J. N. "DING" DARLING
NATIONAL WILDLIFE REFUGE
Sanibel, Florida

FLORIDA GULF NATIONAL WILDLIFE REFUGES

TAMPA BAY NATIONAL WILDLIFE REFUGES

ANNUAL NARRATIVE REPORT
Calendar Year 1979

NATIONAL WILDLIFE REFUGE SYSTEM
Fish and Wildlife Service
U.S. DEPARTMENT OF THE INTERIOR

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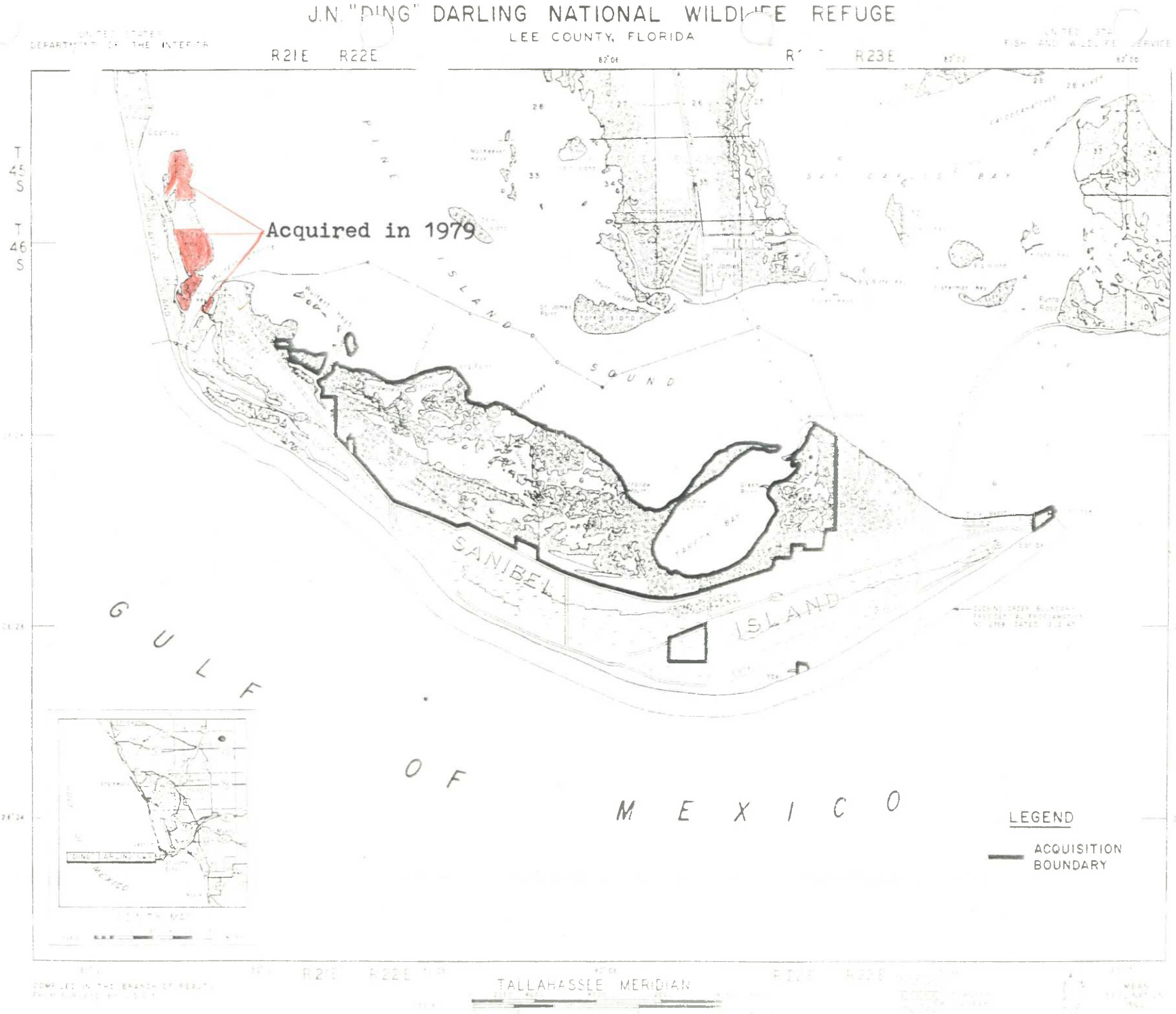

J. N. "DING" DARLING NATIONAL WILDLIFE REFUGE

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I. GENERAL

A. Introduction

The J. N. "Ding" Darling National Wildlife Refuge is located on Sanibel Island, a 12 mile long crescent-shaped barrier island on Florida's lower southwest coast. Situated at the mouth of the Caloosahatchee River, Sanibel is about 20 miles from Fort Myers and connected to the mainland by a three mile long toll causeway.

First surveyed for development in the 1830's, Sanibel has changed dramatically because of man's impacts since the 4,860 acre refuge was established in 1945. To curtail overdevelopment the islanders overwhelmingly voted to incorporate in 1974. The refuge is situated within the corporate limits of the City of Sanibel.

About 3,262 acres of the refuge consist of tidal mangrove forest, 1,377 acres are tidal or impounded sounds and bays, 100 acres in rain-dependent fresh water marshes, 85 acres of noncommercial West Indian forests, 26 acres of sand areas, and 10 acres of native grasslands.

B. Climate and Habitat Conditions

Temperatures were normal for the year and we were frost-free. Summer highs attained a peak of 96° F - average summer high daily temperature is about 93° F.

Precipitation totaled 42.5 inches for our rain gage located at the Lighthouse and 40.5 for the device situated inside the Darling Unit. There are often surprising discrepancies in total rainfall between the two sites. Some severe summer squalls that strike the eastern tip of Sanibel are "petered-out" before they reach the Darling Unit which is six miles to the west. Other line squalls with their customary high winds and torrential rain may reach one section of the island and not the other.

Hurricane "David" gave us a scare in early September but veered north along Florida's east coast. We still had winds gusting to 35 knots and above average high tides. Hurricane "Frederic" moved up the Gulf of Mexico and hit Mobile, Alabama causing considerable property damage. We experienced high storm tides from the storm but no damage. Other named storms developed but never turned into anything serious.

C. Land Acquisition

1. Fee Title

About 210 acres of Buck Key which is near Captiva Island were added to the "Ding" Darling Refuge this year. The Buck Key acreage is located on two tracts of the approximately 280 acre key. It was transferred to us from The Nature Conservancy which received it as a gift from Mrs. Elena Benedict. Our Branch of Realty estimates the value of this gift as being between $800,000 and one million dollars.

Runyan Key was purchased for $45,000. This seven acre island is located between Buck Key and Sanibel Island.

2. Easements

Nothing to report.

3. Other

Nothing to report.

D. System Status

1. Objectives

We are still in a transition process insofar as objectives and outputs are concerned. We will be abandoning the Point Ybel Unit in 1980 or 1981 which will eliminate a large portion of swimming, picnicking, shelling and some of the fishing use from our area of administration. The Visitor Information Center, expected to be completed in late 1980 or 1981, will result in a huge increase in interpretive uses. The steady addition of refuge lands is resulting in increased wildlife outputs attributed to the complex and intensified public use of all types. The areas acquired on Buck Key in November already have a system of foot trails and canal access channels on it that receive light public use. As this area becomes known as a refuge unit, we can expect it to become one of the major public use areas in the complex.

This year we received permission to report the Caloosahatchee, Matlacha Pass, Pine Island and Island Bay Refuges under one sub-complex (Gulf Coast Refuges) for output reporting; Egmont Key, Pinellas and Passage Key Refuges under another sub-complex (Tampa Bay) and the units on or adjacent to Sanibel Island on another ("Ding Darling). Although this involves more paperwork it will result in a more accurate recording of output data for the area. Formally all data was lumped into one reporting unit and it was impossible to tell from the output forms where the output occurred.

2. Funding

Because of infusions from YACC and pollution control funds, and some reasonable O & M funding we have been adequately funded for the past two years. However, a series of circumstances happening or coming to a head in 1979 has put us in a position of being underfunded and understaffed.

a. The YACC program was taken away; first through loss of our last enrollee who finished his one year assignment, then the elimination of the group leader's position. For all practical purposes this was the same as losing two laborer positions. It appears improbable we will have another YACC program due to local recruitment problems stemming from a high employment rate and restrictions to enrollees concerning Government furnished transportation.

b. Due to numerous environmental, administrative and enforcement problems occurring at the Tampa Bay Refuges, we had a critical need for a full time position there. When Assistant Manager Musaus transferred, his replacement, Bill Black, was assigned to Tampa Bay - 135 miles north of Sanibel. This solved many of our problems there but since our station ceiling remained unchanged, left the "Ding" Darling area short one staff member.

c. Biological Technician LeBuff was assigned as Field Response Coordinator for oil spills and other pollution emergencies in the Southwest Florida coastal area in 1978. In 1979 the

responsibility involved the writing of a plan, making many contacts, responding to minor spills, attending workshops and other time consuming activities. Because of the extremely high potential for pollution incidents here, we expect this station will continue to be deeply involved in duties associated with preparing for and responding to oil spills.

d. The station was assigned more responsibilities for manatee patrol off the refuge.

e. With the placing of loggerhead sea turtles on the threatened list there has been an increased necessity for refuge personnel, especially LeBuff, to attend meetings, write management recommendations, and give talks covering these and other sea turtle species.

f. Although only 447 new acres were added to the complex this year, this amounts to approximately one million dollars worth of new lands scattered from 6 to 25 boat miles away from the main refuge in a very heavy public use area. At least one million dollars worth of additional lands will be acquired in 1980.

g. The water control structure project started in 1979 will allow us to do some much needed water management, but will require considerable time in a program previously requiring little time.

h. We have become more or less committed to continuing our exotic plant control program to avoid losing ground gained during the past two years and to keep momentum going on this long neglected management need.

i. We have added planned burning to our management program.

Not new in 1979 but continuing, is the constant increase in people on and near the refuges. We are located in one of the fastest growing areas of the United States and this growth is expected to keep up. Several million people live within 100 miles of the complex. Hundreds of thousands of tourists and "snowbirds" add to the resident population during the winter months.

Fiscal Year	O & M Funds MB	Endangered Species or Mammals	I & R	Rehab & Const BLHP	YCC	YACC	Manpower PFT	Manpower PPT
1976	$ 42,400*	2,500* (ES)	43,300*	2,500	24,700	-0-	3	1
1977	$ 35,000	-0-	47,000	19,000	23,172	-0-	3	1
1978	$ 53,400	-0-	82,600	420,500	25,698	10,500**	6	2
1979	$ 64,000	2,000 (M)	89,000	726,000	20,000	17,000	6	2
1980	$ 80,000	5,000 (ES)	88,000	650,000	14,500	?	6	1

*Includes funding for transition quarter.

**Capitol equipment acquired with YACC funds: Boat trailer and brush chipper.

FOOTNOTE:

Additional FY '79 funding amounted to $2,177 from activities 1911 and 1921 for Field Response Coordinator (Pollution Control) duties. Approximately $1,600 was paid by other stations for travel by staff for L. E. Training, FRC duties, participation in a Hunt Program, etc.

Also, not new, but an increasingly important funding factor due to the acceleration of transportation costs is that, although the total refuge complex acreage is less than 6,000 acres, we are, for all practical purposes, one refuge spread out over 135 miles of coastline. To compound our logistics problems most public use takes place at opposite ends of the 135 mile refuge.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

Two BLHP projects were contracted in Fiscal Year 1979. Parkland Construction Company, located in Orlando, Florida submitted the winning bid ($418,000) for the Maintenance Center. Zep Construction Company of Fort Myers is constructing seven water control structures on the wildlife drive area for $308,000.

The Maintenance Center, expected to be completed by the summer of 1980, will consist of an equipment storage building, a service-storage building, a paint and oil storage building, gas storage facilities, etc. The shop facilities will be an immense improvement over our cramped little shop space presently in use. We have not had covered storage space for vehicles and equipment before. In this salt air environment, rust is a continuous problem and the new storage area should result in reduced maintenance costs.

In cooperation with the Sanibel Vegetation Committee, the site to be cleared for the Maintenance Center was opened to the public to take whatever plants they desired. About 80 persons took a variety of shrubs and trees. Gumbo limbos, cabbage palm, sea grape and wild coffee were the most popular species. (See photograph on following page.)

The seven water control structures, expected to be ready by July 1980, will finally give us the means to control water levels and salinities in our 800 acres of brackish water impoundments. For the 15 years since the Lee County Mosquito District constructed the dike, water levels and salinities have been controlled only by the weather and an occasional breeching of the dike to let surplus water out.

Many plants were hauled away from the Maintenance Center site, for transplanting to homesites on Sanibel.

About 6,000 yards of fill material for the Maintenance Center site was taken from the Bailey Tract. The excavation resulted in adding more than an acre of pond to the existing Mangrove Head Pond.

Initial clearing of Maintenance Center site.

A 2.3 mile bicycle path, built by the City of Sanibel between Tarpon Bay Road and the entrance to the wildlife drive, is located on refuge property adjacent to the Sanibel-Captiva Road. In the planning stage the city wanted to place the path among the refuge trees winding 50-200 feet from the road. We wanted it on the other side of the road opposite the refuge. The compromise resulted in the path being on our side. The five foot wide path is located from 22 to 35 feet from the edge of the road. (See photographs on the following page.)

B. Major Equipment

A BLHP funded D-3 tractor with low-boy trailer and a backhoe, a YACC funded brush chipper and an O & M funded Ford 6600 tractor with an offset rotary hydro mower, were received this year. Except for some of the attachments for the tractors, these were purchased with 1978 funds.

In the interest of fuel economy one compact pickup (Ford), and a 200 cc motorcycle were purchased for use in refuge administration. The former gets about 29 miles to the gallon; the latter about 80. Because of the many months of warm weather and a 35 mph speed limit on Sanibel, a small motorcycle is very suitable for many uses in refuge administration here. However, we have found that not everyone can learn to operate a motorcycle safely so we have postponed plans for purchasing another one.

C. Maintenance

The waste water treatment plant at Tarpon Bay continued to give us headaches in 1979. The system had to be continually watched. One major problem was the grease load the facility received. We attributed this to the absence of a greasetrap at the Tarpon Bay Marina concession where they have commercial cooking facilities. The lift station had to be drawn down and pressure washed by refuge personnel on two occasions to help reduce the problem. Finally, after much prodding by us, the concessionaire installed a trap.

The 5,000 gallon aeration tank had to be pumped out because of suspended solids content. This was handled by a local septic tank maintenance company.

Sanibel-Captiva Road looking east from near Rabbit Road. Before and after bike path construction.

The high suspended solid levels contaminated the dousing and chlorine contact tanks and choked the filter. This resulted in problems that required constant attention. We installed a refuge-fabricated air lift system in an attempt to increase exchange of solids from the settling tank back to the aeration end.

The gas chlorine system was discarded and replaced with liquid chlorine equipment. We hope this will reduce costly maintenance expenses that we experienced because of the inadequacies inherent with the original chlorine injection setup.

Mowing was accomplished on trails in the Bailey Tract and the shoulders of the Darling Tract's wildlife drive. Grassed areas at headquarters, refuge area entrances and fuel and equipment storage sites were mowed as required.

Heavy rains occasionally caused washouts on the wildlife drive/dike that made the roadway hazardous for public use. We hauled many loads of fill from the Bailey Tract to improve the situation. Grading of the drive was attempted several times with refuge equipment, but what we have available makes this activity almost a waste of time. The Lee County Department of Transportation was kind enough to send a grader to the refuge and the drive prior to the Christmas tourist crush. This grading was done gratis.

A long-term maintenance program aimed at rehabilitation of the Bailey Tract was initiated in 1979. When the new D-3 bulldozer arrived it immediately went to work taking out vast growths of Schinus sp. The southwest quarter of the tract was cleared and some brush piles were burned as follow-up.

The D-3 was also used in a prescribed burn area of the refuge to clear a fire lane. Unusual wet weather prohibited completion of this project before the end of the year.

Refuge boundary signs were replaced as required and new signs and posts were erected as necessary with our portable jet pump.

Regular preventive and service maintenance was accomplished on refuge-owned vehicles, boats and heavy equipment.

We assisted in locating core sampling sites for the new maintenance and visitor information centers and setting bench marks and locations for the water control structures -- all projects in the Darling Tract.

A new parking barricade was installed at the Bailey Tract parking lot.

The Gasparilla Trail was trimmed to accommodate public use.

Minor plumbing and electrical repairs were made to residences, office and shop.

D. Wildfire

While clearing the first fire lane for our prescribed burning program on "Ding" Darling Refuge, the crew discovered a group of burned cabbage palms that had probably been ignited by a lightning strike. About a half-dozen trees caught fire but conditions were not right and the fire went out by itself.

III. HABITAT MANAGEMENT

A. Croplands

Not applicable.

B. Grasslands

Not applicable.

C. Wetlands

Above normal rainfall during the year kept the 800 acres of water included in our two impoundments at normal levels. Salinities, although gradually increasing since the flushing out action of the 1977 season, are still well below sea strength.

D. Forestlands

We continued our Brazilian pepper (Schinus sp.) and Australian pine (Casuarina sp.) control programs using various methods.

About 10 acres of Schinus were cleared on the Bailey Tract north of the Airplane Canal through use of our

D-3 tractor. Although some follow-up work with chemicals will be required to kill regrowth, about 90 percent control was achieved.

All old growth Schinus in the vicinity of Gasparilla Trail was cut down and chipped. This was a labor intensive effort requiring much hard work by refuge, YACC and YCC crews. It is not a recommended Schinus control method except for relatively small high public use areas where aesthetic value is an important consideration. Regrowth was treated with Banvel-720 but many root systems are still healthy. It will take years of unrelenting treatment before the majority of the root systems are controlled in the vicinity of the trail.

Ten acres of Schinus and Casuarina in a planned burn unit along the Sanibel-Captiva Road were sprayed with Banvel-720 from a Lee County Mosquito Control District helicopter. We hope to have enough dead vegetation in the unit to support a burn in early 1980. Although fire will not kill root systems in pepper, it can kill most of the plant making follow-up chemical treatment easier. Casuarina can be controlled by fire.

Other units treated this year were most of the areas accessible by pickup truck along the Sanibel-Captiva Road, the south dike, the Mangrove Head Pond area of the Bailey Tract and the dike along the power right-of-ways in the Darling Unit. Control was about 50 percent. These areas were treated with a 99 part water - one part Banvel-720 mixture applied with a mechanical sprayer at about 150 pounds pressure.

Schinus in the wilderness area east of the Tarpon Bay Road was basal treated with a nine part water - one part Banvel-720 mixture applied with hand sprayers. This resulted in less than a five percent mortality. We plan to try a basal application again in 1980 but using diesel instead of water as a mix.

A few Schinus plants in areas inaccessible to vehicles were foliar treated with a Banvel-720 mixture applied with back pack mist blowers. For some reason, even though the mixture was the same as used with other methods of application, the kill rate was less than 10 percent.

Considering Schinus has taken over much of the upland areas of Southern Florida in a period of two or three

decades, and the fact it is still spreading, it is very surprising that more research has not been done on its control. According to Jack Ewel, Botany Department, University of Florida, Schinus has the characteristics that make it an almost perfect weed -- it grows rapidly, is a prolific seed producer, its foliage flushes nearly continuously, it coppices vigorously, tolerates a wide range of site conditions, produces relatively large animal dispersed seeds, has large cotyledons which aid seedling survival, and the seedlings are remarkably capable of survival in shade conditions.

The only demonstrated effective method of Schinus control has been to cut it down and build a condominium on its roots.

Casuarina control is much easier than Schinus control. A 90 percent or better kill can be obtained by injection of 2,4-D into the tree trunks. We have about 90 percent of the refuge cleared of this species. Because of its abundance on Sanibel, it will require constant surveillance to keep this exotic from reestablishing itself on refuge lands.

E. Other Habitat

Nothing to report.

F. Wilderness and Special Areas

Eleven Caloosa Indian mounds have been nominated for listing in the National Register of Historic Places. These sites were surveyed in a cultural resources study by Dr. William Kennedy in 1978.

G. Easements for Waterfowl Management

Not applicable.

IV. WILDLIFE

A. Endangered and/or Threatened Species

1. Florida Manatee

Manatees are occasionally observed in the mangrove/tidal areas of the refuge. It is not uncommon for two or three to visit the refuge boat basin during the summer when the animals are widely dispersed.

2. American Alligator

We estimate that our alligator population remains at about 150 individuals although staff members observed more groups of hatchlings than in the recent past. Attrition of young 'gators seems to be relatively high on the refuge because in subsequent observations these groups contained a reduced number of siblings.

Illegal killing of alligators on and off the refuge is still a problem. Gator carcasses that were discovered in 1979 were not skinned but had their tails removed. The tenderloin of the reptile's tail is a delicacy and we must have a few people on Sanibel Island who are aware of this. The State of Florida is permitting alligator tail meat to be served in restaurants but this is supposed to come from legal sources -- nuisance animals that are destroyed by licensed hunters.

3. Eastern Brown Pelican

Brown pelicans use all sections of the refuge although none nest within the refuge boundary. Both immature and adult birds are considered pests at the fishing pier where they beg or try to steal fish from anglers. On occasion the birds become entangled in fishing lines or are hooked and the staff is called upon to assist. In cases where we are unable to provide assistance we call on Care and Rehabilitation of Wildlife (CROW), a Sanibel-Captiva organization, to capture and release or treat the birds.

4. Southern Bald Eagle

Bald eagles were observed on the refuge periodically in 1979. A nest is located just off the refuge on private lands. This nest was active during the year in that the birds were observed at the vicinity of the nest tree. Most eagles that visit the refuge are either migrants or birds originating on Pine Island where there is a small nesting population.

5. Peregrine Falcon

A total of two birds were seen on the refuge in the Fall of 1979. This species is generally present for a few days during periods of migration.

6. Eastern Indigo Snake

We estimate that the refuge population of these large beautiful snakes remained at about 40 adults in 1979. They frequent the higher elevations of the refuge where they are often a cohabitant of gopher tortoise burrows. Specimens were observed at our maintenance center site and in the refuge interior during fire lane development.

7. Loggerhead Turtle

Four loggerhead turtle nests were located on refuge beaches in 1979. Of these, three produced hatchlings with the fourth believed to be the victim of high cutting tides.

Loggerhead nesting on Sanibel Island occurs mostly on the more remote and less developed western section.

8. Other Sea Turtles

A dead juvenile Kemp's ridley turtle washed up on a nonrefuge section of beach. This is only the second case of stranding by this now rare species on Sanibel since accurate sea turtle record keeping for the island was initiated in 1959.

9. Endangered Plants

In 1978 an endangered plant survey was conducted under contract by the University of South Florida with provisions that a report would be provided to the refuge. We received word that none of the nine species which might be on the refuge were found here.

B. Migratory Birds

1. Waterfowl

During 1979 our waterfowl populations peaked in February with an average population of 4,179 birds. This was up considerably over the December 1978 annual peak which totaled 2,580 birds.

Species present during February included coot (1,700), mallard (2), pintail (400), green-winged teal (125), blue-winged teal (225), wigeon (700),

shoveler (60), ring-necked (50), lesser scaup (700), mottled (125), fulvous whistling (2), red-breasted merganser (75), and hooded merganser (15). The mallard and fulvous whistling ducks were unusual species for the refuge as they never occur here with any regularity.

The resident mottled ducks peaked in August with 225 birds. The refuge produced several observed broods in both the Bailey and Darling Tracts. We estimate that 120 mottled ducks were produced on the refuge in 1979.

2. Marsh and Water Birds

Through our rehabilitation activities in the Bailey Tract we had hoped to see reoccurrence of colonial bird nesting in the once productive mangrove head. This mangrove island was a very important rookery up until the late 60's but the moat-like water body which surrounded it overgrew with emergent vegetation. The alligators moved out, the predators moved in, and the birds moved out. Several expert birders on Sanibel at least, give this as the responsible chain of events and we concur. Since the construction operations there have been some loafing and feeding activities by wading species but no indication of nesting.

During 1979, 24 different resident species of marsh and waterbirds were present for a total of 403,170 use days - down over 200,000 use days from 1978. This decline does not reflect true populations for this refuge. Prior to calendar year 1979 our marsh and water bird output reports included population data for this station and our satellite refuges. For 1979 the complex is divided into three output reporting units and each indicates population levels and use days for respective segments of the complex. Henceforth, population figures will be more realistic.

On this refuge the bulk of our marsh and waterbird use is in the shallow impoundments and tidal flats of the Darling Tract. During low inside pool levels or tide stages the areas are literally covered with thousands of birds in this classification. The more abundant species represented are white ibis, great and snowy egrets, Louisiana and little blue herons.

Roseate spoonbills are abundant in late spring and summer. Our population attained an early summer peak of 400 birds. This species is extremely popular to refuge visitors -- the more uninformed of which think they are flamingos.

3. Shorebirds, Gulls, Terns and Allied Species

Like other classes of waterbirds discussed above, the refuge has a large variety of species which fit the present category. They too utilize identical refuge habitat to its maximum use.

Forty-two species of shorebirds, gulls and terns occur on the refuge and were present at least part of 1979. The more abundant species include: laughing and ring-billed gulls, royal and least terns, black skimmer, short-billed dowitcher, dunlin, willet, black-bellied plover, ruddy turnstone, lesser and greater yellowlegs, and least sandpiper.

Black-necked stilts successfully produced young in both the Bailey and Darling Tracts.

We treated two sandy areas in the Bailey and Darling Tracts with Pramitol to prevent vegetative regrowth and disced the 1/4 acre plots in a scheme to provide nesting habitat for least terns. Unfortunately the birds gave the sites little attention.

4. Raptors

Ospreys used available nesting trees and four artificial nesting platforms in the refuge. Mark Westall, President of the Sanibel-Captiva Audubon Society, monitors refuge and off-refuge osprey populations. He provided the following data for refuge lands during the osprey 1978 - 79 breeding season:

Occupied nests	21	Chicks produced	24
Occupied nests destroyed	2	Chicks lost	8
Active nests	19	Percent mortality	33%
Nests with unknown number of eggs	4	Percent of active nests successful	42%
Nests with known number of eggs	15	Young per active nest	.84
Average clutch size	2.73	Young per successful nest	2.00
Eggs destroyed or infertile	17	Chicks fledged	16

TABLE OF OSPREY NESTING - 1978-79

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The popular osprey nest located at Stop Number 8 on the wildlife drive blew down in 1979 and its statistics are included in the table on the preceding page.

An additional artificial nesting platform was erected on the island's main high voltage transmission line which crosses through the refuge. We erected this pole, at no cost to the refuge, in a cooperative venture with the Lee County Electric Cooperative. To compensate for required nest removal from their structures we provided a site for artificial platforms.

A 4 x 4 foot platform with either plywood or chainlink decking is attached to surplus electric poles to entice ospreys. These are extremely effective and often birds are on them within minutes.

Electric power structures have been death-traps for many ospreys, both adult and young. Often after rainfall nest limbs conduct high currents electrocuting birds.

Other raptors commonly observed on the refuge include the red-shouldered hawk, kestrel, and black and turkey vultures. The red-shouldered hawk is distributed throughout the habitat types of the refuge but we observed no nests during 1979. Nonresident species observed included swallow-tailed kite, Cooper's and sharp-shinned hawks and Merlin.

5. Other Migratory Birds

Robins migrate through our area usually twice a year, spring and fall. They are counted into the thousands and gorge themselves on the abundance of Brazilian pepper berries.

Warbler and other migratory passerine populations were down for the year.

C. Mammals and Non-Migratory Birds and Others

1. Game Animals

Nothing to report.

2. Other Mammals

Small mammals occur throughout the refuge. Raccoons are common and the refuge roads and trails each morning are dotted with their tracks and waste. They are seldom seen abroad during daylight; however, occasionally on extreme low tides family groups are observed foraging on the flats.

Armadilloes and opposums are relative newcomers to the refuge - neither were known on Sanibel Island prior to the construction of the Sanibel Causeway. They were seldom observed but both species were frequent road kill victims on the Sanibel-Captiva Road -- the refuge's southern boundary.

Otter were observed frequently on the wildlife drive and impoundments and occasionally in the tidal areas adjacent to the dike/drive.

Otter attract a great deal of attention from visitors. They utilize the island's freshwater interior and the brackish water and often tidal areas of the refuge.

Marsh rabbits were extremely abundant and very tame. It was not uncommon to see visitors standing and taking photographs within six feet of a feeding bunny.

Small mammals on the refuge include: barn rats, cotten rats, Sanibel rice rats, and one or two species of mice. There has never been an attempt to collect and catalogue any of the rodents.

Bottle-nosed porpoise are common in the waters around the refuge and often excite visitors to the headquarters beach. In 1979 a group of pilot whales beached themselves to the north of Sanibel and we had a report of a female and calf attempting to beach about four miles to the west of headquarters off-refuge. We investigated just in case we could help but never sighted them.

3. Resident Birds

Nothing to report.

4. Other Animal Life

A three-foot eastern diamondback rattlesnake was captured as it crossed the road at headquarters. It was later taken to a remote section of the refuge and released. Several adult coral snakes were observed on the Gasparilla Trail by the YCC enrollees and refuge staff. (See photograph on following page.)

Yellow rat snakes, southern ribbon snakes, and mangrove water snakes were observed infrequently along the wildlife drive. Florida water snakes and blacksnakes were seen occasionally in the Bailey Tract.

Gopher tortoise populations identified as small at 51 active burrows in 1978 appeared to be stable. Peninsular cooters, chicken turtles, and Florida softshell turtles were in abundance in the various Bailey Tract pools.

Cuban tree frogs that were introduced to Sanibel Island coincidental with increasing landscape plant introduction from the mainland have virtually wiped out our native green and squirrel tree frogs on the eastern more populated section of the island.

Eastern diamondback rattlesnakes occur in upland areas of the refuge and are believed to be relatively abundant although seldom seen. There are no recorded cases of venonous snakebite on Sanibel Island.

The native populations of Hyla are still heard in the refuge but will probably be eaten or outcompeted by the large antagonistic exotic.

Other common amphibians which are widespread over the refuge include pig and leopard frogs and narrow-mouth and southern toads.

Freshwater fish represented by large-mouth bass and bream, occur in the pools of the Bailey Tract and the nearby "Sanibel River." The Darling Tract impoundments contain many species of landlocked marine species - among these are 2-4 foot tarpon. The tarpon are often hooked by the serious anglers, the more professional of which release their catches after the thrill is gone.

The tidal waters contain great numbers of mullet, a prime commercial species, that are harvested by gill netters. Under an agreement with the State when the mangrove forested section of the refuge

was acquired in a land exchange, the Service agreed not to impede the commercial fishing industry -- that is why we have powerboats and nets in our Wilderness Area.

Sport fish are caught seasonally from the wildlife drive or by boaters in the deeper tidal creeks of the refuge. Snook is the most sought after species with redfish a close second. Speckled trout, mangrove snapper, sheepshead, and the undesirable salt-water or gaff-top catfish are caught with regularity.

Sanibel's reputation is based on two natural features: its birdwatching and shelling. Earlier sections of this report discuss bird populations.

Over 400 species of seashells have been collected in the waters around Sanibel and many of these occur in refuge waters. Large shells like horse conchs, left-handed whelks, king's crown and angel wings have been overcollected by the hundreds by tourists who scavenge the Gulf beaches and accessible mud flats. We prohibit live shelling in the refuge other than the taking of oysters and clams. In 1979 the Sanibel City Council passed a resolution regulating the taking of live shells. Two live specimens of each species is now an acceptable daily limit.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

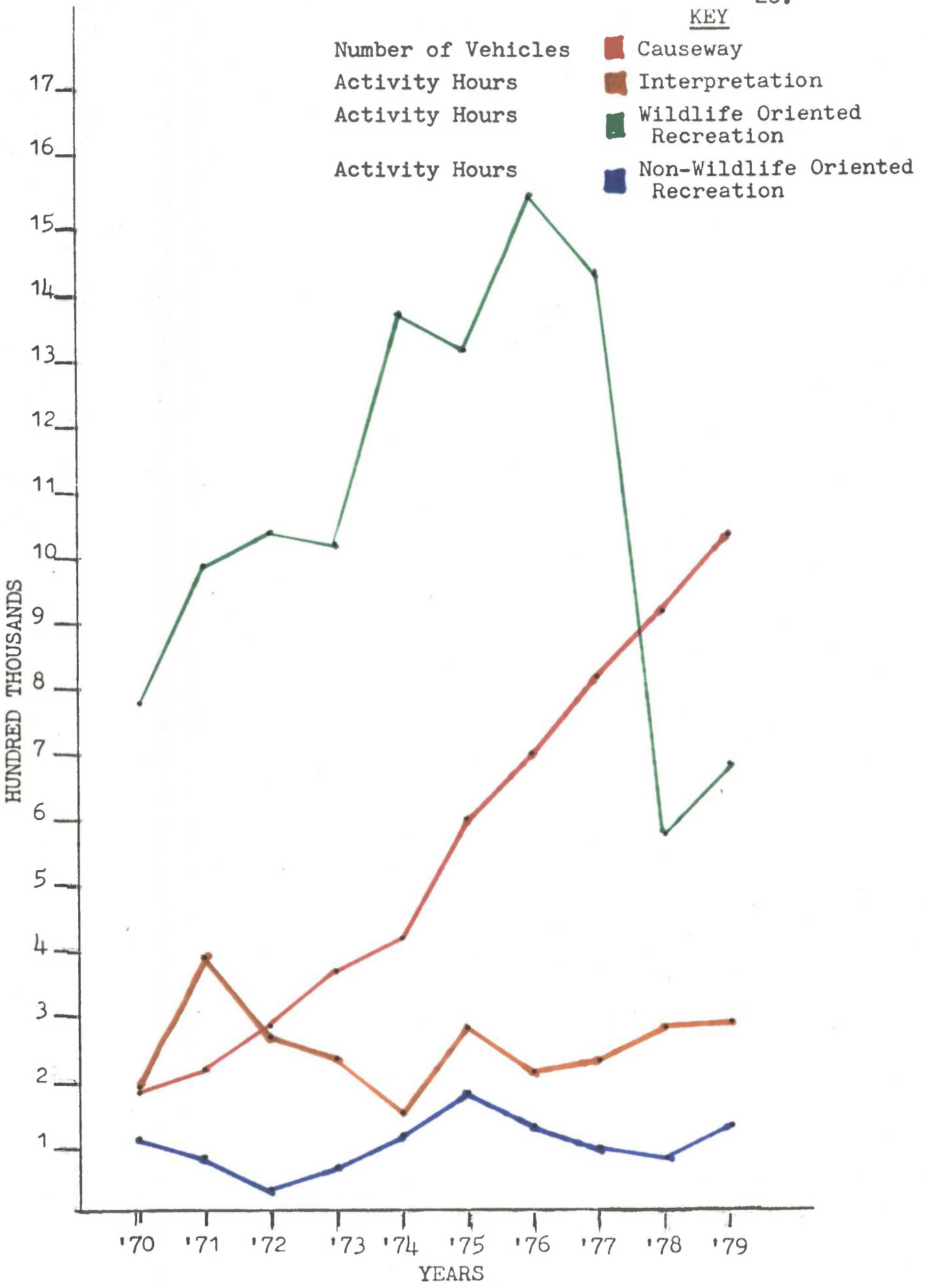
1. On-Refuge

"Ding" Darling continues to be a busy public use refuge. This past year visitation totaled 832,400, an increase of 8% over 1978. Of this, 289,500 visitations were to the self-guided interpretive wildlife drive. April was the peak month when over 112,000 people came to the refuge. Many of these utilized the beach at the Lighthouse for swimming and shelling.

For the past year scheduled tours of the refuge have been given by the refuge staff. These have been given by the refuge staff. These have been moderately successful. Tours of the wildlife drive were given to 361 people and 333 participated in the canoe trail tour. A number of scout troops were also taken through the refuge along with two university groups. These tours consisted of introductory talks to acquaint the visitor with the refuge.

Visitors awaiting the arrival of the roseate spoonbills in late February.

The chart on the following page dramatizes the trend over the past 10 years of public use on the refuge. Even though the number of cars crossing the causeway has steadily increased, the number of people visiting the refuge has more or less leveled off especially in interpretation and non-wildlife recreation. This difference can be attributed to several factors: the number of people working on the island but living on the mainland due to the high cost and unavailability of island housing; as the area has built up the number of day visitors has also increased. One other factor involves the type of visitor to the area, the past five years have seen the island become more of a resort, thus even though island visitation has increased, the ratio of refuge visitors to island visitors has declined. The reason for the dramatic decrease in wildlife oriented recreation as indicated on the chart from 1977 - 78 is the method used for reporting the figures were reevaluated and were found to be highly inflated.


KEY
Number of Vehicles
Causeway
Activity Hours
Interpretation
Activity Hours
Wildlife Oriented Recreation
Activity Hours
Non-Wildlife Oriented Recreation
HUNDRED THOUSANDS
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
'70
'71
'72
'73
'74
'75
'76
'77
'78
'79
YEARS

Some island visitors desire a more intense knowledge of Sanibel and the surrounding area. To fill this niche local guides use refuge lands and surrounding areas for nature and bird tours. Visitors pay $10.00 - $14.00 for this service. This past year over 1,800 people partook of this type of experience. These local guides also provide an excellent public relations device. Through meetings, both formal and informal, with the refuge staff they keep well informed of refuge purposes, goals and ongoing activities. This is an excellent program that benefits the refuge.

Throughout the year we had 5,340 people visit our office at the Lighthouse. These visitors were not only seeking information about the refuge but also about motels, restaurants, the Lighthouse and directions to various places. We also answered a number of unusual questions and requests such as "What time do you feed the roseate spoonbills?" This past year there were a few weddings, a Christmas Eve church service, and one man was granted permission to spread his wife's ashes under the Lighthouse.

Another 1,200 persons made telephone inquiries. This does not include official calls. About 400 letters and cards requesting information of various sorts were answered.

Other happenings at the Lighthouse end of the refuge included both commercial and non-commercial events. A kite day was held last spring. Kite enthusiasts from around the area used the beach for staging various displays, contests and clinics. A local radio station utilized the office as a backdrop for a promotional ad and a custom van business also was granted permission to use our facilities as background for their brochure. Local artists and various art classes set up their easels to paint the Lighthouse and buildings numerous times.

The Lee County School system continued to operate an excellent environmental education program. This past year 782 students and 43 teachers utilized the wildlife drive portion of the refuge with the environmental education staff. Many more used the beach and Lighthouse area on their own for various learning experiences. This program involved minimal contact with refuge staff, thus allowing them to accomplish other tasks.

The installation of new Canoe Trail signs has ended reports of people getting lost.

Refuge interpretation and recreation projects completed or initiated this year include: the interpretive concept plan, interpretive trail signs for the Gasparilla Trail area, and the installation of a new entrance sign and trail markers for the canoe trail. Before the trail markers were erected we had several reports of people getting lost in the mangroves.

2. Off-Refuge

We continued to try to make the public more aware of the refuge and its goals and purposes. Refuge Manager Del Pierce wrote a bi-weekly column for the two local papers touching on such topics as how to observe wildlife and unusual refuge happenings. The CBS "Sunday Morning" program spent two days on the refuge filming various sights for use on a few of its segments regarding wildlife. Manager Pierce and Biological Technician LeBuff were interviewed on a local radio show concerning general refuge information. Various newspaper articles appeared throughout the year in both the

island papers and Fort Myers paper covering topics such as Brazilian pepper control, closing of the wildlife drive, vacating of the Lighthouse living quarters and one referring to Manager Pierce as "Mountain Man."

Presentations were given by the staff to various groups including: The Sanibel-Captiva Audubon Society, Daughters of the American Revolution in Naples, National Wildlife Week program at a local elementary school. Biological Technician LeBuff gave a number of programs regarding the loggerhead sea turtle to various organizations.

The staff continued to participate in local community organizations and affairs. Manager Pierce is an ex-officio member of the Sanibel-Captiva Conservation Foundation Board of Directors, the Care and Rehabilitation of Wildlife; and is a member of the Fort Myers Chapter of Toastmasters International. Biological Technician Charles LeBuff, Jr. is a member of the Sanibel City Council, Project Director of Caretta Research, Inc., the City's Live Shelling Committee, Vegetation Committee and Marine Advisory Committee. Outdoor Recreation Planner Donna Stanek is a member of the Sanibel-Captiva Audubon Society Board of Directors and Service Unit Director of the local Girl Scouts of America.

B. Recreation

1. Wildlife Oriented

Use of the trails becomes more popular even in areas such as the Bailey Tract, where rehabilitation has been going on most of the year. Approximately 148,000 people explored the refuge on foot.

Canoeing is another activity that continued to be popular on the refuge. The marina concession recorded 6,458 people renting canoes and utilizing the self-guided canoe trail which winds through the mangroves and tidal flats west of Tarpon Bay. Fishing and shelling were the most popular activities at the Lighthouse Unit with 29,300 and 158,000 participants respectively.

Birdwatching is the most popular activity on the refuge.

2. Non-Wildlife Oriented

The only two activities that were available in this category were swimming and picnicking, the majority of which occurred at the Lighthouse Unit. Public use figures for these two were 50,000 and 26,000 respectively.

The big one that did not get away.

C. Enforcement

Traffic related violations, vandalism, removal of plants, litter and the use of motorized vehicles on foot trails are major problem areas.

Cases made during 1979 that have cleared the Federal Court in Tampa include:

Violation	Fine
Fishing in a closed area	$ 35.00
Speeding	50.00
Littering	50.00
Driving carelessly and the wrong way on wildlife drive	150.00

Cases still pending are one involving the removal of plants, one speeding, and one riding a motorcycle on the beach.

The refuge staff continued routine patrol during weekends.

Numerous verbal warnings were given for driving over the speed limit on the wildlife drive, feeding alligators, picking sea oats or other plants and driving mopeds off public roads.

These century plants were confiscated from a man who thought they would look better in his yard.

VI. OTHER ITEMS

A. Field Investigations

Research permits were given to a variety of people for a variety of projects.

	Project	Affiliation
Adam Smith	Collect sand and water samples in recently dug out Mangrove Head Pond to monitor changes as pond matures	Sanibel Resource Center
Robert Snell	Take mud samples, build shorebird enclosures, etc. to determine quantity and type of food shorebirds consume	MS Candidate State Univ of New York
Dr. Stuart Correll	Collect botanical specimens for scientific research	Material for plant book
Dr. Richard Wunderlin	Survey of endangered and threatened plants as per FWS contract	Univ of Southern Florida
Carol Zucca	Study of vegetative structure of mangroves	Univ of Florida
Dr. Vivian Mendenhall	Collect brown pelican eggs	FWS Patuxent
Dr. William and Jo Winter, Jr.	Study, tag and collect Lepidoptera	Self
George Campbell	Capture and measure young alligators	S.W. Florida Regional Alligator Assoc
Dennis Jackson	Take blood samples from flightless birds for monitoring encephalitis	Lee County Mosquito Control District
Norma J. Byrd	Collect native plant seeds for propagation studies	Sanibel-Captiva Conservation Foundation

	Project	Affiliation
Dr. Ernest Estevez	Tag, collect and transplant mangroves	Dir of Environmental Studies, Univ of South Florida
Mark Westall	Osprey reproduction study	Private osprey study

Progress summaries are as follows:

Adam Smith	Pending
Robert Snell	Pending
Stuart Correll	Pending
Richard Wunderlin	Plant list submitted to refuge. No plant on U. S. Threatened or Endangered List found on the refuge
Carol Zucca	No report
Vivian Mendenhall	No report
William and Jo Winter	No report
George Campbell	Pending
Dennis Jackson	Did not collect this year
Norma Byrd	Pending
Ernest Estevez	Pending
Mark Westall	Census and reproduction figures given to refuge and used in output reports

B. Cooperative Programs

1. YACC

The YACC program fizzled along with a complement of one group leader and one enrollee until June

when Rick Mowry, the enrollee, reached his mandatory termination date. Shortly thereafter, Group Leader Leroy Wynn received his RIF notice.

Later in the year we received notice that the YACC program would start up again but that we could not be a part of it because we were in a high employment area. We were given a quota of one, then three. None of these considerations made any practical difference, however, as we were unable to get any referrals from the Florida State Employment Service. The year closed with no prospects for restarting the YACC program at this refuge, but some possibilities exist for transferring our quota to the Tampa Bay Refuges.

For the months we had them, YACC personnel helped considerably with the Brazilian pepper and Australian pine programs, posting of Passage Key, litter control and various cleanup and painting jobs.

YACC Group Leader Leroy Wynn and enrollee Rick Mowry. The loss of these men ended our participation in the YACC program for the year.

2. YCC

Although we had a 20 enrollee camp assignment, we only had 13 enrollees actually sign up. Even with the transportation problems and relatively low pay offered enrollees, we feel we could have recruited the full complement if we did not have to go through the computer process first. By the time we could get final word to prospective enrollees that we could hire them, many had already found other jobs.

The six week program was altogether too short. It seems as though most of the first week was spent in getting various mandatory organizational matters cleared up; another week was shot because of the Fourth of July holiday period and the last week was spent in getting things wound down.

We did manage to get a greal deal of necessary handwork done in cutting and hauling Brazilian pepper from the Gasparilla Trail. Most enrollees developed a deep hatred for pepper, or at least for the control work associated with it.

The three day YCC trip to Tampa Bay resulted in the cleaning up and removal of thousands of pieces of litter and the killing by herbicide injection of several hundred Australian pines.

Other projects included the building of a storage area for YCC equipment, some transplanting of yucca for natural barricades at the Lighthouse Point area and a lot of litter cleanup work.

Environmental awareness programs included water quality testing, talks by local naturalists, seining for marine life and various on-the-job contacts with ecology and environmental matters. The enrollees earned a high school biology credit for their participation in the EA program.

3. Field Response Coordinator

Biological Technician Charles LeBuff is the designated Field Response Coordinator for the subregion extending along Florida's Gulf Coast from the mouth of the Suwannee River south to Broad Creek in Everglades National Park. This is about 300 miles of coastline.

In this capacity he is responsible for planning and response to oil and hazardous substance spills that impact wildlife and habitat. In 1979 he prepared and submitted, through channels, a Local Pollution Contingency Plan for Field Response. This document was produced after considerable research, consultation, and coordination. It identifies such items as endangered species, critical habitat and nesting aggregations of colonial birds that must have priority in deployment of protective devices in the event of a spill.

Three ports are located within his subregion. One of these, Tampa, is the eighth largest port in the nation. In 1979 imports and exports passing through the Port of Tampa totaled over 48,000,000 tons. Of this petroleum products (excluding gasoline) accounted for 5,000,000 tons or 31,000,000 barrels or 1,302,000,000 gallons. The potential for an oil spill because of collision, grounding, or human error is a frightening reality.

A Gulf Oil Corporation tanker headed for a Port Tampa terminal approaching the Sunshine Skyway in Tampa Bay. The narrow ever-shoaling channel makes this a hazardous passage. (This is where the Coast Guard vessel "Blackthorn" collided with an oil tanker and sunk in January 1980 losing 23 crew members.)

In 1979 one pollution incident occurred that LeBuff had to respond to. A 10,000 gallon "mystery spill" at a phosphate terminal in Tampa threatened a large bird rookery. The Coast Guard and their contractors deployed boom and prevented any serious impacts. Fortunately there were no oiled birds as a result of the incidents.

4. Refuge Guides

Four guides under refuge Special Use Permits continue to use the refuge for a major portion of field trips. In 1978 CGS determined that, since the guides did not use refuge facilities in any way different from other refuge visitors, they would not have to have a refuge Special Use Permit. However, three of them had been under the permit system several years and they all felt it added a certain amount of prestige to be a "licensed refuge guide." Therefore, they requested that they still have the privilege of paying for Special Use Permits. We lowered the guide fee from $15.00 to $5.00 and are continuing to issue the permits. A few other guides, hired by local condominium and interval ownership businesses, also take groups through the refuge drive.

One big advantage of having guides under Special Use Permits is that it keeps us in closer contact with them. We call upon their expertise constantly and they freely supply such information as unusual bird sightings, census estimates, incidents of violations, and other management information. They also offer us another means of informing the public on such matters as water management, construction programs, etc.

Our guides represent an interesting variety of talents and skills.

George Campbell has the highest profile of the four guides. His field trips are oriented towards local plants and ecology. He is author of the book The Nature of Things on Sanibel; is International Coordinator for Fund for Animals and usually manages to be financed for guiding two or more natural history tours per year to other parts of the world. During the past couple of years he has made trips to the Galapagos Islands, India, Russia and China. He has a reputation

for being an outspoken environmentalist as the Lee County Mosquito Control District, the City of Sanibel, various Congressmen and anybody within his considerable sphere of influence well knows. George is not discriminatory -- the refuge also gets its share of criticism. He charges $7.00 per person for a 2-3 hour tour.

George Weymouth is considered by many to be the most knowledgeable birder in the area and his guiding trips are strongly oriented toward bird identification. He also does wildlife paintings and wood carvings (one of his carvings recently sold for $1,000). He is very active in all aspects of birding including coordinating the Christmas Bird Count (a big undertaking in this area), writing a newspaper column about birding and participating in various information gathering projects sponsored by national organizations. George has worked on the refuge as a part-time maintenanceman in past years. George charges $12.00 per person for a 3-4 hour tour.

Griffing Bancroft, a well known radio and TV commentator in the 1950's, combines an intense interest in birds with his skills as a commentator to become a very proficient birding guide. He guides on a part-time basis. He is the author of two books: The White Cardinal and Snowy: The Story of an Egret. Griffing charges $10.00 per person for a 3-4 hour tour.

Mark Westall has been guiding on Sanibel for two years. He specializes in canoe trips for birding and general natural history. Mark is conducting an independent study on osprey production in the area, and supplies the refuge with production data on these birds. He is the incumbent President of the 350 member Sanibel-Captiva Chapter of the Audubon Society. Mark worked as a YCC camp group leader in 1979. He charges $14.00 per person (he furnishes the canoes) for a 3-4 hour tour.

Refuge guides left to right -- Mark Westall, George Weymouth, George Campbell and Griffing Bancroft.

5. CROW (Care and Rehabilitation of Wildlife)

Our job at "Ding" Darling is made much easier because of CROW. This area has a dense concentration of people but also has surprisingly large numbers of wildlife. One of the inevitable results is a large number of injured wildlife. Almost daily we receive phone calls from well meaning persons whose compassions are aroused by injured wild animals to the point they will call the "Fish and Wildlife People." However, most informants once they have eased their conscience by giving us a call, do not want anything else to do with it and often expect us to travel 10-50 miles to pick up and care for the creatures they have "saved." Without CROW we would continually be forced to try to explain about such things as not being an injured animal clinic, not having fuel or manpower to pick up injured animals, etc. We would also have to try to explain that we are concerned about endangered species but we can't spend all our time chasing injured brown pelicans around. Or on the other hand, if we did choose to respond

to all injured wildlife reports, it would take at least one full-time employee just to handle the demand. As it is now, we simply refer the caller to the dedicated people at CROW.

We cooperate to the extent that we often transport injured wildlife from the local area to CROW facilities. Many of the animals involved are brown pelicans which, because of their habit of hanging around fishermen, are subject to becoming hooked, getting entangled, etc. CROW handled 425 injured creatures in 1979 including 80 pelicans. They released 166 recovered patients back into the wild, 106 died, 35 permanently disabled were directed to raptor centers, nature centers etc. The rest are still undergoing treatment. A total of 72 species were treated.

6. Caretta Research, Inc.

This privately funded local organization is another one that is useful to have around. They do most of the census work on sea turtles using Sanibel and other Southwest Florida beaches, respond to reports of dead or injured turtles and otherwise do much of the work the public would naturally expect the Fish and Wildlife Service to do but for which we are not funded. Caretta activities are headed by Charles LeBuff during off duty hours.

7. Southwest Florida Regional Alligator Association

Still another helpful private organization is the local Alligator Association. They handle complaints by catching and transferring nuisance 'gators. Many of these complaints, especially those from people living near refuge boundaries, are directed to the Fish and Wildlife Service.

C. Items of Interest

Assistant Manager Mark Musaus was promoted and transferred to Piedmont National Wildlife Refuge in June after serving here for nearly two years.

Bill Black, Mark's replacement, transferred to the refuge in September from Choctaw National Wildlife Refuge. His primary responsibility is on-the-ground management of the Tampa Bay Refuges. Bill, his wife Judy and son are residing in St. Petersburg.

Biological Technician Charles LeBuff and his family moved out of one of the Lighthouse buildings where they had resided for 20 years. Because the refuge is giving up its lease on the Lighthouse buildings in 1981, the vacated building will not be rented out by us again. The LeBuff's moved to the Tarpon Bay residence vacated by the Musaus'.

Administrative Clerk Ede Stokes received a Special Achievement Award of $300.00 for doing a super good job during a six month period in 1978 when she had an abnormally heavy workload.

The Tarpon Bay Marina lease and sublease grossed $467,834.00 in 1979. The Government's share was $14,035.00 (3% of the gross sales).

Mark Hamby, operator of the Tarpon Bay Marina, received newspaper coverage several times for his generosity in donating use of canoes to youth groups.

To cut down on our electric consumption we put an on-off switch on the office hot water heater (it is off 99 percent of the time); unplugged, for good, one of the two headquarters refrigerators and we unplug the water cooler over the weekends. We also make a point of utilizing the sea breezes as much as possible during the hot months (April - November) and, therefore, have air conditioners on less than 10 percent of the time.

Training and Workshop Sessions:

Delano A. Pierce	Four week Refuge Law Enforcement School, Glynco, Georgia, February.
	Training Session for Ecological Services Permit Evaluation, May, 24 hours.
	Basic Fire Control Behavior Course, Nashville, Tennessee, September, 24 hours.
	Jacksonville Area Office Meeting, September.
Bill Black	Waterfowl Banding Assignment at Delta National Wildlife Refuge, January, 48 hours.
	Attended Refuge Academy at Beckley, West Virginia, April, 160 hours.

	One week refresher course at Refuge Law Enforcement School, Glynco, Georgia, May.
	Defensive Driving Course, July, 8 hours.
	Fire Management Course in Atlanta, Georgia during November, 40 hours.
	Manatee Awareness Workshop, Tampa, Florida, November, 8 hours.
Charles LeBuff	Field Response Coordinator Training, Savannah National Wildlife Refuge, January, 24 hours.
	Field Response Coordinator Training, Tampa, Florida, April, 24 hours.
	Training Session for Ecological Services Permit Evaluation, May, 24 hours.
	Controlled Burn Workshop, Ocala National Forest, September, 16 hours.
	Basic Fire Control Behavior Course, Nashville, Tennessee, September, 24 hours.
	Migratory Bird Banding Workshop, October, 16 hours.
	Manatee Awareness Workshop, November, 8 hours.
	World Conference on Sea Turtle Conservation, Washington, D. C., November, 40 hours.
	Sea Turtle Symposium, Tampa, Florida, December, 24 hours.
Ferrell Johns	Controlled Burn Workshop, Ocala National Forest, September, 16 hours.
Mark Musaus	Writing Effective Letters, Miami, Florida, January, 24 hours.
	Ecological Services Permit Evaluation, Jacksonville, Florida, April, 16 hours.

	Attend FLETC, Glynco, Georgia, May, 40 hours.
Ede Stokes	Small Purchases/FSS Course, Atlanta, Georgia, March, 40 hours.
	Seminar for Administrative Assistants, Jacksonville, Florida, April, 16 hours.
	YCC Training Conference, Atlanta, Georgia, April, 32 hours.
Donna M. Stanek	Cynosure II and National Association of Interpretive Naturalists Conference, Minneapolis, Minnesota, February, 40 hours.
	Basic Refuge Law Enforcement Training, Glynco, Georgia, April, 160 hours.
	Defensive Driving, May, 8 hours.
	Southeast Regional Association of Interpretive Naturalists Conference, Highlands, North Carolina, October, 32 hours.
Dolores Ambrose	Defensive Driving, May, 8 hours.

Other sessions, ceremonies, etc:

Delano A. Pierce	Attended ceremonies transferring Buck Key lands from the Benedict family to The Nature Conservancy.
	Attended Sanibel Emergency Preparation and Evacuation Meeting with local officials.

Maintenance Worker Ferrell Johns received a $50.00 Incentive Award for his suggestion that all Government boat operators be required to attend a U. S. Coast Guard sponsored Power Boating Course.

Mark Musaus was detailed to the St. Vincent Refuge for a few days to assist with a refuge hunt.

Two beer can collectors from Miami were given permission to pick up all the beer cans they wanted in the Gavin Site area. They took out about ten sacks full including several Regal Beer cans they believed were worth $8.50 apiece.

The City of Sanibel purchased the 29.1 acre Steamboat property for $1,335,600.00. It will be opened for public use and beach access but will have only minimal development. We have had several preliminary meetings with city representatives regarding tying in nature trails with the Perry Tract. This three acre tract, donated to the refuge in 1954, has received no public use or development because of its isolation from the rest of the refuge and its small size.

Some of the more prominent visitors to the refuge in 1979 included: U. S. Congressman Sydney Yates, Chairman of the Interior Appropriations Committee; Mr. Kikua Apis, a Congressman from Micronesia, accompanied by Lewis Schwartz from the U. S. State Department, and Mr. Zen-Ping Chen from the Taiwan Department of Natural Resources.

Credits for this report are as follows:

Del Pierce - Sections I, II, A and B, III, VI, A and B.

Charles LeBuff - Sections II, C, D and IV.

Donna Stanek - Section V.

Edythe Stokes - Section VI, D and edited.

Dolores Ambrose - Typed and collated the report.

Staff - VI, C.

D. Safety

Our safety record for YACC and YCC was perfect for the year. All enrollees participated in safety courses and the refuge monthly safety meetings.

Unfortunately, the refuge's lost-time record was broken in December. To that point in time our last lost-time accident had been November 12, 1970 with a total of 75,257 employee hours worked.

Following are listed Reports of Accident/Incident:

Ferrell Johns had an allergic reaction to an ant bite on his left eye -- no lost-time.

Donna Stanek injured her knee when stepping from a dock into the refuge boat -- no lost-time.

William Black received a deep laceration on the index finger of his right hand while sharpening his ax -- no lost-time.

Our one lost-time accident, and a much more serious one, involved Charles LeBuff and our 6600 Ford Tractor. Charles was operating the machine when a high-pressure hydraulic line situated behind and above him broke. He was sprayed with hot oil and attempted to stop the machine and jump clear. When he jumped he was struck by dual rear tractor tires, knocked to the ground, and run over. It is unknown whether the machine was actually taken out of gear or proceeding under momentum. Charles actually walked away from the scene of the accident! He walked a mile and a half to the refuge motorcycle and drove himself home - approximately four miles. He suffered multiple injuries -- fractured ribs, broken nose, internal and external contusions, wrenched back, and bruised lower back and left leg. Lost time totaled 76 hours and he returned to work on restricted work activities December 26.

J. N. "DING" DARLING
NATIONAL WILDLIFE REFUGE COMPLEX

FLORIDA GULF REFUGES

ISLAND BAY,
PINE ISLAND,
MATLACHA PASS,
CALOOSAHATCHEE
NATIONAL WILDLIFE REFUGES

Review and Approvals

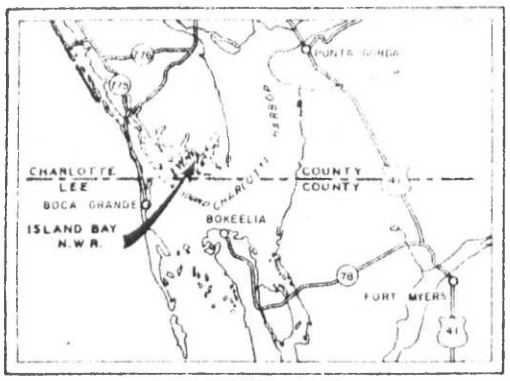
Del Pierce	Donald A. Hankla	3/20/80
Submitted by:	Area Office	Date
J. N. "Ding" Darling NWR		
Refuge	Regional Office	Date

ISLAND BAY NATIONAL WILDLIFE REFUGE

CHARLOTTE COUNTY, FLORIDA

UNITED STATES
DEPARTMENT OF THE INTERIOR

U.S. FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



VICINITY MAP

0 10 20 MILES
SCALE OF MILES

82°12' 82°11' 82°10'

26°49' 26°48' 26°47'

LOT 4
CASH
MOUND

JOHN QUIET
MOUND

LOT 1

CAPE HAZE

BULL BAY

ROBERTS GAP

LOT 2

BULL KEY

LOT 1

GALLAGHER KEY

LOT 2

LOT 1

22 23 24 27 26 25 34 35 36

THE NARROWS

CUTOFF

BAY

TURTLE

R21E
R22E

T42S CHARLOTTE COUNTY
T43S LEE COUNTY

COMPILED IN THE BRANCH OF ENGINEERING
FROM SURVEYS BY THE B.L.M. AND C.&G.S.

ATLANTA, GA. MARCH, 1981

TALLAHASSEE MERIDIAN

Scale 0 20 40 60 CHAINS
1/4 0 1/4 1/2 3/4 MILE

TOWNSHIP DIAGRAM

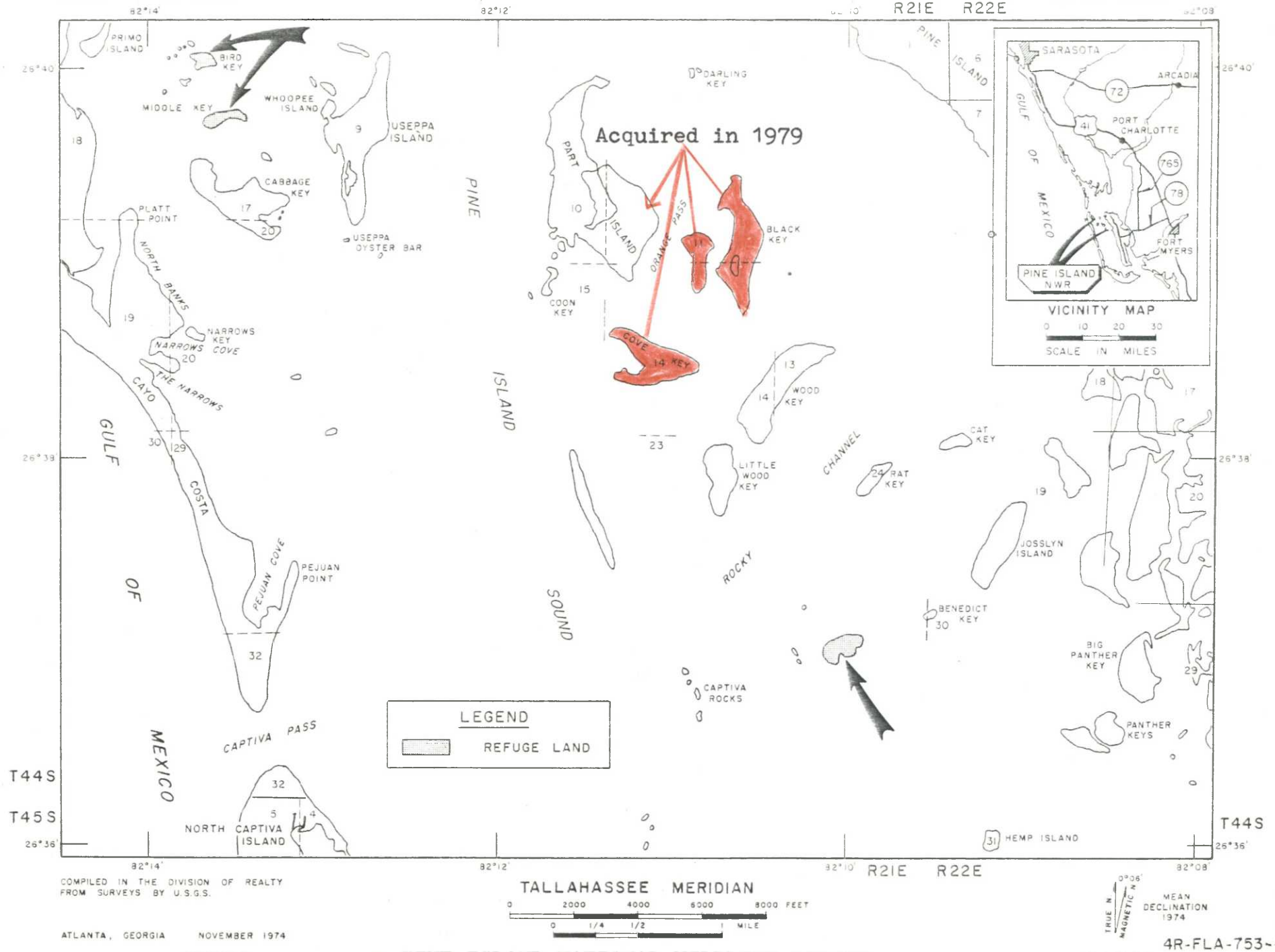
MEAN DECLINATION 1980

PINE ISLAND NATIONAL WILDLIFE REFUGE

LEE COUNTY, FLORIDA

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 NOVEMBER 1974

4R-FLA-753-403

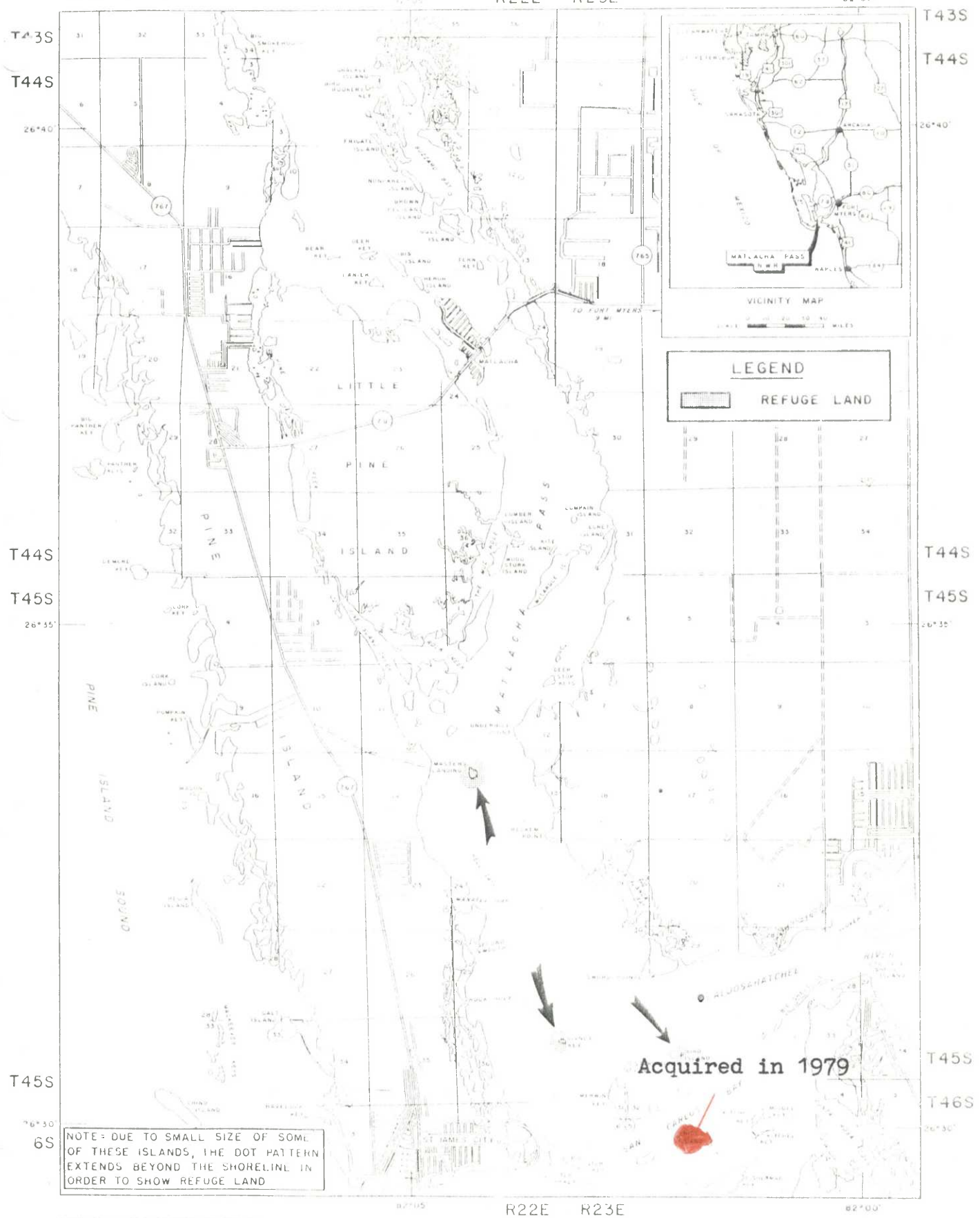
PINE ISLAND NATIONAL WILDLIFE REFUGE

MATLACHA PASS NATIONAL WILDLIFE REFUGE

LEE COUNTY, FLORIDA

UNITED STATES
DEPARTMENT OF THE INTERIOR

UNITED STATES
FISH AND WILDLIFE SERVICE



LEGEND

REFUGE LAND

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

ATLANTA, GEORGIA NOVEMBER, 1974

MEAN DECLINATION 1974

4R-FLA-754-404

CALOOSAHATCHEE NWR

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I. GENERAL

A. Introduction

This arrangement of four groups of islands is located in the Charlotte Harbor and Caloosahatchee River estuaries to the north and east, respectively, of the J. N. "Ding" Darling Refuge. The majority are typical mangrove keys that range between minimal and intensive wildlife use. At least one refuge island is a major and significant habitat for the endangered brown pelican.

In all cases only lands above the mean high tide level are considered to be Service-owned. Because of this there are no wetland habitats on any of the islands; however, some interior depressions may temporarily hold rainwater or seawater when spring tides broach the typically higher elevation fringe around most of them. Due to this phenomena the majority of the refuge components are tremendously large producers of salt marsh mosquitoes.

Island Bay Refuge was established in 1908 and totals about 20 acres in size. Little mangrove is within this area and the vegetative types are predominantly beach and West Indian. Bull and Gallagher Keys are miniature barrier islands with southern exposure to low energy waves often produced by Charlotte Harbor waters. Two Caloosa Indian middens on Turtle Bay although surrounded by mangroves are West Indian and grassland vegetated. John Quiet Mound is relatively undisturbed but Cash Mound was severely damaged in the early 60's when a shell company illegally began to excavate and barge away shell for road building.

Island Bay became a Wilderness Area in 1970. Back then it was quite a unique "Wilderness." A squatter lived on Bull Key and his shack along with three others really gave the place a wild look. When the man became ill in the early 70's and had to be moved off the island all buildings were burned down - probably by a lightning strike!

Little wildlife use is known to exist on the refuge. Some areas are utilized as loafing sites for colonial birds and the ornate diamondback terrapin nests on the small beaches of the barrier keys.

John Quiet Mound of Island Bay Refuge is relatively undisturbed. Such mounds are easily located from the air because of distinct differences in vegetative types.

Pine Island Refuge is composed of seven mangrove-fringed islands in Pine Island Sound. Three of these were included in the then young refuge system in 1908 and gave this group a total acreage of 31 at that time. The extent of the islands is much more than this but, again, only above mean high tide land is included. All of Black, Little Black, and Cove Keys, and a parcel on Part Island were acquired during the year. These acquisitions brought total refuge acreage to 188.

The northernmost island, Bird Key, receives a highly significant amount of wildlife use and is best known for its brown pelican population. Immediately to the south is Middle Key which has no known bird use other than occasional loafing. Big Bird Rookery Island is located to the southeast of the above islands and on the opposite side of Pine Island Sound. This island is believed to have been given its name because many years ago it was probably the site of a large colonial bird nesting colony. Today perhaps a dozen great blue herons nest on Big Bird Rookery. The four islands added during the year receive no intense wildlife use other than roosting or feeding sites.

Matlacha Pass Refuge is situated between Pine Island and the mainland. It originally consisted of three small islands that were included in the fledgling refuge system in 1908. The original three keys totaled 10 acres; two are red mangrove fringed with black mangrove centers and another is relatively high having an oyster shell base and a small mound that may be of prehistoric origin. In 1979, 62 acre red mangrove covered Big Island was purchased and is administered as part of Matlacha Pass Refuge.

Upper Bird Key (all these Bird Keys get confusing) was used as a dense nesting place by colonial birds up to the late 60's when the trees became so defoliated from bird "white-wash" that nest-anchoring vegetation was at an absolute minimum. Some nesting occurred on this key in 1979.

Middle Bird Key has no real nesting vegetation available. Australian pines have taken over most of the island and are now dead because of our chemical control activities in 1978. Colonial birds utilize these pest trees for roosting but not nesting. A shell mound with typical West Indian type flora dominates the eastern tip of the key. Some fine specimens of gumbo-limbo, prickly pear cactus, cats claw, and sea grape give the location real subtropical charm.

Bird Island is the southernmost refuge in Matlacha Pass and is mostly low mixed mangrove species that support several forms of colonial birds as a rookery.

Caloosahatchee Refuge is 40 acres in size according to Service records. Originally the refuge consisted of eight small islands in the Caloosahatchee River about five miles east of Fort Myers at the mouth of the Orange River; a Caloosahatchee tributary.

When the Caloosahatchee Waterway was constructed there was a title question and the ownership of the islands was somehow vested in the State of Florida. Under this condition four islands disappeared and spoil from the channel was deposited on two of the remaining islands. The two center islands were raised several feet and are now so altered that encroaching Australian pines and Brazilian peppers cover most of the upland.

To make matters worse, two high bridges of Interstate 75 cross over the refuge on its way across the Caloosahatchee.

B. Climatic and Habitat Conditions

The Florida Gulf Coast Refuges, being predominately mangrove forests, are major contributors to the marine environment. Mangrove systems are very stabile and if left alone change very little from decade to decade.

These island refuges are situated within the normal precipitation patterns for our area of Florida. During the rainy season, early June until mid-September, severe thunderstorms develop into powerful line squalls and a tremendous amount of rain falls on the region. Annual precipitation averages 55 inches.

Temperature ranges are also within the normal for the region. During 1979 temperatures did not get below the mid-30's or much above the mid-90's. Water temperatures adjacent to the refuges ranged from a low of about 57° F to a high of approximately 90° F.

C. Land Acquisition

1. Fee Title

Black Key, Cove Key, Little Black Key and a small lot on Part Island were acquired as a 157 acre package purchased for $54,000. Almost all the area included in this package is forested with red or black mangroves.

Patricio Island, a 109 acre island with about 40 acres of Indian mound upland, was acquired by The Nature Conservancy for resale to the Fish and Wildlife Service. Approximate purchase price was $575,000. We expect to have custody the first quarter of 1980. This island has a beautiful house, outbuildings, docks, a small citrus grove, its own power supply and a fresh water well. It would be an excellent location for a subheadquarters area since it is near the seven other islands included in the Pine Island National Wildlife Refuge and the areas included in the Island Bay National Wildlife Refuge. Other nearby islands will probably be acquired in the near future. Several islands expected to be acquired soon for the Matlacha Pass National Wildlife Refuge will also be within 10 miles of Patricio Island.

Big Island, a 62 acre predominately mangrove island, was purchased for $55,000. Due to procurement technicalities it is listed as being a part of the Pine Island Refuge but should be included with the islands in the Matlacha NWR.

2. Easements

Nothing to report.

3. Other

Nothing to report.

D. System Status

Reported in the J. N. "Ding" Darling Narrative Report.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

Nothing to report.

B. Maintenance

Boundary reposting was accomplished on those refuge islands where necessary.

Our chemical control program for Australian pine (Casuarina) and Brazilian pepper (Schinus) reached our satellites in 1979. All Casuarina were injected with 2,4-D that could not physically be pulled out on all islands and Banvel 720 was applied to heavy Schinus growth on the Caloosahatchee Refuge.

Results on the Casuarina were excellent with close to a 90% kill. A good kill of the treated Schinus occurred but some regrowth is expected. Long-term maintenance may someday see both plants under control on all Florida Gulf Refuges.

C. Wildfire

Nothing to report.

III. HABITAT MANAGEMENT

A. Croplands

Nothing to report.

B. Grasslands

Nothing to report.

C. Wetlands

Nothing to report.

D. Forestlands

As reported earlier much of these islands are forested by various mangroves. Higher elevations are vegetated by the West Indian flora which is being slowly overpowered by Casuarina and Schinus in most cases.

E. Other Habitat

Nothing to report.

F. Wilderness and Special Areas

Island Bay Refuge was established a part of the National Wilderness Preservation System in October 1970.

The waters of the Caloosahatchee River, immediately to the north of the refuge bearing its name, were determined to be Critical Habitat for the manatee. Special regulations adopted in 1979 provide a zone of controlled boat speed. Propellers from speeding boats are a chief factor in sirenian mortality. This special area is to be posted and regulated from November 15th to March 31st of each year.

G. Easements for Waterfowl Management

Nothing to report.

IV. WILDLIFE

A. Endangered and Threatened Species

1. Florida Manatee

Manatees are seasonally quite common in the waters around all of the refuges. The Critical Habitat discussed above also extends for a short distance up the Orange River where a large regional Florida Power and Light Company generating plant discharges heated cooling water effluent. In winters during extremely low water temperatures (55-65° F) manatees congregate in the heated water for warmth.

Florida's largest group of manatees was observed during one aerial survey in 1979 in the Orange River area influenced by this thermal discharge -- 270 individuals -- over 25% of the State's estimated population.

2. Eastern Brown Pelican

Brown pelicans nest on Bird Key of Pine Island Refuge, Upper Bird Key and Bird Island of Matlacha Pass Refuge.

The colony on Bird Key may equal or exceed the aggregation on Tarpon Key in Tampa Bay. Approximately 1,200 nests produced about 2,600 young in 1979. Upper Bird Key and Bird Island jointly fledged around 100 pelicans.

The confrontation between fisherman and pelican remained a problem. Some of the birds habitually frequent public fishing piers where they are inadvertently hooked. Uninformed people who are unfamiliar with techniques to release hooked birds simply cut the birds free. Weak monofilament often breaks as the birds fight to free themselves. Both of these conditions result in the bird flying off trailing yards of material. Upon landing at their night roosts or nesting islands the birds end up entangled in the mangroves. It is not uncommon during our visits to these islands to rescue starving pelicans or cut down dried carcasses.

3. Loggerhead Turtle

Loggerhead, green and Kemp's ridley sea turtles occur periodically near many of these islands. A few of each are netted (and supposedly released) by commercial fishermen annually.

Because of the absence of suitable beaches there is no nesting by any of these marine turtles on the refuges.

B. Migratory Birds

1. Waterfowl

Rafts of lesser scaup and groups of red-breasted mergansers often occur near many of these refuges.

Some of these occasionally are observed along the shoreline resting on the refuges.

The resident mottled duck occurs on all refuge islands but not in great numbers. A peak population was present in July when 12 birds were tallied.

2. Marsh and Water Birds

Great, reddish, snowy and cattle egrets, great blue, little blue, Louisiana, yellow and black-crowned night herons and white ibis occur on most of the Florida Gulf Refuges. Many of these are represented as major reproducing species in the large rookery on Bird Key and to a lesser extent on Upper Bird Key and Bird Island.

Magnificent frigatebirds roost on the prime rookery islands of the Florida Gulf Refuges, but do not nest north of the Marquesas, to the west of Key West.

Cormorants nest on the same islands and hundreds of frigatebirds roost on Bird Key. Roseate spoonbills are sometimes observed on the above islands also.

3. Shorebirds, Gulls, Terns and Allied Species

Herring, ring-billed and laughing gulls are frequently seen as they fly over the refuges, as are royal, least and sandwich terns. Occasionally individuals of these species perch upon boundary signposts or large trees where they wait to try to steal morsels from nesting birds feeding their young.

4. Raptors

Ospreys are often seen on feeding flights over the islands but do not nest on any of them. Ospreys raise young on the many daymarkers and other navigational aids in the Pine Island Sound portion of the Intracoastal Waterway.

C. Mammals and Non-Migratory Birds and Others

1. Game Mammals

Nothing to report.

2. Other Mammals

From what we can determine, based on track observations, raccoons occur on all islands except those of Matlacha Pass Refuge.

Small rodents and marsh rabbits occur on many of the islands.

3. Resident Birds

Nothing to report.

4. Other Animal Life

In 1978 we attempted a gopher tortoise transplant on the Caloosahatchee Refuge consisting of the release of 10 adults. The first monitoring indicated that the program would be effective but all specimens eventually disappeared. These large land turtles are reasonably territorial, do swim, and may have departed on their own initiative. Perhaps it is more reasonable to assume that they were removed by the occasional boaters who visit the refuge.

The ornate diamondback terrapin occurs on all the refuges except Caloosahatchee, as do mangrove water snakes. Yellow rat snakes are found on Bird Key where they make at least a seasonal living off bird eggs.

Although we have no verification they exist there, both Cash and John Quiet Mounds are suitable habitat for the eastern diamondback rattlesnake.

The grass flats that surround the marine portions of Florida Gulf Refuges are highly productive for sport and commercial fishermen. Gill netters harvest thousands of pounds of mullet annually from the area and commercial cane pole fishermen make substantial catches of speckled trout. Sport fishermen seek the trout, redfish and snook.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On-Refuge

Nothing to report.

2. Off-Refuge

During the presentation of formal programs the Florida Gulf Refuges are often discussed or referenced because of their endangered species value.

In 1979 we responded to several mail inquiries from people seeking information on these refuges. The fact that they are accessible only by boat and we discourage any visitation during the nesting season precludes any real interpretive program.

B. Recreation

1. Wildlife Oriented

Some local motorboat guides make stops at Bird Key for their customers to get a glimpse of the great numbers of birds.

2. Non-Wildlife Oriented

Nothing to report.

C. Enforcement

There were no violations observed at any of the Florida Gulf Refuges in 1979.

Illegal camping evidence was noticed on Bull Key and Caloosahatchee Refuge but refuge personnel were never at the right place at the right time.

We noticed no recent digging activity by treasure hunters on either Cash or John Quiet Mounds.

VI. OTHER ITEMS

A. Field Investigations

A Special Use Permit (79-10) was issued to the Lee County Health Department in March to collect blood samples from birds in the Florida Gulf Refuge group. This was for the 1979 Arbovirus Surveillance Program conducted by the county under the aegis of the Florida Department of Health and Rehabilitative Services. There were no samples collected under this permit.

B. Cooperative Programs

Nothing to report.

C. Items of Interest

All of this report, except I-C, was written by Charles LeBuff. Del Pierce prepared I-C. Typed by Dolores Ambrose.

D. Safety

All work projects on the Florida Gulf Refuges were conducted in a safe manner. Since travel to and from the various islands is over large expanses of water safe motorboat operation is essential.

J. N. "DING" DARLING
NATIONAL WILDLIFE REFUGE COMPLEX

TAMPA BAY
NATIONAL WILDLIFE REFUGES

EGMONT KEY,
PASSAGE KEY,
PINELLAS
NATIONAL WILDLIFE REFUGES

NATIONAL WILDLIFE REFUGE SYSTEM
Fish and Wildlife Service
U.S. DEPARTMENT OF THE INTERIOR

Personnel

William Black, Asst Refuge Manager, GS-7, PFT, EOD 9/23/79

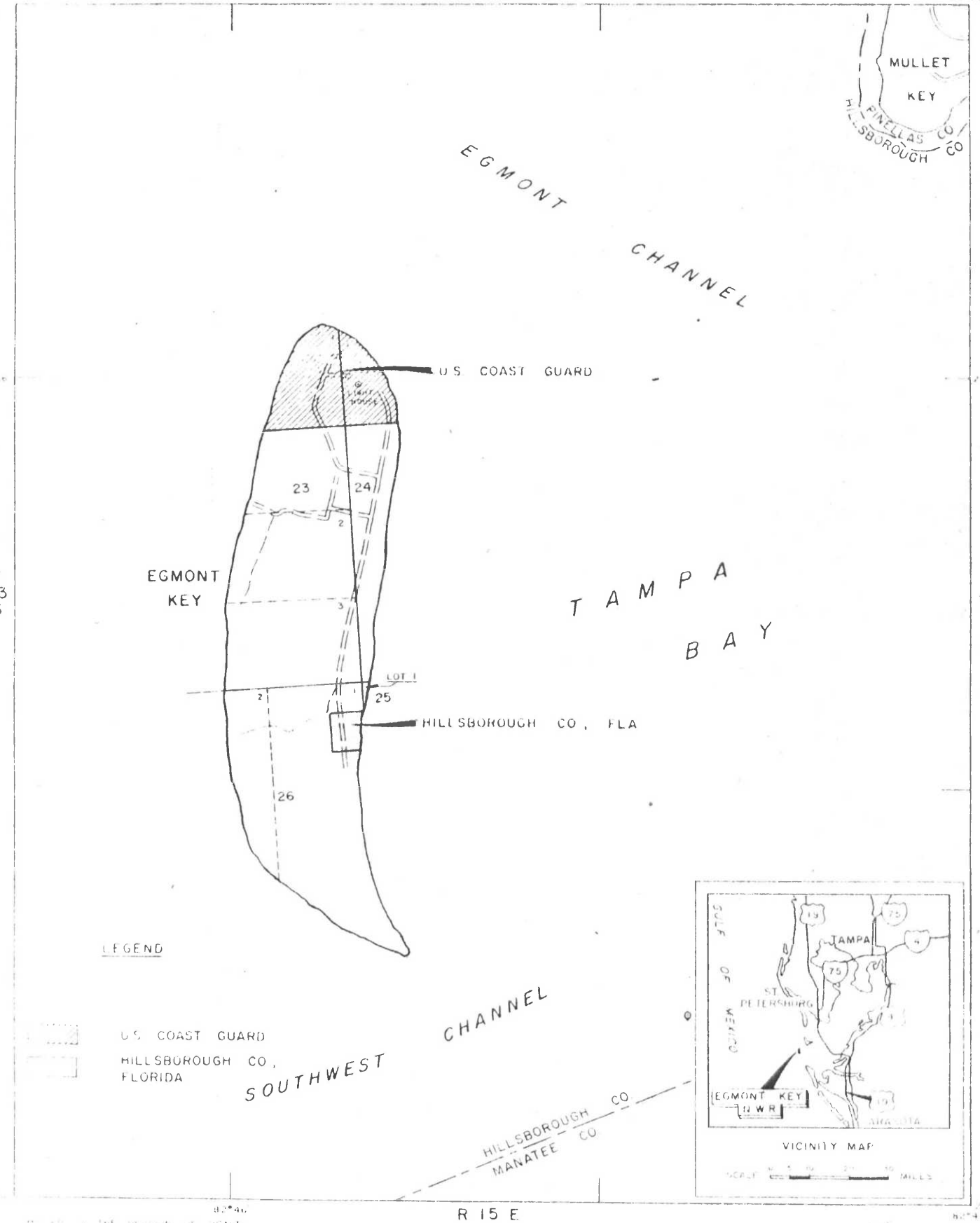
Review and Approvals

Del Pierce	Donald J. Hardkla	3/28/80
Submitted by:	Area Office	Date
J. N. "Ding" Darling NWR		
Refuge	Regional Office	Date

EGMONT KEY NATIONAL WILDLIFE REFUGE

HILLSBOROUGH, COUNTY, FLORIDA

R 15 E



R 15 E

TALLAHASSEE MERIDIAN

Scale

4R-FLA-

PASSAGE KEY NATIONAL WILDLIFE REFUGE

MANATEE COUNTY, FLORIDA

UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

82°46' R15E 82°44' R16E 82°42'

27°36' T 33 S

27°34'

27°32' T 34 S

EGMONT CHANNEL

Egmont Key

T33S-R15E

SOUTHWEST CHANNEL

HILLSBOROUGH CO
MANATEE CO

HILLSBOROUGH CO
MANATEE CO

TAMPA BAY

GULF OF MEXICO

PASSAGE KEY INLET

NOTE
APPARENT SHORELINE OF PASSAGE KEY FROM AERIAL PHOTOGRAPH DATED NOV. 1969

PASSAGE KEY

Bean Point

Atoma Manor

Holmes Beach

SCHOOL RD

VICINITY MAP

GULF OF MEXICO

TAMPA
CLEARWATER
ST. PETERSBURG
SARASOTA
PASSAGE KEY NWR

41 75 19 301 4 60 41 301 64 41

SCALE 10 0 10 20 30 MILES

COMPILED IN THE DIVISION OF REALTY
FROM SURVEYS BY USGS

ATLANTA, GEORGIA MARCH, 1971

TALLAHASSEE MERIDIAN

Scale 2000 1000 0 2000 4000 6000 FEET
1/2 0 1/2 1 MILE

TOWNSHIP DIAGRAM

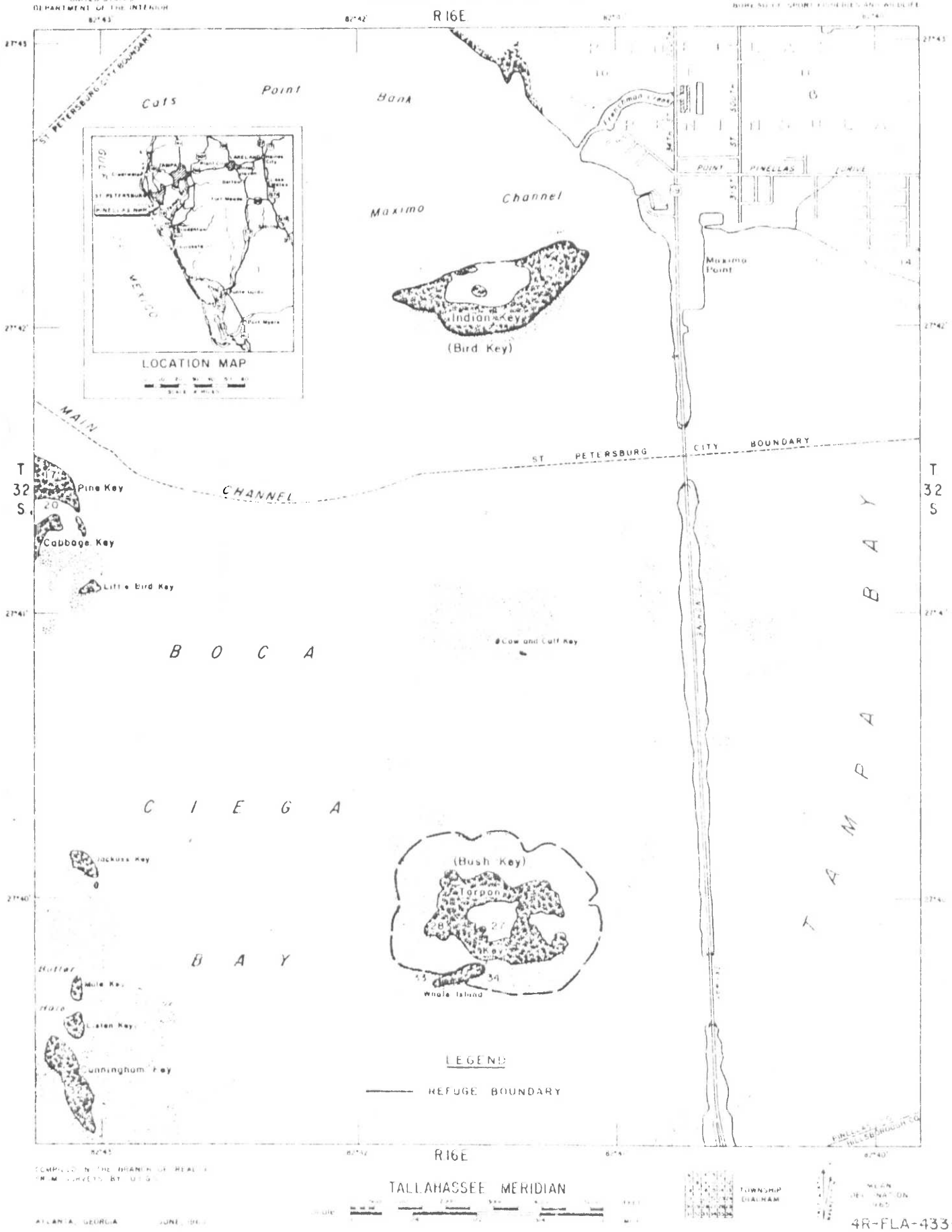
TRUE NORTH MAGNETIC 3½°

MEAN DECLINATION 1971

4R-FLA-31-403

PINELLAS NATIONAL WILDLIFE REFUGE

PINELLAS COUNTY, FLORIDA



4R-FLA-433-403

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I. GENERAL

A. Introduction

The Tampa Bay Refuges are situated in the western extremities of Tampa Bay near St. Petersburg. Four islands make up this group of refuges. Passage Key became a National Wildlife Refuge in 1905, Pinellas in 1906 with redefinement in 1921, and Egmont Key in 1974. In 1970 Passage Key was designated as a component of the National Wilderness Preservation System.

The characteristics of the refuges are typically marine yet each is topographically different than the other. Passage Key is a sand bar which is constantly having its configuration altered by tides and currents and Pinellas Refuge consists of two low mangrove islands which are almost totally submerged at high tide. Egmont Key is a 397 acre barrier island of subtropical upland habitat. Of this land 55 acres have been retained by the Coast Guard for lighthouse and station purposes and five acres are under a long-term lease to Hillsborough County, who in turn sub-leases the tract to the Tampa Bay Pilot's Association. The Service permits Pilot's Association's use of another adjoining five acres under a revocable permit.

When it was established in 1905 as a refuge, Passage Key was 36 acres in size. In 1978 less than 10 acres of dry land existed at a normal high tide.

Tarpon Key

Indian Key

The two islands of Pinellas Refuge total some 377 acres. The boundary of Indian Key follows its red mangrove fringe whereas that of Tarpon Key includes considerable bay bottom surrounding the island. This water-covered area accounts for about one-third of this refuge's acreage. Because of their proximity to urban centers (St. Petersburg-Tampa) the Tampa Bay Refuge complex undergoes considerable adverse pressures because of public use. The Port of Tampa, one of the busiest in the southeast, attracts millions of shipping tonnage each year. The refuge islands and area wildlife are constantly threatened by the dangerous potential of a pollution incident.

Indian Key in center background. St. Petersburg in foreground.

With the transfer of Assistant Manager Mark Musaus from J. N. "Ding" Darling, the decision was made to station his replacement in the St. Petersburg/Tampa Bay area in order to actively manage the refuges and to assist with various other Fish and Wildlife Service responsibilities. After lengthy delays, Assistant Manager William Black transferred from Choctaw National Wildlife Refuge in southern Alabama on September 23rd.

B. Climatic and Habitat Conditions

The refuges felt the effects of two major hurricanes, both of them being of the male gender. Hurricane David proceeded up the east coast of Florida and Hurricane Frederic skirted the west coast, striking Mobile, Alabama. Damage was limited to high storm tides resulting in further erosion of Egmont Key and Passage Key, and the loss of several boundary signs.

During the summer months afternoon thunderstorms are the rule, providing a little relief from the heat but adding to the high humidity. During the winter precipitation moves into the area with the cold fronts, giving a pattern of two or three days of cool and cloudy weather, then a slow warming trend lasting

for 5 - 10 days before the next front approaches. Precipitation averages about 50 inches a year, with daytime temperatures of about 72° F - 90° F in the summer and 55° F - 75° F in the winter. Occasional cold snaps can drop the temperatures into the high 20's - low 30's.

Passage Key and Pinellas Refuges are devoid of fresh water but Egmont Key has several low areas and drainage ditches that fill with rain water during the wet season. This provides an abundant and ferocious crop of mosquitoes during the spring, summer and fall. The Coast Guard and the Tampa Bay Pilots both draw their water from shallow wells on the island and Egmont is criss-crossed with water lines and "sewer" lines from the military periods.

C. Land Acquisition

No new lands were added this year, although progress continued on the purchase of four islands adjacent to Tarpon Key in the Pinellas National Wildlife Refuge.

In mid-December realty was offered a 17 acre island approximately four miles north of Pinellas National Wildlife Refuge. Although the island was inspected, the owner insisted on selling by January 1 for income tax purposes. Neither the Service nor The Nature Conservancy was able to purchase the island in the two week period it was offered and it was sold to a private concern.

D. System Status

Reported in the J. N. "Ding" Darling Narrative Report.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

The decision was made to close Passage Key National Wildlife Refuge to the public during the colonial bird nesting period, April 1 to September 1. Two large wooden informational signs with concrete posts were placed on the key in the spring. One sign was washed out during Hurricane Frederic, found and reerected in October, and once again washed out in late December due to the shifting of the island to the west. Most of the smaller boundary signs were also washed out and covered over with sand.

Two of these signs were erected on Passage Key in 1979.

B. Maintenance

Replacing boundary signs kept refuge personnel busy during their monthly trips to the refuges prior to October. Most of these signs were victims of the tide and currents eroding away the beaches on Passage and Egmont Keys.

The motor on the 24' Aquasport was replaced during the summer with another Johnson 200 hp. The boat's bottom was cleaned and repainted with anti fouling paint during the year.

Prior to a prescribed burn in December, the Coast Guard borrowed a LCM from the Army Reserves and transported the refuge's bulldozer to Egmont Key. In return, the refuge dug the Coast Guard a garbage pit, cleared some old stumps and vegetation, and buried some of the trash accumulated through the years. The refuge also covered the Pilot's Association's old pit and dug them a new one in an attempt to keep their trash confined to their land. In addition to the fire lanes plowed out the bulldozer was also used to uproot several dozen large Brazilian peppers and dig several trash pits in order to bury unsightly trash accumulated on the refuge during the years.

Several hundred feet of the brick roads constructed during the 1890's were hand-cleared of vegetation. These roads are beginning to suffer from the dense vegetation encroaching on them and uprooting sections of brick.

Litter pickup was attempted when manpower and time permitted. Litter is a major problem on these islands where it must be hauled off by boat or buried.

C. Wildfire

On Egmont Key, several illegal campfires are found every month and the pilots and Coast Guard burn their garbage, both potential sources of wildfires. The last wildfire occurred in the Spring of 1975 on the northeast section of Egmont. Burn marks on the palms indicate that most of Egmont has been burned over at least once in the past.

The other islands are fairly fireproof due to their nature: i.e., sand and mangroves.

III. HABITAT MANAGEMENT

A. Croplands

Nothing to report.

B. Grasslands

Northing to report.

C. Wetlands

Nothing to report.

D. Forestlands

Nothing to report.

E. Other Habitat

Control of Australian pine (Casuarina) and Brazilian pepper (Schinus) is a major management priority. The Australian pines are found on all the islands except Passage Key. Control on Pinellas National Wildlife Refuge is just a matter of spending the hours needed to search the islands for approximately 75 - 100 pines scattered about on the high spots of these mangrove islands. Egmont's pines are located in three distinct

areas and are readily accessible. Approximately 25% of these pines have already been treated.

The Brazilian peppers are located on Tarpon Key and Egmont Key. Tarpon Key's peppers are localized and will only require a minimum amount of time to control. The peppers on Egmont Key are scattered from one end to the other and include some monstrous specimens.

A prescribed fire was planned for the southern half of Egmont Key in December but had to be postponed. We hope fire will remove the litter under the dead Australian pines and kill the pepper and young pines in the burn area.

F. Wilderness and Special Areas

Passage Key has been a Wilderness Area since 1970 and is so posted.

Egmont Key was determined to be eligible for the National Registry of Historic Places in 1978 due to the remains of the Spanish American War's Fort Dade. Pinellas County received permission in November to relocate two large artillery pieces from the southwest fortification on Egmont Key to Fort DeSoto County Park on Mullet Key. Both of these weapons are in imminent danger of falling into the gulf due to the beach erosion on this portion of Egmont Key.

The remainder of Egmont Key's historic sites are in fairly good shape. The wooden buildings were burned years ago leaving the foundations and several concrete buildings. There are approximately two miles of brick and concrete roads, several large bomb proof shelters or ammunition bunkers, and the large intact fortification on the Coast Guard's north end.

G. Easement for Waterfowl Management

Nothing to report.

IV. WILDLIFE

A. Endangered and Threatened Species

1. Florida Manatee

There were no sightings of the Florida manatee this year in the Tampa Bay Refuges. Past local reports

indicate the manatee may use the shallows around Pinellas National Wildlife Refuge. The manatees do winter on a section of the Alafia River which is further west of the refuges on the east side of Tampa Bay.

2. Eastern Brown Pelican

One of the largest nesting aggregations of brown pelicans in the nation exists on Tarpon Key. An estimated 680 nesting pairs produced approximately 1,400 young. Whale Island is one of the islands being considered for acquisition and is about 75 yards north of Tarpon Key. This red mangrove island supported the refuge's overflow of nesting birds. Indian Key appears physically to be as suitable for pelican nesting but serves the outer Tampa Bay population only as a loafing site.

3. Loggerhead Turtle

Historically, Egmont Key has been identified as an important nesting site for the threatened loggerhead turtle. We have been told by older Tampa Bay area residents that in the early part of this century family groups would camp on the island to harvest sea turtle eggs. Aerial surveys made in the early 1970's did not indicate real density nesting and revealed that loggerhead use on Egmont Key was of minor significance. Refuge personnel observed four nests and estimate that eight clutches were deposited on Egmont Key by loggerheads.

Sea turtles have not been known to visit Passage Key in recent times. Surrounded by a large shoal the shallow waters probably discourage most nest-bent loggerheads. Erosion of both refuges certainly accounts for the low density of nest sites.

4. Southern Bald Eagle

Several eagles nest in Pinellas County each winter and probably utilize the refuges on occasion. Pinellas County has one of the highest human populations in the State, but also has one of the higher eagle nesting populations.

B. Migratory Birds

1. Waterfowl

Various species of waterfowl are found in the waters surrounding each of the Tampa Bay Refuges.

Since these waters are outside of the refuge boundary we have not attempted to record numbers that seasonally exist there. Lesser scaup, ring-necked ducks, blue-winged teal, mottled ducks and red-breasted mergansers have been observed in the central lagoon of Tarpon Key, Pinellas Refuge.

2. Marsh and Water Birds

A variety of marsh and water birds occur on the three Tampa Bay Refuges. Although Passage and Egmont Key Refuges support feeding populations of waders, Tarpon Key of Pinellas Refuge provides both breeding and feeding habitats.

Roseate spoonbills and white ibis are observed frequently feeding on the rich grass flats surrounding both Tarpon and Indian Keys. Other colonial birds including great and snowy egrets, great, little blue and Louisiana herons and cormorants are known to nest there. No accurate surveys were conducted to make an estimate of colonial bird production on this refuge. Brown pelican nesting success is discussed in a previous section. Winter migrants include the common loon, white pelican and the horned grebe.

3. Shorebirds, Gulls, Terns and Allied Species

Historically, Passage Key has been a significant nesting site for laughing gulls, least terns, black skimmers and American oystercatchers. The erratic shifting of the island produced four small sandbars in 1979. Only the center two had an elevation high enough to permit vegetation to reestablish or provide dry sand nesting areas. About 180 skimmers, 14 least terns, and one oystercatcher nests were observed by personnel in 1979. Although laughing gulls loafed on the refuge none nested -- probably due to the absence of vegetation in which this species likes to conceal their nests.

Following one visit when but a few dozen skimmers had pipped, high storm tides inundated the key on two occasions and swept away the majority of eggs present. Consequently, production for 1979 was insignificant.

Black skimmer eggs and young.

The beaches of Egmont Key provide habitat for willets and other less common sandpipers and plovers. The southern tip of the island is a wide beach that has attracted 500 loafing royal terns, 200 laughing, 50 ring-billed, and 15 herring gulls during at least one visit in 1979.

Passage Key National Wildlife Refuge was closed to the public from April 1st to September 1st during the laughing gull and black skimmer nesting season.

Passage Key during nesting season.

In October approximately 150-200 laughing gulls died on Passage Key due to excessive levels of E-Coli bacteria. This was believed to have been caused from heavy run-off from floods in September, which washed raw sewage into Tampa Bay.

In December, a large number of small shorebirds died on Anna Maria Island and Passage Key National Wildlife Refuge. The State lab could not determine the cause of this die-off.

4. Raptors

Ospreys were observed in the vicinity of the Tampa Bay Refuge group but none are known to nest on the islands.

Kestrels were seen regularly on Egmont Key and Pinellas Refuges.

5. Mourning Doves

Indian Key, and to a lesser extent Tarpon Key, are major mourning dove roosts for the St. Petersburg area.

C. Mammals and Non-Migratory Birds and Others

1. Game Mammals

Nothing to report.

2. Other Mammals

Raccoons inhabit Pinellas Refuge but no tracks or signs were observed this year on Egmont Key.

Several dozen semi-wild house cats inhabit the Pilot's Station. Although fed daily, they do roam over the entire island which partially explains the lack of ground bird nesting on this refuge.

Small rodents occur on Egmont Key but we have not attempted to ascertain species or population sizes.

3. Resident Birds

Nothing to report.

4. Other Animal Life

Other than certain birds, the gopher tortoise is the most noticeable wildlife species on Egmont Key. The Florida box turtle is also present as well as Key West and green anoles. A single black snake and two diamondback rattlesnakes were observed this year. In the fall the Coast Guard crew killed one rattlesnake swimming under their dock to the beach, and another was found under their boardwalk.

The Coast Guard light station has a large golden retriever that is terrorizing the island's gopher tortoises. He is able to crush all but the largest in his mouth. We have been trying to solve this problem some way other than with shotgun diplomacy. The only other major predator of the tortoises is the visiting public. One tortoise was found drowned in a large above-ground cistern and another was found washed up on Passage Key, presumably tossed overboard from a boat.

The waters of Tampa Bay support a large commercial fishery with mullet being the most sought after food species. Deep waters adjacent to Egmont Key (90 feet just off the island's northern tip) are reported as being good grouper holes. Both Egmont

and Passage Keys are reported to be high on the list of surf fishermen with good catches of snook, speckled trout and redfish.

Shelling attracts many people to both refuges. Bivalves are very common and nice specimens of sunrays and cockles clutter the beaches. Univalves are not as common as on Sanibel Island or some of the other barrier islands further south, but fighting conchs, left-handed whelks, and horse conchs are occasionally found washed up on the beaches.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On-Refuge

Until October the only public contact was made during the monthly trips from Sanibel. During the last three months of the year the Assistant Refuge Manager was on scene at least every weekend. Approximately 40,000 people visit the three refuges annually.

The peak visitor season appears to be from May to October with the weather deciding the visitation during the rest of the year. Other than one tour boat and a few rental boats, the visiting public must use their personal watercraft to reach the islands. What effect $1.25+ fuel will have on the visitation will remain to be seen. Until we obtain some reliable visitation figures we will depend on trends observed by the staff and the regular visitors to determine any upward or downward swing.

We have begun consideration of a combination nature/history foot trail on Egmont Key. Such a trail would utilize the remnants of the Fort Dade road complex. It would interpret the coastal barrier island ecosystem and the coastal defense program of the U. S. military.

Visitation on Pinellas National Wildlife Refuge is usually discouraged due to its importance as a nesting/resting/roosting area. The inner lagoon of Tarpon Key is closed during the pelican nesting season.

Passage Key is closed to the public from April 1st to September 1st. The remainder of the year it is open and heavily used by shellers.

2. Off-Refuge

One program was given to a biology class at Eckerd College in December. In November the Federal role in the Florida manatee's protection was presented to State Marine Patrol Officers in Tampa at an Audubon sponsored meeting.

Several news releases were issued during the year concerning staffing, closures, and other management activities.

B. Recreation

1. Wildlife Oriented

Fishing and shelling are very popular with visitors to Passage and Egmont Key Refuges. Birding enthusiasts regularly visit Tarpon Key (Pinellas Refuge) to view birds from boats and on occasion overenthusiastic birders investigate the center lagoon for improved bird watching.

2. Non-Wildlife Oriented

Hundreds of visitors regularly land on Egmont Key during the season simply to enjoy the sun and relatively isolated beach. Many of the larger boats spend one or more nights anchored around the island. The military ruins also attract a smaller but still sizeable crowd to the interior of Egmont. All the refuges are restricted to daylight use only.

C. Enforcement

Due to the increased patrol time during the summer and the stationing of a permanent employee in October several cases were made on the refuges. Following are listed these violations:

Violation	Fine
Trespassing - closed area Passage Key	$ 50.00
Trespassing - closed area Passage Key	50.00
Trespassing - closed area Passage Key	50.00
Trespassing - camping - Egmont Key	50.00
Trespassing - camping - Egmont Key	50.00
Hunting - Indian Key	50.00
Hunting - Indian Key	50.00
Unauthorized vehicle - Egmont Key	50.00

All of the trespassing cases were made after the violators were observed reading one of the regulation signs and then ignoring them, or found so near a regulation sign that they could not have missed it. The unauthorized vehicle was a motorcycle on Egmont Key that failed to stop when approached by a refuge officer. The hunting cases were made on dove hunters on Indian Key in Pinellas National Wildlife Refuge, and were worked with the assistance of Special Agent John Minick, the St. Petersburg Police Department's helicopter and boat, and the local Florida Game and Fresh Water Fish Commission Officer. Four hunting cases are still pending involving hunting on Indian Key, and one for camping on Egmont Key. The cooperation between law enforcement agencies in this area is excellent.

In September two Tampa men pleaded nolo contendere to the killing of a brown pelican. The case was worked by Special Agent Minick and the Florida Game and Fresh Water Fish Commission Officers. Since they were indigents, as a part of their probation, the court sentenced them to work one day every other weekend on the Tampa Bay Refuges for six months. They have proven to be a mixed blessing.

Again this year we had our problems with the Army conducting exercises on Egmont Key. On December 5th it was discovered that a local Army Reserve Unit was going to conduct landing craft maneuvers on Egmont Key. The unit was contacted and informed that all maneuvers were to be limited to the Coast Guard property on the north end of the island. On the day of the exercises the unit that had been warned stayed off the refuge, but they dropped off three vehicles belonging to another unit on the refuge's southeast beach, and 60 Boy Scouts on the southwest beach. The latter were planning to camp on the refuge for the weekend which is against regulations. Although the Assistant Refuge Manager was able to corral the vehicles, by the time he got to the Boy Scouts they were already set up and hopelessly scattered. The damage done to the vegetation and to the low dunes common to Egmont will take a long time to heal, while the damage to the beach will increase an already serious erosion problem. We expect this will be the last exercise that violates refuge regulations.

During the opening weekends of dove season Assistant Manager Black worked with Special Agent Minick and State officers on areas surrounding Tampa and St. Petersburg. In addition to making several good cases it was a valuable learning experience.

VI. OTHER ITEMS

A. Field Investigations

One hundred twenty nestling brown pelicans were captured on Tarpon Key by personnel of the Florida Game and Fresh Water Fish Commission and the Louisiana Game and Fish Commission. These birds were transported to Louisiana for release in an attempt to reestablish this endangered species in that State. This has been an ongoing project for several years.

Dr. Vivian Mendenhall from Patuxent Wildlife Research Center visited Tarpon Key to collect a series of brown pelican eggs for pesticide level studies.

Young brown pelicans "migrating" to Louisiana.

B. Cooperative Programs

The YCC group from J. N. "Ding" Darling Refuge visited Egmont Key for litter removal and pest plant control. The trip has become an annual affair and adds something special to the program.

C. Items of Interest

As in the past several pleasure boats were lost on Egmont's beaches due to rough seas surprising some rather foolhardy boaters. No loss of life was reported.

The Assistant Manager was named Charles LeBuff's Alternate Field Response Coordinator for oil spills and he attended one session on oiled bird rehabilitation sponsored by the Florida Audubon Society.

Special Agent John Minick generously offered to share his office with Refuge Manager Black. The offer was taken and has been a definite help.

This report was written by Bill Black and typed by Dolores Ambrose.

D. Safety

All work projects on the Tampa Bay Refuge islands were conducted in a consistently safe manner. Activities were carried out with each employee recognizing that they were working many miles and a lengthy time span from medical assistance, and if a major medical emergency occurred it could result in serious personal consequences for the individual involved -- not just paperwork either!

Assistant Manager Black attended the Coast Guard Auxiliary's Safe Boating Course and a Service sponsored Fire Training Session in Atlanta. He also made arrangements to enroll at St. Petersburg Junior College for Emergency Medical Training. Due to the large visitation and the distance and difficulties involved in getting to medical help this course was felt necessary to better serve the public and fellow employees.