table 4.


Table 4. Task description and related costs.

TASK	TASK DESCRIPTION	DELIVERABLE	MONTHS	COST
YEAR 1				
1	Southwest Marine Specialist Position & CRW Year 1 Kick-off	<ul style="list-style-type: none"> - Contract Southwest Marine Specialist Position - Work Plan for Year 1 GSF MRE - Work Plan for CRW Pollution Threat Analysis 	Months 1-3 after contract is signed	\$ 8,000
2	CRW Pollutant Threat Analysis	Potential list of BMPs Projects	Months 3-6	\$ 13,000
3	Southwest Marine Specialist Position	<ul style="list-style-type: none"> - Kick-off Meeting - Progress Report 	Months 3-9	\$ 10,000
4	Draft Final Document	Complete list of Recommended Integrated Management Actions for CRW	Months 6-12	\$8,000
5	Southwest Marine Specialist Position	Progress Report for Year 1	10-12	\$6,000
YEAR 2				
6	Southwest Marine Specialist Position &	Work Plan for Year 2	Months 12-13	\$4,150
7	CRW Year 2 Kick-off Meeting	Work Plan for Year 2	Months 12-13	\$2,000

Table 4. Task description and related costs.

TASK	TASK DESCRIPTION	DELIVERABLE	MONTHS	COST
8	Environmental Compliance & Permitting	Environmental Compliance Approval	Months 14-15	\$6,000
9	BMP Implementation	Purchase of materials Implement recommended BMPs for selected Pilot Project (see Table 3)	Months 15-20	\$13,000
10	Southwest Marine Specialist Position	Preliminary Progress Report for Year 2	Months 14-18	\$6,000
11	Maintenance & follow up visits	- Certify functionality of implemented BMPs - CRW Final Report	Months 21-24	\$14,000
12	Southwest Marine Specialist Position	Progress Report for Year 2	19-24	\$10,000
			Total	\$100,150.00

APPENDIX A: YEAR 1 AND 2 WORK PLAN



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Southwest Marine Specialist; Cabo Rojo Watershed Pollution Threat Analysis for Potential BMPs & Pilot Project

Contract number: 2021-000078

Proposed Work Plan – 2022

Proposed Work Plan Year I-II

YEAR I				
TASK	TASK DESCRIPTION	PARTNERS	OBJECTIVES AND DELIVERABLES	TIME PERIOD
1. Southwest Marine Specialist (SMS) & Cabo Rojo Watershed (CRW) Kick-off	Advertise and contract SMS position Year 1 Work Plan for CRW Pollution Threat Analysis	PDC, PR-DNER	<ul style="list-style-type: none"> Advertise in social media Sign 2-year contract with selected candidate Year 1 Work Plan for CRW 	February 2021- March 2021
2. CRW Pollutant Threat Analysis	Potential list of BMPs projects	PDC, PR-DNER	<ul style="list-style-type: none"> Targeted Potential Working Sites 	March 2021- April 2021
3. SMS Year 1 Project Support	Support PR-DNER in Guánica State Forest management efforts	PDC, PR-DNER	<ul style="list-style-type: none"> Kick-off meeting with GSF Manager and Biologist Develop Year 1 Work Plan Gather community members to compile recommendations for the management of the Marine Reserve Preparation and distribution of educational material Create mailing list 	April- May 2021
4. CRW Recommended Integrated Management Actions Document	Complete list of recommended integrated management actions for the CRW	PDC, PR-DNER	<ul style="list-style-type: none"> Develop potential list of BMP projects for: Stormwater Treatment, Erosion and Sediment Control, and Nutrient Reduction Draft Final Document 	May 2021- September 2021
5. SMS Progress report for Year 1	Develop progress report for Year 1	PDC, PR-DNER	<ul style="list-style-type: none"> Submit progress report for Year 1 	January 2022
YEAR II				
6. SMS Year 2 Project Support	Continue supporting PR-DNER in management efforts	PDC, PR-DNER	<ul style="list-style-type: none"> Meeting with GSF Manager and Biologist Update and develop Year 2 Work Plan Continue education efforts and community outreach Update Year 1 mailing list 	February 2022
7. CRW Year 2 Kick-off meeting	Year 2 Work Plan for CRW	PDC, PR-DNER	<ul style="list-style-type: none"> Update and develop Year 2 work plan for the CRW 	March 2022
8. Environmental Compliance & Permitting	Environmental Compliance Approval	PDC, PR-DNER	<ul style="list-style-type: none"> Receive Environmental Compliance Approval 	July 2022- August 2022
9. BMP Implementation	Purchase materials Recommended BMPs	PDC, PR-DNER	<ul style="list-style-type: none"> Implement recommended BMPs for selected pilot project 	August 2022- September 2022
10. SMS preliminary progress report for Year 2	Develop a preliminary progress report for year 2	PDC, PR-DNER	<ul style="list-style-type: none"> Submit preliminary progress report for Year 2 	August 2022
11. CRW maintenance & follow up visits	Functionality of implemented BMPs CWR Final Report	PDC, PR-DNER	<ul style="list-style-type: none"> Certify functionality of implemented BMPs Develop and submit final CRW report 	August 2022- September 2022
12. SMS progress report for Year 2	Develop a final version of the progress report for Year 2	PDC, PR-DNER	<ul style="list-style-type: none"> Submit final version of progress report for Year 2 	September 2022

Image 1. Work plan followed by PDC for years I and II.

APPENDIX B: SMS PROGRESS REPORT FOR YEARS I AND II

Directorio de Personas y su Uso con la Reserva Marina

	Nombre	Teléfono	Entidad	Pueblo	E-mail
Gobierno Estatal	DRNA Central	787-844-4660	DRNA Región	San Juan	
	Darién Lopez (Oficial de Manejo)	787-821-5706	Bosque Seco	Guánica	
	Ilia Velázquez Vega (Bióloga)	787-519-2667	Bosque Susúa	Sabana Grande	ilopezocasio@drna.pr.gov
	Maria Vega-Rodriguez	787-502-1445	Programa de Conservación de Corales		ivelazquez@drna.pr.gov
	Alfredo Montañez	787-397-0669	CEN		maria.vega@drna.pr.gov
	Ricardo Colón	787-996-9334	CEN		alfredo.g.montanez@gmail.com
	Mary Lou Marquez	787-974-0931	Autoridad de Tierras		rcolon@drna.pr.gov
	Bañero de Cana Gorda	787-299-0350	Parques Nacionales	Guánica	
	Cuerpo De Vigilantes	787-821-1710	Vigilantes DRNA	Guánica	
	Nilda Jimenez	787-821-1730	Dir. Division Esp. en Peligro de Ext.	San Juan	
Org. Sin Fines de Lucro	Yohaira Ayala	787-645-5593	Biologa DRNA	Guánica	yayala@drna.pr.gov
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	Norman Maldonado	787-616-0680	Protectores de Cuentas	Ponce	naldonado@protectoresdecuentasinc.org
	Jose Silva	787-242-7799	Para la Naturaleza	Guánica	
	Mariana Rivera Figueroa	787-722-5834 ext.276	Para la Naturaleza	Ponce	
	Mariana Rivera Figueroa	787-697-1912	Para la Naturaleza	Ponce	
	Sandra Franqui	787-244-7669	Para la Naturaleza	Ponce	
	Zamira Pagán	787-307-9082	Para la Naturaleza	Ponce/Guánica	
	Para la Naturaleza Region	787-722-5834	Para la Naturaleza Oficina Central		info@paralanaturaleza.org
	Cabezas de San Juan	787-722-5834 ext.269	Para la Naturaleza	Fajardo	
	Hacienda Buena Vista	787-722-5834 ext.231	Para la Naturaleza	Ponce	
	Hacienda La Esperanza	787-722-5834 ext.261	Para la Naturaleza	Manatí	
	Vivero Arboles mas Arboles	787-722-5834 ext.265	Para la Naturaleza	Rio Piedras	
	Vivero Arboles mas Arboles	787-722-5834 ext.223	Para la Naturaleza	Barranquitas	
	Mayra	787-306-2154	Club de Leones	Guánica	
	Scuba Dogs		Scuba Dogs		atodecosta@scubadossociety.org
	Guillermo J. Plaza Rodriguez	787-341-8888	Tortugeros del Sur	Guánica to Guayama	tortugerosdelsur@gmail.com
	Jan Manuel Sandoval	787-640-7492	Neon	Guánica	
	Wilmari	787-308-7440	Neon	Guánica	
	Dr. Ernesto Weil	787-899-2048 ext. 241	UPR Maguëyes	Lajas	ernesto.weil@upr.edu
	Julio Moreno	787-450-0139	Caricoos	Guánica	
	CARICOOS	787-832-4040 x.6288	Caricoos	Lajas	
	Jose "Paquito" Sanchez Cintron	787-508-9363	Coalicion Pro Bosque Seco	Guánica	
	Yasmin Detres	939-640-9848	Caricoos	Guánica	yasmin.detres@upr.edu
	Ruperto Chaparro	787-832-3585 ext. 5260	Sea Grant	Mayaguez	ruperto.chaparro@upr.edu
	René F. Esteves Amador, Marine extens	787-832-3585 ext. 5268	Sea Grant	Mayaguez	rene.esteves@upr.edu
	Rafael Rivera Martinez	787-722-5834 x263	Para la Naturaleza	San Juan	rafael@paralanaturaleza.org
	Alberto Mercado	787-674-4802	The Nature Conservancy	San Juan	
	Team 821	787-613-9315	Team 821	Guánica	team821@hotmail.com
	Mariana Quiñones		Consultor Ambiental	Sabana Grande	
	Carlos Juan Cruz	787-601-2632	Consultor Ambiental	Sabana Grande	
	Glenis Padilla	787-508-2475	Aleli Environmental	Lajas	alelienvironmental@outlook.com
Comerciantes	Eco Water Adventure	939-644-9702	Jet Ski Alquiler	Guánica y Lajas	www.ecowateradventure.com / Info@ecowateradventure.com
	Guilligan View Apartments	787-404-7838 (7824)	Kayaks Alquiler	Guánica	
	Jorge	787-202-3295	Giant Kayak	Guánica	
	Marcos Chacón	787-599-3037	Administrador Pescadería	Guánica	
	Viajes hacia Guilligan	787-404-7838	Viajes hacia Guilligan Catamarán	Guánica	
	Luis (Como primera Opción)		Lanchas o Barcas, recogido de		
	good sea services	787-475-9574	escombros en el área marina		
	Charles Clean Harbors	787-671-9492	Lanchas o Barcas, recogido de		
	Jorge Clean Harbors	787-513-0079	escombros en el área marina		
	Pedro Buzo	787-309-6556	Buzo	Guánica	
	Lou Villalobo	787-821-0505	Hotel Copamarina	Guánica	
	"Tato" Operador de Botes	787-821-4941	San Jacinto Boat	Guánica	
	Diane Cuenoud	787-438-6853	Veterinaria	Guánica	dcuenoud@hotmail.com
	Aquatica Dive & Surf	787-890-6071	Buceo	Aguadilla	aquaticadivesurf@gmail.com
	Paradise Scuba & Snorkeling Center	787-899-7611	Buceo	Lajas	paradisescubapr@gmail.com
Iniciopios	Blue Water Scuba	787-840-0707	Buceo	Ponce	jesusbluewater@yahoo.com
	Island Scuba Puerto Rico	787-309-6556	Buceo	Guánica	info@sanjuandiver.com
	The Dive Shop Puerto Rico	787-833-6455	Buceo	Mayaguez	info@diveshop-pr.com
	Parador 1929				
	Alcaldía	787-821-2777	Alcaldía	Guánica	
	Sr. Edwin Montalvo Pérez	787-821-2777 ext 105, 106	Ayuda al Ciudadano	Guánica	pacomunguatica2021@gmail.com
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	Sargento Sáez	787-223-0835	Bomberos	Guánica	
	Bomberos	787-821-2330	Bomberos	Guánica	
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	Angel Luis Torres Alcalde	787-967-9200	Alcalde	Yauco	
		787-674-5446	Alcalde	Yauco	

Mu	Ricardo Cedeño	787-242-3801	Turismo de Yauco	Yauco
		787-835-6603		
	Alcaldia	787-835-2660	Alcaldia	Guayanilla
		787-835-2360		
	Arte, Cultura y Turismo	787-835-7715	Arte, Cultura y Turismo	Guayanilla
Otros	Lourdes Guilbe	787-543-8864	Lider Comunitaria	Guánica
	Jeffrey "El alcalde"	787-364-9500	Residente Local	Guánica
	Dora Carbonell	787-685-4358	Residente Local	Guánica
	Jose L. Velazquez "Chewi"	787-685-3839	Lider Comunitario Guaypao	Guánica
	Pedro Buzo	787-309-6556	Buzo	Guánica
	Willy	787-543-6501	Pescador	Guánica
	Miguel Canals	787-543-2979	Lider Comunitario	Guánica
	Gerry Meyer "Agricultor"	787-246-2870	Agricultor	Guánica

Image 2. Mailing list with contacts from the government, NGOs, stakeholders, and community leaders generated by the project team.



¿Sabías que el Bosque Seco de Guánica comprende de una Reserva Marina?



La Reserva Marina de Guánica, se encuentra al Sur del Bosque Seco, con una extensión de 14.2 kilómetros², en la cual comprende de los municipios de Guánica, Yauco y Guayanilla. En el 1983 fue sometida como la extensión marina, por su rico valor ecológico que hay en el lugar.

En ella, podemos encontrarnos distintos ecosistemas como lo son las praderas de hierbas marinas. Entre ellas, la hierba de Tortuga (*Thalassia testudinum*), la hierba de Manatí (*Syringodium filiforme*). Estas dos son muy importantes para la alimentación de dos especies en peligro de extinción, como lo son los Manatíes (*Trichechus manatus*) Actualmente una población aproximada de 300 individuos en nuestras costas y la Tortuga Verde o Peje Blanco (*Chelonia mydas*) especies residentes de la Reserva Marina. Además, estos ecosistemas de praderas cumplen una función muy importante en la absorción del CO₂ y en la producción de oxígeno por medio de la fotosíntesis.



También otro de los ecosistemas marinos lo son los arrecifes de Coral, organismos sumamente importantes a nivel mundial pues son los que crean las plataformas de las islas, ayudan a reducir los embates fuertes de las olas que puedan ser causados por las marejadas ciclónicas y así reduciendo la probabilidad de la erosión costera en la isla. En los arrecifes de coral podemos encontrar que más del 75 al 90 % de las especies marinas de alto valor como lo son los peces, muchos de ellos importantes para la industria pesquera en donde se refugian o viven en los arrecifes en sus etapas larvales y juveniles.

Image 3. Educational pamphlet generated for distribution among visitors and stakeholders in the Marine Reserve.

ATENCIÓN

Si ves algún Manatí ó Tortuga Marina que haya sido **IMPACTADO con una embarcación ó **Varado** en la orilla, llámanos:**



Manatíes, impacto por embarcaciones

Tortuga Verde, impacto por Jet Ski

Por Favor:

- Estamos ante un alza en las MUERTES de las especies marinas en **PELIGRO DE EXTINCIÓN**.
- **13 Muertes** en lo que fue el 2021, la población del Manatí Antillano ya se encuentra aproximadamente entre los **300 individuos**.
- Si usted es el **capitán de la embarcación**, Respete los **Límites de Velocidad** establecidos en el área. Igualmente para Usuarios de **Jet ski**.
- Seamos conscientes que hay vida bajo el mar.

NO SEAS PARTE de una EXTINCIÓN.

AYÚDANOS A SEGUIR PROTEGIÉNDOLOS

Baja la aplicación **Dolphin & Whale 911** para reportar ó al Centro de Mando al **787-724-5700**
Tortugueros del Sur al **787-341-8888**



Image 4. Informational material generated for visitors and stakeholders of the Marine Reserve.



Cuestionario para identificar usos de la Reserva Marina del Bosque Seco de Guánica

Localización: _____

Fecha: ____/____/____ (DD/MM/YY) Hora: _____

1. ¿Con qué género se identifica más?

____ Masculino

____ Femenino

____ Otro

____ Prefiero no responder

2. ¿Cuál es su edad?

____ 12 años o menos

____ 13-18 años

____ 19-29 años

____ 30-39 años

____ 40-49 años

____ 50-59 años

____ 60 años o más

3. ¿Cuál es su profesión u oficio?

4. ¿Cuál es su nivel escolar?

____ escuela elemental



- ____escuela intermedia
- ____escuela superior
- ____grado técnico
- ____grado asociado
- ____bachillerato
- ____maestría
- ____otro

5. Municipio de residencia:

6. ¿Es dueño de una compañía que provee algún servicio en la reserva marina?

- ____Sí
- ____No

De responder si, ¿Cuál es su compañía? _____

7. ¿Conoce usted que está en una Reserva Marina?

- ____Sí
- ____No

8. Razón por la cual está visitando la Reserva Marina de Guánica:

- ____recreación
- ____turismo (gastronomía)
- ____reside en el área
- ____trabajo/negocios
- ____estudios



9. ¿Con cuanta frecuencia visita la Reserva Marina de Guánica?

- ☐ Primera vez
- ☐ 1 – 5 veces a la semana
- ☐ 1 vez al mes
- ☐ 1 vez al año
- ☐ Soy renter (temporales)

Utilización de los Recursos en la Reserva Marina

10. ¿Cuál de las siguientes actividades realiza en la Reserva Marina de Guánica?
Marque todas las que apliquen.

- ☐ Buceo
- ☐ Snorkeling
- ☐ Kayaking
- ☐ Paddleboarding
- ☐ Jetski
- ☐ Paseos en bote
- ☐ Pasadía en cayos
- ☐ Eventos culturales
- ☐ Eventos musicales
- ☐ Pesca
- ☐ Otro

Si marcó alguna, es con alguna compañía/concesionario _____ o por cuenta propia

Si es con alguna compañía o concesionario ¿Cuál es? _____



11. ¿Cómo considera que están siendo manejados los siguientes aspectos? Utilice las columnas de la derecha para catalogar su respuesta con una X.

Aspectos de Manejo	Manera en la que está siendo manejado				
	Deficiente	Poco eficiente	Neutral	Eficiente	Muy eficiente
anclaje y amarre de botes					
escorentías y aguas usadas					
uso de la rampa para botes					
actividades pesqueras					
control de ruidos					
manejo de usos recreativos					
velocidad de tráfico marítimo (cantidad y velocidad)					
seguridad (vigilancia y primeros auxilios)					
integridad de ecosistemas marinos costeros (corales, mangles, praderas de hierbas marinas)					
desperdicios sólidos y contaminación					
facilidades e infraestructura (baños, agua potable, y estacionamiento)					
rotulación (flora, fauna, direcciones, actividades permitidas y prohibidas)					

12. Escoja de la siguiente lista el asunto que entiende que es prioritario atender en la Reserva Marina de Guánica. Favor marcar solo uno.

- ___ anclaje y amarre de botes
___ escorentías y aguas usadas



- ☐ uso de la rampa para botes
- ☐ actividades pesqueras
- ☐ control de ruidos
- ☐ manejo de usos recreativos
- ☐ velocidad de tráfico marítimo (cantidad y velocidad)
- ☐ seguridad
- ☐ integridad de ecosistemas marinos y costeros
- ☐ desperdicios sólidos y contaminación
- ☐ facilidades e infraestructura
- ☐ rotulación

13. Anote en el siguiente espacio algún otro aspecto de manejo que no haya sido incluido en la pregunta anterior y que considere debe atenderse.

14. ¿Favorece la creación de un área de 'No Pesca' en la extensión marina de Guánica?

- ☐ sí
- ☐ no

Si la respuesta es sí, ¿Qué área recomienda que se designe 'área de no pesca'?



15. ¿Qué recomendaciones nos daría para el manejo de las áreas?

16. ¿Quiere recibir información sobre actividades y el manejo y conservación del Bosque Seco de Guánica y la extensión marina?

___ Sí

___ No

De responder sí, ¿cuál es su correo electrónico y/o número de teléfono?

Image 5. Survey being used to gather feedback on management and to identify uses of the Guánica Dry Forest and its Marine Extension.

All educational materials were distributed to visitors and stakeholders in the area. A lack of public awareness on the geographic limits and existence of a marine reserve was initially identified by the project team. Therefore, initial efforts were focused on increasing public knowledge on the protection of endangered marine life and educating visitors on the geographic limits of the marine extension. The survey helped identify what topic the project team should focus on educating and helped expand the mailing list. Furthermore, the survey helped identify what the major use (recreational or economic) the marine extension has and this in turn will help optimize management practices in the future. The final mailing list is included in this report.



Figure 1. Pie chart showing answers to the question “Do you know you are in a marine reserve?” More than a third of surveyed people did not know they were in a marine reserve.

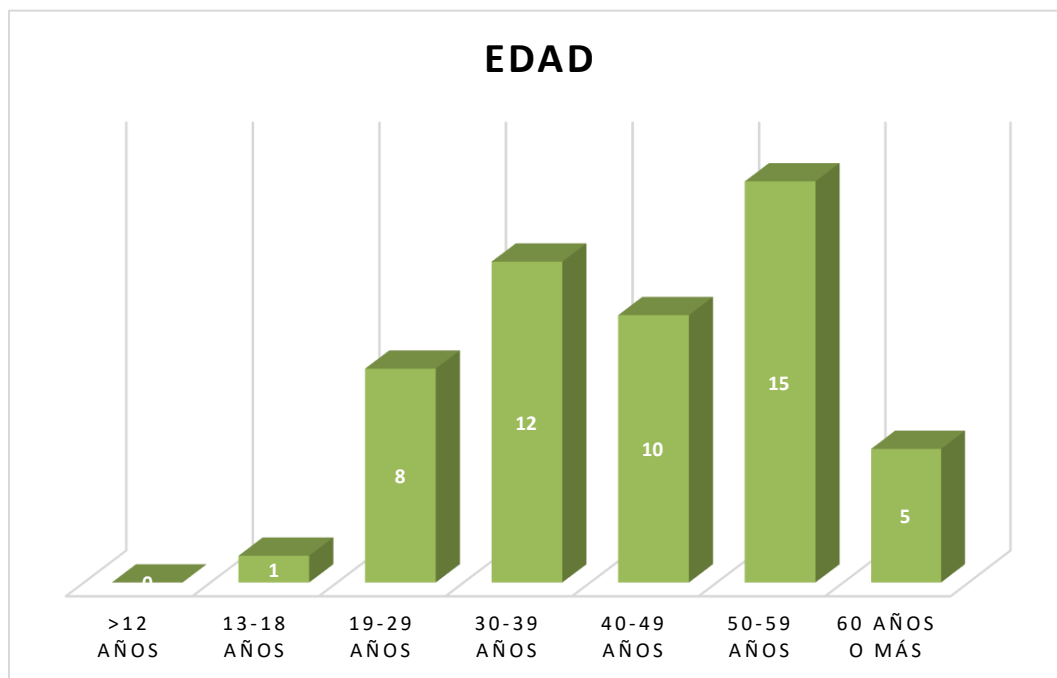


Figure 2. Graph chart showing the distribution of participants within age groups.

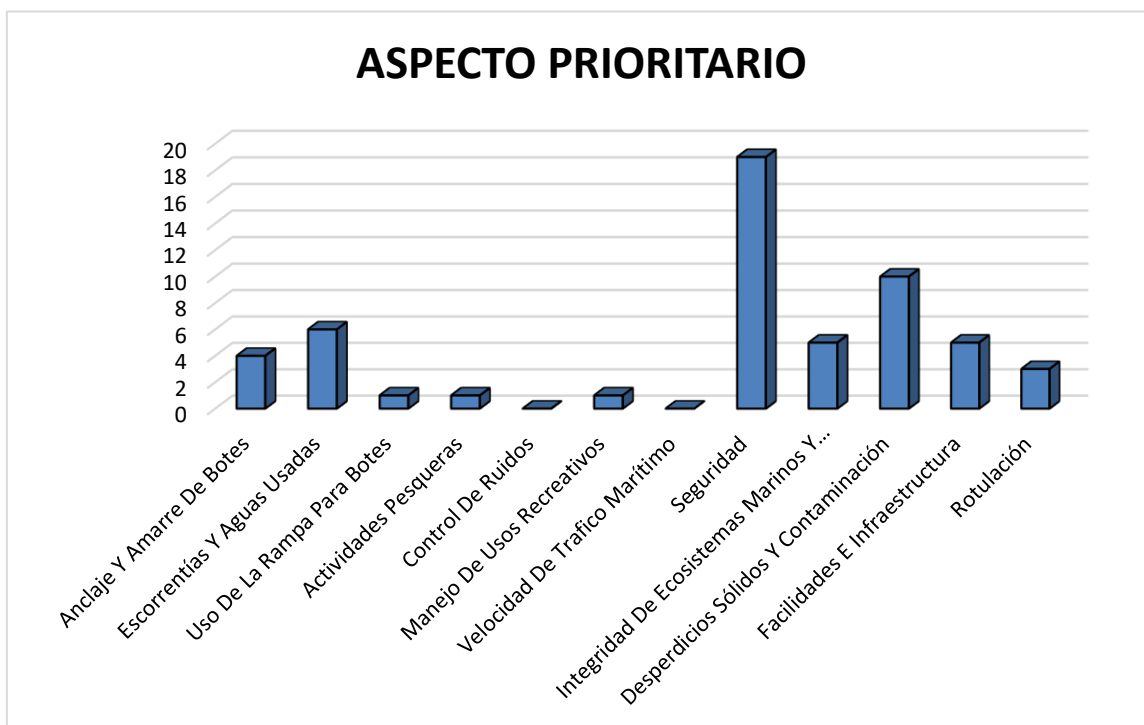


Figure 3. Graph chart showing the topic surveyed people thought should be a priority for the management of the GSF ME.

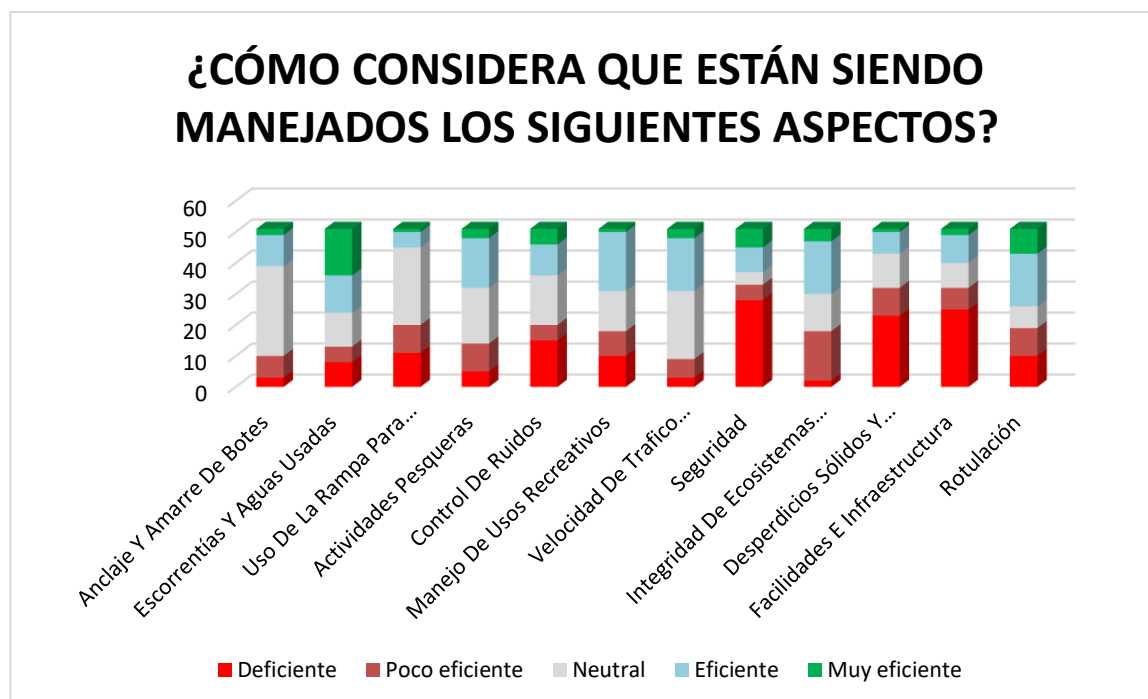


Figure 4. Graph chart showing the distribution of votes related to management aspects of the GSF ME. Options were Deficient, Inefficient, Neutral, Efficient, Very Efficient.

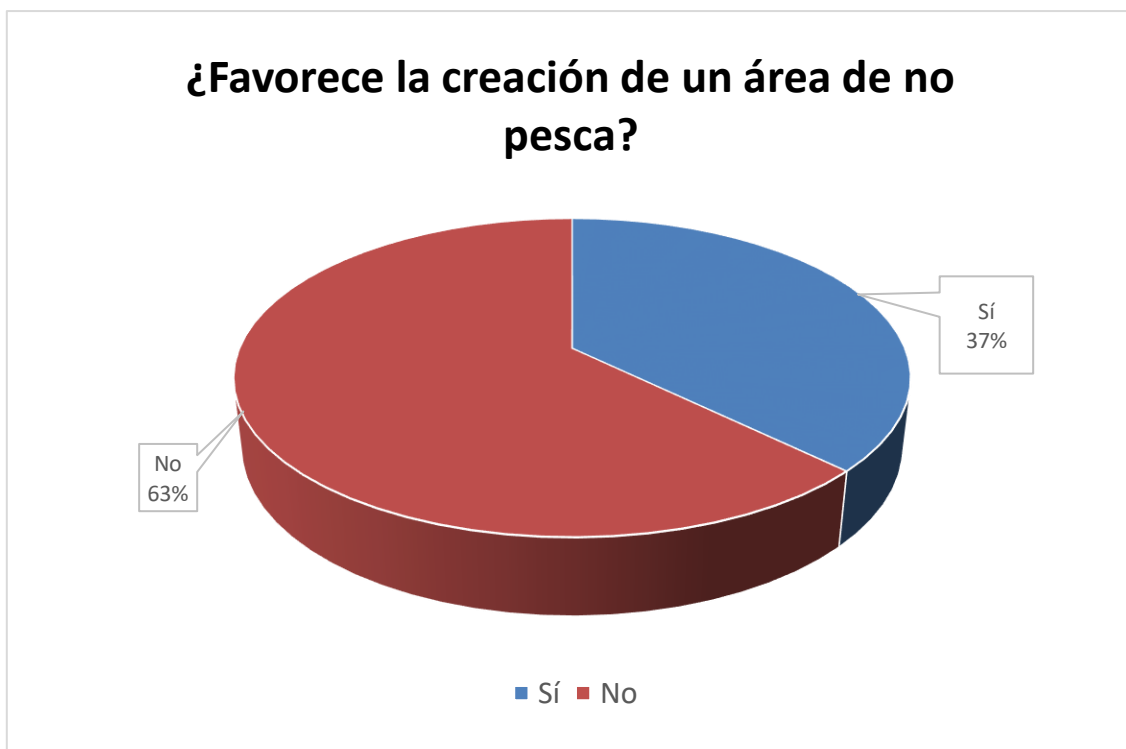


Figure 5. Pie chart showing the percent of surveyed people that were in favor or not of establishing a 'No take Zone' in the GSF ME.

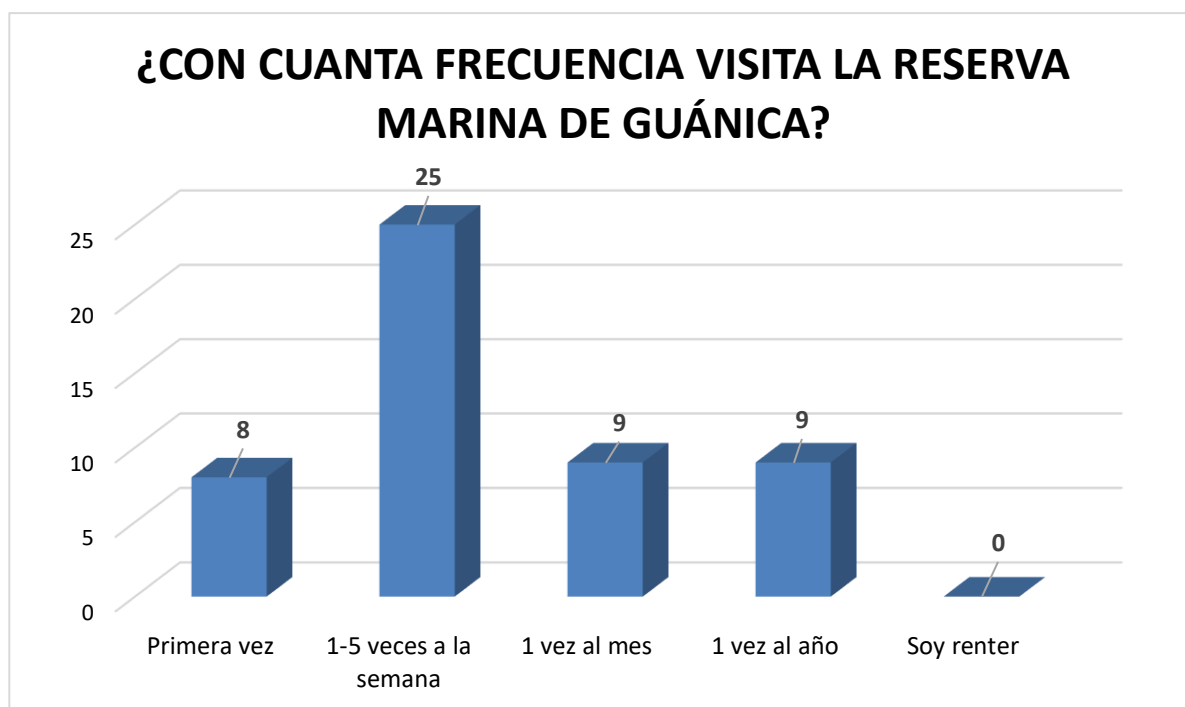


Figure 6. Graph chart showing how frequently surveyed people visited the GSF ME.

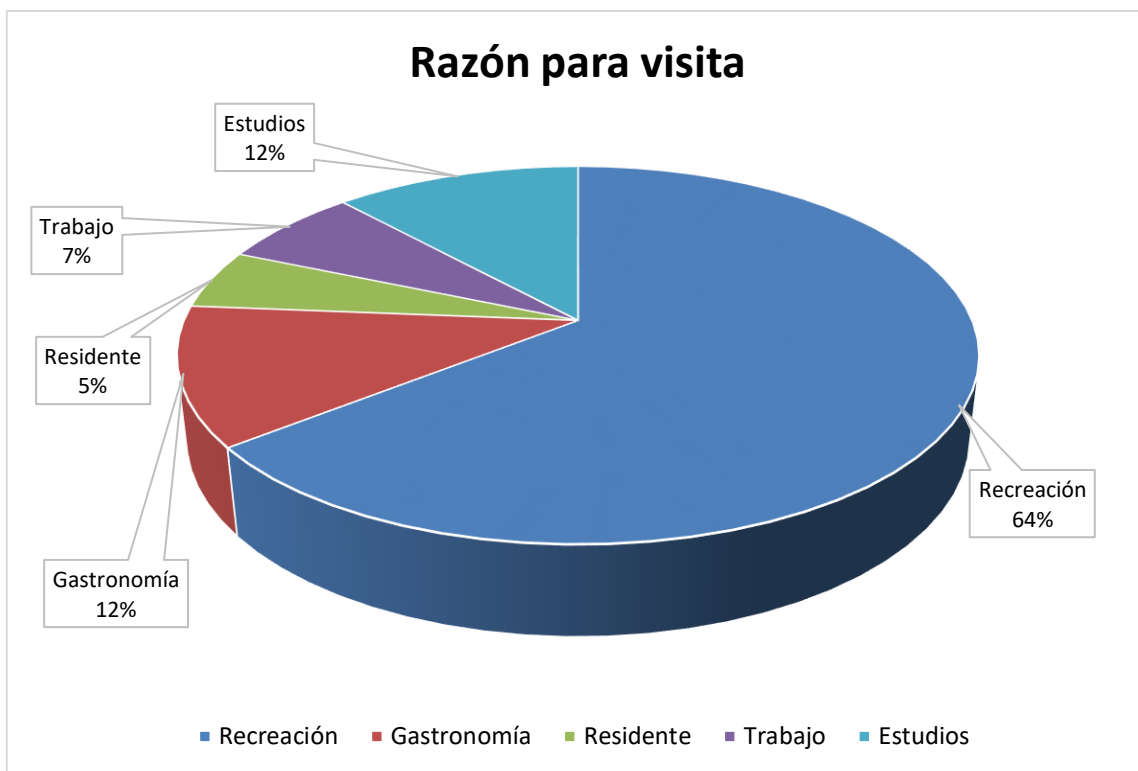


Figure 7. Pie chart showing the distribution of reasons of visits to the GSF ME.



Image 6. Art used to promote the *Día Nacional de la Reserva Marina de Guánica*, and the fishing tournament organized by the project team and collaborators.



Image 7. Beach cleaning efforts the project team participated in Bahía Ballenas. A total of 1,794 pounds of trash were removed from the beach.



Figure 8. Map of area where an aquatic diversity census was carried out by the SMS.

An aquatic diversity census was carried out by the project team near a coral reef ecosystem by Playa Aroma in Guánica. During this census, the SMS identified fishing lines as a potential threat to this ecosystem since there were many and there was evident coral tissue damage (scars). The species identified in this census can be seen in Table 5.

Table 5. Species identified in the aquatic census at Playa Aroma, Guánica.

Genus	Species	Common Name
Chordata		
<i>Acanthurus</i>	<i>coeruleus</i>	Caribbean Blue Tang
<i>Thalassoma</i>	<i>bifasciatum</i>	Bluehead Wrasse
<i>Pomacanthus</i>	<i>paru</i>	French Angel
<i>Lutjanus</i>	<i>analís</i>	Mutton Snapper
	<i>synagris</i>	Lane Snapper
	<i>apodus</i>	Schoolmaster Snapper
<i>Stegastes</i>	<i>variabilis</i>	Cocoa Damselfish
<i>Gymnothorax</i>	<i>funnebris</i>	Green Moray Eel
<i>Abudefduf</i>	<i>saxatilis</i>	Sargent Major
<i>Ocyurus</i>	<i>chrysurus</i>	Yellowtail Snapper
<i>Anisotremus</i>	<i>virginicus</i>	Porkfish
<i>Equetus</i>	<i>lanceolatus</i>	Jack-knifefish
<i>Elacatinus</i>	<i>evelynae</i>	Sharknose Goby
<i>Haemulon</i>	<i>flavolineatum</i>	French Grunt
<i>Trachinotus</i>	<i>goodei</i>	Palometa
Arthropoda		
<i>Stenopus</i>	<i>hispidus</i>	Banded Coral Shrimp
<i>Panulirus</i>	<i>argus</i>	Spiny Lobster
<i>Stenorhynchus</i>	<i>seticornis</i>	Arrow Crab
<i>Mithraculus</i>	<i>sculptus</i>	Emerald Crab
Mollusca		
<i>Aliger</i>	<i>gigas</i>	Queen Conch
<i>Cittarium</i>	<i>pica</i>	Whelk

APPENDIX C: CABO ROJO WATERSHED POLLUTION THREAT ANALYSIS

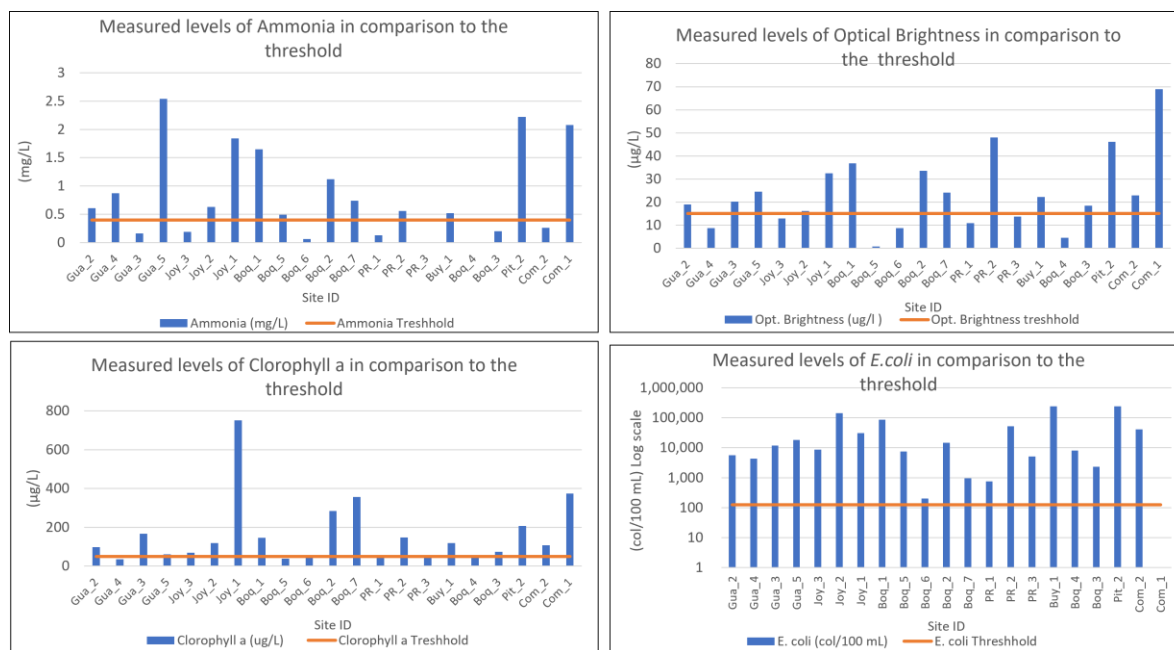


Figure 8. Levels of key parameters and their threshold (red line) for the sampling sites.

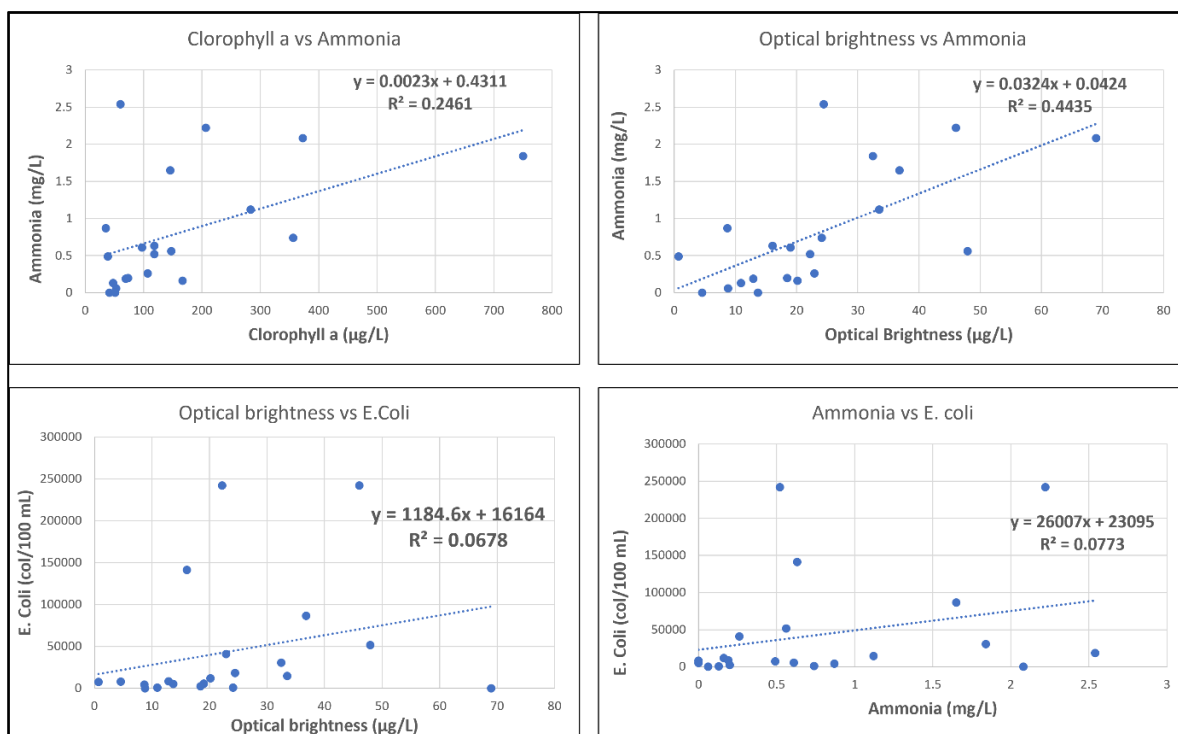


Figure 9. Correlations between key parameters for the sampling sites.

APPENDIX D: SMS PRELIMINARY PROGRESS REPORT FOR YEAR 2



Image 9. PDC personnel participating in a beach cleaning event in Atolladora and Tamarindo beach.



Image 10. Participants fishing during the family fishing tournament organized by the project team.




Image 11. Top: DNER personnel weighing fish. Bottom: PDC personnel alongside the Guánica mayor, DNER personnel, and the Guánica Tourism Office.



Image 12. Participants during the trophy ceremony at the family fishing tournament celebrated on July 16 at the Guánica State Forest.


PO BOX 1563
Yauco PR 00698
Tel. 787-457-8803



Interesados en ser parte del lista de Contactos de PDC

	Nombre y Apellidos	Email	Teléfono	Municipio	¿Desea recibir comunicaciones sobre actividades de nuestra organización vía email?	
					Si	No
1	Felix Cruz	cruz.felix359@gmail.com	787-920-1509	Guánica	✓	
2	Bryan Acosta	bryanxdy@gmail.com	787-630-8711	Cabo Rojo	✓	
3	Angel Talamo Chaviz		787-203-7644	Magüey	✓	
4	Alonso Chacon Fraguera		787-385-9931	Cabo Rojo	✓	
5	Francisco Lopez	francisco.lopez@unhcr.org	787-641-7940	Hormigueros	✓	
6	Jose L. Perez	protaunad19@gmail.com	939-281-4180	LA PS	✓	
7	Marcos Chacon (basano) (9)	aly72488@hotmail.com	787-202-37310	Guánica	✓	
8	Marcos Chacon (gratals) (papa)	" " familia	" "	" "	✓	
9	Carina Chacon (asiana) (11)	" "	" "	" "	✓	
10	Alissa Chacon (mama)	" "	" "	" "	✓	
11	Jose Sanchez Rivera		939-339-6052	Yauco		
12	Jose D. Rodriguez Zafra	jrodriguez.zafra@ucpr.edu	939-246-7276	Yauco	✓	
13	Alejandro (Lito) Rodriguez	alejandro.lito@gmail.com	787-223-7584	Yauco		
14	Kenneth Santana Medrano	kennethsantana@hotmail.com	787-207-5414	Adjuntas		X
15	Thom Grady Montano	gratals.montano@yahoo.com	787-585-6033	Adjuntas		
16	Marcos A. Chacon Soto	marcosachacon@hotmail.com	787-585-3037	Adjuntas	✓	
17	Miguel A. Melendez	andresmelendez@gmail.com	787-350-7770	Bayamon	✓	
18	Wilbert Riber Rodriguez	wilbert.riber@gmail.com	787-967-5256	Bayamon	✓	
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PO BOX 1563
Yauco PR 00698
Tel. 787-457-8803



Interesados en ser parte del lista de Contactos de PDC

	Nombre y Apellidos	Email	Teléfono	Municipio	¿Desea recibir comunicaciones sobre actividades de nuestra organización vía email?	
					Si	No
1	Rafael Sanchez Torres (38)			San Juan Grande		
2	Dylan E. Sanchez (6)			San Juan Grande		
3	Luis A. Rodriguez (36)			Yauco		
4	Diana A. Rodriguez (6)			Yauco		
5	Jose Vega Torres (38)			Hormigueros		
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Image 13. Register sheet used for the family fishing tournament on July 16 celebrated in the Guánica State Forest.

APPENDIX E: DEMONSTRATIVE RAINGARDEN PROJECT IN VILLA TAÍNA



Image 14. Top: Site identified for a demonstrative project in the CRW. Bottom: Native plants used for the coastal habitat enhancement.



Image 15. Top: Native coastal plants used to delimit ecologically sensitive areas. Bottom: Vetiver grass being planted by the project team.



Image 16. Top: PDC personnel completing the hydroseeding in the area. Bottom: Completed rain garden and hydroseeding project.



Image 17. Demonstrative rain garden project completed in Villa Taína.



Image 18. The project team installed rocks to prevent cars from entering and damaging the rain garden.

August 16, 2022

Robert A Viqueira Ríos
Executive Director
Protectores de Cuencas Inc.
Yauco, PR 00698

Dear Robert Viqueira Ríos,

**AUTHORIZATION TO CARRY OUT DEMONSTRATIVE RAINGARDEN PROJECT
IN VILLA TAÍNA, BOQUERÓN, PR**

The administration of the Villa Taína residential complex formally authorizes Protectores de Cuencas Inc. to carry out the proposed demonstrative raingarden project in Villa Taína in the area described in Appendix A of your organization's formal request for authorization.

We understand that Protectores de Cuencas Inc. has received funds from the PR-DNER to identify sites within the Cabo Rojo Watershed for potential projects. As part of this project your organization is authorized to carry out the following tasks in Villa Taína:

- Create a raingarden to reduce the amount of sediment reaching the nearshore area.
- Establish erosion control measures.
- Reforest areas adjacent to the raingarden with native coastal species.

This decision was made based on your experience working with environmental restoration projects and your formal request to carry out a demonstrative restoration project within the facilities of Villa Taína.

We are looking forward to this collaboration.

Sincerely,



Chasmina Mercado
Administrator
Villa Taína
Boquerón, PR 00622

Image 19. Authorization from the administrator to carry out the demonstrative rain garden project in Villa Taína.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Caribbean Ecological Services Field Office
Post Office Box 491
Boqueron, PR 00622-0491
Phone: (787) 851-7297 Fax: (787) 851-7440



In Reply Refer To:
Project Code: 2022-0075380
Project Name: Villa Taina

August 16, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

THE FOLLOWING SPECIES LIST IS NOT A SECTION 7 CONSULTATION. PLEASE CONTACT OUR OFFICE TO COMPLETE THE CONSULTATION PROCESS

The purpose of the Endangered Species Act (Act) is to provide a means whereby threatened, and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect those species and/or their designated critical habitat.

Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action". The enclosed species list provides information to assist with the U.S. Fish and Wildlife Service (Service) consultation process under section 7 of the Act. However, **the enclosed species list does not complete the required consultation process.** The species list identifies threatened, endangered, proposed and candidate species, as well as proposed and designated critical habitats, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. A discussion between the Federal agency and the Service should include what types of listed species may occur in the proposed action area and what effect the proposed action may have on those species. This process initiates informal consultation.

Once a species list is obtained for the proposed project, an effect determination for endangered and threatened species should be made. The applicant could make an effect determination by using available keys on IPaC for specific species. For species with no determination keys, the applicant should request concurrence from the Service by sending a project package to caribbean_es@fws.gov. To obtain guidance for completing this process and the minimum requirements for project packages, please visit:

08/16/2022

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<https://www.fws.gov/southeast/pdf/letter/consultation-under-section-7-of-the-endangered-species-act-with-the-caribbean-ecological%20Services-field-office-template-letter.pdf>

When a federal agency, after discussions with the Service, determines that the proposed action is not likely to adversely affect any listed species, or adversely modify any designated critical habitat, and the Service concurs, the informal consultation is complete, and the proposed project moves ahead. If the proposed action is suspected to affect a listed species or modify designated critical habitat, the Federal agency may then prepare a Biological Assessment (B.A.) to assist in its determination of the project's effects on species and their habitat. However, a B.A. is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a B.A. where the agency provides the Service with an evaluation on the likely effects of the action to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a B.A. are described at 50 CFR 402.12.

If a federal agency determines, based on its B.A. or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to further consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species, and proposed critical habitat be addressed within the consultation process. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species.

This list is provided pursuant to Section 7 of the Endangered Species Act and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action". Please use this list to determine whether your project requires consultation and to make your effects determination. For more guidance, use the Guideline for Consultation under Section 7 of the Endangered Species Act with the Caribbean Ecological Services Field Office by clicking [here](#).

This species list is provided by:

Caribbean Ecological Services Field Office
caribbean_es@fws.gov
Post Office Box 491

08/16/2022

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Boqueron, PR 00622-0491
(786) 244-0081

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Marine Mammals
- Wetlands

08/16/2022

1

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Caribbean Ecological Services Field Office

Post Office Box 491

Boqueron, PR 00622-0491

(787) 851-7297

08/16/2022

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Project Summary

Project Code: 2022-0075380

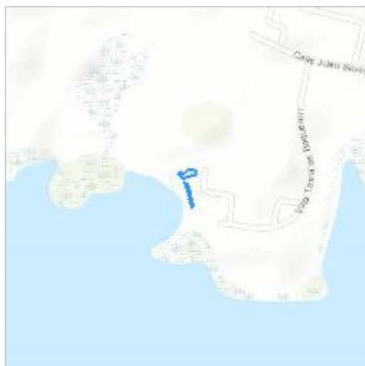
Project Name: Villa Taina

Project Type: Shoreline Stabilization

Project Description: We are considering implementing a small demonstrative project with the objective of reducing soil erosion and restoring the coastal habitat.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@18.030427250000002,-67.18524508871259,14z>



Counties: Cabo Rojo County, Puerto Rico

08/16/2022

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Endangered Species Act Species

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
West Indian Manatee <i>Trichechus manatus</i>	Threatened
<p>There is final critical habitat for this species. The location of the critical habitat is not available. <i>This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.</i> Species profile: https://ecos.fws.gov/ecp/species/4469 General project design guidelines: https://ipac.ecosphere.fws.gov/project/CJED7RGILNCEPNCGRKHW53ZVHA/documents/generated/6943.pdf</p>	

Birds

NAME	STATUS
Yellow-shouldered Blackbird <i>Agelaius xanthomus</i>	Endangered
<p>There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7383</p>	

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Reptiles

NAME	STATUS
<p>Hawksbill Sea Turtle <i>Eretmochelys imbricata</i></p> <p>There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3656 General project design guidelines: https://ipac.ecosphere.fws.gov/project/CJFD7RGILNCEPNCGRKHW53ZVHA/documents/generated/6948.pdf</p>	Endangered
<p>Leatherback Sea Turtle <i>Dermochelys coriacea</i></p> <p>There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1493 General project design guidelines: https://ipac.ecosphere.fws.gov/project/CJFD7RGILNCEPNCGRKHW53ZVHA/documents/generated/6947.pdf</p>	Endangered
<p>Puerto Rican Boa <i>Chilabothrus inornatus</i></p> <p>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6628 General project design guidelines: https://ipac.ecosphere.fws.gov/project/CJFD7RGILNCEPNCGRKHW53ZVHA/documents/generated/6941.pdf</p>	Endangered

Flowering Plants

NAME	STATUS
<p>Cobana Negra <i>Stahlia monosperma</i></p> <p>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2282</p>	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

THERE ARE NO FWS MIGRATORY BIRDS OF CONCERN WITHIN THE VICINITY OF YOUR PROJECT AREA.

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list

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of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical](#)

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[Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Marine Mammals

Marine mammals are protected under the [Marine Mammal Protection Act](#). Some are also protected under the Endangered Species Act¹ and the Convention on International Trade in Endangered Species of Wild Fauna and Flora².

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walrus, polar bears, manatees, and dugongs] and NOAA Fisheries³ [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the [Marine Mammals](#) page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

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1. The [Endangered Species Act](#) (ESA) of 1973.
 2. The [Convention on International Trade in Endangered Species of Wild Fauna and Flora](#) (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
 3. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

NAME

West Indian Manatee *Trichechus manatus*

Species profile: <https://ecos.fws.gov/ecp/species/4469>

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Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

Image 20. Informal consultation conducted by the project team before starting work at Villa Taína.

APPENDIX F: FOLLOW-UP VISITS AND MAINTENANCE





Image 21. PDC personnel has completed various maintenance visits to the demonstrative raingarden in Villa Taína. Additionally, the project team validated the practices were functioning properly during rain events.

