

CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGES

CULEBRA NATIONAL WILDLIFE REFUGE

DESECHEO NATIONAL WILDLIFE REFUGE

CABO ROJO NATIONAL WILDLIFE REFUGE

BUCK ISLAND NATIONAL WILDLIFE REFUGE

GREEN CAY NATIONAL WILDLIFE REFUGE

SANDY POINT NATIONAL WILDLIFE REFUGE

VIEQUES FIELD STATION

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U. S. Department of the Interior  
Fish and Wildlife Service  
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGES

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Refuge Manager

5/14/86  
Date

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Refuge Supervisor Review Date

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Regional Office Approval

5/28/86  
Date

## Caribbean Islands NWR's

### INTRODUCTION

The Caribbean Islands National Wildlife Refuges began its administrative existence as the Culebra National Wildlife Refuge in 1978 and was named with its present title in 1981. The complex functions over an area estimated to cover about 20,000 sq. miles and every unit of the complex has a different animal and plant species composition. Depending upon the refuge, the individual emphasis of units are: seabirds, endangered sea turtles, endangered ground lizards, endangered blackbirds, native waterfowl, and endangered plants. In Puerto Rico and the U.S. Virgin Islands, the complex administers four distinct island units (Desecheo NWR, Culebra NWR, Buck Island NWR, Green Cay NWR), a unit on the island of St. Croix (Sandy Point NWR), a unit on the island of Puerto Rico (Cabo Rojo NWR), and a technical assistance program for 30,661 acres of Navy land (Vieques Field Station). Two additional units (Laguna Cartagena NWR, Laguana Tortugero NWR) on the island of Puerto Rico were authorized for acquisition in FY 1985.

Additionally, since the complex represents the entire Wildlife Resources program rather than representing only the Division of Refuges, the staff provides resource management assistance for land management, migratory game bird management and endangered species management activities to a variety of Federal, Commonwealth and Territorial agencies. The complex also provides support functions for the Law Enforcement, Research, Habitat Preservation, Endangered Species and Federal Assistance programs on an as requested basis.

INTRODUCTION

	<u>Page</u>
TABLE OF CONTENTS	i

A. <u>HIGHLIGHTS</u>	1
----------------------	---

B. <u>CLIMATIC CONDITIONS</u>	1
-------------------------------	---

C. <u>LAND ACQUISITION</u>	1
----------------------------	---

D. PLANNING

Master Plan.....(NTR).....	
1. Management Plan.....	2
Public Participation.....(NTR).....	
Compliance with Environmental and Cultural Resource Mandates.(NTR)	
2. Research and Investigations.....	3
3. Other.....	3

E. ADMINISTRATION

1. Personnel.....	4
2. Youth Programs.....	9
Other Manpower Programs.....(NTR).....	
3. Volunteer Programs.....	9
4. Funding.....	10
5. Safety.....	10
6. Technical Assistance.....	11
7. Other.....	12

F. <u>HABITAT MANAGEMENT</u>	12
------------------------------	----

G. WILDLIFE

Wildlife Diversity.....(NTR).....	
1. Endangered and/or Threatened Species.....	13
2. Waterfowl.....	13
3. Marsh and Water Birds.....	14
4. Shorebirds, Gulls, Terns and Allied Species.....	14
5. Raptors.....	14

G. WILDLIFE (Cont.)

	<u>Page</u>
Other Migratory Birds.....(NTR).....	
Game Mammals.....(NTR).....	
6. Other Resident Wildlife.....	14
7. Marine Mammals.....	15
Fisheries.....(NTR).....	
Wildlife Propagation and Stocking.....(NTR).....	
Surplus Animal Disposal.....(NTR).....	
Scientific Collections.....(NTR).....	
8. Animal Control.....	15
9. Marking and Banding.....	15
Disease Prevention and Control.....(NTR).....	

H. PUBLIC USE

1. General.....	16
2. Law Enforcement.....	16

I. EQUIPMENT AND FACILITIES 17

J. OTHER ITEMS 17

K. FEEDBACK 18

### A. HIGHLIGHTS

Mr. Don Knowles of the Senate Appropriations Committee visited the Caribbean Refuges and proposed acquisition areas in January 1985. (Section C)

In November 1985, Manager Furniss filed water rights claims for two lagunas on Culebra as the first step in exerting federal ownership over the areas. (Section C)

The first aerial surveys of island wide waterfowl populations was completed in March 1985. (Section D.3)

Major increases to the Caribbean staff occurred in 1985. (Section E.1)

Computer equipment scheduled for arrival on April 1. (Section K)

### B. CLIMATIC CONDITIONS

Weather data for Cabo Rojo, Culebra, Vieques and St. Croix are provided in the respective narrative sections and give an overview of the climatic differences between the various areas. All areas administered by the refuge are classified as subtropical dry forest but do vary from one another in subtle ways.

Hurricane Gloria was the only significant storm of the year to pass by Puerto Rico and it had only a limited impact in the Caribbean area. Except for the intense rains associated with Tropical Storm Isabel in October, the 1985 weather would have been considered normal.

### C. LAND ACQUISITION

In September, 1984, the joint House and Senate Conference Committee on Appropriations approved 5 million dollars for the purchase of both Laguna Tortugero NWR for endangered plants and Laguna Cartagena NWR for native and migratory waterfowl. In December 1984, the Caribbean Islands Project Leader began preparation of the environmental assessments (EA's) for the acquisition of the two areas. In January, both EA's and Section 7's were sent up to Atlanta, where they were retyped because the Regional Office did not like the quality of the printout from the Imagewriter printer.

In January 1985, Mr. Don Knowles (Senate Appropriations Committee) visited St. Croix and Puerto Rico to look at the recently acquired (Sept. 1984) Sandy Point NWR and the sites for the proposed Laguna Tortugero and Laguna Cartagena NWR's. In February, Jerry Vits and Jeff Donahoe (Realty - Atlanta, RO) visited Puerto Rico to look at the two proposed acquisition areas.

Originally, Realty was working with and using the Puerto Rico Conservation Trust to act as a middleman in the acquisition program. For various reasons, that relationship proved to be less than optimal and the relationship was terminated. Then Realty worked out an agreement with the Trust for Public Lands (TPL) to do the land acquisition for Cartagena and Tortugero. That did not work either and TPL withdrew from the agreement. The Tortugero acquisition was not approved by the Commonwealth Planning Board during the Commonwealth review process, which did not greatly distress anyone except those folks (i.e. not Federal agencies) who had actively supported that part of the acquisition proposal.

In October of 1985, the Commonwealth Planning Board reversed the previous administration's approval for the FWS acquisition of Laguna Cartagena. Additionally, the PR Secretary of State, in a meeting with the PR Sec. of Justice and PR Sec. of Natural Resources, indicated that not an inch of ground would be given up to the Federal government during the tenure of the present administration. So as can be seen the future for the acquisition of these areas is not very bright. With the continuous degradation of Puerto Rico's waterfowl habitats and the nomination of the four principal resident waterfowl species for Federal listing as threatened, things did not look up for waterfowl in 1985.

In November, Manager Furniss filed water rights claims for Lagunas Flamenco and De Los Patos, both on Culebra Island, and for ponds at Cabo Rojo NWR. The water rights filing for Flamenco and De Los Patos is the first step in expressing federal claims to these two lagoons on Culebra. It is the FWS position that these lagoons were formerly Spanish Crown lands and were transferred to the U.S. as a result of the Treaty of Paris.

#### D. PLANNING

##### 1. Management Plan

During 1985 management plans were prepared for yellow-shouldered blackbirds at Cabo Rojo NWR, for forest management at Cabo Rojo NWR and for wildlife inventory plans at Cabo Rojo and Desecheo NWR's

## 2. Research and Investigation

A general summary of the various refuge studies is provided in this section, details of individual refuge studies will be found in the appropriate refuge narrative reports.

Doctoral student Cynthia Staicer completed the second year of her three year project on Adelaide's warbler ecology at Cabo Rojo NWR. Doctoral student Fred Schaffner completed the second year of his three year project on the white-tailed tropicbird at Culebra NWR. The second year of the Earthwatch sea turtle program for Culebra was undertaken in 1985 and the fourth year of the Earthwatch leatherback sea turtle program at Sandy Point was completed. Canadian seabird biologists Drs. John Chardine and Ralph Morris began the first of three years of noddy tern and bridled tern research, funded by the Canadian government. Dr. Henry Zuill completed a structural analysis of the vegetation on a 6 ha study plot on Cabo Rojo NWR.

Caribbean Islands NWR's NR85 - "Shorebird Survey of the Cabo Rojo Salt Flats."  
41520-01-85.

This project was initiated by biologist Collazo in October 1985. The objectives of the study are to: 1) obtain an estimate of shorebird abundance and ascertain species composition, 2) document seasonal fluctuations in abundance and species composition, and 3) monitor nesting activities of snowy plovers.

Up to the present time only very limited information on shorebirds has been available in the Commonwealth of Puerto Rico. This study will be used to assess the value of the Cabo Rojo salt flats for both resident and migrant shorebird.

## 3. Other

The first year of island wide waterfowl surveys, which began in September 1984, was completed in March 1985. The island wide surveys provide basic information on the distribution and seasonal abundance of waterfowl, brown pelicans and ospreys. Manager Furniss provided the Regional Office with recommendations regarding the continuation of the survey for the Sept. 1985 - April 1986 season. The Regional Office decided that we would continue the 84-85 survey schedule in 85-86. We decided that we would eliminate the extra hour flight to San Juan to pick up the DNR biologist and eliminate the flights to

Vieques and Culebra for safety reasons. Those two changes will result in a saving of \$360 a flight or about \$2880 in flight costs for the 85-86 survey period.

On the basis of the observations that took place during the survey period, useful population data may have been obtained for blue-winged teal (high 647, low 0), whistling duck (high 48, low 2), ruddy duck (high 81, low 0) and osprey (high 8, low 1). Some habitat use information was also obtained for white-cheeked pintail and brown pelican. A complete report on the results of the survey work will not be made until the completion of a full three years of work with comparable ground data and helicopter vs. fixed winged comparison.

#### E. ADMINISTRATION

##### 1. Personnel

1. Sean Furniss, Refuge Manager, GS-11, EOD 7/78, PFT
2. Roger Di Rosa, Refuge Manager, GS-9, EOD 11/84, PFT
3. Jaime Collazo, Biologist, GS-9, EOD 7/85, PFT
4. John Taylor, Refuge Manager, GS-9, EOD 11/82, PFT, Transferred 12/85
5. Marc Weitzel, Refuge Manager, GS-9, EOD 9/84, PFT
6. Carmen Mendez-Santoni, Secretary, GS-4, EOD 12/82, PPT
7. Mariano Rodriguez-Flores, Maintenance Mechanic, WG-9, EOD 12/84, Temp.
8. Henry Morales, Maintenance Worker, WG-7, EOD 8/85, PFT
9. José Velez-Carrero, Laborer, WG-3, EOD 1/85, Temp.
10. Indalecio Comacho, Laborer, WG-3, EOD 1/85, Temp.
11. Anton Tucker, Biological Technician, GS-4, EOD 7/85, Temp.
12. Julio DeJesus, GS-3, EOD 6/85, LWOP 8/85, Coop. Educ. Student
13. Ron Childs, YCC Laborer Foreman, WS 1, 5/85-7-85, Temp.
14. Martha Furniss, Volunteer Administrative Coordinator, EOD 7/78.

In January of 1985, two laborer positions, for fire presuppression work, were filled with the hiring of José Velez-Carrero (a former YACC crew member) and Indalecio Comacho. The filling of the station biologist position, although two grades too low, in July by Dr. Jaime Collazo, rates as a significant advance for the biological program in the Caribbean, and was a result of the dedication of Refuge Supervisor Grabill and the Personnel Management staff in the Regional Office. The hiring of our first Cooperative Education Student, Julio de Jesus, was a testimony to the diligent work and efforts of both the EEO and PM staffs, without whom it never would have happened.

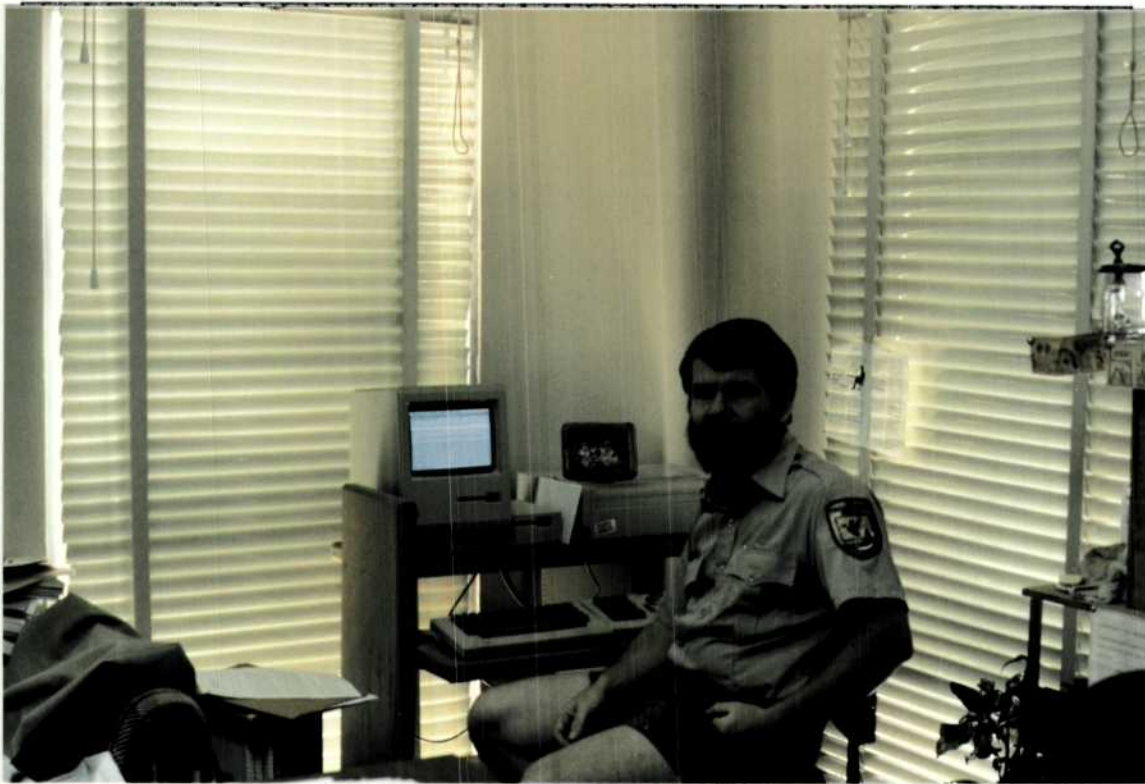
The Culebra Refuge was very pleased to be able to put on their first maintenance worker with the hiring of Henry Morales, who got right to work making everything ship shape. Tony Tucker the hard working Field Team Leader for the Culebra Earthwatch Project went from volunteer status to paid staffer in July, after 90 nights on the beach with the Earthwatch Teams. Talk about true grit, that is what it takes to work for nothing but belief in the cause. We were very pleased to be able to put Tony on the payroll.

The personal crew of Manager Furniss increased by one more with the addition of Erin Furniss in June. Manager Taylor and his wife Maggie, brought home a keeper with the arrival of their first child, John Paul Taylor, in November. John and his family left us after three years of dedicated work. We hope they appreciate him at Bosque del Apache, as we will surely miss both John and Maggie on Culebra. They laid the part of the foundation for the future in Culebra.

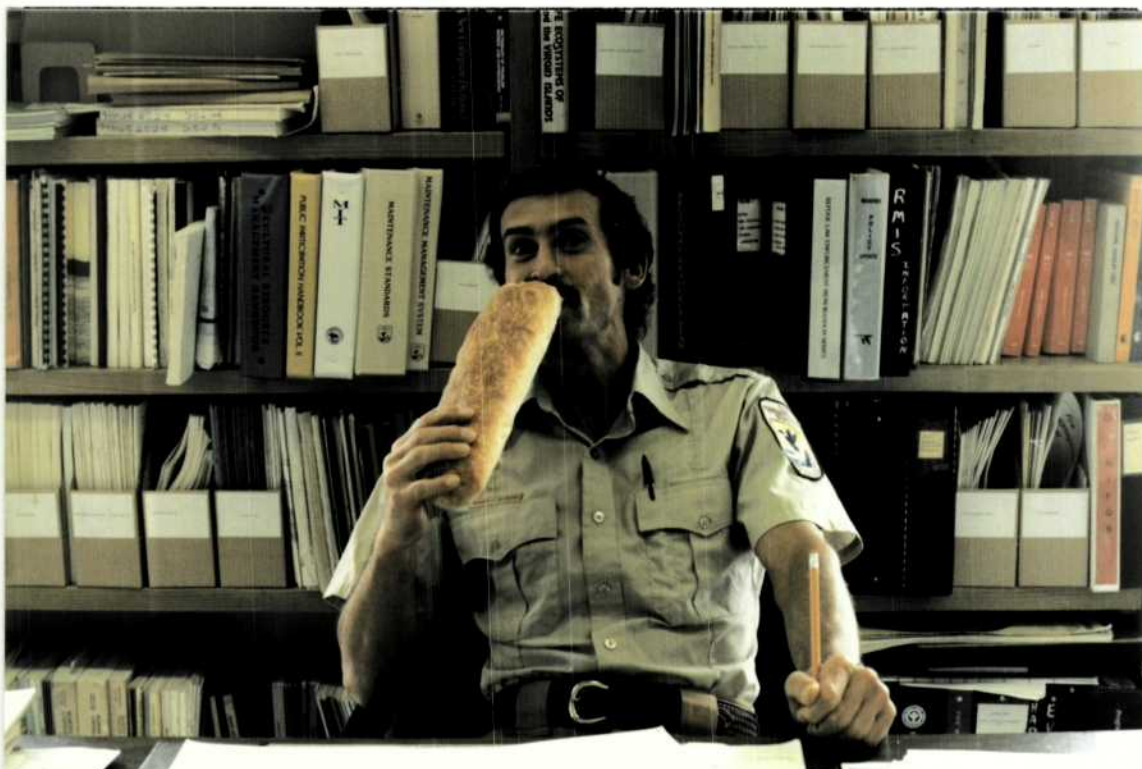
We would also like to make a note at this point in time that an appeal to the Office of Personnel Management in New York, regarding the GS-11 rating of the Project Leader position, was turned down with a comment that they felt that much of the work done here rated only a GS-9 but the position had just enough higher level duties to warrant a GS-11. The position was once again redescribed and resubmitted to Personnel Management in October but no evaluation of the revised PD had been made as of the end of the year. A table showing the five year staffing pattern for the Caribbean follows below:

Caribbean Refuges Staffing Summary

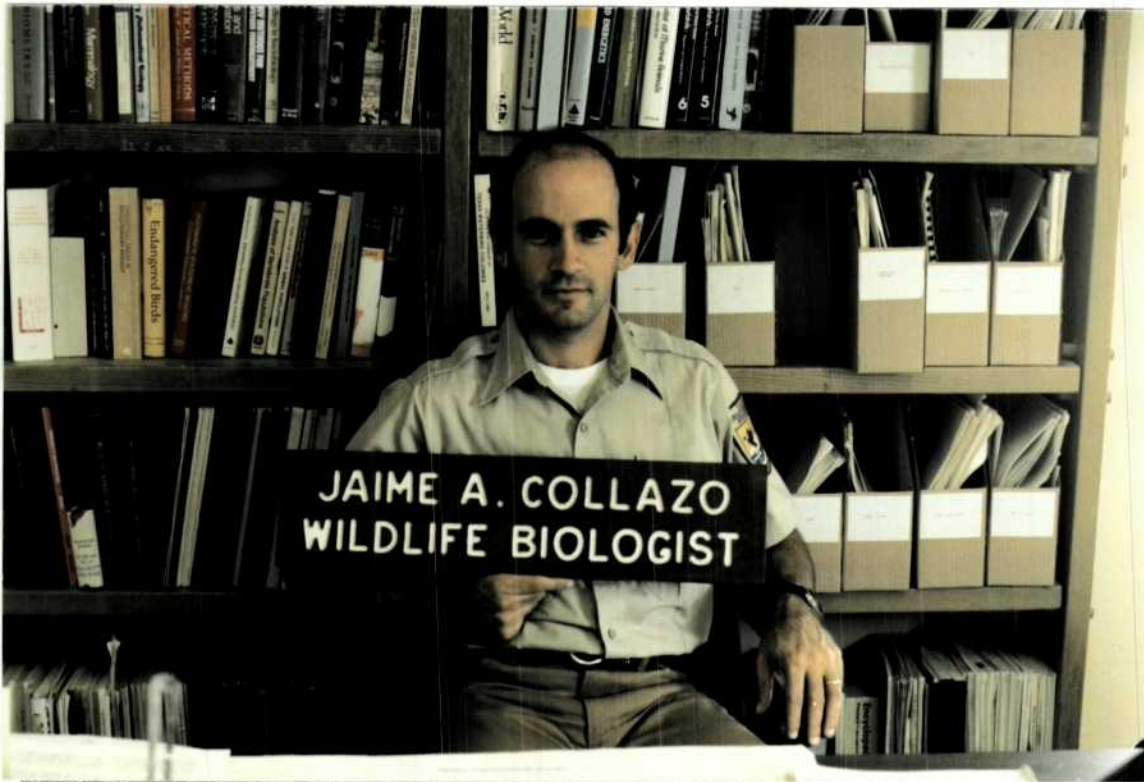
	<u>Permanent</u>		<u>Temporary</u>	<u>Total</u> <u>FTE</u>
	<u>Full-Time</u>	<u>Part-Time</u>		
FY 1981	2	1.6	0	3.6
FY 1982	2	1.6	0	3.6
FY 1983	3	0.6	0	3.6
FY 1984	3	0.6	0	3.6
FY 1985	6	0.8	3.8	10.6



Project leader Sean Furniss at the controls of the Caribbean Islands NWR's.  
R. Di Rosa. AN-85-CRB-01



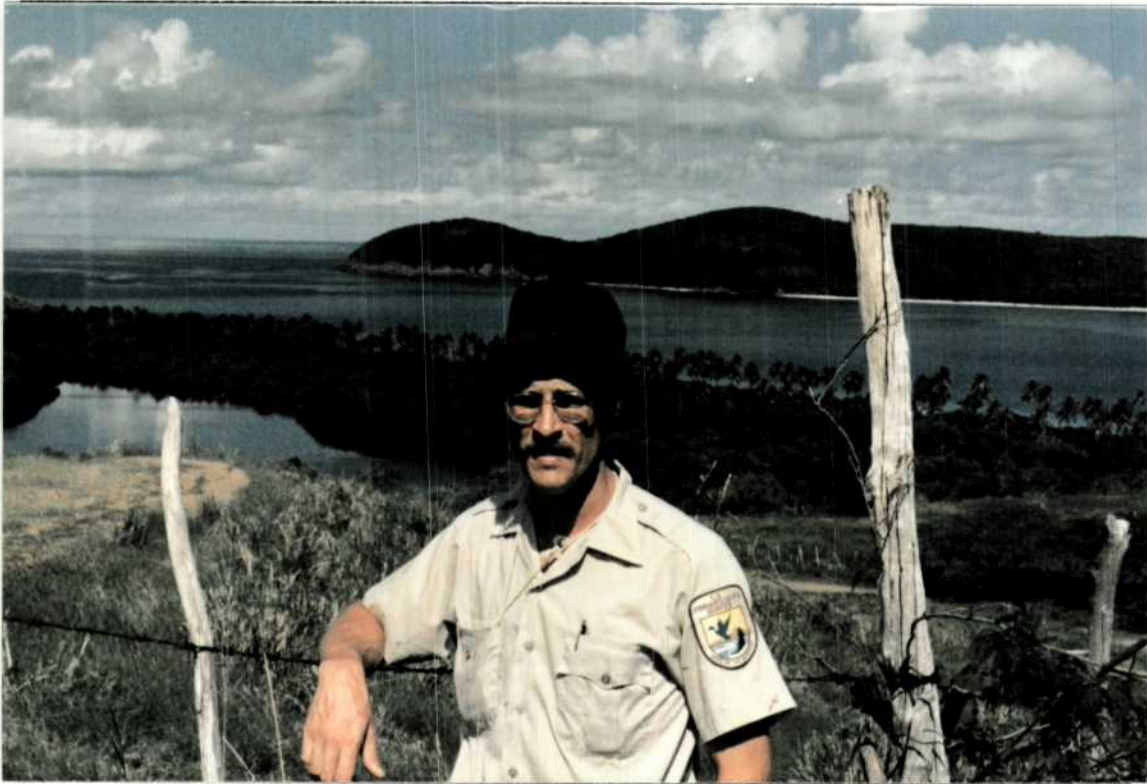
Primary assistant manager Roger Di Rosa testing an offering before the  
project leader will eat it. C. Mendez. AN-85-CRB-02.



The complex biologist Dr. Jaime Collazo showing off his new regulation name tag, issued to newly graduated PhD's. R. Di Rosa. AN-85-CRB-03



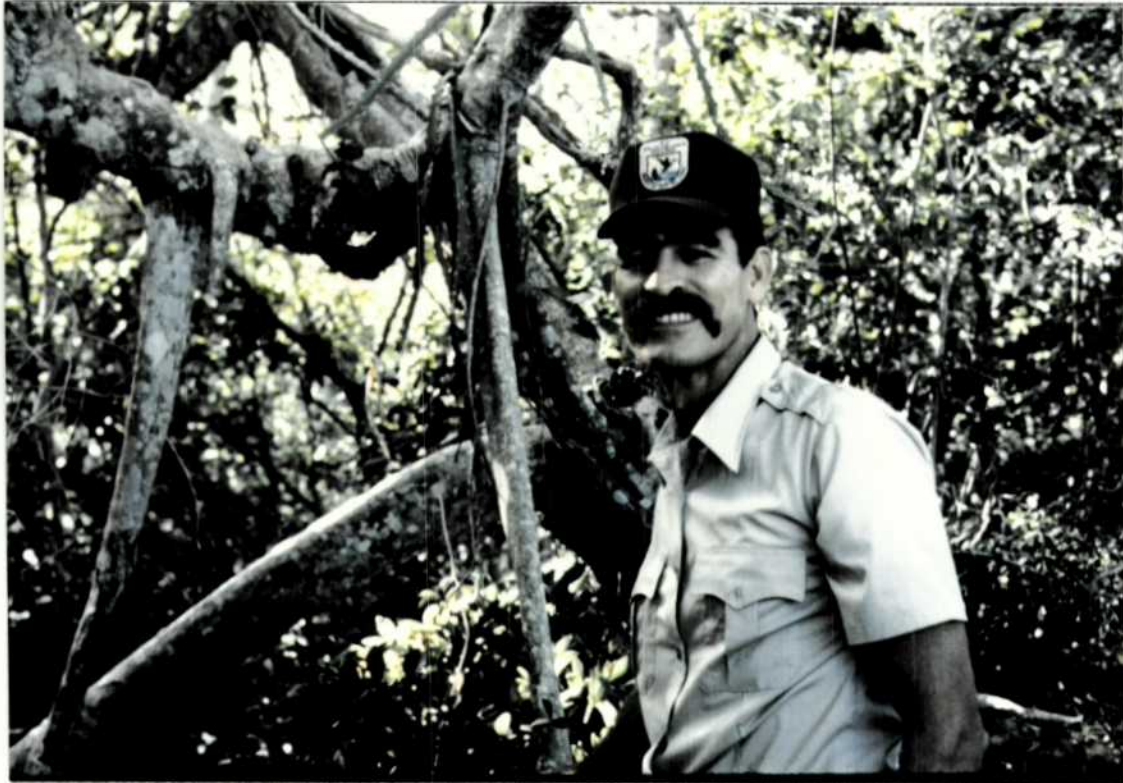
Secretary Carmen Mendez-Santoni. Cheerful Carmen was always ready to do more than expected and is worth more than we can pay her. R. Di Rosa. AN-85-CRB-04



Talented John Taylor kept the watch on Culebra most of last year. He departed for Bosque del Apache in November. R. Di Rosa. AN-85-CBR-05



Marc Weltzel serves as the land manager for the Navy and tries to keep them on the right track at Roosevelt Roads and Vieques. AN-85-CRB-06



Maintenance Worker Henry Morales joined the Caribbean staff in August and immediately began putting his skills and dedication to work at Culebra NWR. R. Di Rosa. AN-85-CRB-07

## 2. Youth Programs

During 1985 both the Culebra and Cabo Rojo NWR's had YCC programs. The Culebra program hired 10 enrollees, 2 youth leaders and 1 work leader, and the Cabo Rojo NWR hired 10 enrollees and a work leader for the 8 week summer programs. These program are very successful as they are a major employment opportunities on the island of Culebra and in Cabo Rojo's neighboring community of Corozo. They provided a lot of needed manpower on the Culebra and Cabo Rojo Refuges.

The personal and very diligent efforts of Joe Markwitz the Regional YCC Coordinator were greatly appreciated in resolving the few administrative problems that came up with the YCC programs. We will always remember the very accomodating reaction of the GSA motorpool manager (who had been giving us problems about a short term rental for the YCC program) after Joe had a heart to heart talk with the GSA supervisor in New York. We enjoyed the YCC van all the more because of it.

## 3. Volunteer Program

Volunteers worked with the Caribbean Refuges at Cabo Rojo, Culebra and Sandy Point NWR's. The majority of the volunteer help came from the two Earthwatch programs at Sandy Point and at Culebra. At these two refuges we had over 150 people donate weeks of their time to work on our sea turtle programs. Additionally, we recruited seabird biologists at the Colonial Waterbirds Group meeting and general avian biologists through the Ornithological Societies Newsletter. We were able to find two doctoral students to conduct research at Cabo Rojo and Culebra. In addition, two Canadian seabird biologists began a three year study on noddy terns at Culebra. The project will include a post doctoral and a post MS student.

The Caribbean Refuges have had a volunteer program since 1978, when our first volunteer began working for us. Our first volunteer is still working with us and has been the pivot point in many of our operations here. She works on an as needed basis and most everyone who has contacted this station in the past has spoken with her. When the offical phone was in the residence of the Furniss family (i.e. there were no phone lines at the office), Martha Furniss was a major factor in the effective communications that we maintained with the outside world. A job that everyone appreciated but one which we sometimes took for granted. Martha was a part of our working team and we appreciate her

efforts. With the installation of the first operational phone line at the Cabo Rojo NWR, the phone at the Furniss residence almost quit ringing but now and then we call her just to chat and see how things are going. Thanks for the seven and a half years of help, the cheery voice and the understanding you have given all of us in helping to get the job done.

#### 4. Funding

The funding for the Caribbean Refuges comes as one consolidated budget, which the Project Leader then plans and partitions among the various competing needs and priorities of the complex. The funding for the Caribbean Refuges does not include the funding from the Navy for the operation of the Vieques Field Station. That funding is discussed in the Vieques Field Station Narrative. Over the last four years the budget had remained fairly stable, but due to the interest of the former Puerto Rican Secretary of Natural Resources, the former Puerto Rican Resident Commissioner and staff members on the House and Senate Appropriations Committee, the Caribbean Refuges received a significant increase in funding for refuge operations in FY 85. The additional funding will provide us with a significant improvement in the resource management programs of the Caribbean Refuges.

#### Budget Summary

Fiscal Year*	Wildlife Resources	Endangered Species	Total
1982	55,000	37,000	92,000
1983	91,000	16,000	107,000
1984	120,000	-	120,000
1985	416,000	-	416,000
1986	555,100	32,000	587,100

\* FY 86 as of 12/31/85; all others as of close of FY.

#### 5. Safety

Nineteen eighty-five was a safe year for the Caribbean Refuges. No lost time accidents occurred on any of the refuges. With the increased staff levels, Safety meetings became a part of the regular program for the Caribbean Refuges. Spanish language safety materials were circulated to all the staff on a regular basis.

## 6. Technical Assistance

The Vieques Field Station is the most intensive assistance program of the Caribbean Refuges. It is essentially a hundred percent commitment of one staff person to assist the U.S. Navy in staying within environmental guidelines. This program is discussed in the Vieques section of the narrative.

The complex provides the Puerto Rico Department of Natural Resources with assistance in conducting dove hunter surveys, evaluating waterfowl habitat, conducting waterfowl surveys, revising wildlife laws and regulations, and planning.

The project leader serves as the Fish and Wildlife Service representative on the Jobos Bay National Estuarine Sanctuary, an appointment given by the Puerto Rico Secretary of Natural Resources.

The Governor of Puerto Rico appointed the project leader, at the request of the Secretary of the Interior, to be the alternate representative of the Department of the Interior on the Culebra Conservation and Development Authority Board.

The project leader represents the Fish and Wildlife Service on the Virgin Islands Resource Management Cooperative.

The project leader is the manatee salvage coordinator for the Caribbean and was the alternate team leader for environmental contaminant spills.

Facilities support at Cabo Rojo is provided to the Puerto Rico Department of Natural Resources cowbird control program, and to the Fish and Wildlife Service's Endangered Species and Ecological Services Programs.

Training assistance is provided to the Boy Scout Nature Team each spring to prepare them as summer camp environmental instructors.

Assistance is provided to the FWS Office of International Affairs for Latin America and Caribbean projects, and to the Agency for International Development trainees in resource management.

## 7. Other Items

Refuge Manager Di Rosa attended a two week, intensive spanish language course at the Federal Law Enforcement Training Center in February.

Manager Di Rosa and Secretary Mendez-Santoni attended a GSA seminar on property management and GSA ordering procedures.

Refuge Supervisor Grabill visited the Caribbean in March to conduct his annual supervisory inspection of the area.

In December the project leader attended the joint Colonial Waterbirds Group - Pacific Seabird Group meeting at San Francisco, California to meet with seabird biologists and hustle for more researchers to come work.

Resource managers from Trinidad and Tobago visited the Cabo Rojo NWR and southwestern Puerto Rico in November as part of a FAO (Food and Agricultural Organization of the United Nations) program. Manager Furniss arranged a varied program with presentations by various FWS and DNR staff in the mornings and field trips in the afternoon.

## F. HABITAT MANAGEMENT

At Cabo Rojo past work has been limited to the replanting of native tree species but with the increased staff in 1985 we were able to become a little more serious about cowbird control and reforestation efforts. Refer to the Cabo Rojo NR for additional details.

At Culebra the habitat management practices involved two types of activities: 1) removal of cattle from Peninsula Flamenco; and 2) removal of vegetation on Cayo Matojo. The practice of vegetation clearing continued at Cayo Matojo, and resulted in limited use of the area by royal terns. Further information on the habitat management practices is available in the Culebra narrative section.

At Sandy Point NWR the significant habitat management work has been the restoration of the former sand mining sites. Numerous contacts had to made with Plateau #1 (the former permittee) to encourage their restoration efforts. The work was still not complete as of the end of 1985. The Sandy Point NWR has the details of the restoration efforts.

## G. WILDLIFE

### 1. Endangered and Threatened Species

All of the lands administered by FWS in Puerto Rico and the U.S. Virgin Islands have one or more federally listed species and one or more Commonwealth or Territorial listed species. The more significant federally listed species include the yellow-shouldered blackbird, tundra peregrine falcon, West Indies brown pelican, Culebra giant anole, leatherback sea turtle, hawksbill sea turtle, green sea turtle, loggerhead sea turtle, and St. Croix ground lizard. Active management programs for the federally listed species are currently restricted to the sea turtle programs on Culebra and Sandy Point NWR's, and are described in more detail in the respective narratives. No active management programs are currently undertaken for Commonwealth or Territorial listed species. A yellow-shouldered blackbird management plan for Cabo Rojo NWR was prepared by Biologist Collazo. The Caribbean Refuges petitioned Endangered Species to list the white-cheeked pintail as threatened in Puerto Rico and the U.S. Virgin Islands.

In June, Earl Possardt (Regional Sea Turtle Coordinator) and Paul Gertler (Supervisor of the Caribbean Field Office) visited Sandy Point and Culebra NWR's to look at the sea turtle research being undertaken with the Earthwatch volunteers.

### 2. Waterfowl

Currently, all FWS activity regarding waterfowl occurs off of refuge lands. The Caribbean Refuges began an aerial waterfowl survey of the Commonwealth of Puerto Rico in September 1984. The survey occurred twice a month from Sept. 1984 thru Mar. 1985, then was reinitiated in Sept. 1985 and continued through the end of 1985. This survey was funded from the refuge budget and is conducted cooperatively with the Dept. of Natural Resources. This survey was established because no one was obtaining any data on waterfowl populations, habitat use, or migrational distribution, but the FWS was allowing the hunting of the resource. Since hunting a resource without data is a very questionable practice (yes, we know it occurs in other places too), it was decided (the interest of the Humane Society helped) that we should make some effort to obtain at least basic information on the waterfowl populations in Puerto Rico. Preliminary indications are: 1) that we can locate concentrations of blue-winged teal, West Indian ruddy ducks, West Indian brown pelicans and ospreys; and 2) that the teal appear to like the shallowly flooded (4-16") areas

that are only seasonally covered with water and produce a lot of widgeongrass (*Ruppia maritima*).

### 3. Marsh and Water Birds

The Green Cay NWR is the only Caribbean refuge with a known breeding colony of herons and egrets. All refuges provide at least minimal habitat for one or more species in this group.

### 4. Shorebirds, Gulls, Terns and Allied Species

Desecheo and Culebra NWR's provide breeding habitat for 13 different species of seabirds. Included in this group are terns, gulls, boobies, tropicbirds, shearwaters and frigatebirds. A great deal of effort is spent in monitoring, studying and banding seabirds on Culebra NWR. Much of the basic research effort comes from non-service employees who come to Puerto Rico to assist us in obtaining basic information on the ecology of our locally breeding species. In an effort to restore the seabird colonies at Desecheo NWR, an ARMM project for the removal of rhesus monkeys at Desecheo Island was approved for FY 85. The contractor worked hard at getting monkeys but in May, he had to give it up because of reduced effectiveness of the removal program. He came back again in December to have another go of it. For more information on the monkey business read the Desecheo NR.

### 5. Raptors

Red-tailed hawks, American kestrels, and short-eared owls breed on the Cabo Rojo and Culebra NWR's. Both the local and migrant raptors (including peregrine falcon, northern harrier, merlin) are found on most of the refuges. Cabo Rojo, Desecheo and Culebra NWR's provide wintering territories and food (e.g. boobies and slow moving cattle egrets) for 1-3 peregrines, per refuge, each winter season.

### 6. Other Resident Wildlife

Culebra is the only refuge with an exotic "game" animal introduced to the area. On July 20, 1966, four white-tailed deer (one buck and three does) were introduced to the island of Culebra as part of a cooperative project between the Federal Assistance program in the Atlanta Regional Office and the Commonwealth Natural Resources program (before the DNR was established). The deer are doing well and utilize the entire area of Culebra as part of their

established habitat. Since hunting is not allowed in the municipality of Culebra and since the largest blocks of publicly owned land contain unexploded military ordinance, there is probably only the remotest chance that this "game" species will ever be reported as a game mammal in the annual reports.

#### 7. Marine Mammals

Nineteen eighty-five was the first year in which the refuge staff were not called upon to salvage any dead manatees in Puerto Rico. This was a result of Tom Carr's manatee work and his salvage efforts rather than a lack of dead manatees.

#### 8. Animal Control

The refuge staff assisted the Kentucky Field Station of the FWS (now USDA/APHIS) Denver Wildlife Research Center with the shiny cowbird control project at Roosevelt Roads Naval Station and helped with trap construction at the Cabo Rojo NWR. Cowbird trapping with FWS support took place at Roosevelt Roads, Cabo Rojo NWR and the Boqueron State Forest. Additional information is available in the Cabo Rojo and Vieques Field Station NR's.

#### 9. Marking and Banding

Banding of tropicbirds, Audubon's shearwaters, and sooty terns occurred at Culebra NWR. All tropicbird banding was done as part of a graduate research project, the results of which are discussed in the Culebra narrative. The banding of shearwaters was done on an opportunistic basis, since this species is so poorly known in Puerto Rico and is only known to nest at Culebra. The sooty tern banding is conducted during the annual seabird surveys and is being used as a tool to enable us to better monitor the population at Culebra. At Cabo Rojo NWR, mist netting and banding are conducted as part of a doctoral research project. Male cowbirds captured during the cowbird trapping efforts were banded and released to see if the birds would habituate to a trap and lead other birds to the trap. Results of the male cowbird trapping were poor due to the late start of trapping and problems with the initial trap design. Color marking was conducted as part of a study of migrant warblers at Cabo Rojo in 1985.

## H. PUBLIC USE

### 1. General

Limited authorized public use takes place on the Caribbean Refuges. Due to the personnel limitations that we have experienced in the past, we actively encourage only very selective public use programs. Our greatest commitment is to the local community on Culebra. We want them to feel that the Culebra NWR is a real part of their community and we feel that spending time with local school students, local handicapped groups and the local media (i.e. the island radio station has its antenna on our land) provides a very positive image with the local folks. Outside of Culebra, we do not advertise our services but word of mouth lets people know that we are here. We do maintain an open door policy, so that whenever the gate is open (weekdays, weekends, or nights) then folks are welcome to come by. We do not get a lot of traffic but folks have come to know that they are welcome anytime they can find us in the office. Increased staffing and funding for displays will assist us in putting out a positive image everywhere, rather than just the image of mere presence we have now.

### 2. Law Enforcement

In the past we did little active law enforcement mostly because of the lack of staff and time, not because we did not have violations. Our active law enforcement program efforts are spent in trying: 1) to discourage, through a highly visible presence, the attempts at violations of the Endangered Species Act by turtle poachers and eggers; 2) to discourage, again through a highly visible presence, the attempts to egg the Culebra seabird colonies; and 3) seeking out waterfowl hunting violations in southwestern Puerto Rico through a hunter monitoring program.

We did manage to add a little spice to the life of a neighbor at Cabo Rojo who kept cutting the fence to provide grazing for his five horses. A 24 hour seizure with an administrative care cost of \$10 an animal and a little heart to heart talk about what we would consider doing the next time, resolved this problem.

In July, Manager Furniss accompanied a team of Special Agents on a raid of a pet shop dealer on Puerto Rico's north coast. The owner of the pet ranch was a former US Customs Patrol Officer, trained at the FLETC. He apparently decided to put his training to work with the smuggling of protected MBTA species between states. After a three hour operation we left with about 10 boxes of

records and 23 birds of 5 species. It was interesting sorting through all the files and records the dealer had on hand. There were some unusual illustrated techniques manuals at the pet ranch but since the wild life they described was not covered by the MBTA, Lacey Act or Endangered Species Act, we felt that the magistrate would not approve of our seizing them for in depth analysis.

#### I. EQUIPMENT AND FACILITIES

Currently our facilities consist of an office building and garage at Cabo Rojo NWR and an office trailer and residence trailer at Culebra NWR. We anticipate little in the way of new construction, although some permanent facilities are needed for Culebra in the future. Three new vehicles were requisitioned with FY 85 funds, but we were still awaiting word on the projected arrival date at the end of 1985. A new Ford tractor was purchased and arrived at Cabo Rojo in July.

Most of our major maintenance efforts are aimed at keeping the fences up, maintaining the structures and facilities, and having YCC help us do the work. With the new funding that we received in FY 85, we were able to do some long overdue maintenance and improve the facilities with some paint and some new signs. Major interior rehabilitation of the Cabo Rojo NWR office was undertaken to prepare space for the Caribbean Field Office (Endangered Species and Ecological Services) and for the new Visitor Contact Facilities.

#### J. OTHER ITEMS

Marc Weitzel wrote the Vieques section of the narrative. John Taylor prepared the Culebra section of the narrative. Roger Di Rosa wrote the Desecheo, Cabo Rojo and Sandy Point sections of the narrative. Sean Furniss and his friendly Apple Macintosh wrote the rest of this and so most of the blame for whatever is wrong must be theirs (although Mac says he only did what he was told to do by the other part of this crew). Marc and Roger assisted Sean with the editing before Mac did the work to get it out in a readable form.

## K. FEEDBACK

The project leader has had a lot to say about how we have had to operate down here over the past few years and, surprisingly enough, is still here to remember it all. Mostly, things have gotten better for us, and we do take some large share of the credit for getting it done in spite of everything. The added funds and personnel will help bring us up to where we think we should be operating. It has been a pleasant change to find that the Caribbean resource problems are finally getting some of the national support that was needed. The project leader still has two issues though (doesn't want anyone to think he has mellowed in his older age).

Item number 1. We fail to understand how Personnel Management and OPM can function on the out of date standards that they use to evaluate the refuge manager series and the wildlife biologist series. The outdated standards can not even begin to consider the problems in managing small, very dynamic ecosystems like we have here. Anyone who thinks that the project leader position here is only a GS-11 slot and that the wildlife biologist slot is only a worth a GS-9 suffers from serious problems in being able to deal with rational thought processes. We also fail to understand how our original secretarial position (given to us by executive fiat) was a GS-5 then changed to a GS-4 (when we had to fill it on our own after the GS-5 went to another local FWS office) when the work was the same at the two offices. Now what really frosts us is that we have a bigger budget, run 3 offices (compared to one 7-person office which combines two programs), have more personnel both permanent and temporary, and the GS-5 at the other office was upgraded to a GS-6. That is equality?

Item number 2. Why Refuges takes so long in being able to get the field stations into the age of computers is beyond our understanding. This whole argument of compatibility is rather moot as far as we can see. Anything produced by any computer can be transmitted in one of several communications modes that all computers can both send and receive. The project leader, having gone out and purchased two for his own use, can attest to the fact that they are an essential tool for doing business. Anyone who thinks their office needs only one such device has no understanding of what they can mean to staff productivity. The project leader fails to understand why we are the last division of FWS to enter the computer age. No matter what standards are developed for today, the capability of even the most basic office computer will surpass those standards long before we get everyone computerized. The most important thing is to get the types of machines that will make everyone feel

comfortable and confident using them in a short amount of time.. This will probably require that several different options be made available and will provide us the opportunity to find something that is being used by other folks in the local area. The best machine in the world is useless unless there is someone nearby who can tell you how to solve your problem, help you become more efficient and/or exchange ideas with. One brand, one type of computer will not help make us more efficient. We need to be flexible and get things that are easy to use. We do not need some industrial analyst or computer programmer to tell us what we need. We need field people getting involved in this issue, going out and test driving some of the different equipment to find out what is user friendly for them.

Now let's see as to delivery date for specifications (not equipment), we were told Sept. 1985, Feb. 1986 and then April 1987. That is progress of a sort but certainly not good for most folks performance standards. At \$3,000 for a megabyte unit with printer and 20 megabyte hard disk drive, we will bet that each refuge could have had at least two user-friendly units in operation for what it is costing in consultants fees, reviews and lost productivity. Now let's see if the guess of IBM will be right in April 1, 1987. Does it really take three years to write a justification for a computer that will not even be state of the art when the contract is written?

And for those that are looking for the little glint of wisdom in these pages, remember these words "El que tiene padrinos, se bautiza" and "Con pan y vino se anda el camino".

CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGES

CULEBRA NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U. S. Department of the Interior  
Fish and Wildlife Service  
NATIONAL WILDLIFE REFUGE SYSTEM

## Culebra NWR

### INTRODUCTION

Culebra, an island of approximately 6,747 acres, lies 17 miles east of Puerto Rico, and 12 miles west of St. Thomas in the U.S. Virgin Islands. The Culebra archipelago is part of the Puerto Rico Bank, a group of islands extending from Puerto Rico to the Virgin Islands.

An archaeological survey in 1979, revealed the presence of two distinct aboriginal populations, one occurring between 800-1000 A.D. and the other between 1200-1500 A.D. Columbus discovered the Culebra archipelago (his second NWR of the trip) during his second voyage to the new world in November, 1493. Early settlers on the island included Taino Indians who were escaping from Spanish slavery in Puerto Rico in the early 1500's. Culebra was later reported to have been a base for pirates who operated against Spanish commerce. Due to the lack of a potable water source on the island, Spanish colonization was delayed until 1889, when the settlement of San Ildefonso was built at what is now called Lower Camp. The settlement was moved twice before permanent establishment at Lobina Lagoon.

After the Spanish-American War of 1898, the residents of the island came under American jurisdiction. Between 1902 and 1911, Culebra was the main anchorage for the U.S. Caribbean Fleet, which was then relocated to Guantanamo, Cuba. It was probably during this time that an American officer, noting the vast seabird populations, recommended the surrounding islands as a wildlife preserve. On February 27, 1909, by Executive Order 1042 of President Theodore Roosevelt, the publicly owned islands and cays of the Culebra group, excluding the main island of Culebra, were designated as a wildlife preserve subject to naval and lighthouse purposes.

The Navy became active in the Culebra area again in 1936 with the approach of WWII, when target ranges for naval ships and aircraft were established. Naval exercises continued until 1973 on many of the outlying islands and cays (which had been included in the refuge) and on the northwest peninsula of Culebra Island (Peninsula Flamenco). Between 1972 and 1976, the Navy exceded most of its land holdings in the Culebra archipelago, and primary jurisdiction for the outlying islands and cays was passed to the Fish and Wildlife Service. In 1982, 776 acres on the main island of Culebra were transferred to the Service. The refuge currently totals 1,478 acres.

The refuge's diverse wildlife habitats include: a subtropical dry forest unit; two mangrove units; a peninsula covered with grasslands, shrubs and isolated woodlands; surf swept rocks; sedge covered cays; and islands covered with grasslands, shrubs and forest.

The Mt. Resaca unit is the largest remaining forest block on the island of Culebra. The northern slopes host microenvironments of tropical rain forest types. These areas, occurring chiefly in boulder strewn canyons and ravines, are hosts to one of the most unique vegetative communities in Puerto Rico. Trees in this area have canopies of 50 feet or more, and trunk diameters of three feet. Natural thorn thickets occur on the drier sites of this unit. Wildlife here includes many of the 25 reptile and amphibian species of the island, including the endangered Culebra giant anole (which may be extinct). A variety of avian species is found here, as is the introduced white-tailed deer.

Peninsula Flamenco is currently in a subclimatic grassland state. The climax forest vegetation was cut over for timber by the local residents and mechanically destroyed through bombardment and fires when used by the Navy. The largest seabird colony of the refuge is the sooty tern colony (30-40,000 birds) located at the northwest tip of the peninsula.

Two mangrove units of the refuge help assure protection of these vital links between terrestrial and marine ecosystems. The Ensenada Honda unit consist of mainly red mangroves and is the largest mangrove tract in the archipelago. The Puerto Manglar unit is a fringe of mangroves around a highly productive bay. It is an important area for brown pelicans and protects the coastal fringe of the phosphorescent bay which is a nursery and feeding area for marine life including green turtles and spiny lobster.

Thirteen species of seabirds (terns, gulls, tropicbirds, boobies, shearwaters) are the predominate wildlife of the 24 outlying islands, cays and rocks of the refuge. The larger islands (Culebrita and Cayo Luis Peña) are the only refuge areas open to the public, and visitation is restricted to daylight hours. These two larger islands have well developed deciduous to semi-evergreen forests, turtle nesting beaches, and brackish lagoons used by a variety of waterbirds.

INTRODUCTION

Page

TABLE OF CONTENTS

i

A. HIGHLIGHTS

1

B. CLIMATIC CONDITIONS

1

C. LAND ACQUISITION

Fee Title.....Nothing To Report.....(NTR).....

Easements.....(NTR).....

1. Other..... 2

D. PLANNING

Master Plan.....(NTR).....

Management Plan.....(NTR).....

Public Participation.....(NTR).....

Compliance with Environmental and Cultural Resource Mandates.(NTR)

1. Research and Investigations..... 2

Other.....(NTR).....

E. ADMINISTRATION

1. Personnel..... 5

2. Youth Programs..... 6

3. Other Manpower Programs..... 6

4. Volunteer Programs..... 6

5. Funding..... 7

6. Safety..... 7

7. Technical Assistance..... 7

8. Other..... 7

F. HABITAT MANAGEMENT

1. General..... 9

2. Wetlands..... 9

3. Forests..... 9

HABITAT MANAGEMENT (Cont.)

	<u>Page</u>
Croplands.....(NTR).....	
4. Grasslands.....	10
5. Other Habitats.....	11
Grazing.....(NTR).....	
Haying.....(NTR).....	
6. Fire Management.....	12
Pest Control.....(NTR).....	
Water Rights.....(NTR).....	
Wilderness and Special Areas.....(NTR).....	
WPA Easement Monitoring.....(NTR).....	

G. WILDLIFE

1. Wildlife Diversity.....	12
2. Endangered and/or Threatened Species.....	12
3. Waterfowl.....	15
4. Marsh and Water Birds.....	15
5. Shorebirds, Gulls, Terns and Allied Species.....	17
6. Raptors.....	18
Other Migratory Birds.....(NTR).....	
Game Mammals.....(NTR).....	
7. Marine Mammals.....	18
8. Other Resident Wildlife.....	19
Fisheries.....(NTR).....	
Wildlife Propagation and Stocking.....(NTR).....	
Surplus Animal Disposal.....(NTR).....	
Scientific Collections.....(NTR).....	
Animal Control.....(NTR).....	
9. Marking and Banding.....	19
Disease Prevention and Control.....(NTR).....	

H. PUBLIC USE

1. General.....	20
2. Outdoor Classrooms - Students.....	20
3. Outdoor Classrooms - Teachers.....	21
Interpretive Foot Trails.....(NTR).....	
Interpretive Tour Routes.....(NTR).....	
Interpretive Exhibits/Demonstrations.....(NTR).....	

PUBLIC USE (Cont.)

	<u>Page</u>
4. Other Interpretive Programs.....	21
Hunting.....(NTR).....	
Fishing.....(NTR).....	
5. Trapping.....	22
Wildlife Observation.....(NTR).....	
Other Wildlife Oriented Recreation.....(NTR).....	
6. Camping.....	22
Picnicking.....(NTR).....	
Off-road Vehicling.....(NTR).....	
7. Other Non-wildlife Oriented Recreation.....	22
8. Law Enforcement.....	23
Cooperating Associations.....(NTR).....	
Concessions.....(NTR).....	

I. EQUIPMENT AND FACILITIES

New Construction.....(NTR).....	
Rehabilitation.....(NTR).....	
Major Maintenance.....(NTR).....	
1. Equipment Utilization and Replacement.....	24
Communications Systems.....(NTR).....	
Computer Systems.....(NTR).....	
Energy Conservation.....(NTR).....	
2. Other.....	25

J. OTHER ITEMS

1. Cooperative Programs.....	25
Other Economic Uses.....(NTR).....	
Items of Interest.....(NTR).....	
2. Credits.....	25

K. FEEDBACK

26

# CULEBRA NATIONAL WILDLIFE REFUGE

CULEBRA ISLAND GROUP—PUERTO RICO

UNITED STATES  
DEPARTMENT OF THE INTERIOR

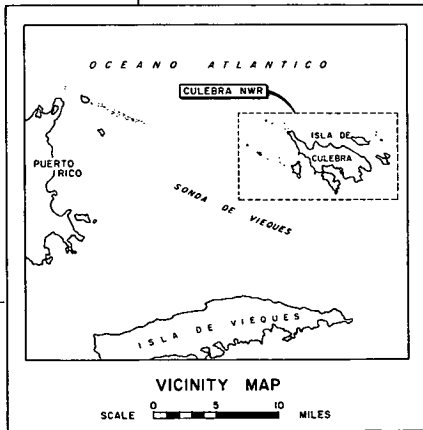
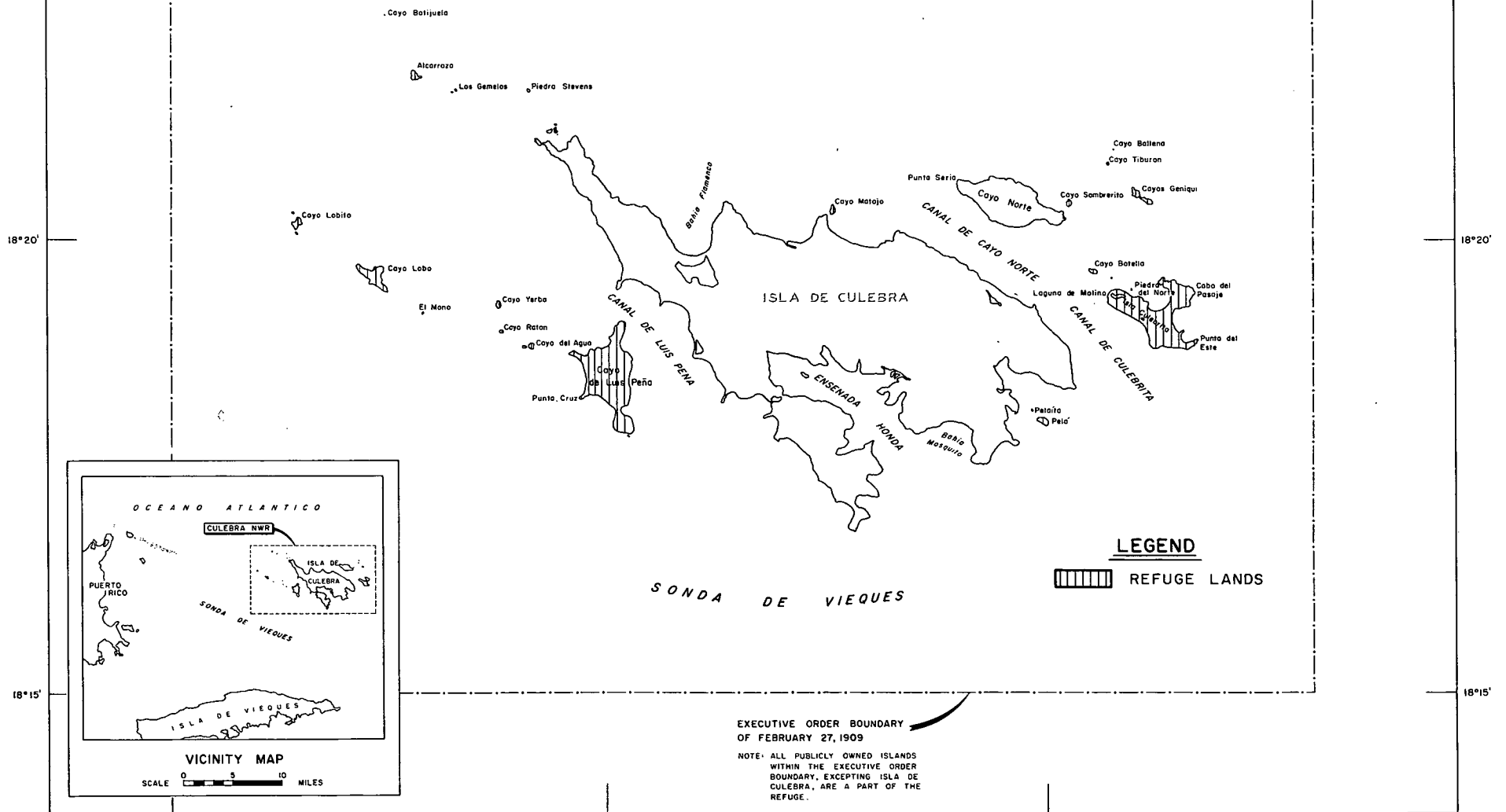
UNITED STATES  
FISH AND WILDLIFE SERVICE

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O C E A N O A T L A N T I C O



## LEGEND

 REFUGE LANDS

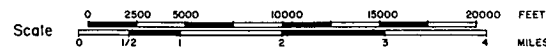
EXECUTIVE ORDER BOUNDARY  
OF FEBRUARY 27, 1909

NOTE: ALL PUBLICLY OWNED ISLANDS  
WITHIN THE EXECUTIVE ORDER  
BOUNDARY, EXCEPTING ISLA DE  
CULEBRA, ARE A PART OF THE  
REFUGE.

COMPILED IN THE DIVISION OF REALTY  
FROM SURVEYS BY USGS

REVISED: 8/79  
APRIL, 1969

ATLANTA, GEORGIA



TRUE NORTH  
MAGNETIC N

MEAN  
DECLINATION  
1969

4R PR 52 403

A. HIGHLIGHTS

Navy leases 90 acre Punta Flamenco tract to FWS (Section C.1)

Four research programs occurred on the Culebra Refuge (Section D.1)

Significant personnel additions and transfers took place (Section E.1)

Over 7,000 volunteer hours used in refuge programs (Section E.4)

Roseate tern breeding population increases by over 100% (Section G.5)

B. CLIMATIC CONDITIONS

During the summer and fall we experienced a rash of nine tropical waves one of which became Hurricane Elena. We also experienced Tropical Storm Isabel which became a killer storm in Puerto Rico. Hurricanes Gloria and Kate passed wide of the island, disrupting the tranquil island life on Culebra.

CLIMATOLOGICAL DATA - CALENDAR YEAR 1985

<u>Month</u>	<u>Inches of Rainfall</u>
January	1.75
February	.80
March	4.20
April	.58
May	11.75
June	1.75
July	4.21
August	3.20
September	3.57
October	7.75
November	3.99
December	---

### C. LAND ACQUISITION

#### 1. Other

The U.S. Navy leased the lands around the Flamenco Observation Post on Punta Flamenco to the U.S. Fish & Wildlife Service in March. The boundary of the unit, consisting of approximately 90 acres, was in the process of being surveyed at the close of 1985 and will be fenced later in 1986. The observation buildings, which are in need of extensive repair, were vandalized before the Navy lease took affect. FWS and the Municipality of Culebra will be negotiating to have the buildings subleased to the municipality. If the Navy agrees to the proposal, we anticipate that the Municipality will assume maintenance responsibilities for the structures in mid 1986.

### D. PLANNING

#### 1. Research and Investigations

##### Culebra NR85-"White-tailed Tropicbird Breeding at Culebra, Puerto Rico" (41522-5)

Fred Schaffner of the University of Miami completed his second year of a three year tropicbird bioenergetics study at Punta Cruz and the Southeast Peninsulaa of Cayo Luis Peña. Through regular visits to each colony, 89 different nest sites were identified, representing 62 pairs. This represents a larger population than was first estimated. Egg weights, chick weights and morphometric measurements have been collected regularly over the two year period. In addition, data on incubation shifts, regurgitation identification, nest site selection and fidelity and interesting behavioral observations have been recorded. A remote weighing device for measuring chick weights was field tested by Schaffner and Colin Pennycuick during the 1985 season and after a few modifications will be used in the 1986 field season. A total of 69 clutches were discovered at both colony locations in 1985. Hatching success estimated by the Mayfield Method was estimated at 20.7% (14 eggs hatched) and fledging success was estimated at 90.6% (13 chicks fledged).

Culebra NR85- "Leatherback Turtle (*Dermochelys coriacea*) Nesting in Culebra, Puerto Rico" (41522-6)

The island of Culebra is the major nesting site for leatherback sea turtles (*Dermochelys coriacea*) in Puerto Rico. All night beach patrols were conducted in the 1984 and 1985 nesting seasons. The complete beach coverage of the saturation tagging program on Resaca (1.0 km) and Brava (1.2 km) enabled nearly all nesting females to be observed. The nesting season extended from 13 February until 16 July, and all night patrols occurred from 31 March until 8 July. Within the study site, 117 nests and 30 false crawls occurred. Seventeen females were tagged. An average of 6.1 nests per turtle was observed with an internesting interval of 9.0 days. Two individuals were documented laying ten nests within the season. The peak of the nesting season occurred in the second week of May with three nests per night being deposited. Mean clutch size counts at oviposition were 75.1 yolked eggs, 36.8 yolkless eggs, total clutch size was 111.9 eggs. Nest depths averaged 72.7 cm. and 97.5% of all nests were laid well above the high tide line on a stable upper beach platform. Nesting female measurements were 157.5 cm. OC notch-tip and 150 cm. SL notch-tip. Head width and body depth measurements averaged 23.3 cm. and 51.6 cm. respectively. Inter-island migration between Culebra and St. Croix was documented for two individuals in 1984 and for one individual in 1985. All nests were left to incubate in situ. A total of 5308 hatchlings emerged from 108 nests. Natural hatchling success is approximately 74.4%. Salt water inundation caused failure of three (2.5%) of the nests and egg poachers may have taken an additional three (2.5%) nests. The average incubation period (64.6 days) varied throughout the season, but decreased as the season progressed. Hatchling predation by crabs, herons, and ants was negligible. Egg poaching by humans was effectively curbed as long as beach patrols continued.

Culebra NR85-"Parental Behaviour and Foraging Ecology of Brown Noddies (*Anous stolidus*)" (41522-7)

A research proposal was received early in the year from Brock University of St. Catharines, Ontario, to examine and compare temperate and tropical seabird differences in breeding biology. Researchers Morris and Chardine arrived in May and chose the Cayo Noroeste brown noddy colony site as a study area. Fifty-one adults were captured and banded of which 34 were mates in 17 pairs. These birds were banded under the station master permit and were also color banded so that individual birds could be identified from a proposed blind. Most of the birds banded were from a group on the south and southwest face. Nest sites were marked as well. Besides taking morphometric measurements of both

birds and eggs in 1986, extensive behavioral observations will be made from a proposed blind to be constructed on the south face of the cay.



Nesting brown noddie on Cayo Noroeste. Researchers Chardine and Morris completed the first season of a three year study of the brown noddie. J. Taylor. AN-85-CBR-01.

Culebra NR85-*Increased Precision in Breeding Population Estimates and Determination of Hatching and Fledging Rates at the Flamenco Sooty Tern Colony, Culebra, Puerto Rico (41522-8)*

Lisa Hilli of Yale University and John Taylor of the Culebra NWR combined to establish an accurate breeding population estimate for Peninsula Flamenco sooty tern colony, a permanent grid system containing an adequate number of randomly chosen points located was utilized. As in 1983 and 1984, nest densities were highest in the croton/panicum scrub habitat with 11.6 clutches/plot. Coccoloba thicket habitat nest density averaged 9 clutches/plot. Other habitat nest densities were less than four nests/plot. Considerable nest clumping was observed in all habitat types but the croton/panicum scrub habitat and random plots which fell on habitat edges recorded higher nest densities. Although the panicum grassland habitat recorded low nest densities,

the value of this habitat was readily observed during regular visits to enclosures. It was used extensively by sooty tern chicks for concealment, and protection from wind, rain and high temperatures. An attempt was made to determine hatching and fledging success for the colony by choosing nine of the most successful sample plots for closer examination. Each of these plots was encircled with foot high wire mesh forming enclosures. Eggs were marked after laying and followed through to either destruction, disappearance or fledging. Of the 149 eggs which were laid in these nine plots (enclosures), 62 (42%) hatched while the remainder were lost (disappeared). Of the 62 chicks that hatched, 46 (74%) eventually fledged. Egg laying chronology within the study plots beginning on May 5th demonstrated three distinct peaks in egg laying occurring around May 15th, May 19th and May 25th, declining sharply on May 31st, and finally ending on June 15th.

#### E. ADMINISTRATION

##### 1. Personnel

Information regarding permanent personnel working at Culebra is covered in the Caribbean Refuges narrative section. Henry Morales joined the Culebra staff in August as a WG-7 maintenance man and is a truly welcome addition. It was almost impossible to cover the refuge adequately with the single permanent position assigned to Culebra. Tony Tucker was brought on board as a GS-4 biological aid to handle beach surveys and in-the-water hawksbill surveys from August through December. John Taylor, the GS-9 refuge manager transferred to the Bosque del Apache NWR in New Mexico as a refuge biologist in December. Although happy to return to his native Southwest, he dearly misses Culebra and island life. (That is just one small unsolicited recruiting ad that we get from our former staffers. Remember that you too can experience the Caribbean, just start learning your spanish)

The following volunteers and YCC personnel worked at the Culebra NWR in 1985.

##### List of Personnel

1. Ron S. Childs, Laborer Foreman, WS-1, 5/85-8/85.
2. Luz Albert, YCC Enrollee, 6/85-7/85.
3. Mario Albert, YCC Enrollee, 6/85-7/85.
4. Andres Lopez, YCC Enrollee, 6/85-7/85.
5. Mildred Monell, YCC Enrollee, 6/85-7/85.
6. Henry Morales, YCC Enrollee, 6/85-7/85.

7. Wanda Munet, YCC Enrollee, 6/85-7/85.
8. Esmeralda Rivas, YCC Enrollee, 6/85-7/85.
9. Aixa Romero-Morales, YCC Enrollee, 6/85-7/85.
10. Ivan Romero, YCC Enrollee, 6/85-7/85.
11. Myra Romero, YCC Enrollee, 6/85-7/85.
12. Luis Sanes, YCC Enrollee, 6/85-7/85.
13. William Solis, YCC Enrollee, 6/85-7/85.
14. Fred C. Schaffner, Volunteer Biologist, 2/85-7/85.
15. Dr. Colin Pennyquick, Volunteer Biologist, 4/85.
16. Tony Tucker, Volunteer Biologist, 3/85-7/85.
17. Kathy Hall, Volunteer Biologist, 3/85-7/85.
18. Dr. Ralph Morris, Volunteer Biologist, 5 & 6/85.
19. Dr. John Chardine, Volunteer Biologist, 5/85.
20. Lisa Hilli, Volunteer Biologist, 5 & 6/85.

## 2. Youth Programs

The third annual YCC program was successfully completed in 1985. This hard-working group of youths was essential in meeting the refuge project goals outlined for the year. The most notable accomplishments during the season included the fencing of the newly surveyed Mt. Resaca Unit of the refuge, cleanup of refuge beaches and mesquite control on Peninsula Flamenco. Iván Romero Peña received the YCC enrollee of the year award for his hard work and dedication.

## 3. Other Manpower Programs

Once again the Culebra Conservation and Development Authority aided refuge personnel by providing boat transportation and an operator while the refuge boat was down, and loaning laborers for fencing projects. Their mechanic also aided the refuge with numerous repairs to refuge vehicles.

## 4. Volunteer Program

Once again the volunteer hours (7,584 hours) donated to the refuge and its projects was one of the largest amounts contributed to the Regional Total. Beach patrols related to the leatherback turtle nesting season contributed most of the hours that were recorded. Biological work on seabird species also contributed quality volunteer hours to the refuge. Frank Cadden, our senior but able sea captain, and youthful Mario Romero and Wanda Colón of the local school devoted many hours and nights on beach surveys. Terry Hall also helped out

with many nights on the beach also and provided repairs on refuge equipment at bargain rates. Maggie Griffin contributed where she could working around her pregnancy and school work. These were just a few of the many devoted volunteers we had in 1985.

#### 5. Funding

This is covered in the Caribbean Refuges section of the report.

#### 6. Safety

As part of the station safety program, staff at the Culebra NWR reviewed safety materials sent from the complex headquarters. Weekly safety meetings were held during the summer months to convey important safety considerations to the expanded seasonal staff. Daily tailgate safety talks were an important YCC function. The first complex safety meeting in Boquerón was attended by the entire Culebra staff in October. Refuge equipment was checked to insure proper functioning. Corrected safety problems for 1985 included the writing of the station safety plan, acquisition of a new refuge boat motor and updating the boat safety equipment. The U.S. Coast Guard repaired vandalism to the door leading to the top of the Culebrita lighthouse after it was found to be off its hinges in June.

#### 7. Technical Assistance

Assistance was provided to: the U.S. Navy in re-establishing the Flamenco Observation Point Unit boundary; the U.S. Coast Guard on rescue operations for stranded boaters and routine boarding operations; to the PR DNR whenever input was needed on resource protection activities on their Culebra lands; to FWS Ecological Services in preventing and assessing illegal projects in the navigable waters around Culebra; to FWS Special Agents during the Puerto Rico waterfowl hunting seasons; to NMFS Special Agents in turtle poaching operations in waters around Culebra; and to EPA and their consultants in preparing an EIS on a proposed wastewater treatment plant for Culebra.

#### 8. Other Items

Manager Taylor attended the 5th Annual Workshop on Sea Turtle Biology and Conservation at Waverly, Georgia, from 13-18 February.

Manager Furniss and Refuge Supervisor Grabill performed a station inspection of Culebra on 27 February.

Ray Pauley of the Chicago Brookfield Zoo visited the Mt. Resaca Unit of the refuge in April to observe the Culebra giant anole habitat. He is an anole expert and has raised the Dominican variety in captivity.

Manager Taylor presented a program on refuge habitat management to 20 members of the Puerto Rican DNR Corps in April.

Manager Taylor attended Law Enforcement Training in Tallahassee, Fl. on 21-26 April.

Norman Hopgood, an amateur film producer, visited the refuge on 5 May to discuss narration of video films made on the refuge during 1984.

Paul Gertler (ES-Caribbean Field Office) and Earl Possardt (ES-Jacksonville, FL Field Office) visited the refuge to discuss marine turtle research needs and funding.

Dr. James Jenkins and Joe Corn of the Southeastern Cooperative Wildlife Disease Study in Athens, Ga. visited the refuge investigating the possibility of Culebra deer acting as vectores in cattle born tick infestations occurring in Puerto Rico.

A refuge survey contract was awarded to E. Cividanes and Feira Assoc. of San Juan, P.R. for boundary establishment of the Mt. Resaca and Puerto del Manglar units of the refuge. The contract price was just over 31,000 dollars.

Bob Turner, dive master for region 4, visited Culebra in October to certify refuge and Ecological Services staffs for diving. He also presented safety materials and a program on safety.

Carmen Mendez, the complex safety officer, performed a safety inspection of the refuge during November.

The Taylor family grew by one on November 17th with the addition of Juan Pablo Taylor-Griffin on Culebra.

## F. HABITAT MANAGEMENT

### 1. General

Habitat conditions on Culebra are greatly dependent on rainfall. The rainy season gives rise to a burst of activity in this environment much the same as the end of the dormant season does in temperate climates. This year a more normal climatic pattern prevailed through April. Periodic rainfalls suppressed high temperatures during these hot months. The rainy season usually begins in May, and this year it started with a 9 inch deluge. Losses to nesting wildlife included several leatherback nests on Playas Resaca and Brava and several nests in the sooty tern colony where terns were incubating newly laid eggs. We attempted to document egg loss in our various seabird colonies and were surprised to find that egg loss was remarkably low, demonstrating the high nest tenacity of incubating adults during such a downpour. June a critical month for nesting seabirds, was fairly dry but periodic showers offered respite to hatching chicks. Consistent rainfall due to several tropical storms kept the islands vegetation lush through the remainder of 1985.

### 2. Wetlands

Water conditions in the seasonally flooded, brackish lagoons were excellent due to consistent rainfall. Fluctuating water levels provided excellent habitat throughout the year for resident and migrant waterfowl, marsh and wading birds and shorebirds. No active management is applied to these lagoons nor is any anticipated in the future.

### 3. Forests

The largest remaining tract of semi-evergreen to deciduous forest on the island comprises the Mt. Resaca unit of the refuge and includes the tree species *Guapira fragans*, *Bucida buceras*, *Susera simaruba*, *Mastichodendron foetidissimum* and *Spondias mombin*. These trees can reach heights of more than 50 feet and have diameters of up to 3 feet. Natural thorn thickets occur on the drier sites and reach heights of 15 feet and have stems less than 3 inches in diameter. Large boulder covered areas in the Mt. Resaca forest have park-like open forests of cupey and jaguey trees, whose roots entwine the boulders like the knarled fingers of an old man. The rock surfaces provide a terrarium-like atmosphere of silky orchids, colorful bromeliads and the waxy jade of the threatened Wheeler's peperomia (*Peperomia wheeleri*).

Isla Culebrita and Cayo Luis Peña both have well developed deciduous, semi-evergreen forests with *Bursera simaruba*, *Pisonia subcordata*, *Bourreria succulenta*, and *Exostema caribaeum*

This year the boundaries of the Mt. Resaca unit were reestablished by surveyors and four original navy corner markers dated 1908 were located. These reestablished boundaries were fenced on all sides but the east by the close of 1985. This will protect the unit from the grazing which has occurred over the years. No forest management occurs on any of these areas and none is anticipated.

#### 4. Grasslands

Range conditions on Peninsula Flamenco were extremely good in early 1985 having recovered from the past overgrazing activity that occurred before the unit was transferred to the refuge. However, in mid-March during the dry season a fire, the second in two years, burned most of the east side of the unit. The fire was controlled just short of Punta Noroeste, the sooty tern colony, and none of this guinea grass habitat was burned. A serious fire in May of 1984 burned a third of this habitat destroying over two thousand nesting adults.

Past overgrazing resulted in mesquite and acacia infestations replacing the solid stands of guinea grass habitat preferred as nesting habitat by sooty terns. It is thought that burning as a result of concentrated naval bombardment, stimulated this grassland to develop and caused the guinea grass to become the dominant species. With this in mind we watched range response to the 1984 fire with optimism. Results were encouraging especially after good rainfall. Mesquite and acacia appeared suppressed while guinea grass and bermuda grass response was phenomenal. A better range was evident after the fire. In 1985 the response was different. Sufficient rainfall did not fall for some time which had the inverse effect. Without rainfall, bermuda grass response was extremely slow and without herbaceous competition mesquite and acacia response went unchecked.

Brush control in the historic colony area continued in 1985 with herbicide treatment replacing brush clearing. Spike herbicide (active ingredient, tebuthiuron) in granular pellets was applied by hand to each mesquite or acacia bush. Ninety-eight percent (Approximately four hectares) of the swale area adjacent to the remaining colony habitat was treated. After sufficient rainfall had fallen to move the herbicide into the root zone, the acacias, which make up about 85% of the vegetation, were killed. The herbicide was not as effective on

mesquite because of its deep tap root. The next step in the restoration effort will be to establish guinea grass through a transplanting program.

## 5. Other Habitats

### a. Mangroves

The Puerto de Manglar unit of the refuge is a mangrove fringe coastal area surrounding the bioluminescent body of water called Puerto de Manglar. Four species of mangroves (red, black, white and button) are found here, with red mangrove dominating the community. Turtle grass or *Thalassia* in the bay provides excellent foraging habitat for green turtles and a healthy supply of conch exists near the bay entrance. Over the summer the unit was surveyed demarking FWS ownership of the area and thus protecting this coastal fringe of the bay from development.

The Ensenada Honda unit, also known as El Cayo after an old townsite in the area, is the most extensive coastal mangrove area on Culebra. All four species of mangrove are also found here. Several mangrove islands within the unit provide pleasant boating through the area. A land ownership dispute between the Fish and Wildlife Service and the Miguel Gonzalez family centers on the upland area located within the unit and on an upland fringe on the east side of the unit. The family has refused to allow FWS access to the uplands in the Ensenada Honda unit and the situation was referred to the Regional Solicitor for further action. This delay prevented inclusion of the unit in the survey contract in 1985. When the situation is resolved, the unit will be surveyed, posted and fenced where needed.

### b. Cays

Vegetation clearing on Cayo Matojo continued for the third year and was initiated on Cayo Lobito for the first time this year. After a favorable response in 1982 and 1983 by sandwich and royal terns to the vegetation removal on Cayo Matojo, we were disappointed to find limited use by these species this year. We feel that poaching activity last year on the cay was largely responsible for the lack of nesting. There was no nesting recorded in the cleared areas on Cayo Lobito. However, limited nesting by these species occurred in a different area of the cay. The majority of the 1984 Matojo population mixed with the roseate terns nesting on Cayo Molinos this year.

### c. Beaches

Refuge beaches include those on Peninsula Flamenco, Isla Culebrita and Cayo Luis Peña. Most of these beaches have recorded hawksbill nesting, and Playa Este on Isla Culebrita has also experienced leatherback nesting activity. During 1985, as in 1984, the beaches on Culebrita and Cayo Luis Peña were cleared of drift trash to facilitate turtle nesting and hatchling emergence.

### 6. Fire Management

No fire management plans have been prepared for Culebra NWR because of the remoteness of the individual units, their small size and, more importantly, the presence of unexploded military ordinance. A fire occurred in March on Peninsula Flamenco. No action was taken and no damage to seabird nesting areas occurred. The wildfires can cause considerable damage if they enter the seabird colony area as in 1984. They also have the potential to control brush encroachment if timed before periods of sufficient rainfall which stimulates herbaceous (grass) competition and dominance.

## G. WILDLIFE

### 1. Wildlife Diversity

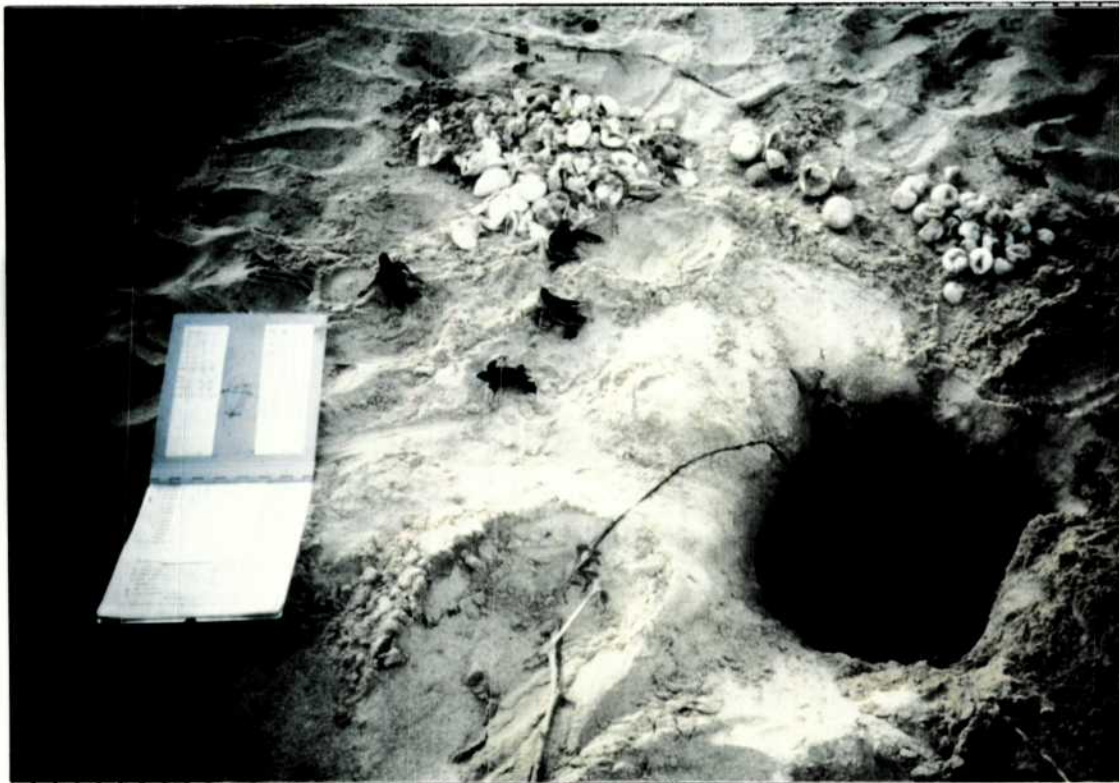
Culebra, like most oceanic islands, is limited in terrestrial wildlife diversity. The island does support an assortment of 25 reptilian and amphibian species including four species of endangered and threatened sea turtles. Four species of introduced terrestrial mammals (black rat, Norway rat, house mouse, white-tailed deer) are found here. Four species of bats (fisherman bat, big brown bat, Brazilian free-tailed bat, velvety free-tailed bat) are known from the area. The greatest diversity occurs in the known avifauna, with over 90 species having been identified here. The most striking component of the avifauna is the seabird group. Thirteen species are known to breed on Culebra, and the breeding season extends year round. Peak populations of seabirds have exceeded 180,000 individuals.

### 2. Endangered and Threatened Species

#### a. Sea Turtles

Four species of sea turtle are present and known to have nested in the Culebra archipelago. These include the leatherback, the Atlantic green, the hawksbill,

and the Atlantic loggerhead. The 1985 nesting season marked the third year of regular beach surveys on the island. Playas Resaca and Brava were again patrolled nightly by Earthwatch volunteers during the entire leatherback nesting season. (See Section D.1) With the addition of Tony Tucker, marine turtle biologist, to the regular staff in July, the first year of a three year hawksbill nesting and foraging study was initiated. By the end of November just 19 hawksbill nests had been found in the Culebra archipelago, most of these on Culebrita. It appeared that 1985 was a poor year for hawksbill nesting throughout the Caribbean.



Post emergence data gathering of leatherback turtle nests helped determine nesting success. T. Tucker. AN-85-CBR-02.

In-the-water hawksbill habitat surveys were initiated in September utilizing SCUBA diving equipment. Important hawksbill habitat was identified on the west side of Culebra. Other areas of Culebra will be surveyed in 1986. Considerable time was saved by using a TECNA dive sled to do the underwater surveys. Tony Tucker submitted a formal proposal for more detailed work involving extended underwater observations of resident hawksbills.

A green turtle tagging and monitoring program for the Culebra area began in March 1986. For several years the Virgin Islands Division of Fish and Wildlife

has had a turtle netting and tagging program for estimating their green turtle population. By using various measurements and recapture data they were able to document turtle movements and growth rates. In 1985, the Culebra staff participated in two turtle netting drives with Virgin Islands personnel.

b. West Indies Brown Pelican

The Culebra archipelago is an important roosting and feeding area for the endangered brown pelican. Up to 60 individuals roost and feed in Puerto de Manglar and groups of 10 to 15 birds are regularly seen feeding off beaches and rocky points.

c. Culebra Giant Anole

No documented sightings of this species have been made since 1932. The refuge office is infrequently visited by individuals claiming sightings of the species but up to now most have been iguanas. A field investigation by the Puerto Rican Department of Natural Resources (funded with Section Six monies) will be conducted in 1986 in an effort to detect its presence or determine its extinction.

d. Peregrine Falcon

The Caribbean island chain is an important wintering area for the tundra subspecies of the threatened peregrine falcon. Three or four birds generally arrive in Culebra in November and remain until March. The birds are commonly feed on booby chicks and on occasion take nesting tropicbirds on Cayo Luis Peña.

e. Commonwealth Plants

There are five endemic species of plants on Culebra and the surrounding islands that are considered to be rare: *Peperomia wheeleri* (Mt. Resaca forest); *Caesalpinia culebrae* (coastal on Culebrita); *Justicia culebritae* (local forb species on Culebrita); *Tillandsia lineatispica* (local forb species on Culebra); and *Leptocereus grantianus* (local cactus on Culebra).

### 3. Waterfowl

Water conditions were much better this year than last year. Major lagoons held sufficient water to support migrating blue-winged teal and resident West Indian ruddy ducks and white-cheeked pintails. Peak blue-winged teal use occurred in mid-March when 75 were observed island wide. The peak West Indian ruddy duck population (which do not nest on Culebra) was reported in February when were seen on Laguna Flamenco by Mgr. Furniss. Twenty-five masked ducks were observed on Laguna Flamenco and the lagoons adjacent to Ensenada Honda near refuge headquarters.

White-cheeked pintails, our resident nesting species, sustained good numbers from January to May averaging 175 ducks and peaking with 225 in March and April. From June to August we were only able to detect an average of 100 ducks when they apparently dispersed to nest. Several broods were seen on Laguna Flamenco, Laguna Zoni, various stock ponds around the island and in Ensenada Honda. White-cheeked pintails are suspected of nesting in guinea grass stands around Laguna Zoni and the airport tract which accounts for the number of broods seen in the bay. Nest locations around Laguna Flamenco remain unknown. At least 20 broods were seen in these areas with many more suspected. Two white-cheeked pintail nests were found on Cayo Molinos and Cayo Ratón this year during seabird nest surveys. At least five broods were reported around the Tres Hermanas area, four miles from mainland Culebra and in the Canal de Luis Peña channel. It is not known if the lack of suitable nesting habitat on mainland Culebra is forcing this dabbling duck to nest on surrounding cays.

### 4. Marsh and Water Birds

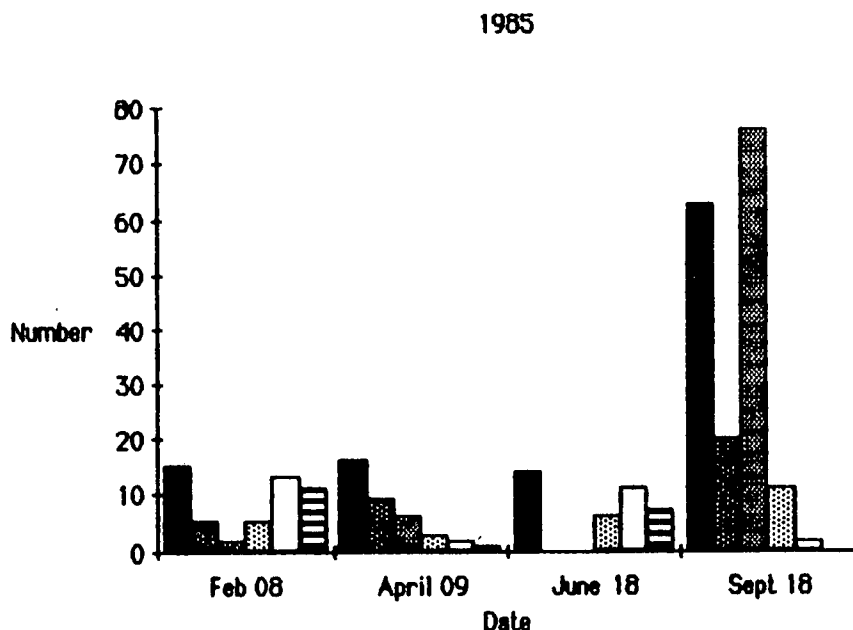
Five species of heron (tri-colored, green-backed, great blue, little blue, yellow-crowned night-heron) are common on the island. By far, the most common is the yellow-crowned night-heron which thrives on land crabs in the mangrove areas and is also an opportunistic predator on hatchling turtles and seabird chicks. The only rookery known on Culebra is a cattle egret rookery located in the mangroves on the north end of Ensenada Coronel containing 300-350 nests.

Other common marsh bird species on Culebra included clapper rails, pied-billed grebes, least grebes, common moorhens, and American coots. The first recorded sighting in at least three years of the Commonwealth endangered

Caribbean coot was made on 23 September on Laguna Flamenco by biologist Tucker. It was the object of considerable excitement.

Three species of booby breed at Culebra. Depending upon the time of year you can find two to five nests of the red-footed booby, eight to 15 nests of the masked booby, and 20 to 200 nests of the brown booby. Booby surveys on Cayo Geniquí were plagued this year by rough seas and boat problems. The figure below summarizes the four survey dates for 1985 by age/development class.

Results of Four Survey Dates in 1985 for Brown Boobies by age/development class on Cayo Geniquí, Culebra NWR, P.R.



Nesting is continuous throughout the year with August and September being the peak egg laying months. Most of the birds fledged before the end of the year.

Information on the tropicbird colony on Cayo Luis Peña can be found in Section D.1.

Audubon's shearwater nests increased this year. Cayo Matojo had 5 nests and a single nests were located on both Cayo Geniquí and Cayo del Agua. The return of banded birds on Cayo Matojo and Cayo Geniquí indicated annual nesting by the species and high nest site tenacity.



Aububon's shearwaters are rarely seen at Culebra NWR. Five nests were monitored on Cayo Matojo, Cayo del Agua and Cayo Geniquis. All chicks were banded. M. Weitzel. AN-85-CBR-03.

#### 5. Shorebirds, Gulls, Terns, and Allied Species

Shorebird populations on Culebra were monitored monthly. Sixteen species were recorded in 1985, two more than were recorded in 1984. These were the willet and the stilt sandpiper. Large concentrations of black-necked stilts, lesser yellowlegs and least sandpipers were noted.

The annual tern and gull population survey was conducted in June and all nesting colonies were surveyed. The sooty tern population was estimated using a circular plot sampling technique for each colony; all other population estimates were based upon direct counts of the breeding colonies. The following table shows the populations estimates for 1971 and 1981-1985.

SPECIES	1971	1981	1982	1983	1984	1985
Sooty Tern	187,570	17,900	30,680	30,420	48,148	37,750
Bridled Tern	720	975	900	850	1,000	606
Brown Noddy	1,110	1,090	1,420	1,360	1,608	1,566
Royal Tern	310	210	252	336	286	174
Sandwich Tern	1,472	840	500	356	342	210
Roseate Tern	650	400	690	550	482	1,082
Laughing Gull	1,290	1,318	810	1,370	1,288	1,452

The sooty tern population declined on the Peninsula Flamenco due to the effects of egg poaching and overgrazing in the late 70's and early 80's. The resulting low recruitment (sooty terns take at least 7 years to enter the breeding cohort) to the population and probable emigration (suggested by band recovery data) to nearby Saba Cay in St. Thomas are reflected in the current sooty tern population numbers. The sandwich and royal tern population declines in 1985 were probably due to last year's poaching activity on Cayo Matojo. Sandwich terns, besides declining in population numbers, moved their main colony to Cayo Molinos. The roseate colony on Cayo Molinos doubled in its breeding population, which was a welcome surprise for this species (which is pending federal listing as a threatened species in the Caribbean).

#### 6. Raptors

American kestrels were common throughout the island. Red-tailed hawks occurred along Mt. Resaca and in areas where seabirds nest in dense colonies. A pair of short-eared owls were residents at Peninsula Flamenco. Ospreys, peregrine falcons and merlins are usual winter visitors to Culebra and prefer the coastal areas and outlying cays.

#### 7. Marine Mammals

Observations of hump-backed whales from the ferry between the islands of Puerto Rico and Culebra are common in February, March and April during migration periods.

Bottlenosed dolphins can be seen throughout the year and large groups are observed in April. Three dolphins appeared to be resident just off Cayo Molinos.

## 8. Other Resident Wildlife

The non-hunted, introduced white-tailed deer population on Culebra appeared to be recovering slowly from losses suffered during the 1984 drought. This is based only on observations and not on any established survey for the species. Lack of personnel and time constraints again hampered a population inventory for this species. Several fawns were sighted during the summer and the population is estimated to be 90 animals.

Mud flats around lagoons and throughout the mangrove areas are host to thousands of land crabs. These crabs are extensively trapped by locals as a traditional food source. Before the Mt. Resaca unit was surveyed to reestablish the boundary we were erroneously prohibiting trapping the crabs in an adjacent area. Due to the state of flux regarding the Ensenada Honda unit, a high crab density area, we cannot protect the crabs there. At present no area on Culebra is protected from land crab trapping. The trapping can be quite thorough and has the potential to seriously deplete this resource.

## 9. Marking and Banding

Ninety-five sooty tern chicks and adults were banded on Peninsula Flamenco as part of a hatching and fledging study. Seven band recoveries were made at the colony this year. Most were previously banded as adults. Ten Audubon's shearwater adults and chicks were banded on three cays. Recapture data indicated strong nest site tenacity by adults. One hundred and twelve brown noddy adults and chicks were banded as part of a behavioral study on Cayo Noroeste by Brock University. Fifty-one brown noddy adults were also color banded in order to observe pairing and parental behavior. Eighty-two white-tailed and red-billed tropicbirds were banded as part of a bioenergetics study on Cayo Luis Peña by the University of Miami. Limited opportunistic banding also occurred on Cayo Geniquí and Cayo del Agua. Eighty brown booby chicks were banded as part of an uncompleted fledging study on Cayo Geniquí. One white-cheeked pintail was banded this year.

## H. PUBLIC USE

### 1. General

1985 marked a new phase in dealings with refuge users and the public on Culebra. We continued as during the past two years, to inform the public as to the role and objectives of the U.S. Fish & Wildlife Service but went a step further this year by issuing citations for violating refuge regulations and taking a harder line on tern and turtle egg poachers. Rapport is maintained with the public via the local radio station during periodic programs concerning natural resource programs and personal contacts with refuge users and the local community. Both off island and local visitors are aware of refuge regulations and programs through the refuge leaflet and signing on our various units. A comprehensive sign plan was approved and awaits funding for implementation.

### 2. Outdoor Classrooms - Students

As last year, outdoor classrooms were combined with classroom instruction for a more meaningful field experience. Having learned from last year, outdoor classrooms were better organized and continuous throughout the seabird and leatherback turtle seasons which were the two basic resource themes.

After a sea turtle presentation and orientation about the methods involved in the leatherback study, students participated in all night beach patrols. Some students became becoming quite proficient in "working" a turtle when it emerged. The students organized several expeditions to the beaches during the season. Two students in particular became regular beach patrollers and were invaluable during the study.

After a seabird presentation at the local school, students were recruited to aid in the sooty tern hatching and fledging study. These students helped set up the grid system which was used to randomly select sample plots, helped set up sample plot enclosures and helped weigh eggs and weigh and band chicks. These students came to understand the fragile nature of a seabird colony and hopefully can aid local islanders at understanding the reasons behind refuge regulations related to seabird protection.

### 3. Outdoor Classrooms - Teachers

Through the summer of 1985, two local science teachers maintained and injected enthusiasm and academic interest in students working on the above mentioned projects. These two women accompanied students to both beaches and the sooty tern colony. They organized and served as a first point of contact for working students. Unfortunate circumstances resulted in the loss, to the teaching profession, of one teacher during the summer and the other at the end of the year. Mrs. Josefina Vélez was one of these teachers. She has been one of the refuge's most vocal supporters since its activation in 1980. Although still residing on Culebra, it will be difficult to replace this fine teacher in the local school.

### 4. Other Interpretive Programs



Manager John Taylor gave many programs to the youngsters of Culebra and took special interest in giving assistance to groups of handicapped youths. Dulce. AN-85-CBR-04.

The second annual outreach program for island handicapped youth was held in June again using the refuge as a focal point for outdoor education experiences. Programs were presented and field trips were made to the sooty tern colonies and to turtle nesting beaches.

Refuge programs were presented on a regular basis to rotating groups of Earthwatch volunteers and local turtle patrol volunteers. Presentations were also made to writers of "Motorboat Magazine", the Rose of Sharon orphanage and 20 members of the Puerto Rican DNR ranger corps.

Norman Hopgood, an amateur videotape producer, continued editing footage of both the tropicbird and sooty tern colonies. Narrations were developed for each program which will be used as environmental education aids in area schools.

#### 5. Trapping

Illegal land crab trapping continued on the Ensenada Honda Unit, but refuge regulations against this activity cannot be enforced due to the uncertainty of refuge boundaries. It is hoped that a proposed boundary survey will rectify this situation. Land crab habitat areas which were thought to have been included in the Mt. Resaca unit of the refuge were opened to land crab trapping when it was found that they were not included in the newly surveyed unit. This represents a great loss in efforts to conserve and properly manage this resource. Currently, the only area where land crabbing can be prohibited is the newly surveyed Puerto de Manglar unit of the refuge.

#### 6. Camping

Regulatory signs prohibiting camping were installed on both Isla Culebrita and Cayo Luis Peña. These regulations were subsequently enforced and several citations were issued this year. Refuge users have come to respect our authority in the area and quality experiences on these areas are now the general rule. Many compliments have been received from the public.

#### 7. Other Non-Wildlife Oriented Recreation

Beach use draws as many as 500 refuge visitors per 3-day weekend to beautiful beaches on both Cayo Luis Peña and Isla Culebrita. Newly placed regulatory signs (although home made) and enforcement has controlled historic problems associated with the large numbers of people. Regular joint U.S. Coast Guard - U.S. Fish & Wildlife Service patrols also have controlled illegal boating practices in these areas.

## 8. Law Enforcement

Great strides in resource protection have occurred on the Culebra NWR in the past three years. Leatherback turtle and egg poaching has declined to just a few isolated cases on the island after years of a truly chronic problem. The decline is attributed to the Earthwatch volunteer program, often involving the local community, which has patrolled major leatherback beaches nightly. Other beaches record only sporadic nesting, chiefly by hawksbills. We strived to maintain a high profile in these areas to discourage poaching activities.

Having brought turtle egg poaching under control on Culebra beaches, emphasis has shifted to controlling illegal turtle netting operations in 300 square miles of Culebran waters. Due to shortage of personnel, patrolling this large area is difficult. Working with the local community, at least two netting operations have been detected and we have turned this information over to Fish & Wildlife Service special agents and the National Marine Fisheries Service special agents. Although a few local persons in the community have been implicated, the majority of these activities are based in neighboring Puerto Rico and Vieques. We are hoping that 1986 will see some good cases made in our area.

Frequent patrols were made during the peak seabird egg laying periods. During that time it was difficult to be everywhere at the same time. Volunteer biologists working at various colonies served as additional eyes and ears detecting and deterring poaching. Regardless of our efforts thus far we still lose eggs to poachers. This year on Peninsula Flamenco at least 300 eggs were taken. Considering the precarious situation of this once much larger population, we can't afford to lose any more recruitment.

Nineteen Eighty-five was the first year citations were issued to refuge violators after a period of public education aimed at familiarization with refuge regulations. Four citations were issued for general trespassing (overnight camping) this year. These violations were detected during joint patrols with the U.S. Coast Guard. The Coast Guard issued at least 25 citations for illegal boating operations in Culebran waters using the refuge boat as a boarding platform. Both the Caribbean Islands project leader and the Culebra refuge manager have undergone boarding officers training. A vast improvement in law and order is evident in the Culebra area since our joint operations began.

Gun hunting is prohibited by the Commonwealth on Culebra thus eliminating related enforcement problems. Nonetheless, illegal migratory game bird and deer hunting exists.

Illegal construction in mangroves was reported to both FWS Ecological Services and the Army Corps of Engineers. Most of the reports resulted in cease and desist orders issued the Corps. Unfortunately, the Corps is ineffective in enforcing its orders and the violators have made no effort to remove the illegal structures.

The Commonwealth of Puerto Rico also has jurisdiction regarding fills (construction) in wetland (mangrove) areas, since many of the problem areas are located on lands transferred to them through the Department of the Interior. Lack of enforcement for removal of the illegal structures contradicts restrictions outlined in the transfer agreement. A beach in the Punta Soldado area has experienced a rash of new beach house developments, little or no action has been taken by the Commonwealth to correct the situation. In the end it is up to the Department of the Interior to either force the Commonwealth to take effective action against these squatters or revert the lands back to the Interior Department.

## I. EQUIPMENT AND FACILITIES

### 1. Equipment Utilization and Replacement

Major refuge equipment at Culebra consists of a 1982 AMC Jeep, a 1979 Dodge 4x4 Crewcab and a 1979 22 foot Boston Whaler and 155 hp Johnson motor.

The refuge jeep aged considerably this year after it once again did the majority of the work for the refuge. The Dodge crewcab has faded away after spending most of the year in the shop. A steering problem developed late last year which forced us to go off island for repairs. The truck ran a short while before developing electrical problems which were too costly to repair, so we were left stranded in the middle of the YCC program and our major work months. That was in June and the truck hasn't moved since. A new crewcab should be arriving sometime in mid-1986.

Rough roads on Peninsula Flamenco broke the motor mounts on the jeep which knocked the muffler off and forced the engine fan into the radiator. Personal vehicles got us by while this was being repaired. The jeep has proven itself time and time again on the island's rough terrain and with proper maintenance should last quite awhile. We wonder at the decision not to manufacture this fine vehicle anymore.

The 200hp Johnson outboard was replaced by a new 155hp commercial Johnson outboard equipped with an oil injection system. The motor has been terrific so far and we are delighted with it. We take it easy with our boat which underwent hull repair after the busy summer season. However, hours of use on the open sea do take their toll.

## 2. Other

Fencing of the Mt. Resaca unit followed on the heels of the boundary survey of the unit. All sides of the unit but the east had been fenced at the close of 1985. This was quite a job which involved clearing dense tropical vegetation. Keeping the fence clear will be a major yearly maintenance project.

## J. OTHER ITEMS

### 1. Cooperative Programs

The cooperative agreement between the Culebra Conservation and Development Authority and the Culebra National Wildlife Refuge has worked very well over the last three years. Authority personnel have helped out the refuge staff on several occasions with habitat improvement projects, boat transportation and vehicle repairs. Now that we have a maintenance man on board, we can pool our resources for repairs and other similar projects. Refuge gasoline and secretarial services (including use of the copy machine) are purchased from the Authority under a cooperative agreement. The refuge headquarters site is also leased from the Authority.

### 2. Credits

This report was written by John P. Taylor in New Mexico on his Mac, and edited by Roger DiRosa and Sean Furniss on Sean's Mac. It was prepared in final form by the Apple Macintosh.

## K. FEEDBACK

With the support of Earthwatch, private researchers, the Congressional Appropriations Committee, and the FWS Endangered Species Program, the Culebra resource management programs are fairly well in hand.

We still have three problems: 1) resolution of land ownership issues, 2) Enforcement of the land transfer agreement, and 3) the need for permanent facilities.

Item Number 1. Land ownership issues involving the Ensenada Honda and Puerto de Manglar Units, and at Lagunas Flamenco and De Los Patos (Zoni) need to be resolved. First, Ensenada honda a determination of title needs to be made in regard to the upland areas and a general boundary survey is needed for the whole unit. Second, at Puerto Manglar and Ensenada Honda a determination as to the ownership of the mangroves is needed in view of the Jones Act amendment which gave the Commonwealth all submerged lands not reserved by the U.S. government. Third, a property ownership issue needs to be resolved at Lagunas Flamenco and De Los Patos (Zoni) in order to see if title belongs to the Commonwealth or U.S. governments. The clear ownership of the lagoon areas is essential to the future management of the white-cheeked pintail, a candidate species for listing as threatened.

Item Number 2. There has been no progress on resolving squatter issues on the transfer lands (Navy to DOI to PR) on Culebra and only minor progress in implementing management practices. The Copmmonwealth has been studying the situation for years with seemingly little progress. If DOI makes a resource committment, then it shoul see to it that there is follow through with action on the part of the Commonwealth and land reversion if there is no action.

Item Number 3. We need some permanent facilities for Culebra. We are protecting valuable resources and we need an adequate base of operations to work from. Given the local interest in the refuge and the significant tourism to Culebra, a small Visitor Contact Station would be a tremendous asset in helping to educate the visiting public and protect the resources. At present, there are not even any plans for this necessity. We feel this merits consideration and evaluation, and should become part of the FWS budgetary needs.

CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGES

DESECHEO NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U. S. Department of the Interior  
Fish and Wildlife Service  
NATIONAL WILDLIFE REFUGE SYSTEM

# DESECHEO NATIONAL WILDLIFE REFUGE

PUERTO RICO

UNITED STATES  
DEPARTMENT OF THE INTERIOR

UNITED STATES  
FISH AND WILDLIFE SERVICE

67°29'

18°23'

18°23'

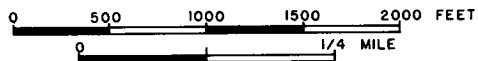
67°29'

6°30'

COMPILED IN THE DIVISION OF REALTY  
FROM A BASE MAP BY M. MANNELLO  
AND R.P. BRIGGS, U.S.G.S. 1966

ATLANTA, GEORGIA

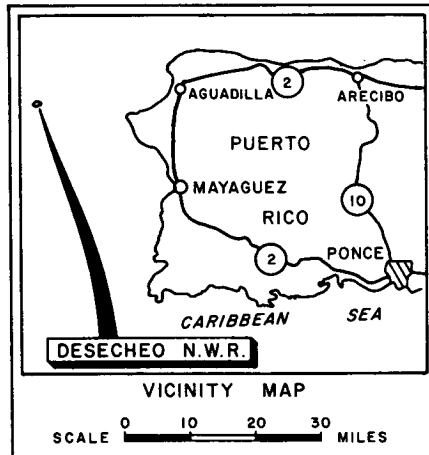
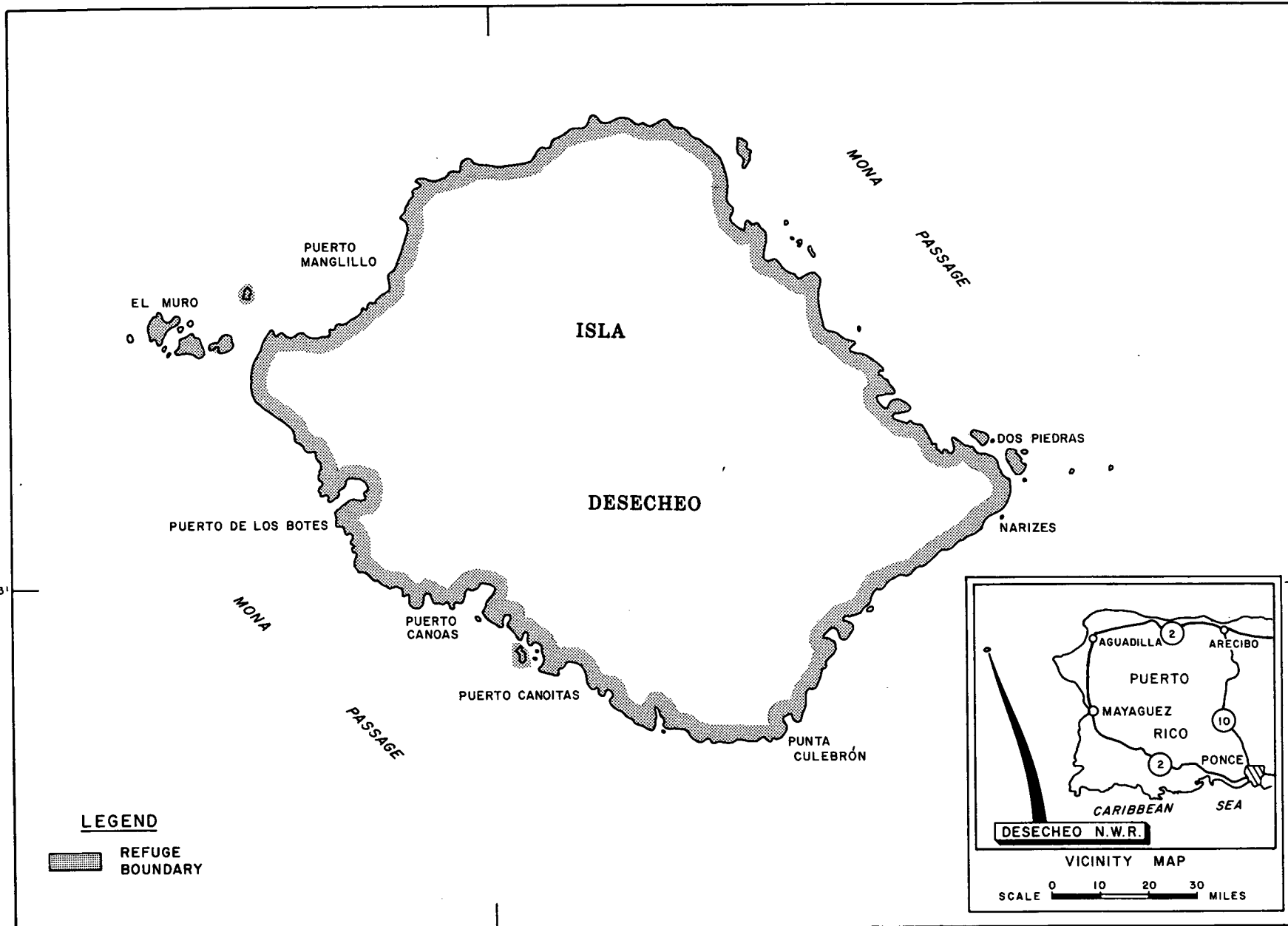
JULY, 1977



TRUE NORTH  
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1966

4R PR 920 403



## Desecheo NWR

INTRODUCTION

The refuge is located in the Mona Passage, about 15 miles west of the northwest corner of Puerto Rico. The name for the island is thought to have originated from the indian word Sikeo, which means "high mountainous land"; derived from Si for high, ke for land, and o for mountain. The early spanish explorers believed that the island was called Cicheo by the indians. On the early maps (from 1500 to 1600) the island was known as la Isla de Zecheo, then became known as Desecheo probably as a result of the merging of the last two words of Isla de Zecheo.

The island is bounded on the north by the Atlantic and on the south by the Caribbean. Desecheo NWR encompasses the entire 360 acres of Desecheo Island. The island is extremely rugged and rocky. Its highest peak is 676 feet according to photogrametric calculations. Geologically, the island is underlain chiefly by deformed fragmental volcanic rocks of the early Tertiary Period.

The early explorer Christopher Columbus passed by the island (seeing his third National Wildlife Refuge of the trip) on November 22, 1493 on his way to the island of Hispanola. In 1788, the early Puerto Rico historian Fray Iñigo Abbad y Lasierra wrote that Desecheo was "...uninhabited, although covered by trees, has many wild goats which are hunted by smugglers..." The island was not visited by naturalists until B. S. Bowdish visited the area to collect bird specimens on June 24, 1900 and again from July 6 to 10, 1901. Dr. A. Wetmore stayed on the island June 13-16, 1912 and recorded his avian observations in a series of publications. The first botanical exploration was conducted by W. E. Hess and F. L. Stevens in May 1913. Dr. N. L. Britton made a botanical exploration of the area February 17-20, 1914 and was accompanied by a group of American entomologists. The geologist B. Hubbard visited Desecheo in the summer of 1916, where he was the first to recognize the two marine benches which he labeled the Upper Desecheo Stage and the Lower Stage. P. H. Struthers visited the island to make ornithological observations in January 1922 and in 1926. Dr. S. Taylor and some of his students spent 4 days (May 7 to 9, 1927) on the island making further ornithological observations. No records of any visits to the island for scientific purposes appear to have been made between 1927 and 1965. The most significant recent scientific work on the native plant and animal life were the visits of botanist Dr. R. Woodbury to the island April 5, 1967, July 12-14, 1968, and in November 1974.

Desecheo Island was part of the original Crown Lands that came to the United States at the end of the Spanish-American War. It was originally reserved by Executive Order of President Taft in December 1912 for use as a forest and bird preserve. At that time it was the site of the world's largest brown booby colony as well as a breeding area for laughing gull, brown noddy, bridled tern, magnificent frigatebird and red-footed booby. The island was transferred, through the Presidential Proclamation of President F. D. Roosevelt, to the insular government of Puerto Rico on June 16, 1937, for use as a forest and bird preserve. In April 1940, Desecheo was transferred to the U.S. War Department for use as a bombing and gunnery range. The island was used from 1940 to 1952 as a practice target for aerial bombardment. From 1952 until 1960 Desecheo was used as a survival area for the U.S. Air Force. (It still is a survival area for all forms of life on the island.) In July 1964, the area was transferred to the National Institutes of Health (NIH). In July 1966, NIH introduced 56 rhesus monkeys to the island to establish a free ranging monkey colony to be cropped for medical research. In December 1976, Desecheo Island and its monkeys returned to the National Wildlife Refuge System.

#### SUMMARY OF CURRENT ACTIVITIES

No personnel are assigned to Desecheo NWR. The area is administered by the complex headquarters for the Caribbean Islands refuges.

Desecheo was formerly known as the location of the world's largest colony of brown boobies (15,000 birds). Currently no brown booby breeding is known to occur on the island. Both brown booby and red-footed boobies are known to be on the island and an estimated 300-400 red-footed boobies are believed to be breeding. As early as 1969, studies of the rhesus monkeys released by NIH indicated extensive predation on the boobies by the free ranging monkeys. Efforts were made to remove the monkey population in 1977, 1979 and 1981. None of these early efforts resulted in more than partial removal of the animals. Calendar year 1985 marked the first time that an intensive and adequately funded monkey removal program was attempted.

Other noteworthy fauna of the island are feral goats which became established in the 1700's. Feral cats and rats are resident at Desecheo Island. Peregrine falcons are seen irregularly as they stop off to harvest a red-footed booby or two during their winter visits to Puerto Rico. Three endemic species and

subspecies of lizards and one species of snake are also found on the island.

Illegal visitation to the island continued despite knowledge that public use is restricted, and drug and alien smugglers use the island for their activities. At least once in 1985, the Coast Guard air-lifted aliens off Desecheo when the smugglers abandoned their passengers. Evidence of such activities commonly is found on the island.

For years we have known about the recreational boaters, goat hunters and land crabbers that camp, hunt and heavily litter the island, however we did not realize the extent of that use until this year. The monkey removal contractor had personnel on the island continuously for approximately 3 months. They recorded public use and clandestine contacts. The use of the island was extensive and ran the gambit from hunting and camping to apparent smuggling.

The island's distance from Puerto Rico (14 mi/ 9.3 km), rough seas and rugged coast line combine to make management difficult. Boat travel to the island is slow and once you get to the island you might not be able to land or once landed you might not get off. Helicopters are faster but at \$600 an hour they can suck the budget dry in a hurry. Therefore, we do not often set foot on the island. The Coast Guard checks the island visually whenever their aircraft are in the vicinity. They respond well to requests for assistance and have helped us with non-emergency helicopter support in the past. Their mission comes first and funding is tight so their non-emergency support is limited.

At the end of calendar year 1984, a rhesus monkey removal contractor was selected and \$25,000 in ARMM funding was obligated for the control project. John Herbert, a well known conservation and wildlife consultant with years of African game and monkey experience, was awarded the contract.

To state that he and his crew had a tough job ahead of them would be like calling water wet. It was obvious to everyone that they had their work cut out for them!! The operation began in January and continued until April. Supplies and personnel were transported at different times by Army, Coast Guard and commercial helicopters.

The game plan was to pack and drag large live traps through brush and up cliffs in order to live trap as many monkeys as possible. The monkeys would be sedated, transported to the Mayaguez Zoo and then transferred to University of Puerto Rico facilities for research purposes. It sounded easy.



"Zeroing in" on Desecheo Island, better known by the military pilots as "skull island". S. Ronke. AN-85-DES-01.



The Coast Guard was generous with their help whenever possible and acted as our life line in emergencies. S. Ronke. AN-85-DES-02

The ruggedness of the island and the monkeys' intelligence were formidable opponents. Oh yes, so were the hermit crabs. Crabs?!! You bet!! They are so numerous, so large (fist size [Mr. T size] shells) and so voracious that they can literally eat any fresh organic matter in minutes to hours. Commercial monkey chow and fresh fruit were the baits of choice. However, the crabs would quickly consume the bait or spring the trap by sheer weight of numbers. They were capable of climbing up and down a single thin strand of wire or string. And were even escaping from chained, locked steel chests while blind folded and dropped in 20 ft of water. Now you think we are kidding, but seeing them in action would make you believe they could do it!!

Several weeks were spent prebaiting and trapping but the effort only gained us nine monkeys, one of which was old ZV (and you who read the last NR thought that we might not remember to tell you this), who was a three year old female when released in June of 1966. Old ZV was caught in a trap in Feb 1985 and found to be pregnant. She was the old lady of the group, lean and mean. She was the only marked animal left from the 1966 release.

The rainy season arrived early which resulted in greener, lusher vegetation and numerous fresh water pools. This lessened the attractiveness of the baits to the monkeys, but they had also become extremely trap shy. Continued trapping efforts were fruitless so the decision was made to remove the remaining monkeys by hunting.

The trapping efforts were a piece of cake compared to hunting them. By late April, 35 monkeys had been removed (9 trapped, 26 shot). The contractor believed that the job was complete by then. So, we enlisted the aid of another independent contractor to verify the results. Yes, there was such a person, Dr. Eric Phoebus and his world famous monkey dog, Juan Bobo!! Juan Bobo indeed was a monkey dog, as opposed to a coon, bear or tiger dog. Despite the ruggedness and cactus cover of the island he did his job well before going belly up and being sent home for rehabilitation. During this verification process, five monkeys were located and one was shot, meaning that the contractor had at least four more to remove.

By then everyone decided to deactivate the project until later in the year when dry weather conditions would be more conducive to completing the project.



Prebaiting from an  
Army helicopter.

S. Ronke.

AN-85-DES-03



The Desecheo hermit crabs.  
That was a 25 lb sack of  
monkey chow placed in a  
tree. Largest shell is  
almost fist sized. S. Ronke.  
AN-85-DES-04

The monkey busters returned in December to continue the operation. By the end of 1985 there was good news and bad news. The good news was that eleven more monkeys were being recycled by the hermit crabs. The bad news was that there were at least eight more on the island and so you will have to tune to Narrative 86 to read what we hope will be the final chapter in this saga.

An interesting aspect to the whole operation was the large amount of interest it generated among animal welfare groups, particularly the anti-vivisection societies. Almost everyone understood our reasons for removing the monkeys and doing it humanely before implementing a shooting program. The big response was due to interest about the welfare of the trapped monkeys. Well over a hundred letters, inquiring about the monkeys donation to the University of Puerto Rico for research, were received by Refuge Supervisor Bill Grabill in Atlanta. The Service informed the New England Anti-vivisection Society that they could have the monkeys if they could locate an acceptable home for them. They were unable to do so as there is not a great demand for wild rhesus monkeys outside of research. FWS then gave the Society the address of the University if they had any further questions. We wonder if they ever found out that they were going to be used in studies of orgasm. If you have to participate in a study it might as well be an enjoyable one!!

Now for those of you who thought the Saga of Desecheo 1985 was over, read on. The American Radio Relay League (i.e. ham operators) declared Desecheo to be a foreign country in 1978 (yes, we have thought about putting in for admission to the UN and asking the US for foreign aid), and we have been involved with numerous radio operators ever since. This year had a little different twist.

A group of ham operators were on the island at the same time as the monkey busters. During their period of cohabitation on the island, a sight on one of their rifles was damaged and a replacement was unobtainable in Puerto Rico. A radio operator called another operator in Texas who bought and then expressed the \$70 sight to us. We delivered it the next day on a scheduled helo supply flight. Now that is service no matter how you look at it.



The original "monkey busters" after two months of deprivation, exposure and eating spam. L to R - J. Herbert, S. Ronke, M. Evans. M. Conser. AN-85-DES-05



Mike Evans (in the red shorts) with a captive rhesus monkey. Effectiveness of the traps soon ceased. S. Ronke. AN-85-DES-06



Asst. Mgr. DiRosa and project contractor J. Herbert, with a baited monkey trap, casting longing looks toward a troop of monkeys (and you wondered why the effectiveness of the traps ceased). S. Ronke. AN-85-DES-07



The last group of HAM radio operators that conquered Desecheo sent out verification cards to all of their contacts.

CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGES

CABO ROJO NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT

Calendar Year 1984

U. S. Department of the Interior  
Fish and Wildlife Service  
NATIONAL WILDLIFE REFUGE SYSTEM

## Cabo Rojo NWR

### INTRODUCTION

The Cabo Rojo National Wildlife Refuge was established in 1974 when 587 acres of upland habitat was obtained from the Central Intelligence Agency. The refuge lies along a coastal plain and has a few gently rolling hills overlooking the southwestern tip of Puerto Rico. The establishment of the refuge was justified for the value that the habitat held for migratory birds, doves and pigeons in particular. The area has turned out to be increasingly valuable as the only block of wooded upland in southwestern Puerto Rico remaining in public ownership and for the great variety of native birds species, including the endangered yellow-shouldered blackbird. The habitat on the refuge consists of roughly 210 acres of grassland, 320 acres of forest and 50 acres of brush. The area is classified as sub-tropical dry forest under the Holdridge classification of world life zones. A total of 244 species of plants and 81 species of birds have been identified on the refuge through 1984.

Preliminary objectives of the area are to restore the native vegetation in such a manner as to provide optimal habitat for both native woodland and grassland species, with special considerations for locally and federally listed plant and animal species.



In the center of the Cabo Rojo NWR is the nerve plexis for the Caribbean Islands NWR's and the Caribbean Field Office (Ecological Services and Endangered Species). The ominous appearance comes from the site's previous owner (The Company) in the 1960's. S. Furniss. AN-85-CAB-01

INTRODUCTION

TABLE OF CONTENTS

Page  
i

A. HIGHLIGHTS

1

B. CLIMATIC CONDITIONS

1

C. LAND ACQUISITION

Nothing to Report (NTR)

D. PLANNING

Master Plan.....(NTR).....	
1. Management Plan.....	2
Public Participation.....(NTR).....	
Compliance with Environmental and Cultural Resource Mandates.(NTR)	
2. Research and Investigations.....	3
Other.....(NTR).....	

E. ADMINISTRATION

1. Personnel.....	5
2. Youth Programs.....	7
Other Manpower Programs.....(NTR).....	
3. Volunteer Programs.....	8
Funding.....	
4. Safety.....	9
Technical Assistance.....(NTR).....	
Other.....(NTR).....	

F. HABITAT MANAGEMENT

General.....(NTR).....	
Wetlands.....(NTR).....	
1. Forests.....	9
Croplands.....(NTR).....	
Grasslands.....(NTR).....	
Other Habitats.....(NTR).....	

F. HABITAT MANAGEMENT (Cont.)

Grazing.....	(NTR).....	
Haying.....	(NTR).....	
2. Fire Management.....		10
Pest Control.....	(NTR).....	
Water Rights.....	(NTR).....	
Wilderness and Special Areas.....	(NTR).....	
WPA Easement Monitoring.....	(NTR).....	

G. WILDLIFE

Wildlife Diversity.....	(NTR).....	
1. Endangered and/or Threatened Species.....		11
Waterfowl.....	(NTR).....	
Marsh and Water Birds.....	(NTR).....	
Shorebirds, Gulls, Terns and Allied Species.....	(NTR).....	
2. Raptors.....		12
Other Migratory Birds.....	(NTR).....	
Game Mammals.....	(NTR).....	
3. Other Resident Mammals.....		13
Marine Mammals.....	(NTR).....	
Fisheries.....	(NTR).....	
Wildlife Propagation and Stocking.....	(NTR).....	
Surplus Animal Disposal.....	(NTR).....	
Scientific Collections.....	(NTR).....	
Animal Control.....	(NTR).....	
Marking and Banding.....	(NTR).....	
Disease Prevention and Control.....	(NTR).....	

H. PUBLIC USE

1. General.....		13
Outdoor Classrooms - Students.....	(NTR).....	
Outdoor Classrooms - Teachers.....	(NTR).....	
Interpretive Foot Trails.....	(NTR).....	
Interpretive Tour Routes.....	(NTR).....	
Interpretive Exhibits/Demonstrations.....	(NTR).....	
Other Interpretive Programs.....	(NTR).....	
Hunting.....	(NTR).....	

H. PUBLIC USE (Cont.)

Fishing.....	(NTR).....	
Trapping.....	(NTR).....	
Wildlife Observation.....	(NTR).....	
Other Wildlife Oriented Recreation.....	(NTR).....	
Camping.....	(NTR).....	
Picnicking.....	(NTR).....	
Off-road Vehicling.....	(NTR).....	
Other Non-wildlife Oriented Recreation.....	(NTR).....	
2. Law Enforcement.....		13
Cooperating Associations.....	(NTR).....	
Concessions.....	(NTR).....	

I. EQUIPMENT AND FACILITIES

1. New Construction.....		14
2. Rehabilitation.....		15
Major Maintenance.....	(NTR).....	
3. Equipment Utilization and Replacement.....		15
4. Communications Systems.....		15
Computer Systems.....(Wish We Had Some).....		
Energy Conservation.....	(NTR).....	
5. Other.....		15

J. OTHER ITEMS

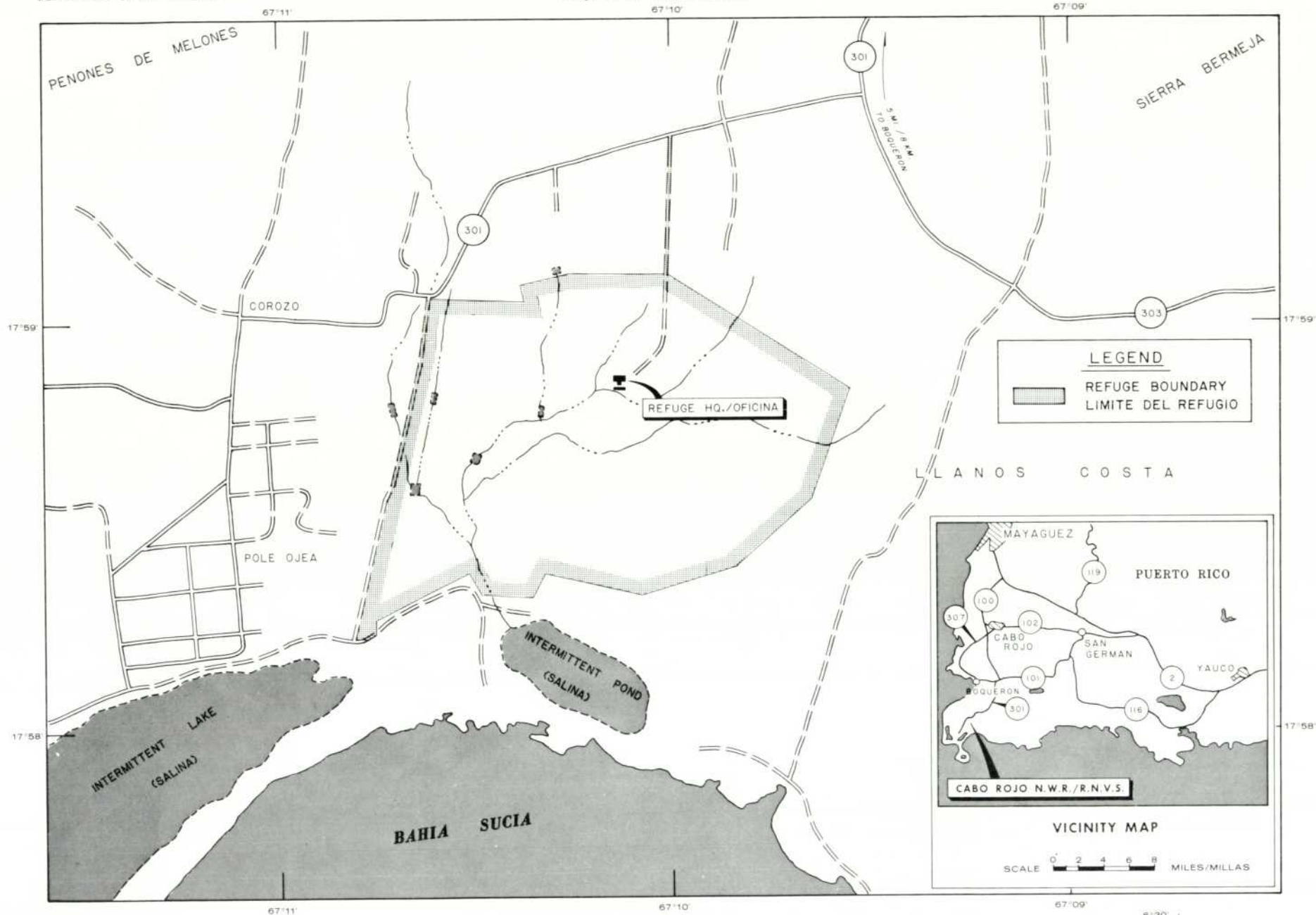
Cooperative Programs.....	(NTR).....	
Other Economic Uses.....	(NTR).....	
1. Items of Interest.....		16
2. Credits.....		16

K. FEEDBACK

**CABO ROJO NATIONAL WILDLIFE REFUGE**  
**CABO ROJO REFUGIO NACIONAL DE VIDA SILVESTRE**  
 BOQUERON, PUERTO RICO

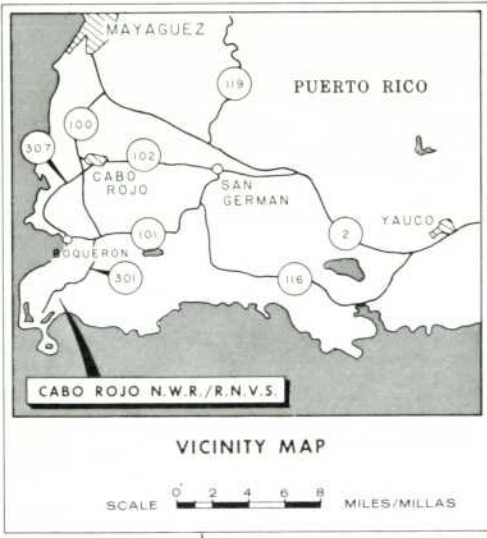
UNITED STATES  
 DEPARTMENT OF THE INTERIOR

UNITED STATES  
 FISH AND WILDLIFE SERVICE



**LEGEND**

REFUGE BOUNDARY  
 LIMITE DEL REFUGIO



COMPILED IN THE DIVISION OF REALTY  
 FROM SURVEYS BY U.S.G.S.



6°30' True North  
 Magnetic N  
 MEAN DECLINATION  
 1966

ATLANTA GEORGIA DECEMBER, 1979

4R PR 877 403

A. HIGHLIGHTS

Refuge reforestation was reinitiated in an organized manner. (Section F.2)

New construction and rehabilitation began on the refuge headquarters to prepare it for the new visitor contact facility and display area. (Section H.1)

Most of the Endangered Species and Ecological Services field office personnel and equipment moved into the refuge headquarters. (Section I.1)

Phones! Phones! Phone service arrived at the Cabo Rojo buildings in December. Who says there is no such thing as Santa Claus? (Section I.4)

The Voice of America initiated action to purchase land and build transmitting facilities adjacent to the refuge. (Section J).

B. CLIMATIC CONDITIONS

Cabo Rojo NWR is located in the path of the easterly trade winds and these constant winds promote a fairly stable temperature throughout the year. The long term mean temperature varies between 75°F and 82°F, with a record low of 55°F and a record high of 96°F. During 1985 the highest temperature of the year was 9°F on , and the lowest temperature was 5°F on .

The torrential rains that pounded Puerto Rico in October caused some local flooding but had no effect on refuge property. The refuge received 14 inches of rainfall in a 24 hour period on October . October 1985 was the wettest month since record keeping began at the refuge in 1980.

WEATHER DATA SUMMARY

<u>Month</u>	<u>1985 Temperatures (°F)</u>		<u>1980-1985</u>		<u>1985</u>	<u>1980-85</u>		
	<u>High</u>	<u>Low</u>	<u>Mean High</u>	<u>Mean Low</u>	<u>Inches of Rainfall</u>	<u>Inches of Rainfall</u>		
Feb.	88	61	86	65	0.86	1.72		
Mar.	87	62	85	66	2.55	2.38		
Apr.	90	60	86	67	0.05	2.53		
May	89	68	88	73	6.41	6.84		
June	90	70	89	73	0.30	0.60		
July	94	72	91	65	0.86	2.96		
Aug.	94	68	91	72	3.60	1.96		
Sept.	92	70	90	73	3.16	4.81		
Oct.	94	72	88	67	14.17	5.87		
Nov.	91	63	87	69	4.72	4.76		
Dec.	90	62	87	65	0.08	2.03		
Ave.			88	68	88 <sup>a</sup>	69 <sup>a</sup>	36.96	41.28 <sup>b</sup>

a = average of the yearly averages

b = average of the yearly totals

### C. LAND ACQUISITION

Nothing to report.

### D. PLANNING

#### 1. Management Plan

Several new plans were completed for Cabo Rojo NWR during 1985. The plans completed and approved were: 1) yellow-shouldered blackbird management plan; 2) reforestation plan; and 3) wildlife inventory plan.

## 2. Research and Investigations

### Cabo Rojo NR85 - "The song and behavioral ecology of the Adelaide's Warbler (*Dendroica adelaidae*)" 41521-84-01

The purpose of this study is to understand the system of vocal communication and its relationship to the behavior and ecology of the Adelaide's warbler (*Dendroica adelaidae*). Information on the following subjects will be recorded during the course of the study: song variation, use of vocalizations, time budgets, territoriality, population dynamics, and song function. This is a three year study being conducted by doctoral candidate Cynthia Staicer of the University of Massachusetts at Amherst. Financial support for this study was received from the Frank M. Chapman Memorial Fund, the Alexander T. Wetmore Award of the American Ornithologist's Union, the Stewart Award of the Cooper Ornithological Society, and a grant-in-aid from the Sigma Xi Scientific Society.

During 1985, additional warblers were caught in mist nets, measured, banded with unique color combinations of plastic bands and released. Vocalizations of Adelaide's warblers were recorded extensively, and the territorial and reproductive behavior of pairs were monitored. Males remained paired and sang during breeding and non-breeding periods, had large song repertoires, shared many songs with neighbors, and used different songs in different contexts. This research will continue into 1986.

### Cabo Rojo NR 85 - "Identification of the bird species utilizing the Cabo Rojo NWR and the determination of the relative abundance of bird species on a typical plot, 8 ha, of woodland" 41521-01-84.

In conjunction with the Adelaide's warbler project, Cynthia Staicer and her assistants terminated this investigation in May after a 7.5 month observation period (March-May 1984, January-May 1985). Eighty-one species were observed in the refuge. The high diversity of species present was probably due to the diversity of habitat types present on the refuge and its proximity to other habitat types. Thirty-four species were consistently present in the eight hectare study plot, and the total number of individuals of these species was estimated at 324. Approximately one-quarter of these were species that migrate to North America to breed.

#### Research initiated in 1985

In addition to and in conjunction with the primary Adelaide's research, Ms.

Staicer addressed two additional ecological questions pertaining to the avian community to which Adelaide's warblers belong: the spacing behavior of several migratory species of wood warblers which winter in the area and the population densities of all avian species present. Initial data gathered from January to May indicated site tenacity by the migratory species, and some individuals, notably Cape May warblers, exhibited territorial behavior. This research will continue through December 1986.

Cabo Rojo NR 85 - "Environmental Physiology of *Cardisoma guanhum* : respiratory, acid-base, and cardiovascular physiology" 41521-01-85.

The purpose of the study on the local land crab covered four areas: 1) environmental conditions of the microhabitat with particular attention paid to the crab burrows; 2) behavior and activity in relation to changing environmental conditions; 3) respiratory and acid-base physiology of the crabs in the burrows; and 4) the investigation of a baroreceptor reflex which modifies heart rate in response to changes in blood pressure. The research was conducted in the field and laboratory by doctoral candidate Alan Pinder from the University of Massachusetts at Amherst. He remained at Cabo Rojo until April and was scheduled to return in 1986 to conduct additional research.

Cabo Rojo NR 85 - "Resource useage by land birds in the Cabo Rojo National Wildlife Refuge" 41521-02-85.

The objectives of this study were to provide an objective classification of the similarities and differences of how the avifauna of the refuge community exploit food resources, and to identify measured parameters that are important in determining the structure of the community. This project was directed by Dr. Alex Cruz, University of Colorado, Boulder, CO.

Cabo Rojo NR 85 - "Breeding biology of landbirds in the Cabo Rojo National Wildlife Refuge" 41521-03-85.

The objectives of the investigation were to obtain information on the breeding biology of landbirds on the Cabo Rojo NWR. Information on nest site characteristics, reproductive success, and parasitism (if any) by the shiny cowbird (*Molothrus bonariensis*) were recorded. This project was directed by Dr. Alex Cruz, University of Colorado, Boulder, CO.

Cabo Rojo NR 85 - "Avian species composition and densities in the Cabo Rojo National Wildlife Refuge" 41521-04-85.

Little quantitative information exists on the use of different habitat types by landbirds in the refuge. The objectives of the study were to determine diversity, species composition, and distribution of landbirds in different habitat types on the refuge. This project was directed by Dr. Alex Cruz, University of Colorado, Boulder, CO.

Cabo Rojo NR 85 - "Seasonal gonadal activity of the shiny cowbird in southwestern Puerto Rico" 41521-05-85.

Despite the widespread distribution and continuing interest in the shiny cowbird, surprisingly little is known about a fundamental aspect of cowbird demography: fecundity. The reproductive cycle of the shiny cowbird through time will be determined by examination of cowbird gonadal material. This project was directed by Dr. Alex Cruz, University of Colorado, Boulder, CO.

Cabo Rojo NR 85 - "Structural analysis of a 6 hectare study area on the Cabo Rojo NWR" 41521-06-85.

Dr. Henry Zuill, Antillean College, Mayaguez, Puerto Rico, compiled a plant density, species diversity analysis, and mapped a representative woodland area of the refuge.

## E. ADMINISTRATION

### 1. Personnel

The Cabo Rojo NWR is administered as part of the Caribbean Islands Refuges by personnel assigned to the complex. The principal assistant manager Roger DiRosa handles most of the routine activities associated with the refuge except when the project leader has a specific interest in things.

During 1985 there were three individuals specifically assigned to the Cabo Rojo NWR. All were hired under temporary not to exceed one year appointments. Tractor operator, later changed to maintenanceman, Mariano Rodriguez-Flores was responsible for directing presuppression fire activities and maintenance

work. Indalecio Camacho and Jose Velez-Carrero were laborers hired to support the presuppression and maintenance activities.



The Cabo Rojo maintenance crew (L to R - Mariano Rodriguez-Flores, Indalecio Camacho, José Velez-Carrero) being presented Special Achievement Awards by Manager Furniss. All three consistently exceeded the expected levels of performance and did so with hard work and dedication. R. DiRosa. AN-85-CAB-01.

The Caribbean Islands complex employed a cooperative education student, Julio de Jesus from the University of Puerto Rico, Mayaguez, for two months during the summer. He was based at the Cabo Rojo NWR and completed most of his work there.

Dr. Jaime Collazo, the newly hired refuge complex biologist was also based at Cabo Rojo NWR and could be heard going through the halls with raucous calls of Hagadar - Hagadar.

## 2. Youth Programs

Ten YCC enrollees were hired for the 8 week summer employment season. They began work May 27th and terminated July 19th. The program was a big success at Cabo Rojo and resulted in the completion of several important projects that would have required a contractor to complete. Total YCC program cost (salaries and materials) totaled \$14,650. We completed work with an estimated appraised value of \$19,964 and a value per enrollee hour of \$59.70. we made a tidy profit, so to speak, plus the added benefits of hiring local youths in a job depressed area. They received a job, some environmental education and choice field trips and we gained some excellent public relations.



Cabo Rojo's illustrious YCC crew. They were a model crew and enabled us to accomplish many projects that otherwise would have been left undone. R. DiRosa. AN-85-CAB-02.

### The Crew

Illeana Vargas-Hernandez  
 Maritza Maya-Rivera  
 Lucy Hernandez-Valentin  
 Zaida Collazo-Rodriguez  
 Aracilia Camacho-Velez

Melvin Albino-Figureoa  
 Luis Arroyo-Toro  
 Arnaldo Camacho-Velez  
 Richard Camacho-Camacho  
 Elvin Carlo-Valladarez

Laborer Foreman - Marariano Rodriguez-Flores



How is that for propaganda? Our T-shirts have appeared in some rather suprising places.

R. DiRosa. An-85-CAB-03.

### 3. Volunteer Program

In 1984 there was only one volunteer doing research on the refuge. In 1985 we had a grand total of 7 volunteers engaged in a variety of research and data gathering activities. They came from all walks of life, PhD candidates to staff spouses. We are an equal opportunity provider. Three of the research projects are continuing in 1986.

The numerous rooms and size of the headquarters building allows us to offer

the sweet bait of free accommodations and kitchen facilities to graduate students. The response has been very good and the quality of the volunteers has been excellent. Almost all of the research accomplished in the refuge is done by volunteers.

#### 4. Safety

No accidents occurred at Cabo Rojo NWR during 1985. The increase in staff assigned to or based at the complex headquarters located at Cabo Rojo required some adjustments to be made to our program. In the past there were not enough personnel to conduct safety meetings. FWS personnel based at the headquarters went from a low of 2 in 1984 to 13 in 1985. We initiated regular monthly safety meetings (presented in spanish only) combining Refuge, Ecological Services and Endangered Species personnel for interdivisional meetings.

Mariano Rodriguez-Flores, tractor operator/maintenanceman, was sent to fire training in Florida to complete the S-130 and S-190 courses.

The refuge fire extinguishers were increased in number and quality to correspond with the increase in people and activity.

### F. HABITAT MANAGEMENT

#### 1. Forests

A 10 year reforestation plan for Cabo Rojo NWR was written and the field work was initiated. It calls for the planting of 5,000 native trees, predominatly ucar (*Bucida buceras*), a year for 10 years, the monitoring of the growth and survival rates, and environmental conditions. One thousand trees were planted in 1985. Preliminary observations have indicated tree survival rates to be approximately 95%. This was beyond our wildest dreams, especially since past data and attempts indicated that rates might be half that or less. However, the plantings have not been through their first dry season. We are expecting the best, but we will reserve full judgement until after the seedlings pass their first birthday on the refuge.

The program was designed to eventually establish a canopy forest in various successional stages that would be similar to the original forest and habitat of the endangered yellow-shouldered blackbird. Early observations and literature indicated that yellow-shoulderededs nested and foraged mainly in canopy forest. They were common in our area in the original forest.

Various sized plots ere established containing from 100 to 400 trees. Trees were spaced 20 ft apart and planted in mowed strips within grassy areas of the refuge. Trees were planted just prior to the expected rainy season so that the young trees could build a root system by the dry season. Adjustments to the number of trees planted each year may be made if the survival rate continues high since the plan was designed for survival rates in the 50% range based on past data.



This little ucar tree is one of thousands being planted to restore the native hardwood forest habitat of the yellow-shouldered blackbird. J. Collazo AN-85-CAB-04

## 2. Fire Management

Two temporary personnel were hired to assist with presuppression requirements as defined by the Cabo Rojo NWR Fire Plan. An additional person was hired as a supervisor just prior to 1985.

Presuppression activities were initiated in 1985 and consisted of clearing all brush and plants from defined fire lanes. The lanes were then periodically mowed during the dry season to keep vegetation to a minimum. Approximately 7 miles of lanes surrounding and sectioning the refuge were established. The refuge has extreme and high fire hazard ratings due to the thick high grass cover over most of the refuge. The fire lanes will act as a deterrent to fire

spread and as avenues for transport of equipment. However, it all may only be academic. The type of fuel, dry trade winds, small refuge size, limited refuge and local fire fighting abilities and limited communications will probably make retreat the better part of valor should a wildfire occur.



Maintenanceman Rodriguez gives our new tractor a workout on Cabo Rojo's grassland. J. Collazo. AN-85-CAB-05.

## G. WILDLIFE

### 1. Endangered and Threatened Species

The past year saw a considerable amount of on and off refuge activity directed at the endangered yellow-shouldered blackbirds. The majority of the work went toward the trapping of shiny cowbirds. They are nest parasitizers of the blackbirds and activities are directed at trapping for removal and research purposes.

Refuge maintenance personnel assisted in the building of cowbird traps for the Puerto Rico Dept. of Natural Resources and the Denver Wildlife Research Center as well as building traps for the refuge. We placed 2 traps in the refuge and after a trial and error period of locating the best trapping sites and preventing

bird escapes, the traps began performing very well. One hundred and seventy one cowbirds (166 females, 5 males) were trapped and removed from the refuge. We expect much better results in 1986. Incidental trapping of 6 other bird species occurred but amounted to only 16 individuals, of which 75% were greater Antillean grackles. Two yellow-shouldered blackbirds were trapped and released unharmed. All incidental species were banded and released.

Refuge personnel built 50 nest boxes and placed them in the refuge. Yellow-shouldered blackbirds are known to nest in cavities and nest boxes provided by the Puerto Rico DNR in mangrove areas. We hope to attract nesting blackbirds to the refuge in consistent numbers. We have anticipated two problems, Caribbean martins and rats. We feel we have solved both problems by utilizing rat guards and placing the nest boxes under the tree canopy to limit their attractiveness to the martins. In 1986 we will begin the first season of monitoring nest box use.

The reforestation program (Section F.2) is a long term program directed at the yellow-shouldered blackbirds. We do not expect any significant results for at least 30-40 years. In the interim we are assuming that current and future programs will at least arrest further decline of the yellow-shouldered blackbird population.

Refuge personnel assisted FWS Endangered Species and the Puerto Rico DNR in a census of yellow-shouldered blackbirds. Personnel were stationed at roosting areas and flyways. Shiny cowbirds and greater Antillian grackles as well as blackbirds were counted. Three hundred and forty three blackbirds were counted. That indicates a 19% decrease from the 1982 census and an 80% decline since 1976 in SW Puerto Rico. A population of approximately 20 exists on the Roosevelt Roads Naval Station and a population of 300 exists on Mona Island.

## 2. Raptors

The antenna posts at Cabo Rojo provide roosting, hunting and feeding perches for the endangered tundra peregrine falcon. Generally a peregrine is seen daily at Cabo Rojo from November through March, where it enjoys a leisurely winter taking the slow moving cattle egrets. Both local raptors (red-tailed hawk, American kestrel, short-eared owl) and migrant raptors (merlin, northern harrier, peregrine falcon) are found at Cabo Rojo.

### 3. Other Resident Wildlife

Observations of mammals on the refuge are limited. No native land mammals, except bats, exist in Puerto Rico. However irregular sightings occur of such exotics as: mongoose, rhesus monkeys, patos monkeys, illegal aliens and land crab poachers.

## H. PUBLIC USE

### 1. General

Currently the refuge does not actively promote public use of the refuge due to the lack of facilities on the site. A few informed birdwatchers and curious motorists dropped by throughout the year. Most days did not record any visitation but some days experienced human waves of 15-20 people (and this does not include the illegal aliens). However, we expect our secluded, tranquil life to explode in a kaleidoscope of visitors in the summer of 1986.

Remodeling of the office and headquarters began in order to receive the displays and dioramas for the new visitor center. Essentially, we will be a small but well designed, attractive and informative museum. By local standards we will be highly attractive and unique to the island. To the best of our knowledge there is nothing else like our future display center between here and South America. This uniqueness and attractiveness will draw large numbers of visitors to the refuge from the thousands of people who pass by (especially in the summer) on their way to heavily used beaches.

We also expect to receive greater attention from university classes and local groups like the Puerto Rico Natural History Society as word gets around.

### 2. Law Enforcement

The complex manager and assistants checked waterfowl hunters during the Puerto Rican split waterfowl season. One citation was issued for shooting a protected species. When the project leader overheard the guide saying that the just killed bird was bigger than a duck (i.e. blue-winged teal), he knew things were looking up. Upon closer inspection it was determined that the perpetrator had shot a North American coot (a protected species because of similarity of appearance with the locally endangered Caribbean coot). When the perpetrator of the deed reached into his pocket to get out his copy of the newspaper

clipping of the bag and species limits, the project leader allowed him to read the list of closed species out loud, all the while enjoying the pleasure of writing up a \$100 ticket for coot hunting.

The proposed Voice of America (VOA) facility that may move in adjacent to the refuge (Section J) has caused us to re-evaluate our security system. A small political faction, (independentistas, socialists, etc.) advocating Puerto Rican independence, has voiced strong opposition to the VOA facility. Rallies have been held and posters have been liberally applied in our local area. In addition, there are two (possibly more) radical groups that have embraced terrorism and maintain an significant anti-federal policy. These groups have performed violent acts against government property and personnel in Puerto Rico and the US mainland.

Our concern is not so much with the legitimate expressions of protest but with the possibility of violence directed at the refuge and personnel working at our facility. Since we occupy an old CIA facility, have a government profile and many people haven't yet made a distinction between us and the CIA, we can be considered as a possible target. Many local people also feel that the VOA is subversive in nature, and that we may be connected with them.

## I. EQUIPMENT AND FACILITIES

### 1. New Construction

Next on our list of great and exciting things was the initiation of the remodeling of the headquarters in preparation for the new visitor center displays and the relocation of the Caribbean Field Office (Ecological Services and Endangered Species Offices) to our facilities. Half the job had been completed by year end and the rest slated for completion by February 1986. Mariano Rodriguez supervised a maintenance crew that did an exceptional job of remodeling. It was no mean feat since concrete walls had to be torn out and rebuilt, plumbing and electrical lines relocated and the area prepared for public view. We thought it was impressive watching the interior wall come down, but it was truly awesome when Mariano brought in the pneumatic jack hammer to open up the cement floors to relocate drain pipes.

In conjunction with this work, construction on the visitor center parking lot began with curbs, gutters and retaining walls being completed.

## 2. Rehabilitation

The original facility waterline was rehabilitated and replaced with PVC tubing after the metal pipe had been eaten out in several places by the soil salts.

Maintenance personnel and the YCC crew gave the headquarters a much needed renovation with inside and outside painting.

## 3. Equipment Utilization and Replacement

The refuge purchased a new 32 hp Ford farm tractor with auger and mower attachments to aid in wildfire prevention and reforestation activities.

A pick-up was ordered for the Cabo Rojo NWR in January 1985. With luck we will see it before the YCC arrive in June 1986.

## 4. Communications Systems

The highlight of the year was the installation of the phone system at the refuge headquarters. Now on the surface, and by state-side standards, this may seem rather mundane. However, in our area it qualified as a major feat and perhaps on par with establishing the first operating phone on the island! We will reserve comment about the Puerto Rico Telephone Company and just say that the whole process was interesting, informative, time consuming, frustrating, costly, quixotic, upsetting and ad infinitum. Of course, much of the credit for being a pain in the gluteus maximus of the phone company must go to Don Pablo Gertler who went through many hour of personal anguish to accomplish this feat. Then there was also the trade off in losing the services of our most durable volunteer, Martha Furniss, who turned over her message taking chores to the staff secretaries.

## 5. Other

Two large underground fuel tanks, left over from the CIA occupation of the refuge facilities were removed, at no charge, by a local farmer in exchange for the tanks. Another quick removal before EPA could come out with its new underground storage tank rules.

## J. OTHER ITEMS

### 1. Items of Interest

In 1984 the VOA began reviewing several areas in Puerto Rico for their potential to be used as a new transmitter site. One of the areas was a 1500 acre site adjacent to the refuge. We ended up the big winner, which is probably a dubious honor. During 1985 the Corps of Engineers and private firms representing the VOA canvassed the area gathering data and negotiating with land owners for the purchase of the property. We assisted them by providing them as much information as possible about local housing, attitudes, economics, topography, wildlife and other items that had a potential to cause problems.

The current Puerto Rican government tends to be anti-federal in its practices and has been opposing federal acquisition of the land. Another, and perhaps more significant, obstacle to the VOA is the endangered yellow-shouldered blackbird which utilizes the area. We and the Endangered Species Office staff have been working with the Corps of Engineers and the private contractors to determine the magnitude of impact the VOA facility will have on the blackbirds. Besides the necessary building facilities, an antenna curtain is proposed that will be approximately 800 ft wide, 400 ft wide, with horizontal wire beginning 25 ft above the ground and spaced every 15 ft. Needless to say, it will be quite a contraption. Construction is not expected to begin before 1987.

The refuge hosted a group of six natural resource managers from Trinidad and Tobago. They were sponsored by the USDA and FAO (Food and Agricultural Organization of the United Nations). The group was on a study tour to observe wildlife conservation projects in the southern United States and in the Caribbean region, where ecological conditions are similar to those in Trinidad and Tobago.

### 2. Credits

Roger DiRosa wrote out all the early drafts of the Narrative Report and edited the final drafts. Sean Furniss added editorial changes and the Macintosh printed the report.

K. FEEDBACK

Cabo Rojo had a good year and we really can not gripe all that much about anything. Our one overriding concern is the lack of a permanent position for a maintenance worker at Cabo Rojo NWR. We have the funds, we have the FTE but we only have a not-to-exceed one year appointment for our senior maintenance worker. We could not exist without his help at Cabo Rojo and it seems unreasonable to have to leave him in a temporary position. It is unfair and discriminatory. How many other stations in the region go without a single permanent maintenance position? Not many, if any!!!!

CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGES

BUCK ISLAND NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT

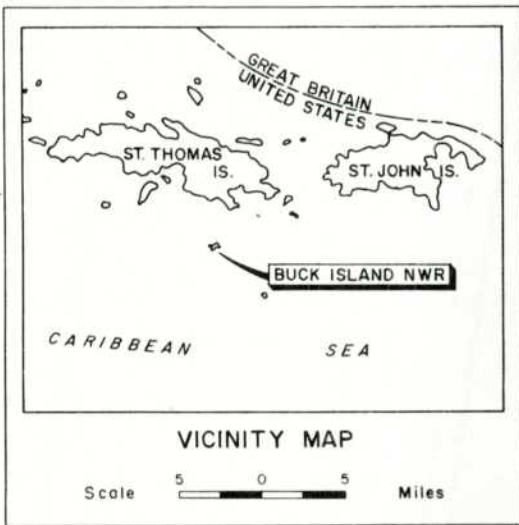
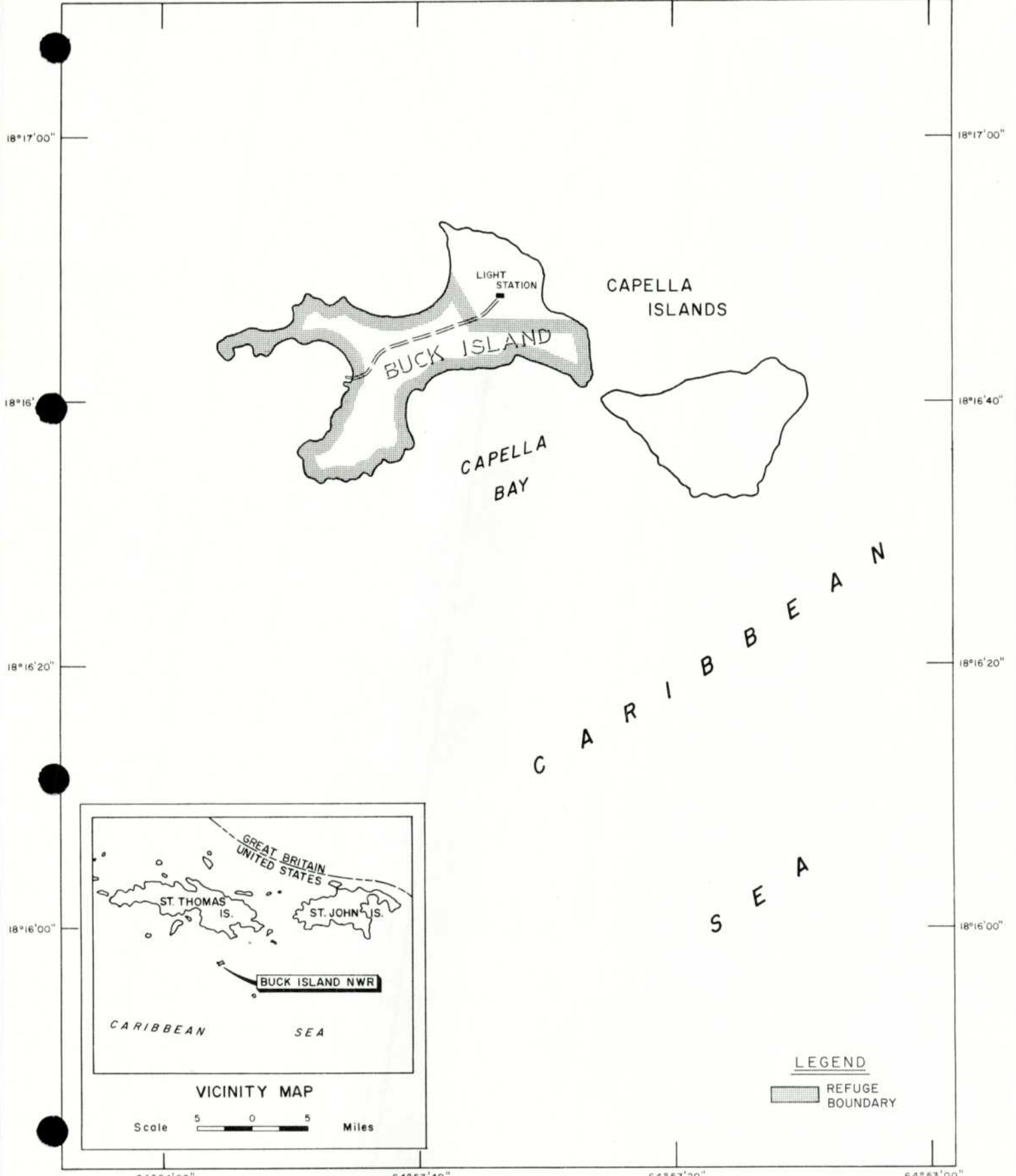
Calendar Year 1985

U. S. Department of the Interior  
Fish and Wildlife Service  
NATIONAL WILDLIFE REFUGE SYSTEM

# BUCK ISLAND NATIONAL WILDLIFE REFUGE VIRGIN ISLANDS

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
64°54'00"

UNITED STATES  
FISH AND WILDLIFE SERVICE  
64°53'00"



**LEGEND**  
 REFUGE BOUNDARY

COMPILED IN THE DIVISION OF REALTY  
FROM SURVEYS BY U.S.G.S.

ATLANTA, GEORGIA

REVISED: 8/79  
APRIL, 1969



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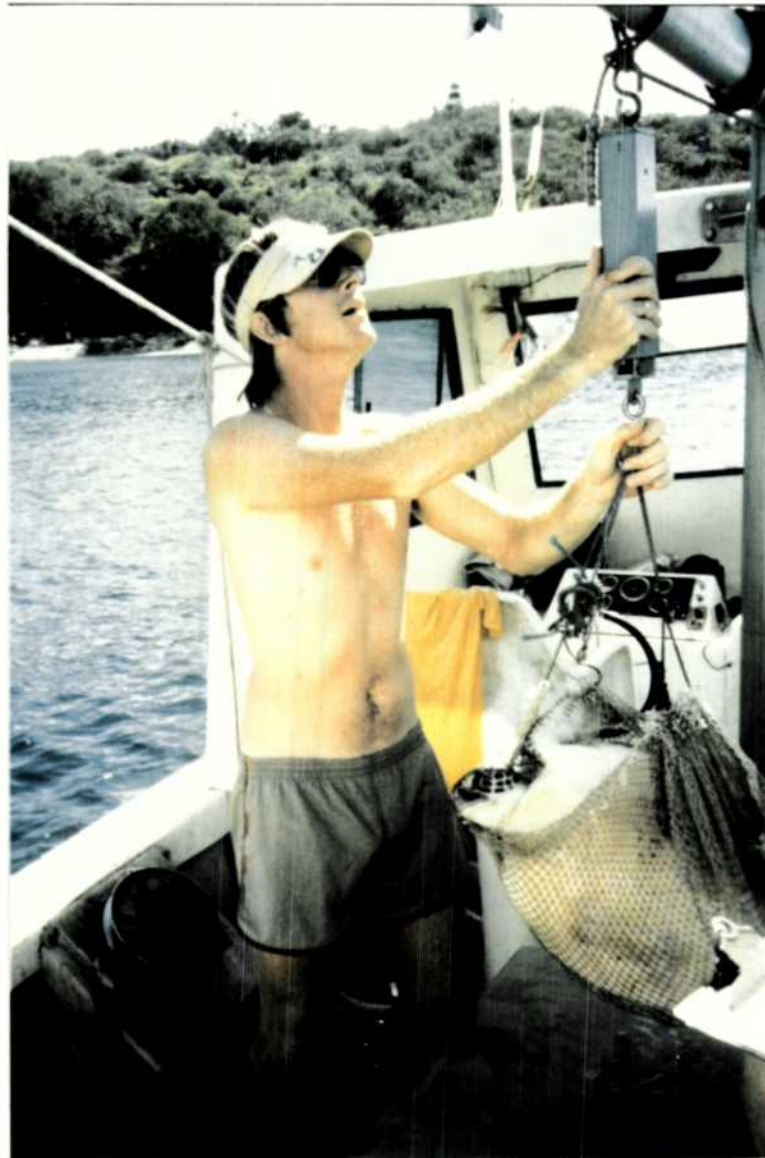
## Buck Island NWR

INTRODUCTION

Buck Island is one of the two Capella Islands located approximately two miles south of the island of St. Thomas in the U.S. Virgin Islands. The refuge consists of the entire 45 acre island and is covered with cactus forest, brush, open grasslands and a rocky shoreline. About 35.5 acres were obtained in 1969 from the U.S. Navy and the remaining 9.5 acres were obtained in 1981 from the U.S. Coast Guard. The original justification statement for establishment of the refuge could not be located but probably was based upon "its value for migratory birds". A limited number of species have been noted on the island. The most noteworthy species on this island is the red-billed tropicbird, about three pairs are believed to nest here. Black rats are the most numerous wild animal species found here. Incidental use of the island is made by divers and snorkelers visiting the reef areas and the wrecks around the island.

SUMMARY OF CURRENT ACTIVITIES

No personnel are assigned to Buck Island. The Buck Island Refuge was placed under the management of the Culebra NWR Refuge Manager at the end of 1984. Long term plans call for the elimination of black rats on the two Capella Islands in order to enhance the value of the area for breeding seabirds. In 1985 Refuge Manager Taylor and Bio. Tech. Tucker traveled to Buck Island to participate in hawksbill sea turtle trapping and tagging operations. This provided them with training in trapping and handling the turtles which will assist us with the Culebra trapping program in 1986.



This is work? Sun, sand and surf accompanied by a paycheck! While visiting Buck Island NWR, the Culebra staff received expert instruction by the U.S. Virgin Islands Division of Fish and Wildlife in learning in-the-water capture and tagging techniques. Tucker. AN-85-BI-01.

CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGES

GREEN CAY NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT

Calendar Year 1985

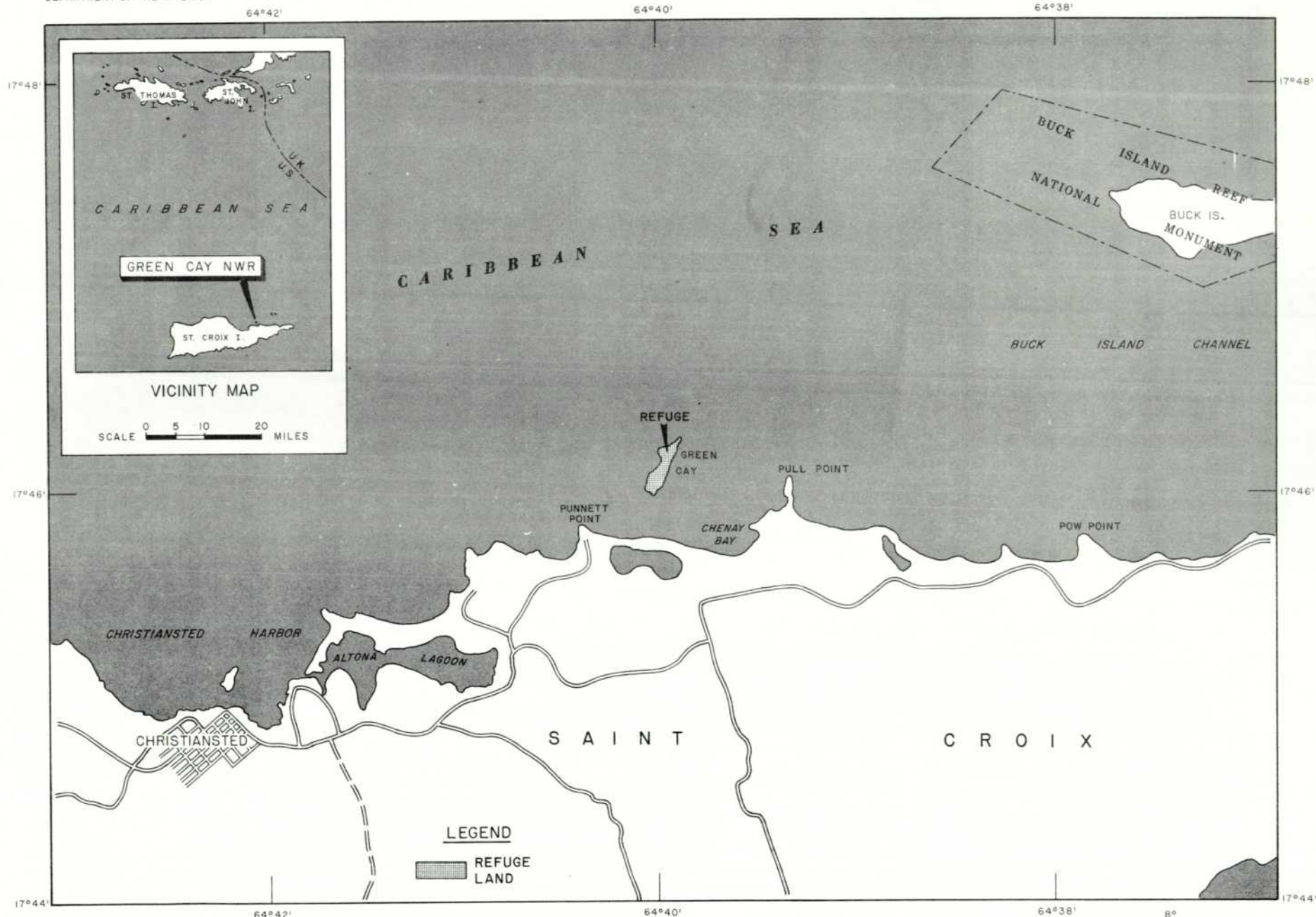
U. S. Department of the Interior  
Fish and Wildlife Service  
NATIONAL WILDLIFE REFUGE SYSTEM

# GREEN CAY NATIONAL WILDLIFE REFUGE

VIRGIN ISLANDS

UNITED STATES  
DEPARTMENT OF THE INTERIOR

UNITED STATES  
FISH AND WILDLIFE SERVICE



COMPILED IN THE DIVISION OF REALTY  
FROM SURVEYS BY U.S.G.S.

ATLANTA, GEORGIA AUGUST 1977

4R V.I.928 403

## Green Cay NWR

INTRODUCTION

The Green Cay National Wildlife Refuge consists of the entire 13.77 acre island of Green Cay (pronounced key). Green Cay is an uninhabited island 62 feet high, about 1/3 of a mile long, lying 1/4 of a mile off the north shore of St. Croix, and nearly 2.5 miles east of the town of Christiansted. This refuge was purchased from Mrs. Virginia Bright on December 15, 1977, in order to protect the endangered St. Croix ground lizard. Green Cay preserves almost 75% of the remaining habitat and over 99% of the remaining individuals of the species. In addition, brown pelicans, great egrets, great blue herons and little blue herons nest here.

This area was the first National Wildlife Refuge seen by European man (i.e. Christopher Columbus, November, 1493) and was used by Indians at least as early as 1020 A.D., nearly a millenium before Columbus. Weiss and Gladfelter studied Green Cay in 1975 and found evidence showing that Neo-Indians used Green Cay as a site for processing of conchs for food. It has been estimated that there were at least 33,000 discarded shells in the midden. This refuge contains the only currently known archaeological site on the Caribbean Refuges.

Green Cay is of volcanic origin. Outcrops of lava, tuffs and breccias are the most common geologic features of the island. Three soil types have been recorded on the island. The flora of Green Cay is composed of 60 species distributed in four major vegetation types. All the vegetation is composed of native species except for one tree species and one grass. Species diversity is low at about 4.5 species per acre. Natural forest is poorly developed except for a mesic forest on the southwestern part of the island. Other forested, less dense, more xeric areas are found scattered throughout the southern half of Green Cay.

SUMMARY OF CURRENT ACTIVITIES

No personnel are assigned to Green Cay. The last official FWS visit to the island was in 1983. The FWS has a Memorandum of Understanding with the National Park Service to provide daily patrols and surveys of the island. Since NPS makes routine trips out to the Buck Island Reef National Monument, it is a relatively simple matter for them to check on the area. As a result of their surveys, it was estimated that about 100 visitor use days occur on the island each year. Concern about the future of the lizard resulted in a cooperative program, between the FWS, NPS and the Virgin Islands Division of Fish and Wildlife, for mongoose elimination at Buck Island N.M. Funding for the program was obtained from FWS and NPS during FY 1984 and actual trapping operations took place in early 1985. A follow-up trapping verification effort in December 1985 found mongoose to still be on the island. Another attempt at removal is expected and if successful, the original plan of trapping St. Croix ground lizards at Green Cay NWR for introduction to Buck Island NM will be implemented.

The big excitement on the cay for 1985 was the finding of a large bale of marijuana on the beach by an NPS patrol. Apparently, it had been jettisoned at sea during a smuggling attempt and then washed ashore. It was given to Virgin Islands law enforcement authorities.

CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGES

SANDY POINT NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U. S. Department of the Interior  
Fish and Wildlife Service  
NATIONAL WILDLIFE REFUGE SYSTEM

## Sandy Point NWR

### INTRODUCTION

The Sandy Point National Wildlife Refuge was established, for the protection of nesting leatherback sea turtles on August 30, 1984 when the West Indies Investment Company agreed to sell 398 acres of land and beach front in southwestern St. Croix to the Fish and Wildlife Service for \$2,500,000.00. The Sandy Point rookery was "discovered" in the mid-1970's and is the largest known nesting population of the leatherback sea turtle under United States jurisdiction. In September 1978, the Fish and Wildlife Service designated a strip of land on Sandy Point as Critical Habitat and in March 1979 the National Marine Fisheries Service determined the surrounding waters to be Critical habitat for the leatherback sea turtle.

Sandy Point is the longest beach area in the U.S. Virgin Islands. The geological formation of the point is unique in the Virgin Islands. The peninsula probably grew from oscillating north and south shore currents which formed spits that gradually closed to form Westend Salt pond. Westend Salt pond may have been formed as far back as the Pleistocene epoch (about one million years ago). Sand deposition and erosion occur continually, and the width of the beach at any one point is very changeable. The trend in the past four to five years has been toward more erosion than deposition; however, the basic geologic feature is quite stable. Maps dating back to 1667 show Sandy Point essentially as it is today. Sandy Point is a flat area and virtually all of it is below the 10-foot contour line.

The littoral woodland vegetation type occurs on the flat sand inland from the beach areas. Plant species diversity is low because of salt stress. The shore of Westend Salt pond is characterized by small patches of mangroves. The animal diversity on Sandy Point is low, as is typical of oceanic islands, because of the relatively harsh beach environment. Birds are the dominant vertebrate life form.

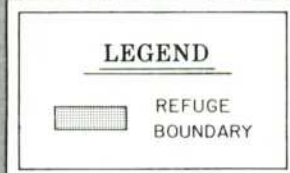
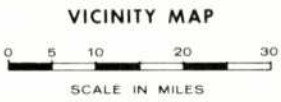
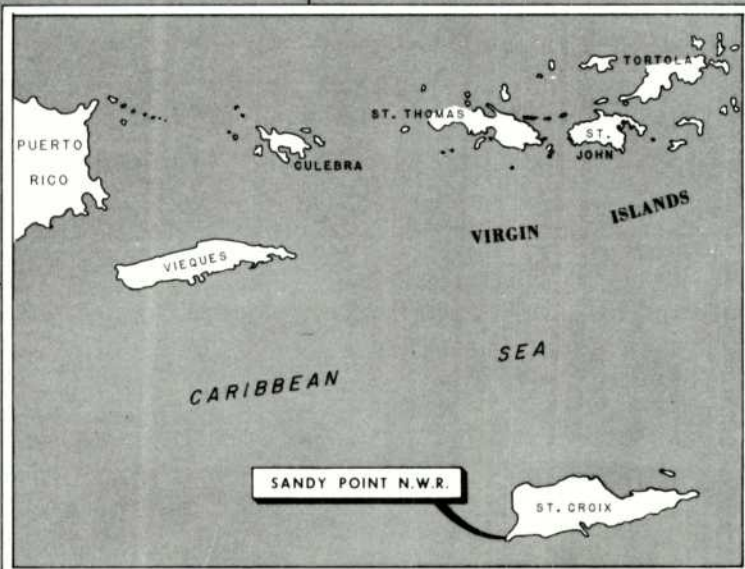
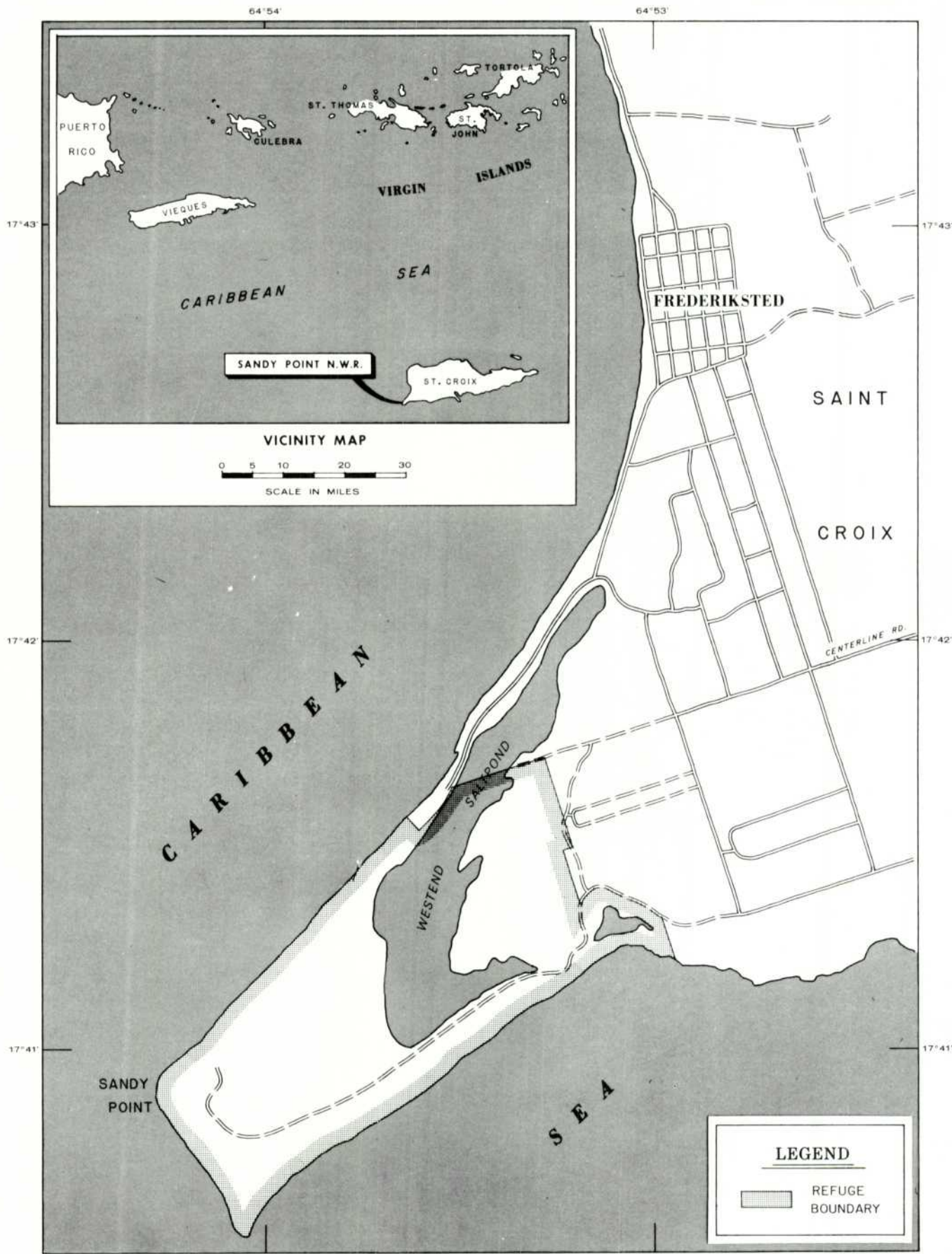
	<u>Page</u>
INTRODUCTION	
TABLE OF CONTENTS	i
A. <u>HIGHLIGHTS</u>	1
B. <u>CLIMATIC CONDITIONS</u>	1
C. <u>LAND ACQUISITION</u>	2
D. <u>PLANNING</u>	2
E. <u>ADMINISTRATION</u>	2
F. <u>HABITAT MANAGEMENT</u>	3
G. <u>WILDLIFE</u>	5
H. <u>PUBLIC USE</u>	7
I. <u>EQUIPMENT AND FACILITIES</u>	8
J. <u>OTHER ITEMS</u>	8
K. <u>FEEDBACK</u>	8

# SANDY POINT NATIONAL WILDLIFE REFUGE

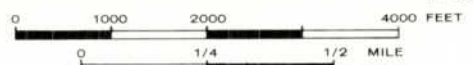
UNITED STATES  
DEPARTMENT OF THE INTERIOR

SAINT CROIX, VIRGIN ISLANDS

UNITED STATES  
FISH AND WILDLIFE SERVICE



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FROM SURVEYS BY U.S.G.S.



ATLANTA, GEORGIA AUGUST, 1980

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### A. HIGHLIGHTS

Plateau #1 ceased sand mining activities and restored most of the mine site to a point where suitable nesting habitat is now available for the coastal race of the least tern. (Section F.)

The refuge boundaries were surveyed and posted. (Section K.)

### B. CLIMATIC CONDITIONS

During 1985 the island of St. Croix did not experience any major storm systems. As we were unable to obtain a summary of the 1985 weather for St. Croix, a copy of the Weather Service's long term averages is presented so that you can see that we also have winter in the Caribbean. Have you ever tried to swim in water that is only 70 °F? That is really frigid after the summer waters in the low 80's. We knew that you would all be able to empathize after reading this, especially all you folks above 19°N.

#### Long Term Weather Summary for St. Croix, U.S. Virgin Islands

Month	<u>Temperature °F</u>				Ave Inches of Rainfall
	Ave Daily Max	Ave Daily Min	Ave Max	Ave Min	
Jan.	83	70	86	65	2.23
Feb.	83	70	86	66	2.19
Mar.	84	71	86	66	1.73
Apr.	86	73	88	68	2.83
May	86	74	89	70	4.31
June	88	76	90	71	3.10
July	88	76	90	71	3.51
Aug.	89	76	91	72	4.58
Sept.	88	75	91	71	6.65
Oct.	88	75	90	70	5.45
Nov.	86	73	89	68	4.65
Dec.	84	72	87	67	3.34
Year	86	73	92 <sup>a</sup>	64 <sup>b</sup>	44.57

a = Average annual highest temperature

b = Average annual lowest temperature

### C. LAND ACQUISITION

Attorneys for an adjoining land owner contacted the Regional Realty Office to discuss a possible land donation along the north side of the West End Salt Pond but after the preliminary information was exchanged no further contacts were made.

### D. PLANNING

This year was the fourth consecutive year that the Virgin Islands Division of Fish and Wildlife funded Scott and Karen and Scott Eckert of the Institute of Ecology at the University of Georgia at Athens to conduct leatherback sea turtle research at Sandy Point. Funding for the program comes through the U.S. Fish and Wildlife Service from a grant to the VI DFW under Section 6 of the Endangered Species Act. The work by Karen and Scott is being used for their doctoral dissertations at the University of Georgia.

This was the last year for the Eckerts on Sandy Point. They have returned to Georgia to finish their educational programs and analyze their data. The Sandy Point project will continue under the auspices of Robert Brandner and Susan Basford (N.Y. Zoological Society) with support by the Center for Field Research and the assistance of Earthwatch volunteers.

### E. ADMINISTRATION

#### 1. Personnel

No personnel are currently assigned to Sandy Point NWR. All administration of the area is handled from the Caribbean Refuges Headquarters at the Cabo Rojo NWR in Boquerón, Puerto Rico. Eventually we hope to staff the refuge with a GS-9 Refuge Manager and a 6 month seasonal. Personnel from Cabo Rojo NWR are assigned temporary duty at Sandy Point whenever situations require their services (i.e. filming of movies).

#### 2. Volunteers

Earthwatch volunteers provided assistance to the Eckerts for the fourth consecutive year. Along with the dedication and experience of the Eckerts a large measure of the success of the last four years of turtle work was due to the enthusiastic Earthwatch volunteers.

In deference to the Eckerts, we will let them sum up their four years of experience and data gathering with the help of Earthwatch by quoting from an a letter to the editor of Earthwatch News.

"To the Editors:

Four years and 35 expedition teams have passed since EARTHWATCH and the Center for Field Research first accepted our proposal to study marine turtles on the island of St. Croix in the West Indies. We're quite sure that, in the beginning, neither you nor we fully comprehended the magnitude of what was being undertaken-or the circumference of its eventual contribution to the Caribbean, to population ecology, and to sea turtle science in general. Never anywhere had the rare 1,00-pound leatherback turtle been targeted for so intensive a research effort.

The results? Over four years, 291 volunteers logged roughly 20,000 (nocturnal!) miles patrolling the 1 1/2 miles of Sandy Point Beach. They collected detailed data (including more than 6,000 measurements in one season) on 114 leatherback turtles, who excavated some 585 nests. EARTHWATCH team members counted more than 45,000 yolked eggs and chaperoned more than 18,000 hatchlings to the sea. ...."

### 3. Funding

Sandy Point NWR has no specific budget. Funds come from the refuge complex and are allocated as necessary.

### F. HABITAT MANAGEMENT

When the refuge was purchased in September 1984 a sand mining area was under lease to a company called Plateau #1. The purchase agreement required that FWS allow the company to continue sand mining for six months after the completion of the land sale agreement.

At the end of the six month period the company was to cease mining and begin restoring the area in accordance with legal requirements of the Virgin Islands government and a restoration plan designed by the VI Division of Fish and Wildlife (DFW).



The Sandy Point sand mining site before operations ceased and restoration began. DiRosa. AN-85-SDP-01



An "almost after" photo. The white sand will be spread over the area, providing nesting habitat for least terns. DiRosa. AN-85-SDP-02

The coastal race of the least tern ( a national species of special emphasis) had been observed breeding on the property in limited numbers. Before the restoration of the mine site began the DFW requested a change in the restoration plan that would prepare the site as least tern nesting habitat instead of returning the area to its premined state. The area would be filled in as planned, however vegetation would not be replanted and a light colored sandy substrate would be placed over the surface.

By the end of the year the habitat restoration was near completion.

#### G. Wildlife

The most significant wildlife species at Sandy Point NWR is the endangered leatherback sea turtle. Both green and hawksbill sea turtles are also known to nest at Sandy Point. A large variety of wading birds is found associated with the West End Salt Pond, and numerous shorebirds visit the pond and the beach during migrations. White-tailed deer and mongoose have been introduced to St. Croix and both have been reported at Sandy Point NWR.

The DFW submitted a proposal to monitor the coastal least tern population and nesting activity occurring on the restored sand mine site within the refuge.

Sandy Point supports the largest and most intensively studied concentration of nesting leatherbacks in the United States and northern Caribbean

The Eckerts 1985 nesting leatherback sea turtle had some pleasant results. Forty-six individual nesting turtles were encountered and 14 of those were remigrant nesters from previous years. That was an increase of 18 turtles from 1984. Nesting began in early March and terminated in mid-July. Between 9200 and 9300 hatchling leatherbacks were released in 1985 (1984: 5200-5300). Three nests were known to have been poached.

Due to be published in 1986 in *Herpetologica* is a research study conducted by Scott and Karen Eckert, David Nellis and Gerald Kooyan on the diving patterns of the leatherback during their internesting intervals in 1985.

Two turtles were fitted with time-depth recording units while they were nesting on Sandy Point. The units continually recorded the diving patterns of each turtle including diving duration, depth and surface time throughout a ten day period. The most interesting data was the depths to which the turtles dove.

Maximum dive depth was 475 meters for the smaller turtle and 314 meters for the larger turtle. Maximum dive time was 27.8 and 37.4 minutes respectively. It was concluded that leatherbacks are active divers during the interesting period. Their dive patterns, depths and durations are similar to other pelagic divers such as seals, sea lions and penguins, and there is a constant duration of dives that may reflect an aerobic limit.

Final outcome of leatherback nests on Sandy Point NWR, St. Croix since 1982.

	KNOWN RESULTS					UNKNOWN RESULTS	TOTAL
	<u>surviving to term</u>			<u>lost prior to term</u>			
	N	<u>% success</u>		<u>erosion</u>	<u>poaching</u>		
X		SD	N (%) <sup>1</sup>	N (%)			
<u>1985</u>							
Relocated	110	53.2	17.8	1	1	8	120
In situ	90	62.8	21.2	16	2	14	122
Total	200	57.6	20.0	17 (7.0)	3 (1.2)	22 (9.1)	<u>242</u>
<u>1984</u>							
Relocated	82	54.8	19.9	0	0	6	88
In situ	41	67.7	16.8	7	1	4	53
Total	123	59.1	19.8	7 (4.9)	1 (0.7)	10 (7.1)	<u>141</u>
<u>1983</u>							
Relocated	69	50.5	20.5	3	0	5	77
In situ	28	64.4	23.9	6	2	0	36
Total	97	54.5	22.3	9 (7.9)	2 (1.8)	5 (4.4)	<u>113</u>
<u>1982</u>							
Relocated	23	64.4	21.3	1	0	3	27
In situ	22	61.4	24.5	25	0	12	59
Total	45	62.9	22.7	26 (30.2)	0	15 (17.4)	<u>86</u>

<sup>1</sup> = proportion total nests



Karen Eckert (right) and a Scripps Institute biologist assisting a leatherback sea turtle in modeling a depth recorder. S. Eckert.  
An-85-SDP-03

#### H. PUBLIC USE

Karen and Scott Eckert handled all the interpretative public use for the area. Groups wishing to visit the beaches at night had to make reservations with the Eckerts in order to be allowed on the beach. An estimated 300-400 people came to the beaches during the nesting season in order to be able to see the turtles nesting.

The Eckerts gave programs to school and other organized groups whenever their schedules allowed. During their four years on Sandy Point they gave hundreds of programs to thousands of people. They were the major force in educating St. Croix residents about the plight of the leatherback and other sea turtles.

In addition, they acted as our eyes and ears after Sandy Point was purchased and notified us of any public use and law enforcement problems. It was their and the Earthwatch volunteers constant presence on the beach during the nesting season that has virtually eliminated turtle and egg poaching on Sandy

Point. There had been a high rate of criminal activity against people and property in the area. Judging from the Eckerts own observations and police records, their presence has greatly reduced such activity.

#### I. EQUIPMENT AND FACILITIES

The refuge boundary survey was contracted to and surveyed by Antillian Engineers, St. Croix. The initial survey was well done except for a small area they missed and the type, placement and permanency of the survey markers. They were a nice bunch of fellows anyway. The problems were resolved and we posted the boundary with blue goose signs.

#### J. OTHER ITEMS

St. Croix archaeological files were examined to determine if a prehistoric Indian site (The Aklis Site) was located close to the refuge. At least half the site, which is listed on the Register of National Historic Places, is located on the Sandy Point NWR.

#### K. FEEDBACK

Sandy Point NWR is now one year old and it had the expected growing pains. It is a locally well known and well used area with the corresponding problems of a high crime area. The Eckerts and Earthwatch have been a big factor in minimizing adverse turtle activities and public use. The program will not continue indefinitely and the Virgin Islands government does not have the resources to adequately monitor the area. It is logistically difficult and expensive in manpower and money for us to provide even limited support to Sandy Point from the current complex staff. It is now essential that at least one full time and one part time staff position be assigned to Sandy Point to coordinate sea turtle, public use and educational activities if the refuge is to fulfill its function.

A glimpse into the life of an Earthwatch Volunteer at Sandy Point and Culebra.



It all begins here. S. Eckert. AN-85-SDP-04



The volunteer's first look at a leatherback. S. Eckert. AN-85-SDP-05



Mama turtle goes to work and so do the volunteers. S. Eckert. AN-85-SDP-06



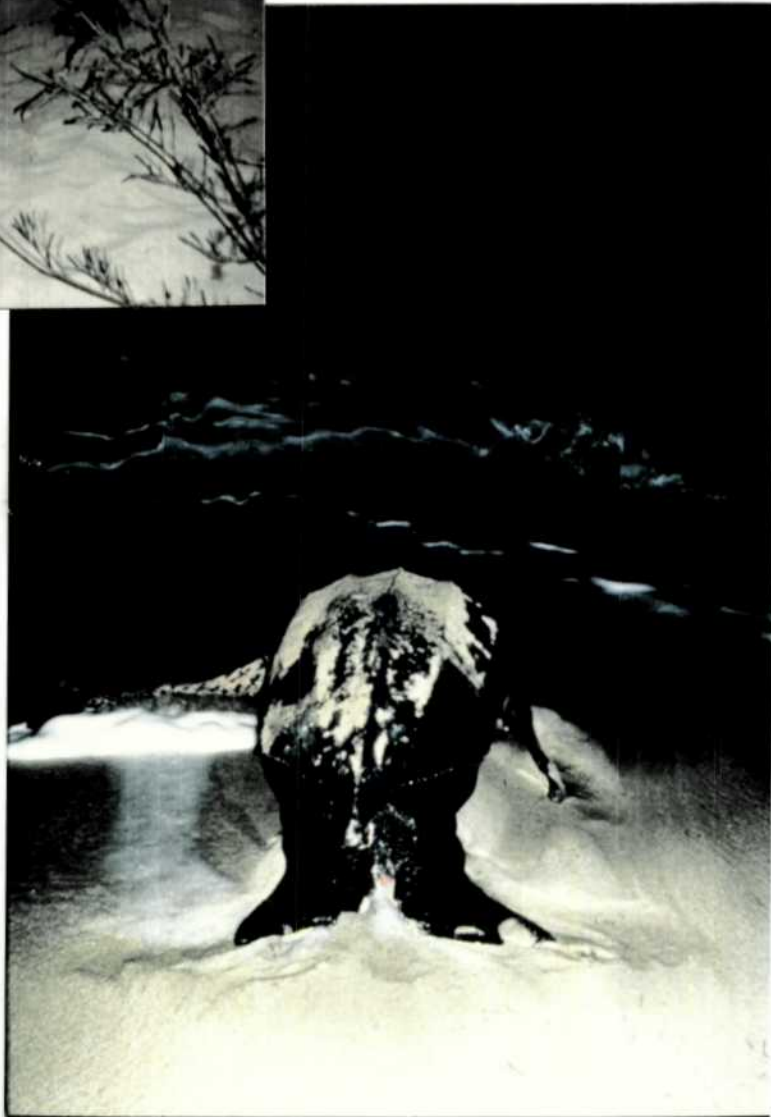
While mama lays eggs, the volunteers remove and count the eggs, take and record body measurements and nest data, and tag the turtles. S. Eckert. AN-85-SDP-07



A few lucky turtles,  
like this medium size  
one (840 lbs), receive  
the dubious honor of  
being weighed.

S. Eckert  
AN-85-SDP-08

An eventful night ends for  
another turtle and the  
Earthwatch volunteers.  
S. Eckert. AN-85-SDP-09





It is the lucky volunteer that gets to spend the evening babysitting. It may begin only with a tell-tale sign in the sand. S. Eckert. AN-85-SDP-10



The "kids" begin to get restless after a short rest. S. Eckert. AN-85-SDP-11



And then the mad scramble begins! But before things get too out of hand, a representative sample of turtles is measured. The nest is unearthed, stragglers are assisted, egg shells and un hatched eggs are counted and the results are compared with initial nest data. S. Eckert.  
AN-85-SDP-12



And, of course, this is what it was all about. The Earthwatch Volunteers can rest secure with the knowledge that their assistance did make a difference. S. Eckert. AN-85-SDP-13

CARIBBEAN ISLANDS NATIONAL WILDLIFE REFUGES

VIEQUES FIELD STATION

ANNUAL NARRATIVE REPORT

Calendar Year 1985

U. S. Department of the Interior  
Fish and Wildlife Service  
NATIONAL WILDLIFE REFUGE SYSTEM

## Vieques Field Station

### INTRODUCTION

At the request of the U.S. Navy, the Vieques Field Station was inaugurated in 1981. The Station's original objective was to provide technical assistance to the Navy in all phases of natural resource management relative to the Vieques Island Naval Reservation, a unit of the Roosevelt Roads Naval Station. In 1984, a revised FWS/Navy agreement expanded Field Station advisory responsibilities to encompass Roosevelt Roads. A priority function of the Field Station is to insure Navy compliance with established Federal, Commonwealth and Navy Environmental policy on both Vieques and Roosevelt Roads.

The Field Station has provided technical expertise in erosion control, mangrove restoration, archaeological reconnaissance work, mariculture, cattle/range management, and timber harvesting. Field Station personnel have participated in a brown pelican population study, manatee distribution surveys, monitoring of marine turtle nesting activities, yellow-shouldered blackbird recovery efforts, environmental education programs with local schools, and in the preparation of various Navy resource management documents.

Vieques Island is situated approximately 11 km (6.8 mi) southeast of the main island of Puerto Rico. The physiography of this 135 sq. km (52.2 sq. mi) island is typified by low hills and small valleys in the central portion; and extensive, planiform coastal zones, characterized by broad belts of red and black mangrove forests.

As the island exhibits both a high evapotranspiration rate and lacks perennial freshwater, floral and faunal communities are dominated by xeric species. Floristically the eastern half of the island has been greatly modified by cattle and military activity. The vegetation is distinguished by such invader species as mesquite, acacia, and giant milkweed. The western half of Vieques, while supporting acres of microphyllous thornscrub, also preserves associations of endemic flora, especially in the upland forest habitat of Monte Pirata.

Approximately 9150 ha (22,606 acres) of Vieques is owned by the Navy, and this property - the Vieques Naval Reservation - is utilized by the military for numerous activities, including amphibious landings, bombing exercises and use as a permanent ammunition depot. In addition, as cattle grazing on the Vieques Naval Reservation is considered by the Navy to be compatible with military operations, 4130 ha (10,200 acres) are leased to the Cooperativa de Ganaderos

de Vieques. Due to mismanagement, some of the Naval Reservation's paramount environmental problems are the result of both severe overgrazing of lease acreage and trespass grazing in ecological sensitive zones outside of the lease area. For a number of sensitive reasons the Navy has been reluctant to deal with this grazing problem. Nearly 8,000 civilians inhabit the remaining 4300 ha (10,620 acres) of Vieques. Civilian occupational pursuits include cattle ranching, construction trades, and commercial and artisanal fishing, including turtle poaching and egging.



View of the SW portion of the Vieques Naval Reservation, including Laguna Playa Grande, a site for waterbird rookeries. Weitzel. AN-VFS-01-85.

Located on the island of Puerto Rico, the 3261 ha (8055 acres) Roosevelt Roads Naval Station was commissioned as a naval base in 1943. At any one time, up to 3400 military personnel and 3000 dependents are posted to the base. The Station employs up to 1100 civilians who perform support duties. Station acreage is categorized as improved/semi-improved or unimproved. Improved/semi-improved includes that property utilized for such facilities as housing, air operations, dock yards, golf course, administrative buildings, arms ranges, etc. Unimproved areas (1900 ha, 4700 acres) include the mangrove and dry coastal forest associations which support a large percentage of the Station's fish and wildlife resources. The entire Naval Station, excluding manmade structures, is designated as Critical Habitat for the endangered yellow-shouldered blackbird.

## INTRODUCTION

## TABLE OF CONTENTS

Page

i

A. HIGHLIGHTS

1

B. CLIMATIC CONDITIONS

1

C. LAND ACQUISITION

Nothing to Report (NTR)

D. PLANNING

Master Plan.....	(NTR).....	
1. Management Plan.....		2
Public Participation.....	(NTR).....	
2. Compliance with Environmental and Cultural Resource Mandates.....		3
3. Research and Investigations.....		4
4. Other.....		5

E. ADMINISTRATION

1. Personnel.....		6
Youth Programs.....	(NTR).....	
Other Manpower Programs.....	(NTR).....	
Volunteer Programs.....	(NTR).....	
2. Funding.....		6
3. Safety.....		6
4. Technical Assistance.....		6
5. Other.....		8

F. HABITAT MANAGEMENT

1. General.....		10
2. Wetlands.....		10
3. Forests.....		11
Croplands.....	(NTR).....	
Grasslands.....	(NTR).....	
4. Other Habitats.....		12

F. HABITAT MANAGEMENT (Cont.)

5. Grazing.....		13
Haying.....	(NTR).....	
Fire Management.....	(NTR).....	
Pest Control.....	(NTR).....	
Water Rights.....	(NTR).....	
Wilderness and Special Areas.....	(NTR).....	
WPA Easement Monitoring.....	(NTR).....	

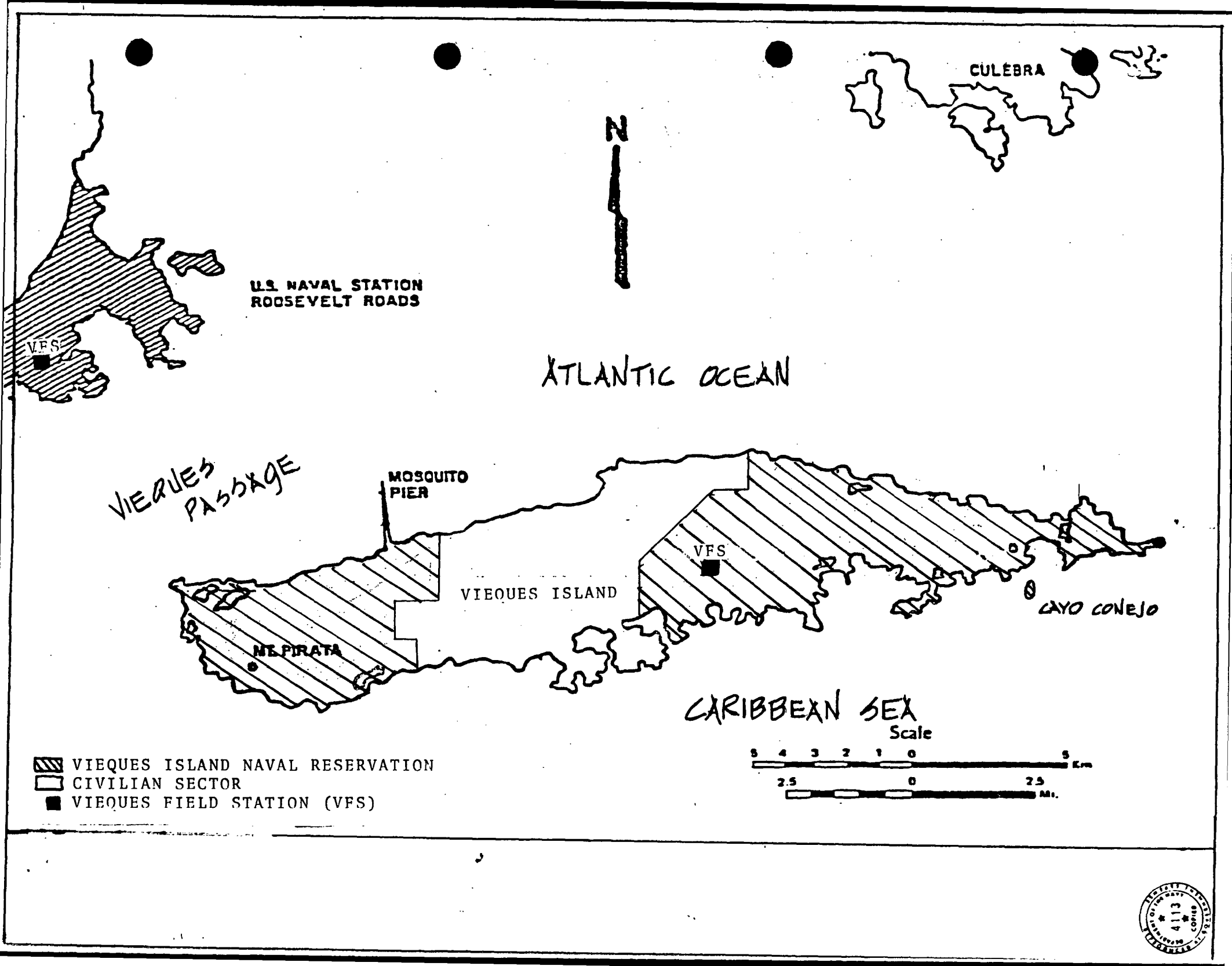
G. WILDLIFE

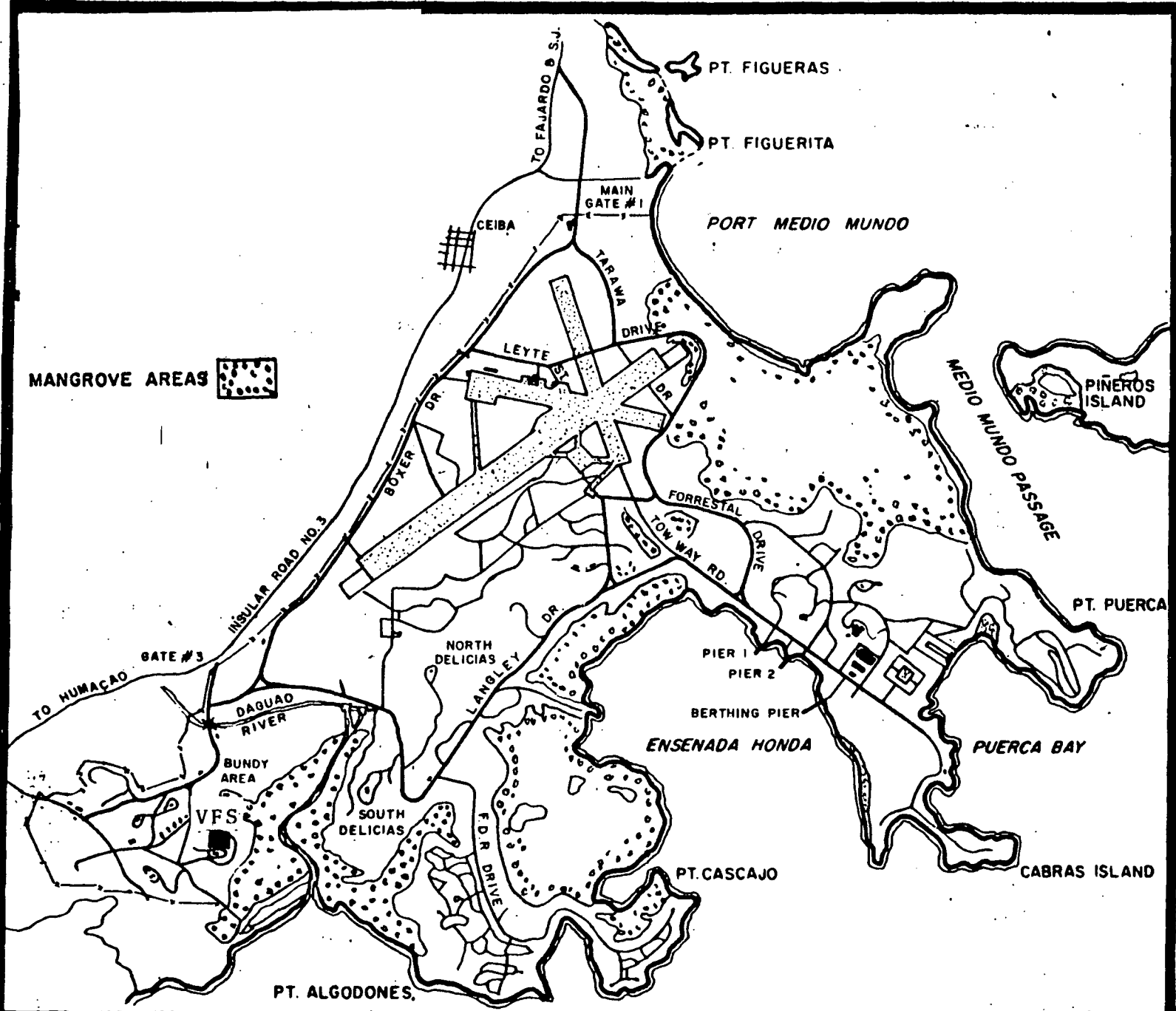
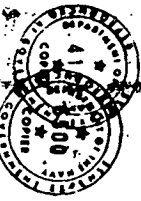
1. Wildlife Diversity.....		13
2. Endangered and/or Threatened Species.....		15
3. Waterfowl.....		16
4. Marsh and Water Birds.....		17
5. Shorebirds, Gulls, Terns and Allied Species.....		17
6. Raptors.....		17
Other Migratory Birds.....	(NTR).....	
Game Mammals.....	(NTR).....	
Other Resident Mammals.....	(NTR).....	
7. Marine Mammals.....		18
Fisheries.....	(NTR).....	
Wildlife Propagation and Stocking.....	(NTR).....	
Surplus Animal Disposal.....	(NTR).....	
Scientific Collections.....	(NTR).....	
Animal Control.....	(NTR).....	
8. Marking and Banding.....		18
Disease Prevention and Control.....	(NTR).....	

H. PUBLIC USE

1. General.....		19
Outdoor Classrooms - Students.....	(NTR).....	
Outdoor Classrooms - Teachers.....	(NTR).....	
Interpretive Foot Trails.....	(NTR).....	
Interpretive Tour Routes.....	(NTR).....	
Interpretive Exhibits/Demonstrations.....	(NTR).....	
2. Other Interpretive Programs.....		20
3. Hunting.....		21

	<u>Page</u>
<u>H. PUBLIC USE (Cont.)</u>	
4. Fishing.....	21
5. Trapping.....	21
6. Wildlife Observation.....	22
Other Wildlife Oriented Recreation.....(NTR).....	
Camping.....(NTR).....	
Picnicking.....(NTR).....	
Off-road Vehicling.....(NTR).....	
Other Non-wildlife Oriented Recreation.....(NTR).....	
7. Law Enforcement.....	22
Cooperating Associations.....(NTR).....	
Concessions.....(NTR).....	
<u>I. EQUIPMENT AND FACILITIES</u>	
	24
<u>J. OTHER ITEMS</u>	
Cooperative Programs.....(NTR).....	
Other Economic Uses.....(NTR).....	
1. Items of Interest.....	24
2. Credits.....	24
<u>K. FEEDBACK</u>	
	25





■ Vieques Field Station (VFS)

U.S. NAVAL STATION  
ROOSEVELT ROADS, P.R.

### A. HIGHLIGHTS

Navy contractors complete various natural resource management documents for Roosevelt Roads Naval Station and the Vieques Naval Reservation (Section D.1-3)

West Indian manatee and marine turtle distribution study completed (Section D.3)

Yellow-shouldered blackbird recovery efforts begin on Roosevelt Roads Naval Station (Section D.3)

Mangrove restoration work completed in NW Vieques (Section F.2)

Vieques forestry project initiated (Section F.3)

A species of Boidae recorded from Vieques (Section G.1)

Violations of the Endangered Species Act documented on the Vieques Naval Reservation (Section H.7)

### B. CLIMATIC CONDITIONS

According to Holdridge's life zone classification system, which is based primarily on mean annual precipitation and biotemperature, the eastern half of Vieques is considered subtropical dry, while the majority of the western half is listed as subtropical moist. Roosevelt Roads lies within a subtropical dry zone.

Roosevelt Roads and Vieques Island are located in the path of the easterly trade winds and this climatic factor promotes a fairly stable temperature throughout the year. For Vieques, the long term mean temperature varies between 24.4°C (76 °F) and 27.7°C (82 °F), with a record low of 15.5°C (60 °F) and a record high of 36.6°C (98 °F). On Roosevelt Roads, long term mean temperature ranges between 22.7°C (73°F) and 30.0°C (86°F), with a recorded low of 15.0°C (59°F) and a recorded high of 35.0°C (95°F). During 1985, the high for Roosevelt Roads was 33.3°C (92°F) in June and the recorded low was 18.8°C (66°F) in Jan., Feb. and April.

Data for Vieques, maintained over the period 1910-1969, shows that rainfall averages 1143 mm (45.0 in) per year, with March usually the driest month with an average of 43 mm (1.70 in) and September typically the wettest month with an average of 150 mm (5.90 in). Rainfall on Roosevelt Roads averages 1448 mm (57 in) per year, with November through April considered "dry season", while May through October is listed as "wet season". Precipitation for 1985 totaled 1601mm (63.03 in) at Roosevelt Roads.

The usual effect of high precipitation is extended inundation and severe accelerated runoff at many localities within both Roosevelt Roads and the Naval Reservation. Especially in the case of Vieques, severe runoff promotes excessive sediment transport to the mangrove fringe systems along the southern coast. During 1985, excessive sedimentation was particularly notable during the months of May, October and November.

WEATHER DATA SUMMARY  
ROOSEVELT ROADS NAVAL STATION

<u>Month</u>	<u>Temperatures (*F)</u>					<u>Inches of Rainfall</u>
	<u>High</u>	<u>Low</u>	<u>Mean High</u>	<u>Mean Low</u>	<u>Mean High/Low</u>	
Jan.	86	66	83	69	76	2.39
Feb.	86	66	83	71	77	2.42
Mar.	89	68	84	72	78	2.20
Apr.	88	66	86	72	79	1.53
May	90	68	87	75	81	10.36
June	92	72	89	78	84	1.55
July	91	71	89	78	84	6.43
Aug.	91	74	89	78	84	6.88
Sept.	91	71	88	76	82	8.23
Oct.	91	69	87	75	81	13.95
Nov.	90	70	86	74	80	5.35
Dec.	86	70	84	74	79	1.74

D. PLANNING

1. Management Plan

From December 1984 through February 1985, Navy contractors (Ecology & Environment, Buffalo NY) completed field studies that resulted in the following

documents: a) Environmental Assessment of Continued Use of the Atlantic Fleet Weapons Training Facility, Inner Range, Vieques; b) Soil erosion Control Plan for the Eastern Maneuver Area and Naval Ammunition Facility, Vieques; and c) Soil Erosion Control Plan for the Atlantic Fleet Weapons Training Facility, Vieques. An additional report, Land Use Management Plan for Naval Facilities, will be completed in early 1986. The Navy will utilize these documents in establishing land use policies for the Vieques Naval Reservation (VNR). Implementation of all programs outlined in the above reports will be costly. For example, to effect recommendations listed in the Soil Erosion Control Plans alone will require a \$2,000,000 expenditure.

In November, Ecology & Environment and Mangrove Systems, Inc (Tampa, FL) were contracted by the Navy to complete a land use plan for Roosevelt Roads Naval Station (RRNS). This plan will concentrate on soil/water management within the Naval Station. The contractors completed their field efforts in November and the final document is expected in early 1986.

During 1985 the Station Manager worked with the Assistant Staff Civil Engineer on the production of a detailed Vieques Land Use Map. The map, when completed in 1986, will depict environmentally sensitive areas (e.g. conservation zones, coral reefs, cultural sites) within the VNR. Because of the nature of some of the information provided (i.e. relative location of Federally protected cultural sites) the map will be available only to those individuals directly involved with VNR resource management activities.

## 2. Compliance with Environmental and Cultural Resource Mandates

During 1985, Navy contractors (Ecology & Environment) completed the following: a) Cultural Resource Management Plan for Roosevelt Roads Naval Station, Atlantic Fleet Weapons Training Facility, and the Vieques Naval Reservation, and b) Preliminary Cultural Resource Reconnaissance Survey of U.S. Naval Station, Roosevelt Roads, Ceiba, Puerto Rico.

The Cultural Resource Management Plan provides guidelines in reference to the protection of known aboriginal and colonial sites, and recommendations on how to approach additional archeological reconnaissance activity.

The Navy is currently responsible for the protection of 33 Class 1 sites located within the VNR, and 6 Class 1 and 3 Class 2 sites at RRNS. In addition, as numerous areas within RRNS have not been surveyed for their cultural value, the Plan dictates that those areas be formally inspected by a qualified

archeologist prior to initiating any land disturbance project (e.g. operating heavy equipment).

### 3. Research and Investigations

#### a). Status of the Hutia on Vieques

In February, the Station Manager assisted Oliver Williams (Jersey Wildlife Trust, England, UK) in determining whether the hutia (*Isolobodon*) still exists on Vieques. It is believed that this rodent, an Antillean relative of the South/Central American *Dasyprocta* and *Agouti*, was introduced by aboriginal Indians as a food source. This investigation included surveying preferred habitat (e.g. limestone cliffs) and interviewing local residents, mainly elderly hunters. No evidence was encountered to indicate that this animal is still found on the island of Vieques.

#### b). West Indian Manatee and Marine Turtle Distribution Study

Navy contractor Tom Carr (University of Florida) completed twelve months of field work in March and his report, "The Distribution of Manatees and Sea Turtles in Puerto Rico, with Emphasis on Roosevelt Roads Naval Station", was distributed in July. His report outlines locations of manatee and turtle concentrations during the twelve month study. Carr did not observe notable seasonal patterns in manatee distribution, however both swimming and floating marine turtles were recorded with greatest frequency from September through November. Carr considers manatee and turtle losses to poaching throughout the Commonwealth to be of paramount concern.

Considering the extreme lack of literature relative to the West Indian manatee, this document provides significant data for use by local resource managers.

#### c). Yellow-shouldered Blackbird Recovery Project

In July, seasonal field activities of the yellow-shouldered blackbird (YSBB) recovery project were initiated by the Kentucky Field Station (KFS), a unit of the Denver Wildlife Research Center, with funding from the FWS Endangered Species Program. Field work ended in late September and will recommence in March 1986. Project activities concentrated on removal of shiny cowbirds, a brood parasite that is considered to be the primary factor affecting the reproductive success of the YSBB. Supplementary work included: banding cowbirds and incidentally trapped blackbirds; radio-tracking cowbirds;

blackbird and cowbird roost surveys; and a YSBB census. The RRNS population of YSBB is currently estimated to hold 25 birds, a significant decline from the 1983 estimate of 75.

To trap cowbirds, 16 walk-in decoy traps, built by the Navy, were placed at selected sites throughout RRNS. These traps were monitored seven days a week, with the combined trapping effort resulting in a capture of 2449 cowbirds. Whether or not this cowbird removal program will have a positive impact on the local survival rates of the YSBB will not be evident until the 1985 YSBB breeding season.



A walk-in trap used in the yellow-shouldered blackbird recovery project.  
Diaz. VFS-85-02

#### 4. Other

In November, the Station Manager reviewed the Navy briefing document "Brief for Ground Forces Operating on Vieques". This document, prepared by the Atlantic Fleet Weapons Training Facility, details the environmental regulations/guidelines that military units must adhere to while working within the VNR. Numerous inclusions were recommended.

## E. ADMINISTRATION

### 1. Personnel

The Field Station activities are conducted by Refuge Manager/Station Manager Marc Weitzel who is responsible for all field and office duties, except for budgetary and personnel matters which are handled by the main office at Cabo Rojo NWR. No personnel changes occurred during 1985.

### 2. Funding

The funding for this Station is a Navy responsibility, stipulated under the FWS/Navy MOU. The CY 1985 budget was \$42,000, 15% of which was automatically deducted for overhead costs for use by the FWS administration (i.e Regional and DFC support).

### 3. Safety

All safety material forwarded by the Complex Headquarters was reviewed. No personal accidents or damage to FWS equipment occurred in 1985.

### 4. Technical Assistance

The Station Manager presented environmental briefings to all newly arrived military construction units. These briefings emphasized adherence to Federal, Puerto Rican and Navy environmental regulations/guidelines. Technical advice was offered in such areas as erosion control, mangrove restoration, mechanical control of thornscrub, herbicide application, and protection of cultural sites and other environmentally sensitive areas.

Details of all military exercises scheduled for Vieques were evaluated to ensure compliance with established environmental restrictions and, when appropriate, briefings (oral and written) were given to military personnel in charge of the exercises when appropriate.

The Station Manager monitored all construction activities on a routine basis. Military construction projects for the period included: small arms range and road refurbishments, brush control, security fence construction, and airstrip upgrading. On RRNS, the Station Manager reviewed projects to ensure compliance with permit requirements and inspected all construction activities that had the potential to adversely impact manatee and yellow-shouldered

blackbird habitat, wetland areas, and zones of archeological importance. Examples of the projects reviewed in 1985 include the construction of Coast Guard sub-station piers in a manatee area, and the placement of hazardous waste monitoring wells near closed refuse dumps.

In Jan., Feb., and Nov. field assistance was provided to numerous Navy contractors involved in the production of land use management documents relative to the VNR and/or RRNS. All preliminary reports resulting from these projects were formally reviewed by the Station Manager.

In Feb. the Station Manager and a Navy contract archeologist conducted on site status inspections at VNR of all 33 cultural sites that have been nominated to the National Register of Historic Places. For each site, potential impacts were evaluated and site protection measures were recommended. On an irregular basis, the Station Manager inspected the condition of stored archeological items ( $\pm$  11 tons worth) at VNR.



Weitzel assisting with the placement of a cowbird trap. Heisterberg.  
VFS-AN-85-03

During July-Sept. considerable time was spent assisting with segments of the yellow-shouldered blackbird recovery project. This assistance included trap construction and placement, nest and roost surveys, cowbird banding, and telemetry activities.

In September the Station Manager provided assistance to the Army Environmental Officer at Fort Buchanan in recommending control measures (including design and placement of traps) for freshwater turtles (*Pseudemys* sp.) that were preying on the locally endangered West Indian ruddy duck.

Additional assistance was provided to individuals/groups who were involved and/or interested in projects at RRNS and/or VNR. These projects included the Vieques Forestry Project, a small scale shark fishery for Vieques, use of *Leucaena* as cattle forage on Vieques, a marine archeology project off the NW coast of Vieques, a field investigation to determine the status of the rodent *Isolobodon*, field work of Puerto Rico Department of Natural Resources (DNR) waterfowl biologists at RRNS, Univ. of PR classes wishing to use the RRNS mangroves areas as study sites, a request from Cornell University to study the introduced monk parakeet on RRNS (even though there are no records of the species at RRNS), and a request from the Institute of Tropical Forestry (USFS) ornithologist to study introduced Psittacids that may be encountered at RRNS.

#### 5. Other

In Jan. a visit was made to the Institute of Tropical Forestry to obtain reference materials for the Field Station and to discuss various aspects of the Vieques Forestry Project with Dr. Frank Wadsworth.

In Feb. the Station Manager participated in law enforcement patrols at the Boqueron Refugio de Aves during the second half of the Puerto Rico waterfowl season, accompanied Navy contract biologist Tom Carr on aerial manatee/turtle surveys and met with Refuge Supervisor Grabill and Project Leader Furniss during the annual inspection trip of the Caribbean Refuges. Grabill, Furniss and Weitzel met with Navy personnel to discuss the status of the FWS-Navy Memorandum of Understanding.

During Mar. and July, trips were made to Culebra NWR to assist with law enforcement patrols, manual brush control, banding Audubon's shearwaters, herbicide application to thornscrub, and weighing and measuring sooty tern chicks. Assistance was also provided to the Earthwatch team working with nesting leatherback sea turtles.

The Station Manager took Ecological Services biologists Lopez and Pace to visit the Cayo Conejo pelican colony, and he provided an orientation trip to RRNS and VNR for Asst. Mgr. DiRosa during the month of April.

In May a visit was made to the Accessions and Property Registry Offices in Humacao to obtain ownership information on Culebra Island properties.

During June a visit to Sandy Point NWR was made for orientation purposes and the Station Manager escorted Navy personnel from Washington, D.C. on a tour of environmental problem areas within the VNR. The visitors included W. Arney (Principal Deputy Assistant of the Navy), R. Cornelius (Assistant General Counsel, Environmental Law), and N. Stehle (Deputy Director, Environmental Policy). Areas of interest included "Impact Area" coral reefs, wetlands impacted by trespass cattle and upland areas exhibiting severe overgrazing. Also during the month, the Station Manager attended the formal change of command ceremony at RRNS, and visited the FWS PR Field Station to pick up specimens for the Cabo Rojo Visitor Contact Station.

The Station Manager attended a meeting between RRNS personnel, USDA Tick Eradication Program personnel and representatives of the PR Dept. of Agriculture in October. The meeting was held to ascertain future program efforts in reference to the Vieques Cattle Cooperative and to establish how the Navy could assist with the program.

In November Station Manager Weitzel met with Arla Strasser (Natural Resources Specialist, Navy, Norfolk, VA) to discuss aspects of the proposed RRNS land use plan and to discuss cattle/range management concerns at VNR. Primary Asst. DiRosa and Mgr. Weitzel attended the Vieques Management Advisory Committee meeting held in San Juan to discuss the Vieques Forestry Project and the cattle situation at VNR.

In December the Caribbean Field Office (Ecological Services/Endangered Species) provided the Navy with an agreement that will allow the Station Manager to evaluate the potential impact of proposed land disturbance projects on endangered yellow-shouldered blackbird habitat within RRNS (all of which is listed Critical Habitat). This agreement will free SE personnel from having to perform most on-site inspections within RRNS, and thus expedite the consultation process with the Navy.

## F. HABITAT MANAGEMENT

### 1. General

The Navy does not generally engage in habitat management/manipulation practices to benefit natural resources. In the past, actions such as various construction activities and military maneuvers typically have involved some type of habitat manipulation (e.g. unregulated vegetation removal, blocking natural drainages, etc.) that has negatively impacted the natural environment. One of the principal functions of the Vieques Field Station is to recommend environmentally sound alternatives to such destructive practices.

### 2. Wetlands

#### General

Of approximately 330 ha (815 ac) of mangrove forests located within the VNR, 70±% (230ha/568 ac) of these mangroves can be classified as stressed. This stress is primarily due to excessive sediment deposition caused by upland soil runoff, old construction activities (e.g. roads and a railroad berm) that blocked traditional internal circulation and sea flushing channels, and excessive impact on the vegetation caused by trespass cattle. Cattle have had a devastating impact on VNR's black mangrove communities. These animals trample cable root systems and pneumatophores (resulting in abnormal aerial roots) and browse the leaves for their salt content. This causes a serious impact on the black mangrove trees and in death of the more adversely affected individuals. The presence of cattle within the VNR wetland zones (i.e. mangroves) is a violation of the Navy/Cooperativa lease agreement. The Navy, due to the political sensitivity of enforcing the lease provisions, has not actively responded to repeated requests that they, as the landowner, enforce the lease agreement requirements.

In contrast to the VNR, the more than 810 ha (>2000 ac) of mangroves found within RRNS include some of the best protected (i.e. least impacted) mangrove systems encountered in Puerto Rico, although some minor negative impacts do occur in the Demajagua and small arms range mangrove zones. An updated mangrove status report, outlining mitigative action, will be available in January 1986.

### Mitigative Projects

To comply with recommendations outlined in a 1981 status report on VNR mangrove forests, the Navy contracted the 8th Engineer Marine Battalion to complete numerous mangrove rehabilitation projects within the NW section of the VNR. Station Manager Weitzel provided technical advice, relative to the restoration activities, to the Engineer Battalion.

The May 1985 restoration projects were directed at the Laguna Kiani/Arenas complex and the Boca Quebrada system. The work involved: a) opening up a direct flushing outlet to the sea at Boca Quebrada; b) constructing new circulation cuts at Kiani/Arenas ( these cuts were made by using ammonium nitrate to blast open two channels in an old railroad berm); and c) widening an existing circulation channel from 2.5± m (8.24 ft) to 11± m (36.3 ft).

Currently these cuts are functioning quite well. The Boca Quebrada channel routinely closes due to beach sand deposition, but heavy rains, with the resulting runoff from Mt. Pirata, "blows" the channels out to allow renewed, although temporary, flushing action. Without a doubt these projects are helping to revitalize these mangrove systems.

### 3. Forests

The long awaited Vieques Forestry Project became a reality in September when the Navy awarded a contract to Tropical Research and Development Inc., Florida. The 40 ha (100 ac) experimental tree plantation will be used to determine the feasibility of commercial timber production on Vieques. Species to be planted include Caribbean pine, two types of mahogany, bucar, and maria. Seedlings are purchased from the Forestry Section of the Puerto Rico Department of Natural Resources. Two hectares (5 ac) of the 40 ha can be planted to species other than those listed above. The contractor is considering a species of *Leucaena* (a variety referred to as the "Hawaiian Giant") for this purpose.

Site preparation (e.g. brush clearing and boundary fencing) commenced in October. Due to the high evapotranspiration rate and lack of perennial fresh water, plantings have to be coordinated with precipitation. The contractor hopes to have all seedlings in the ground by mid-1986, and the first thinning is anticipated in five years. Approximately 6.5 ha (16 ac) had been planted by the end of December. Station Manager Weitzel assisted Navy personnel in delimiting the plantation boundaries, and contact was maintained with the contractor's on-site representative.

In March, one mesquite harvest permit, and one tamarindillo harvest permit were issued to Vieques residents. The wood is employed as a local fencing material.

#### 4. Other Habitats

For segments of RRNS Ensenada Honda and VNR Mosquito Pier area, Mgr Weitzel proposed establishing "no wake" zones to protect the extensive sea grass beds from prop wash. The grass beds provide critical manatee habitat. The Navy was receptive to the idea and it is hoped appropriate regulations will be issued in the near future.

In March, the Station Manager accompanied PR DNR Ranger M. Feliciano and RRNS Environmental Coordinator F. Mestey to evaluate numerous quebradas (stream beds) within the VNR as potential sand extraction sites. The Commonwealth requires that stream sand removal not result in water table exposure. This requires that sand extraction activities be rotated between quebradas. Runoff eventually redeposits sand in exploited quebradas. Routine removal of sand performs two functions: 1) provides local residents with sand, a sought after building material, and 2) maintains these channels in an "open" state, thereby reducing the potential for stream backup, during periods of heavy rains, that could promote erosion within the surrounding area. By allowing local residents to remove sand, the Navy is spared the costly and time consuming job of constantly unblocking these stream channels. The directed sand removal also helps reduce the illegal extraction of sand in other areas that are more ecologically sensitive.

Throughout the period, the Station Manager issued freshwater sand extraction permits to residents of Vieques. Permittees were restricted to specific sites within the VNR and they were obligated to remove sand by manual methods only. The sand is used in local housing construction.

Mgr. Weitzel responded to a 756 L (200 gal) diesel spill in Ensenada Honda at RRNS in July. The Navy's oil spill crew contained most of the fuel. Mgr. Weitzel checked the surrounding area for potential contamination to manatee habitat, but no impact was detected.

Station Mgr. Weitzel attended all Vieques "Inner Range Refurbishment" meetings held at RRNS. As refurbishment activities included land clearing and/or applying herbicides to selected sites, the Station Manager inspected the target areas prior to issuing an environmental clearance.

## 5. Grazing

In January, Station Manager Weitzel met with L. Herrero (Director, Vieques Local Economic Development Corporation), J. Chevres (Agronomist, Administracion de Fomentos Y Desarrollo Agricola) and officials of the Cooperative de Ganaderos de Vieques to discuss Navy plans to establish tame pasture on a 405± ha (1000 ac) parcel within the eastern half of the VNR. This area is currently dominated by dense acacia and mesquite. A complete brush removal/control effort, which the Station Manager considers infeasible in this case, would result in extensive accelerated soil runoff into the sensitive wetlands that fringe the southern coast of the VNR. Other negative environmental problems would also occur if the project was undertaken. However, due to lack of a Navy decision on the matter, no immediate action on this project is likely to be forthcoming in the near future.

In August, Mgr. Weitzel accompanied Dr. C. Myello (herbicide specialist, Navy, Norfolk, VA) to Vieques to inspect all military fences in reference to the application of a herbicide to control fence line vegetation. Glyphosate, with a short active life, was selected for vegetation control in order to avoid the problem of herbicide runoff into sensitive areas (e.g. mangroves).

Throughout the period, the Station Manager monitored Cooperativa compliance with cattle lease provisions. Violations were reported to appropriate Navy personnel.

## G. WILDLIFE

### 1. Wildlife Diversity

Wildlife composition on Vieques, as is typical for most insular habitats, is dominated by its avifauna, which currently approximates 120 species. The more notable species include: zenaida dove, Puerto Rican woodpecker, Caribbean martin, Puerto Rican lizard cuckoo, Antillean crested hummingbirds and West Indian nighthawk.

Mammalian fauna is poorly represented, with bats constituting the primary form. Introduced mammals (e.g. Norway rat, black rat, house mouse, mongoose) are frequently observed in a variety of habitats. No doubt some of these exotics are responsible for depressing populations of endemic ground nesting birds and various herptiles. Other free ranging mammals encountered on the VNR include cattle, cattle thieves, horses, feral dogs, feral cats, feral pigs and feral wildlife poachers.

With the exception of its avifauna, wildlife composition on RRNS has received little attention. Up to 150 species of birds have been recorded, including the Puerto Rico Emerald, bananaquit, pin-tailed whydah, glossy ibis, mangrove cuckoo, and the short-eared owl. Exotic mammals (e.g. mongoose, rats, mice) are common.

Terrestrial herptiles on Vieques number about 20 species. This includes a subspecies of a mildly venomous snake, *Alsophis portoricensis*. This snake has been recorded twice from Cayo Conejo, site of the brown pelican breeding colony. Herps commonly observed include the marine toad, geckos, ground lizards and anoles.



Boidae taken from the Vieques Naval Reservation in November. Feliciano. VFS-AN-85-04

In November, land crabbers killed (one of several that were supposedly seen) a species of Boidae on the eastern end of the VNR. Boids have not been previously recorded on Vieques, and it was originally thought that this finding might be the Federally endangered Puerto Rican boa, and thus be a range extension for the species. However, after the initial examination Mgr. Weitzel tentatively identified the 2.82 m (9.4 ft) long (snout to tip of tail) specimen as a boa constrictor (*Constrictor constrictor*). It is possible that the snake(s) arrived on one of the Central/South American military ships that utilize the Vieques area for joint maneuvers, or it may have been a former household pet. The crabbers maintain that two additional large snakes were also in the vicinity at the same time. If this is the case, the snakes could be reproducing on Vieques. With the exception of the boa constrictor which has adapted to fairly arid environments, the lack of perennial freshwater and the paucity of terrestrial vertebrates would be limiting factors for most boids. A live trapping program might be in order to determine the status of this animal.

The herpetofauna of RRNS has not been formally studied. However, observations of *Alsophis* sp., *Pseudemys* sp. and various unidentified anoles at RRNS have been made by Mgr. Weitzel.

## 2. Endangered and/or Threatened Species

The federally listed species considered to be breeding residents at RRNS, VNR and/or within adjacent federally controlled waters are noted in the table shown below. Seasonally occurring migrant species include the peregrine falcon (VNR), humpback whales and unidentified cetaceans.

### Endangered And Threatened Species Considered To Be Breeding Residents at RRNS, VNR And/or Within Adjacent Waters.

<u>Species</u>	<u>RRNS</u>	<u>VNR</u>	<u>Status</u>
loggerhead sea turtle	PO <sup>1</sup>	OC	T
green sea turtle	OC	OC	T
hawksbill sea turtle	OC	OC	E
leatherback sea turtle	PO	OC	E
West Indian manatee	OC	OC	E
West Indian brown pelican	FL	OC	E
yellow-shouldered blackbird	OC	AB	E

<sup>1</sup> PO = probable occurrence, OC = occurrence, FL = feeding and loafing only, AB = absence, T = threatened, E = endangered

While the green, hawksbill and leatherback sea turtles nest on Vieques, there is a significant lack of good data regarding these species. Selected beaches are checked by the Station Manager on a routine basis for marine turtle activity. When military helicopter service can be obtained, aerial surveys are conducted to record turtle and manatee distribution in the areas near VNR and RRNS. To this date, RRNS beaches have not been formally inspected for turtle nesting activity, although the Station Manager plans to initiate such a program in 1986.

Roosevelt Roads NS supports a population of the endangered yellow-shouldered blackbird. Based upon 1985 estimates, the minimal population estimate for the species may be 25 individuals, however manpower constraints precluded the completion of a reliable census.

A West Indian brown pelican colony is located on Cayo Conejo, 400 m (1320 ft) off the southeastern coast of Vieques. The Station Manager visits the Cay on a routine basis to check for signs of human disturbance, and to record basic population data. It appears that the cay is used for nesting only, and that primary feeding and loafing areas are located off the northern coast of Vieques, Culebra Island and the Fajardo area on the main island of Puerto Rico. Of the three active pelican colonies in the Commonwealth, only Cayo Conejo exhibits year round nesting, and, because of Navy protection, human disturbance to the colony is virtually non-existent. In past years over 100 active nests have been recorded over a 12 month period. Since the current Station Manager started duty in Sept. 1984, less than 20 nests have been observed at one time. This low level of nesting activity probably reflects a natural depression in the colony's breeding cycle. Since 1984 basic Cayo Conejo population data have been forwarded to the Colonial Bird Register at Cornell in New York. This information represented the first Puerto Rico contribution to the Register.

### 3. Waterfowl

Species commonly recorded on Vieques include the white-cheeked pintail, blue-winged teal (migrant), common moorhen, purple gallinule and the Caribbean Coot. Other confirmed sightings include gadwall, West Indian whistling duck, and the red-breasted merganser.

Both RRNS and VNR, along with the nearby Culebra NWR, offer some of the best remaining white-cheeked pintail habitat in the Commonwealth. It is estimated that up to 350 birds, the largest white-cheeked pintail concentration in PR and the US VI, shift between Culebra, Vieques and RRNS.

#### 4. Marsh and Water Birds

Species of waterbirds noted frequently on Vieques and Roosevelt Roads include: great blue heron, little blue heron, tricolored heron, cattle egret, snowy egret, and yellow-crowned night-heron. Clapper rails are commonly heard in the Los Machos mangrove forest at RRNS. On Vieques, some of the herons noted have rookeries in the mangrove systems around Laguna Playa Grande, Laguna Kiani, and Bahia Tapon. The nesting status of these species within RRNS is unknown.

The Station Manager observed a greater flamingo in November 1984. This observation occurred at Punta Arenas, Vieques and was the first documented sighting of a flamingo in the Commonwealth of Puerto Rico since November 24, 1940 when one was shot by a hunter on the island of Vieques.

#### 5. Shorebirds, Gulls, Terns and Allied Species

Numerous shorebirds, mainly migrants, have been recorded at both VNR and RRNS. Prominent species include: black-necked stilt, greater and lesser yellowlegs, semi-palmated sandpiper, willet, short-billed dowitcher, killdeer, black-bellied plover, semi-palmated plover and ruddy turnstone. Knowledge relative to the nesting status of shorebird species on the Navy properties is unknown.

Magnificent frigatebird, bridled and royal terns, and laughing gulls have been noted in both areas. Mgr. Weitzel observed flocks of up to 50± laughing gulls feeding within RRNS Los Machos mangrove forest in July.

#### 6. Raptors

The red-tailed hawk and the American kestrel are frequently sighted, especially on the eastern half of Vieques, where the habitat is dominated by thornscrub. Both species nest on Vieques. Short-eared owls can be seen during the early evening hours, particularly on the eastern part of Vieques. Seasonal visitors include osprey, merlin and peregrine falcons.

Red-tailed hawks and American kestrels also appear to be fairly common at RRNS. Osprey and merlins have been recorded at RRNS.

## 7. Marine Mammals

Migrating whales (humpbacks and unidentified species) are usually recorded during February and March off the eastern tip of Vieques Island. Bottlenose dolphins are frequently noted in the Vieques Passage.

The coastal areas of Vieques and RRNS support an estimated 30-40% of the Commonwealth population (100± animals) of the West Indian manatee. The extensive seagrass beds (*Thalassia* sp., *Syringodium* sp. associations) in these areas provide critical feeding, loafing, breeding and calving habitat for manatees.

## 8. Marking and Banding

In 1985, yellow-shouldered blackbird recovery project activities included banding shiny cowbirds and incidentally captured blackbirds. Trapping activities were conducted using large walk-in traps constructed by the Navy.



Attaching transmitter to shiny cowbird during radio telemetry phase of yellow-shouldered blackbird recovery project. Weitzel. VFS-AN-85-05

## H. PUBLIC USE

### 1. General

The Navy discourages public use activities within the VNR. Recreational pursuits are basically limited to swimming, snorkeling, and fishing (sport and artisanal).

Recreational diversions within RRNS include sport fishing, especially hook and line angling off the piers in Ensenada Honda, and numerous water sports (e.g. windsurfing). Various beaches within the area have been set aside specifically for recreational use. The Navy is scheduling completion of a RRNS Outdoor Recreation Plan in FY 87. Under consideration is establishment of an off-road vehicle zone.

To accommodate local requests for Puerto Rico hunting and fishing regulations and information, relevant brochures are maintained at the Field Station Office.

## 2. Other Interpretive Programs

The Station Manager presented informal interpretive discussion on a regular basis to the construction battalion detachments (Sea Bees) assigned to Vieques. Subjects included mangrove ecology, fishery resources (e.g. spiny lobster locations), marine turtle nesting activity, and endangered species in general.

Manager Weitzel was the guest speaker at the 1985 annual meeting of the Conservation and Historical Trust of Vieques in March. Thirty-three members of the Trust were present to hear Mgr. Weitzel's presentation on Navy conservation measures and mangrove ecology.

In June, the Station Manager arranged for Armed Forces Caribbean Network (AFCN) coverage of the yellow-shouldered blackbird recovery project.

Manager Weitzel was interviewed by AFCN, in July, on aspects of marine turtle biology and management.

At the request of the Vieques Sea Bee Detachment Chief in August, Station Manager Weitzel submitted an interpretive memo on *Aisophis* (a local genus of mildly venomous snake) for inclusion into the Vieques Sea Bee orientation manual.

In October, the Station Manager received a tour of the FWS's Puerto Rican parrot research project facilities located at the Caribbean National Forest.

The Puerto Rico Environmental Quality Board requested assistance, from Manager Weitzel in October, in establishing an ecology club at Ceiba High School. The Station Manager agreed to become the club's academic advisor. This will be the first of such clubs scheduled throughout Puerto Rico.

Manager Weitzel delivered a slide-talk on marine turtle biology and management to a total of 109 (six separate classes) seventh and eight grade biology students at Roosevelt Roads High School (RRNS) in October. Stuffed turtles, shells, jewelry, still photographs and preserved hatchlings were also exhibited.

In November, the Station Manager loaned various marine turtle shells, whole mounts and preserved hatchlings to the RRNS on a long term basis.

The film "Manatees in Peril" was shown in November, by Mgr. Weitzel, to three seventh and eighth grade biology classes (51 students) at RRNS. School personnel ran the film an additional ten showing, which included 251 students.

### 3. Hunting

Hunting is prohibited on Navy property and this restriction is adamantly enforced within RRNS and usually so on the VNR. Due to lax military enforcement, hunting, though infrequent, is a problem within portions of the VNR.

In September, due to political pressure (and in the absence of a formal Station regulation prohibiting such activity on the Naval Reservation), the Navy, in a last minute decision, allowed hunting within the eastern half of the VNR during the opening weekend of the dove and pigeon season. The situation, monitored by PR DNR law enforcement personnel, was a fiasco, with numerous Commonwealth and Federal violations noted. By using information supplied by the Project Leader, and by consulting appropriate general Dept. of the Navy regulations, Station Manager Weitzel was able to convince the Navy that by opening hunting, they had violated numerous internal restrictions. The Navy again closed hunting on the VNR. In order to avoid a repeat of the situation, the RRNS Commanding Officer signed a formal Naval Station regulation, in November, that will ban all hunting activities on the VNR.

### 4. Fishing

In December, Manager Weitzel provided comments to the Navy regarding a proposal from the Smithsonian Institution to establish a Caribbean king crab mariculture project in Vieques Ensenada Honda. This crab species is endemic to the area.

### 5. Trapping

The extensive mangrove systems on Navy property support large numbers of the juey (land crab, *Cardisoma guanhumi*). This crab is a highly prized animal in Puerto Rico, and land crabbing for the juey, though an illegal activity on Navy property, is undertaken with great vigor by civilians, both within the VNR and to a lesser degree in the RRNS. On RRNS, crab traps are routinely destroyed by military security personnel. It is not uncommon for crabbers to leave notes threatening to kill these security people, and, in fact, security personnel have been physically attacked by land crabbers.

## 6. Wildlife Observation

On the VNR birding, especially around the Laguna Kiani complex, is enjoyed by some; however, for security reasons, the Navy prohibits public access to many of the avian rich areas, such as Monte Pirata and Laguna Playa Grande. In February, Manager Weitzel issued a use permit to a small group of stateside birding enthusiasts to enter the western end of the VNR.

Within RRNS, birding is pursued by a few military personnel and dependents. In addition, these same individuals will sometimes report manatee and marine turtle observations to the Station Manager.

In June, Manager Weitzel escorted 50 members of the Puerto Rico Natural History Society to the Roosevelt Road's Cape Hart sewage treatment plant effluent zone to view West Indian manatees. Manatees congregate around the two outfall pipes located approximately 50 m (165 ft) and 150 m (494 ft) offshore. On this tour Natural History Society members spent about one hour watching and filming at least four manatees. The event was covered by the Armed Forces Caribbean Network and the Station Manager was interviewed about manatee biology and management. The visitors also received a briefing on the yellow-shouldered blackbird recovery project from Dr. Jon Heisterberg, FWS Kentucky Field Station.

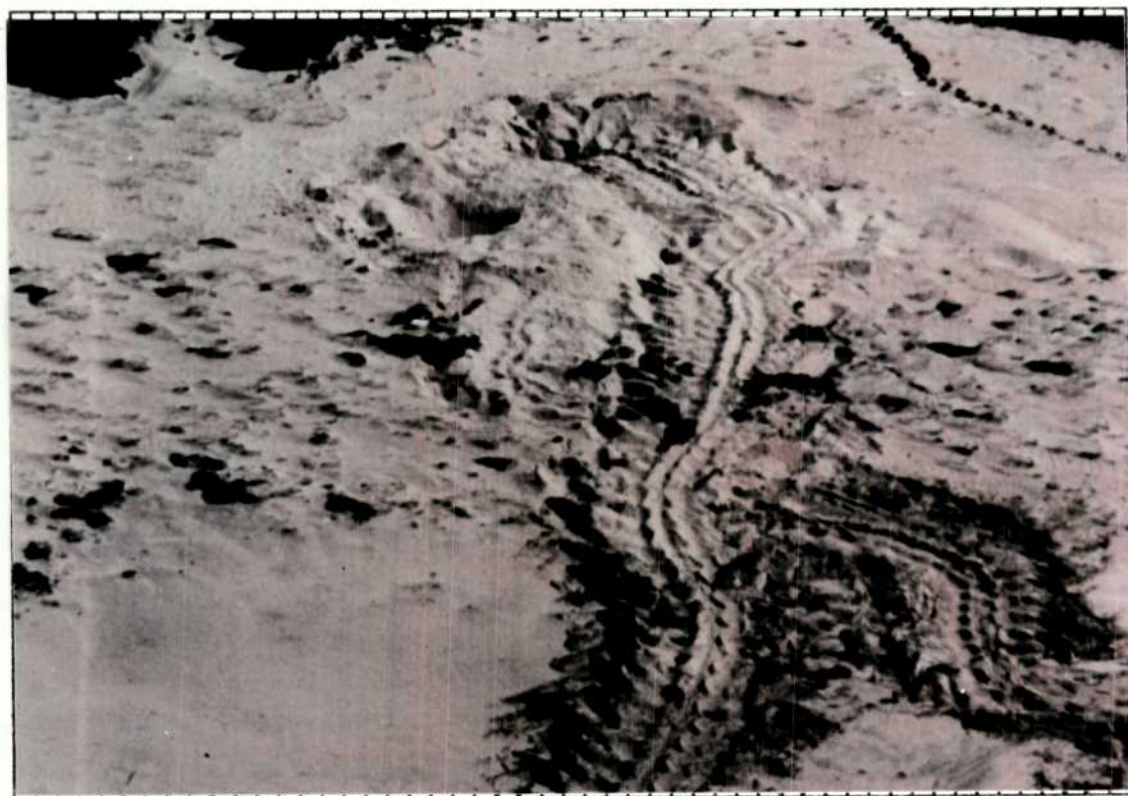
## 7. Law Enforcement

The Station Manager monitored adherence of Federal and applicable Commonwealth natural resources laws within the military and private sectors on Vieques and RRNS. Frequent contact was maintained with Puerto Rico DNR law enforcement personnel. Violations of federal wildlife laws were reported to the Project Leader and to the Senior Resident Agent.

Except for Navy Security's war on land crabbers, wildlife law enforcement problems at RRNS are not significant, however on Vieques this is not the case. Enforcement problems on Vieques (including the Naval Reservation) are primarily related to: sea turtle poaching, including the sale of eggs (\$2.00 ea) and shell jewelry; unauthorized beach and freshwater sand extraction (Commonwealth and Navy violation); land crabbing and harvesting restricted species of trees (Navy violations); and illegal bird hunting.

Within the VNR, Mgr. Weitzel recorded several violations of the Endangered Species Act during 1985. These included: a) The killing of a leatherback sea

turtle in April. The turtle was found secured to a large beach rock on the NE tip of Vieques. The Station Manager's attempt to maserrate the turtle's head in water (to retain the skull for educational purposes) was unsuccessful; the skull, as is typical for the leatherback, separated into numerous small, unsalvageable pieces. b) During an aerial survey in April, along the northeast coast of the VNR, disturbance was noted at the site of one leatherback nest and an additional leatherback or green turtle nest. c) During the July aerial survey along the southeast coast of the VNR, disturbance was observed at the site of one leatherback nest and apparent molestation was recorded at another leatherback nest.



Leatherback crawl recorded on the Vieques Naval Reservation's southern coast in July. Nest has been excavated by egg poachers. Weitzel.  
VFS-AN-85-07

In August, partly as a result of these infractions, local FWS personnel (Endangered Species and Refuges) met with key Navy representatives at RRNS to relay FWS concerns over the paucity of law enforcement within the Naval Reservation. Related natural resource problems and possible solutions or mitigative actions were discussed.

## I. EQUIPMENT AND FACILITIES

The Field Station includes a primary office located at RRNS and a secondary installation at the VNR. The Vieques office is used for storage and is maintained for extended field visits. The Navy handles all maintenance for both the Roosevelt Roads and Vieques offices.

FWS owned equipment includes a 1982 CJ-5 Jeep, office furniture for both Vieques and Roosevelt Roads, and a Nikon camera. The Navy provides most general office supplies, including an IBM typewriter for each location.

The Station Manager made infrequent visits to the Defense Reutilization and Marketing Office to obtain assorted supplies (e.g. a safe, office furnishings, etc.) for use at both the Field Station and the other FWS offices in the Caribbean.

Early in the year the Navy accomplished a major structural renovation of the Vieques office, and this project included replacing walls and a large part of the ceiling.

In August, the Navy refurbished the top of the Field Station jeep. The jeep top was in a highly dilapidated state due to excessive rust.

## J. OTHER ITEMS

### 1. Items of Interest

In December, Manager Weitzel met with members of the Florida based Treasure Salvors, Inc., including company President Mel Fisher (of Atocha fame). Treasure Salvors, with an initial Commonwealth endorsement, are on Vieques for an indefinite period to search for offshore colonial era shipwrecks. Four wrecks have currently been located, and Salvors wishes access to Navy archeological sites and file reports in order to compare land based and offshore cultural data. The Station Manager is acting as Navy liaison in this matter.

### 2. Credits

This report was prepared by Station Manager Marc Weitzel, edited by Sean Furniss and Marc Weitzel, and produced with the assistance of the Apple Macintosh.

### K. FEEDBACK

The Fish and Wildlife Service personnel assigned to VNR/RRNS have worked diligently during recent years to promote and guarantee the sound management of all natural resources found on RRNS and VNR, and they have made commendable strides in this direction. Paramount concerns do exist, however, and two of these, overgrazing and wildlife law violations at VNR, must be addressed before we can maintain that the resource management situation is "under control".

Trespass grazing and range abuse are probably the factors most adversely impacting the natural resource base of VNR. The Navy's forthcoming land use plan will outline a cattle-range management scheme for the VNR, and this, at least, is an indication of the Navy's commitment to approach the problem. Implementing the plan will be a Navy responsibility, and will involve effecting some politically unpopular decisions. With a general cut in the Naval Station's budget anticipated, we can only hope that the possible lack of funding will not be used as an excuse to back off from this expressed interest to resolve the grazing problem.

Wildlife law violations within the VNR, particularly the poaching of sea turtles (including egging), should be of prime concern to the Navy. As federal landowners of a "restricted entry" area (i.e. VNR), the Navy should be held accountable for documented infractions of the Endangered Species Act. This may at least force the Navy to make a serious effort to minimize poaching. Efforts to protect sea turtles (e.g. replacing the civilian guard force with military security personnel, night patrols by military security, especially during leatherback nesting season, and actually enforcing the "restricted entry" rule) can not be implemented without the risk of aggravating the already sensitive anti-Navy atmosphere that is present on the island of Vieques, however, these measures could help to reduce the killing of nesting marine turtles within the area. Traditionally, the Navy has avoided the necessity of choosing between protection of its exploited sea turtle resources, and further alienation of the Vieques civilian population. Enforcing certain provision of the Endangered Species Act may assist the Navy in making this choice.