

MACKAY ISLAND NATIONAL WILDLIFE REFUGE

KNOTTS ISLAND, NORTH CAROLINA
and
VIRGINIA BEACH, VIRGINIA

ANNUAL NARRATIVE REPORT

Calendar Year 1981

NATIONAL WILDLIFE REFUGE SYSTEM
Back Bay NWR Complex
Fish and Wildlife Service
U.S. DEPARTMENT OF THE INTERIOR



1 4 5 7 6 3 2
PERSONNEL

1. Glen W. Bond, Jr.	Project Leader	GS-12	PFT
	EOD 09/17/77		
2. Allen C. Hundley	Assistant Refuge Manager	GS-9	PFT
	EOD 07/02/78		
3. Michael J. McMinn	Assistant Refuge Manager	GS-7	PFT
	EOD 07/02/78		
4. James A. Pittman	Maintenance Mechanic	WG-10	PFT
	EOD 04/09/62		
5. Edna M. Ford	Administrative Clerk	GS-6	PFT
(PT for Mackay Island)	EOD 01/18/65		
6. Daniel R. Dinkler	Outdoor Recreation Planner	GS-7	PFT
(PT for Mackay Island)	EOD 03/28/81		

TEMPORARY APPOINTMENTS

7. Timothy G. Williams	Maintenance Worker	WG-3	700 Hr.
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YACC ENROLLEES AT MACKAY ISLAND DURING 1981

8. Buddy Wade	8 months	Thru end of year
9. Jerry Burkindine	6 months	Negative termination November 6

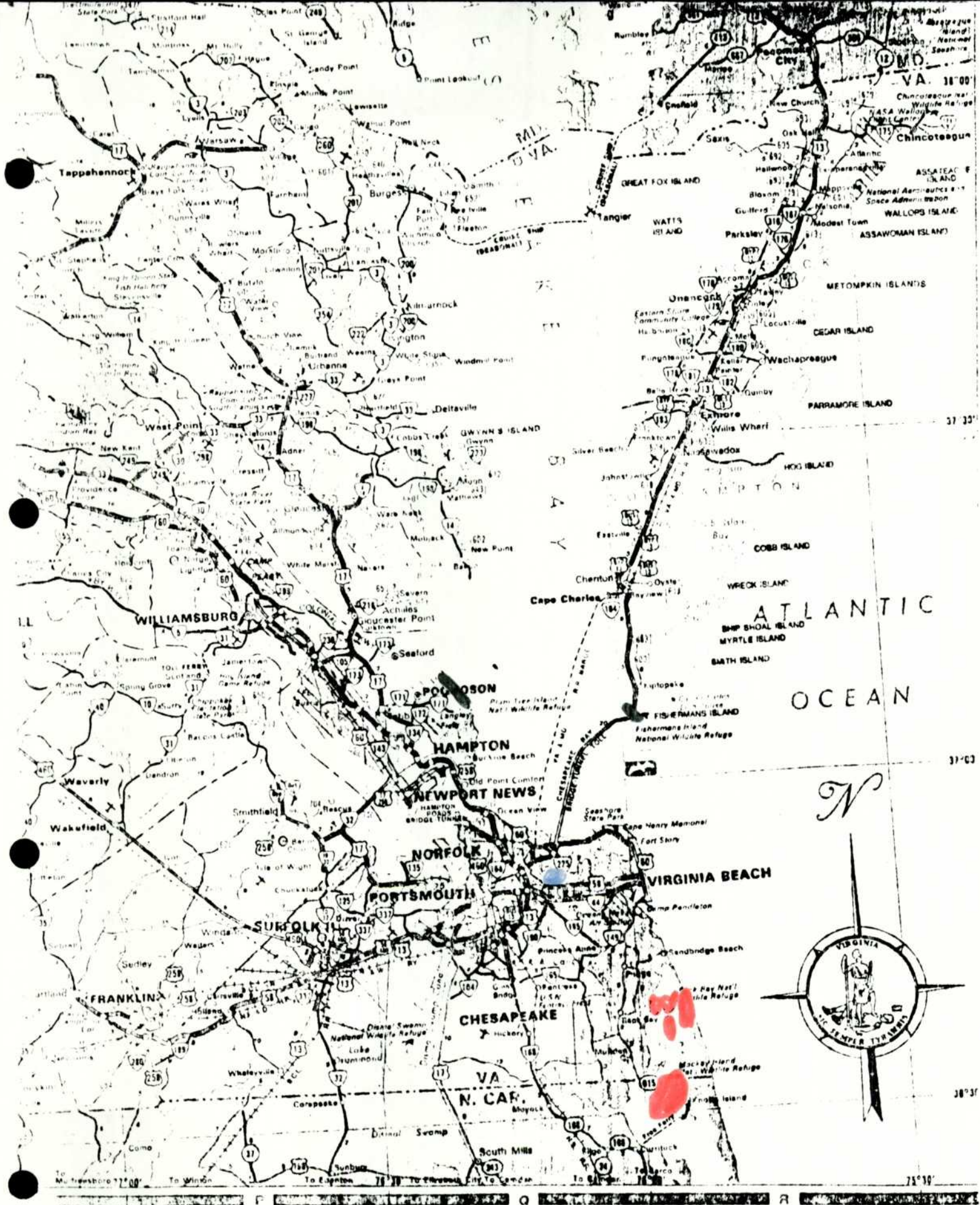
Review and Approvals

Glen W. Bond Jr. 4-23-82
Submitted by Date

Paul D. Daly 4-28-82
Area Office Date

Back Bay NWRC
Refuge

Regional Office Date



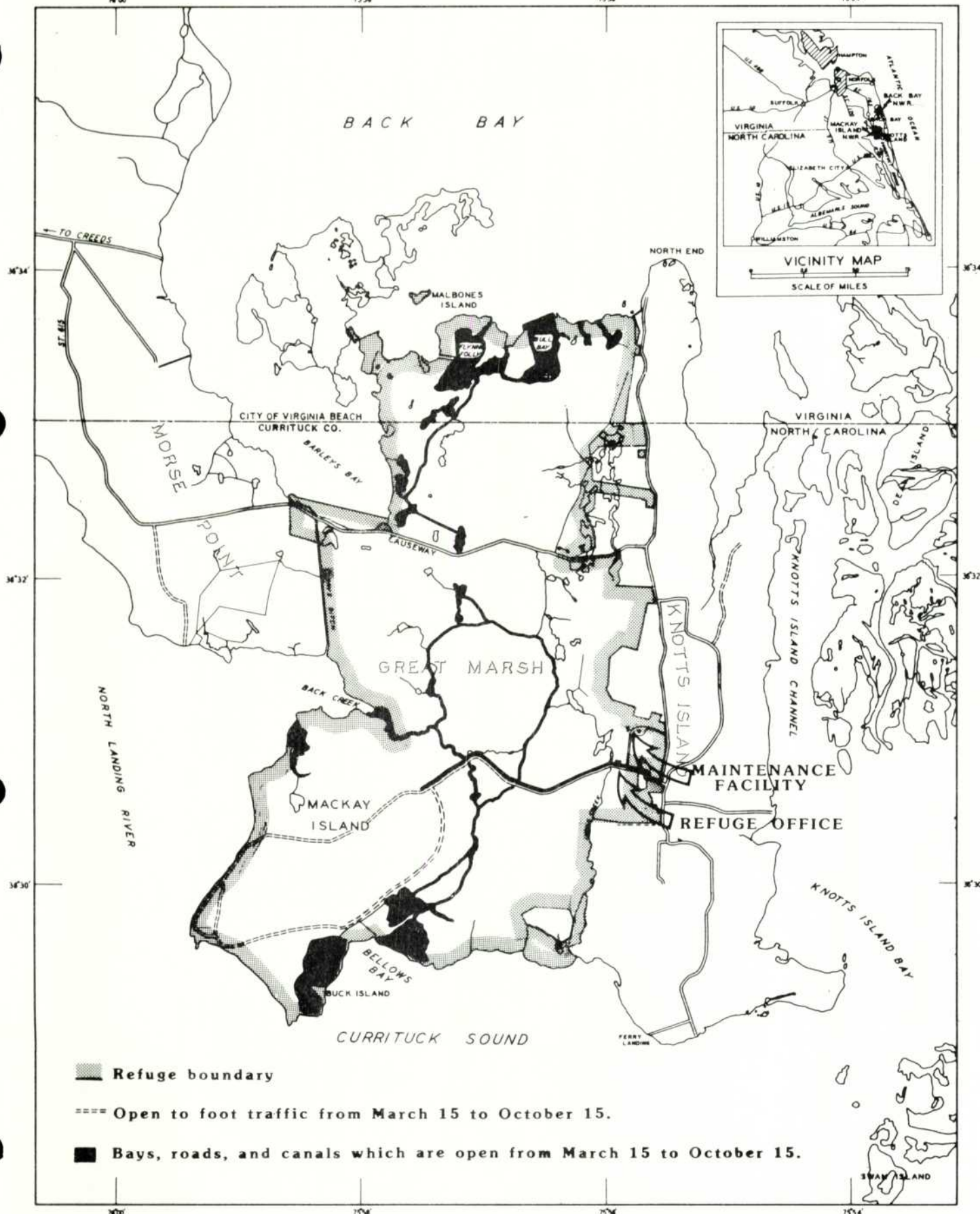
- Office Location -
- Back Bay Complex
- Manned Stations
- Unmanned Stations

MACKAY ISLAND NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

CITY OF VIRGINIA BEACH, VIRGINIA
CURRITUCK COUNTY, NORTH CAROLINA

UNITED STATES
FISH AND WILDLIFE SERVICE



Refuge boundary

==== Open to foot traffic from March 15 to October 15.

Bays, roads, and canals which are open from March 15 to October 15.

COMPILED IN THE BRANCH OF REALTY
FROM SURVEYS BY G.S. AND
AERIAL PHOTOGRAPHS BY U.S.D.A. AND
U.S.M.C.

NEWTON CORNER, MASS. DECEMBER, 1956

Scale 0 20 40 80 120 160 CHAINS
0 1/4 1/2 1 1 1/2 2 MILES

MEAN
DECLINATION
1954



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BACK BAY NATIONAL WILDLIFE REFUGE
PEMBROKE OFFICE PARK
PEMBROKE # 2 BUILDING, SUITE 218
VIRGINIA BEACH, VIRGINIA 23462

MACKAY ISLAND N.W.R.
FISHERMAN ISLAND N.W.R.
PLUM TREE ISLAND N.W.R.

SPORT FISHING REGULATIONS

Sport fishing on the Mackay Island National Wildlife Refuge is permitted on the areas designated by signs as open to fishing. These areas, which are open from March 15 to October 15, include Mackay Island Road and the canals and bays throughout the marshes of the refuge. Areas which are open to fishing throughout the year include Corey's Ditch and fishing from the banks of the Knotts Island Causeway. Boat launching at the causeway bridge on Corey's Ditch is permitted throughout the year.

- 1) Commercial fishing, trot lines, and eel trapping are not permitted in the bays or canals of the refuge.
- 2) Sport fishing is permitted during daylight hours only.
- 3) There is no horsepower limitation on boat motors. Airboats are prohibited.

The canals and bays open to sport fishing from March 15 to October 15 are designated by a heavy dark line on the reverse side. Sport fishing shall be in accordance with all applicable state regulations.

The provisions of this special regulation supplement the regulations which govern fishing on wildlife refuge areas generally, which are set forth in Title 50, Code of Federal Regulations, Part 33.

For further information contact: Refuge Manager
Mackay Island National Wildlife Refuge
P. O. Box 31
Knotts Island, North Carolina 27950
Telephone: AC 919-429-3100

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A. HIGHLIGHTS

The first bid-for-unit trapping program was held this year and \$1,209.00 were submitted to the refuge for trapping privileges on the refuge. (Section H. 10)

The refuge office and shop were burglarized during the year. (Section H. 17)

A black swan was observed on the refuge on April 10. (Section G. 3)

Cornell University-raised Peregrine Falcons were introduced to the wild at Mackay Island, after a controversy over using an introduction site in North Carolina. (Section G. 2)

Volunteer help was used at Mackay Island this Spring for the first time. (Section E. 4)

The first legal deer hunt to ever be held on Mackay Island was held this year. (Section H.8)

The refuge staff, with YACC assistance, dismantled one building and built it anew as a storage building for large refuge equipment. This building puts approximately 3,211 square feet of storage space under roof. (Section I. 1)

B. CLIMATIC CONDITIONS

Mackay Island National Wildlife Refuge records the daily rainfall, but the temperature readings in this report are recorded at Back Bay National Wildlife Refuge, which is approximately nine air miles from Mackay Island National Wildlife Refuge. Subfreezing temperatures were experienced from January 10-13. The hottest spell of the year was July 9 and 10 when the temperature never dropped below 90° F. The subfreezing temperatures of January 10-13 were during the longest freeze-up of the Bay and of Currituck Sound in the memories of most local residents. The freeze-up, combined with the one and one-half years of drought, gave wintering waterfowl in the area very little reason to stay, so most waterfowl moved further south. The frozen sound and marsh caused 300 snow geese to begin feeding on the refuge farm fields on Knotts Island. This was the first time these fields have been used by snow geese. This hard freeze kept many waterfowl out of the area until mid-February, when temperatures began to moderate.



Mackay Island on a chilly day in 81-13 ACH
December.

The 30-year average growing season in this area is 244 days and the last frost of the year usually occurs on March 22 and the first frost of the winter comes near November 21. This year the frost free growing season was from March 26 to November 13.

The Hampton Roads Area drought of the last two years may actually have begun coming to an end as there was 12 inches of rain recorded at Mackay Island during August. The average normal rainfall over thirty years is 44.68 inches. The following table depicts the rainfall at Mackay Island and the temperature variations at Back Bay during 1981. The two weather stations are approximately 10 miles apart.

	1981 Back Bay NWR		Temperatures Fahrenheit		1981 Mackay Island	
	Rainfall	Snowfall	Maximum	Minimum	Rainfall	Snowfall
January	1.37	TR	63	09	2.16	TR
February	3.21		67	12	3.85	
March	2.10		75	30	2.37	
April	1.60		86	37	2.35	
May	2.25		90	46	1.85	
June	4.97		97	60	6.66	
July	5.40		96	65	3.25	
August	10.30		96	60	12.15	
September	3.61		89	50	.87	
October	2.66		85	42	1.95	
November	1.82		88	28	2.11	
December	4.67	TR	68	18	3.97	TR
	43.96	TR			43.54	TR

The average daily temperature in January was 35.7⁰ and the average daily temperature in July was 83.5. The driest month of 1981 was September when only .87 inches of rain fell and the wettest month was August when 12.15 inches of rain fell.

C. LAND ACQUISITION

1. Fee Title

Although the eastern boundary of the refuge is very irregular, there are no immediate plans to acquire the land. There was one adjacent landowner who offered to sell his land to the U. S. Government.

D. PLANNING

1. Master Plan

No work was accomplished this year in preparation for a refuge master plan.

2. Management Plan

A new Big Game Management Plan was written and submitted this year, which presented the opportunity for a white-tailed deer hunt to be held during the 1981 fall season.

3. Public Participation

Comments on a possible deer hunt were solicited as part of the Environmental Assessment, which proposed a deer hunt for Mackay Island. Most letters received at the station were people asking for permission to hunt. Very few people actually responded with comments on whether there should or shouldn't be a hunt.

A water control structure proposal requiring an environmental assessment prompted a newspaper release soliciting comments on the proposal. As of this writing there had been no comments received on this issue.

4. Compliance with Environmental Mandates

Environmental Assessments were required for the big game management plan and the cross dike proposal. For each of these assessments, there was a finding of no significant impact.

A proposal to build two weir-type water control structures in the Great Marsh was initiated during this year and a news release was printed in a local newspaper on December 30, 1981. The news release is the initial step in the environmental assessment process which is required for that project.

Besides addressing all N.E.P.A. requirements, these assessments also addressed the Executive Orders on Floodplains and Wetlands. The station also had to apply to the Corps of Engineers for permission to build a Peregrine Falcon hacking tower.

5. Research and Investigations

Back Bay NR 81 - "Survey of Amphibians and Reptiles on Back Bay National Wildlife Refuge Complex (BB-80-2)

Dr. Joseph Mitchell and Chris Pague were issued a permit in 1980, which was extended through 1981 to develop a listing of reptiles and amphibians found on Back Bay NWR and on Mackay Island NWR in Virginia. All of their collecting was done on the Back Bay NWR in 1981 and a preliminary listing of these species was submitted to the Project Leader in 1981. Although there have been no conclusions reached yet, it does appear that turtle growth may be affected positively by the refuge impoundments. The study will be continuing into 1982.

E. ADMINISTRATION

1. Personnel

There were no personnel changes in the staff assigned solely to Mackay Island. But there was a slight change in the staff which is assigned to Mackay Island part of the time. Dan Dinkler, from Wapanocca NWR transferred to Back Bay to fill the vacated ORP position and he does interpretive and educational work on Back Bay and on Mackay Island. The way transfers came to a screeching halt during calendar year 1981, it appears that the Mackay Island staff may just as well plan on retiring as North Carolinians.

	Full-time	PERMANENT		Temporary
		Part-time	Part-of-the-time*	
FY 82	3	0	3	1
FY 81	3	0	3	1
FY 80	3	0	3	1
FY 79	3	0	3	1
FY 78	3	0	3	1

* These are employees that are assigned to the Back Bay NWR Complex, but spend time working on each station. (Project Leader, Administrative Clerk, and Outdoor Recreation Planner.)

2. Youth Programs

The Back Bay YACC Camp was closed, with the administration activities transferred to Bombay Hook. We had two enrollees at the time, but one was fired for theft of government property. (Section H-17)

Looking back at four years of this program, the feelings are mixed as to the plus and minus of it all. We got two new storage buildings and some nice equipment. We had many headaches and damaged equipment. We got a lot of tedious manual labor jobs done and saw a lot of waste in time and material. All in all we are better off in having the program, but, oh, if it could have been administered differently.

There was no YCC camp this year.

4. Volunteers Program

We had one volunteer this year who spent all his time helping with the wood duck nesting survey.

5. Funding

Funding at Mackay Island NWR wasn't even enough to keep basic refuge operations out of the red until FY '78 when the funding began to improve significantly. Fiscal Year '78 was the first year that this station was able to begin progress in maintaining and improving the habitat for wintering waterfowl. It was in Calendar Year 1978 that a new Assistant Manager position was created as well as a new Outdoor Recreation Planner position to the Back Bay Complex.

The funding at the station has gradually climbed over the past three years, but not sufficiently to keep pace with inflation. The following table depicts the budget here over the past five years.

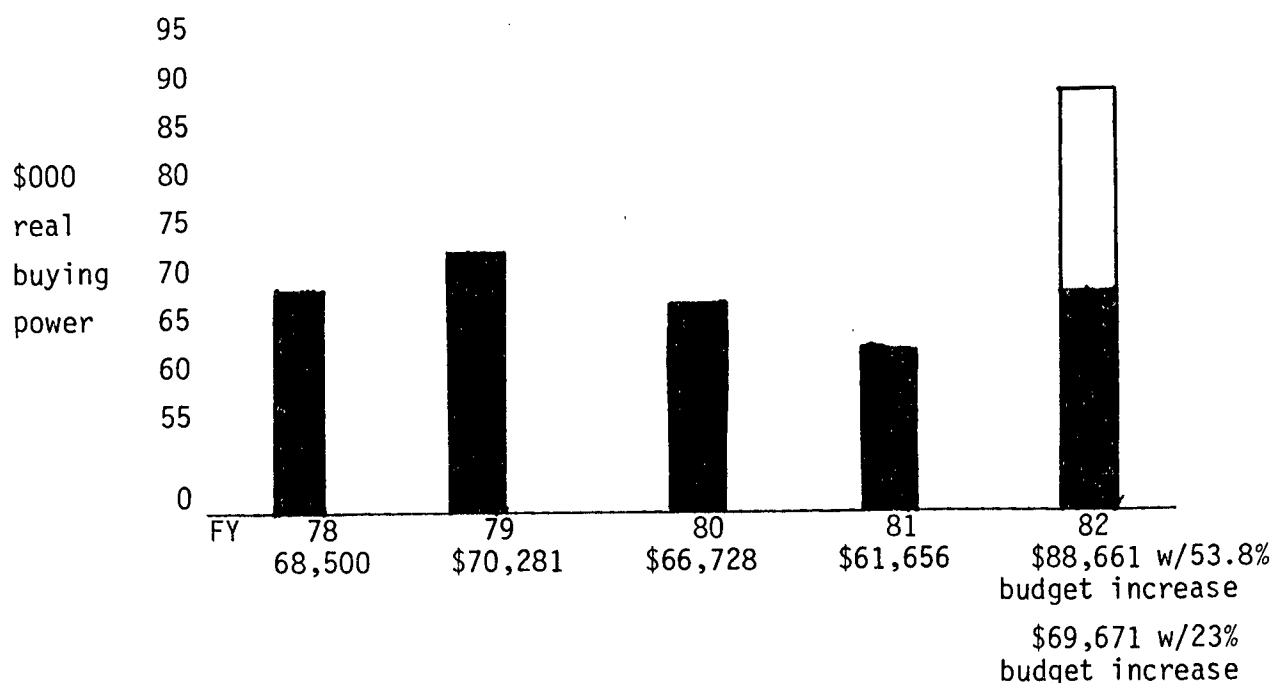
(\$000)

	Total	1210	850	1220	1240	850	1994
FY 78	68,500	58	0	1	9.5	0	0
FY 79	76,000	66	0	1	9	0	0
FY 80	76,000	56	10	1	5	4	0
FY 81	78,000	56	10	3	4	4	1
FY 82	120,000	68	32	11	6	2	1

The \$120,000 budget for FY 82 has been reduced by 20% down to \$96,000. Using the Consumer Price Index to track inflation over the past five years, I have illustrated the real budget picture for Mackay Island NWR. The consumer price index indicates a loss in buying power which is offset in some years, in part, by budget increases. In computing these real changes in buying power, you should keep in mind that the change each year is relative to the previous year only. And that the actual buying power each year is the net change in budget and the rate of inflation from the previous year. Compiling these changes does not give you the accurate change over this five year period since all figures are relative to the previous year and not based directly on 1978 dollars. Although the illustration lists CPI as an up figure, in reality it is a down effect on the buying power of dollars. By combining the down effect of the previous year CPI with the new budget you will get the net change in buying power for that year. The table illustrating the changes over the past five years is as follows:

Consumer Price Index + Budget Increase = Real Buying Power			
FY	(rate of inflation)		
78	up 8.4%		
79	up 12.2%	up 11.0%	up 2.6%
80	up 10.2%	No change	down 12.2%
81	up 10.0%	up 2.6%	down 7.6%
82		up 53.8%	up 43.8%
		(23% after 20% cut)	(up 13% after 20% cut)

When these figures are combined and put on a graph the real budget picture for Mackay Island NWR takes on a different look.



As you can see the real buying power of the Mackay Island NWR budget has only increased \$1,171 since 1978.

BLHP construction appropriations intended for Mackay Island and those actually spent here are as follows:

	<u>Appropriated</u>	<u>Actually Spent</u>
FY 78	\$279,000	\$198,398
FY 79	\$ 10,000	\$ 5,610
FY 80	0	
FY 81	0	
FY 82	\$ 75,000	?

The initial funding received for FY 82 would be an acceptable budget for this station to accomplish its mission in operations and maintenance, but there are still some major construction funds and acquisition funds desperately needed for this station to approach its potential. Funding is severely needed for protection of three and one-half miles of dike which is in jeopardy of burrowing mammal-undermining and erosion.

6. Safety

The author would first like to congratulate the refuge manual coordinator on moving the safety section from the last section in the narrative to at least much closer to the front. I have always wondered if safety had been thrown into the old format as an afterthought or last only because someone somewhere along the line felt safety required at least lip service.

Safety at Mackay Island was again kept foremost in the minds of the staff as all projects were initiated. But as usual a YACC enrollee managed to sustain an injury while on the job. An enrollee from Back Bay strained his back while helping the Mackay Island refuge staff get a marsh vehicle unstuck.

Another YACC enrollee at Mackay Island contracted a case of poison ivy.

The marsh vehicle, Spryte, was again used in the refuge marshes and it again created an aftermath which made the staff express some less than affectionate utterings for the makers of the Spryte. The first unfortunate event was the tracks separating while in a pond, the next event was the vehicle getting stuck in the marsh, and the "last straw" was the track coming off of the vehicle while it was in floating marsh. Is anyone interested in a Thiokol Spryte?

No lost time accidents have occurred since the refuge was first manned September 25, 1961, a total of 7,209 calendar days.

F. HABITAT MANAGEMENT

1. General

The primary habitat management carried out on Mackay Island NWR is the water level manipulation inside the two impoundments and prescribed burning in the marshes of the refuge. There is also a cooperative farming program which allows the refuge to provide some supplemental green browse for wintering geese. To monitor habitat conditions and determine types of plant foods available on the refuge and in the immediate water area, vegetative transects have been established for annual sampling of the available plants.

The Great Marsh is divided into three distinct units by roads. There is a transect line in each marsh. These lines are sampled on a rotation of one unit each year. The small impoundment transect is sampled every year as is

a transect established in the open water of Buck Island Bay. There is nothing that the refuge can do to manipulate the plant composition in Buck Island Bay, but the information being gathered should serve as a good data base on the desirability of the various plant species in Currituck Sound.

2. Wetlands

Small Impoundment

The small impoundment, 26 acres, is the only wetland where the refuge has total control over the water level. This impoundment also has a solid enough bottom to allow occasional disking. Prior to 1979, the only manipulation of this impoundment was mowing after the plant seed heads had shattered, and flooding in November. Although there was heavy waterfowl utilization, it appeared that greater utilization might occur with manipulation which would encourage more wild millet.

During the summer of 1979, the impoundment was disked and limed. Each year it is drained from March to November and flooded with 8" to 12" of water the other months. Transect results of the seven most common plants are compiled on the following table.

	% of total plant composition		
	1979	1980	1981
Saltmarsh <u>Fimbristylis</u>	20.9	2.2	0.5
Wild Millet	19.0	8.8	4.0
Panic grasses	14.0	27.3	19.0
<u>Cyperus</u>	6.5	2.6	0
Spikerushes	6.5	5.3	0.5
Partridge Pea	1.5	3.5	26.0

Partridge pea was the most common plant in the impoundment before the disking and it appears that it will be the dominant plant again. Utilization of the impoundment was below average during all three years. Drawdown as usual will occur in 1982, and the impoundment utilization will be observed next winter to determine whether the impoundment is low on available waterfowl food or if the low use is simply a product of the extremely low waterfowl populations wintering in this area.

The flooding of the impoundment is usually initiated by opening the water control structure and allowing water from Currituck Sound to enter. To raise the water level further, a 16" Crisafulli pump on a John Deere 2640 tractor is utilized. Pumping time and fuel consumption over the last five years is as follows:

	Fuel Consumption	Time Pumped	Tractor Power Plant
1977	153	200 hrs.	Ford with 8" pump
1978	108	166 hrs.	Ford with 8" pump
1979	86	32 hrs.	JD 4240 with 16" pump
1980	51	17 hrs.	JD 2640 with 16" pump
1981	96	41 hrs.	JD 2640 with 16" pump

Before the flooding this year, the refuge staff mowed some strips in the impoundment on October 21. After mowing with a 7' rotary mower, on October 23, the impoundment was burnt. Approximately 60% of the vegetation burnt, thus, leaving excellent habitat diversity to over-winter waterfowl. Approximately 500 ducks were observed regularly on the impoundment during November and December. Still, the impoundment which looked so good to the refuge staff was not utilized by waterfowl nearly as much as the staff had anticipated it would be.

Large Impoundment

On December 4, 1980 this impoundment was burnt by refuge staff. The burn was excellent, as good a burn as any staff members ever recall seeing. Water was held on this impoundment from the date of burning right on through till March. The average reading was 1.3', which is approximately 4" of water on the marsh area. The maximum of 1.5' was not attained till the last week of February, just prior to dewatering. No significant waterfowl use occurred on this impoundment.

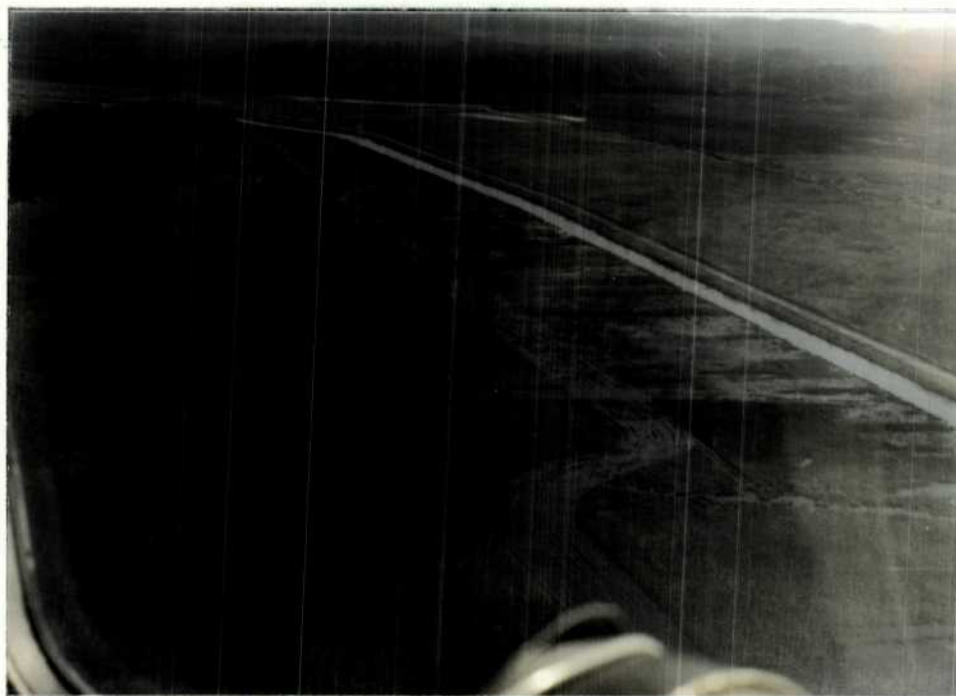
The excellent burn did provide a growing environment for many desirable plant species during the 1981 growing season. The vegetative transect, done on September 23, 1981, indicated significant improvement in the plant composition for wintering waterfowl. The plant composition difference between 1978 and 1981 is indicated here.

<u>Species</u>	<u>1978</u>	<u>1981</u>
Needlerush	50%	14%
Spikerush	23%	27%
Bareground	16%	6%
Phragmites	4%	3%
Smartweed	0	21%
Salt meadow cordgrass	0	8%
Beggarticks	0	4%

The first step taken to improve the accessibility of the plants was to run the marsh vehicle (Spryte) in the impoundment to mat down some grasses to create habitat diversity in the Fall. Then some areas of the impoundment were burnt to create more open spots. These two methods opened up approximately 15% of the impoundment.

Pumping with the JD 2640 and the 16" Crisafulli pump was begun on December 8 at the Hog Pen Point tower site. After losing water there, the pump was moved to the intersection of the long dike and Mackay Island Road. The water level was pumped from 1.2' above msl to 1.8' above msl on January 4, 1982. This indicates almost 10" of water on the marsh, but the pumping required 119 hours and 252 gallons of diesel fuel. What appears to be a perfect marsh in the eyes of man still does not appear so to any of the waterfowl.

A cross dike is proposed for this impoundment and the engineering is presently scheduled for FY 82. The engineering for this project has been estimated to cost \$75,000. A proposal submitted to the Regional Office to have all engineering for this project done by the local Soil Conservation Service has been well received and the SCS has completed their field work and the drawings. The environmental assessment for this project has been completed and the Corps of Engineers permit application was submitted in 1981. If the SCS engineering is acceptable then it is hoped that the \$75,000 will be used to initiate actual work on the crossdike. The SCS has also volunteered to provide the technical assistance in overseeing the construction work.



This impoundment looked good to us,
but the waterfowl shied away from it.

81-12 ACH

Great Marsh

Prescribed burning on the Great Marsh is our only available management tool now and it is becoming more hazardous each year as canals which used to serve as firebreaks continue silting in, thus, allowing vegetation bridges to develop across them. Another hazardous factor besides the firebreak deterioration is the increasing number of residences immediately adjacent to the refuge boundary. The Station's tracked marsh vehicle (Spryte) is a miracle when it works, but a real horror story when something goes wrong. Such an occasion occurred January 13 when the vehicle was being used to make a firebreak and evaluate fire safety along the northeast boundary of the north unit. The Spryte got stuck in the marsh. In desperation, the staff tried to get the Ford and JD 2640 tractors to the stuck vehicle, but to no avail. Finally, the OC-6 crawler from Back Bay NWR and some ingenious winching rigged by Assistant Manager McMinn and Maintenance Mechanic Pittman combined to free the vehicle.

That very same fire line was put to the test two days later when someone set fire to marsh on the north side of the Causeway with a southwesterly breeze blowing. The someone was probably the trapper who had successfully bid on that unit and he was to begin trapping on the 20th. That morning he was in the office talking with Assistant Manager Hundley and Hundley had said that that unit was due to be burnt, but safe conditions had not presented themselves yet. Coincidentally, a half an hour later that unit was burning! (He prefers trapping a burnt marsh.) Houses were jeopardized by the fire as it was carried by the winds directly towards the houses.

Even more coincidental was the appearance of the trapper at the suppression site and his efforts to assist in the suppression efforts. Fortunately no houses burned. The moral of the story? Watch what you say to your trappers!

The dry southwest wind did give a good burn to the marsh, but also a very dangerous one. The local populace blamed the station for the fire

and were quite vocal about the poor planning. More detail of fire will be under the Fire Management Section (F-9)

Bays and Canals

The only vegetative survey under this category is done in Buck Island Bay. This bay, like all the other bays where the government owns the bay bottom, is unmanageable by the station, but information gathered here will allow us a better understanding of what is actually going on around us. A compilation of the Buck Island Bay transects follows:

<u>Species</u>	<u>% Plant Occurrence</u>		
	<u>1979</u>	<u>1980</u>	<u>1981</u>
Niaids	33.7	36.5	24.0
Wildcelery	24.7	5.5	16.0
Littorella	15.7	19.3	4.0
Eurasian Milfoil	14.6	19.3	47.0
Elodea	3.4	5.5	6.0
Spikerush	2.2	0	0
Nitellas	2.2	0	0
Redhead-grass	2.2	0	1.0
Sago Pondweed	1.1	0	0
Bareground	0	2.7	1.0

Graphs depicting the changes in the Great Marsh follow on pages 11, 12 and 13.

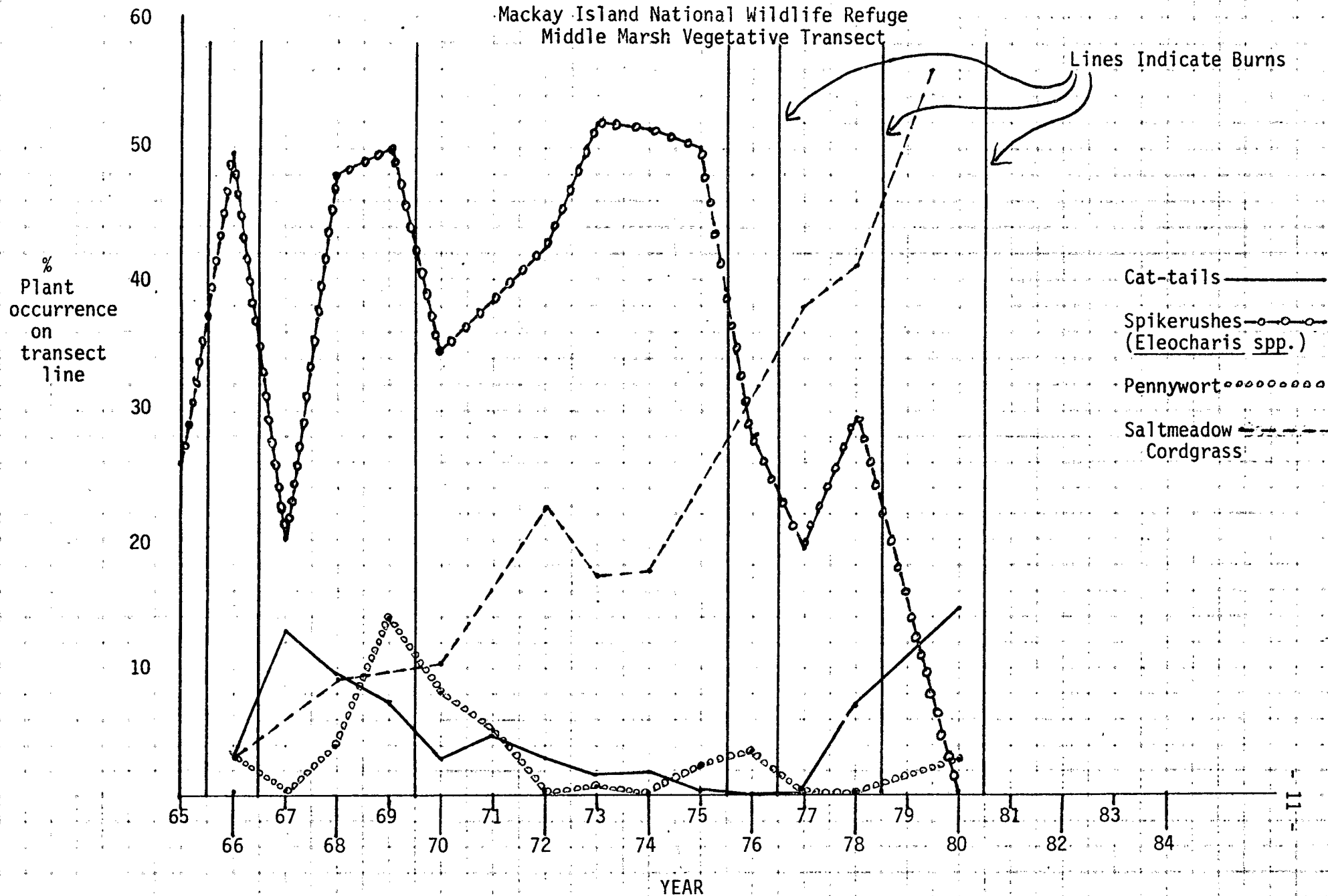
3. Forests

The January 19 arson fire appears to have killed approximately two acres of pine trees which were encroaching into the north marsh.

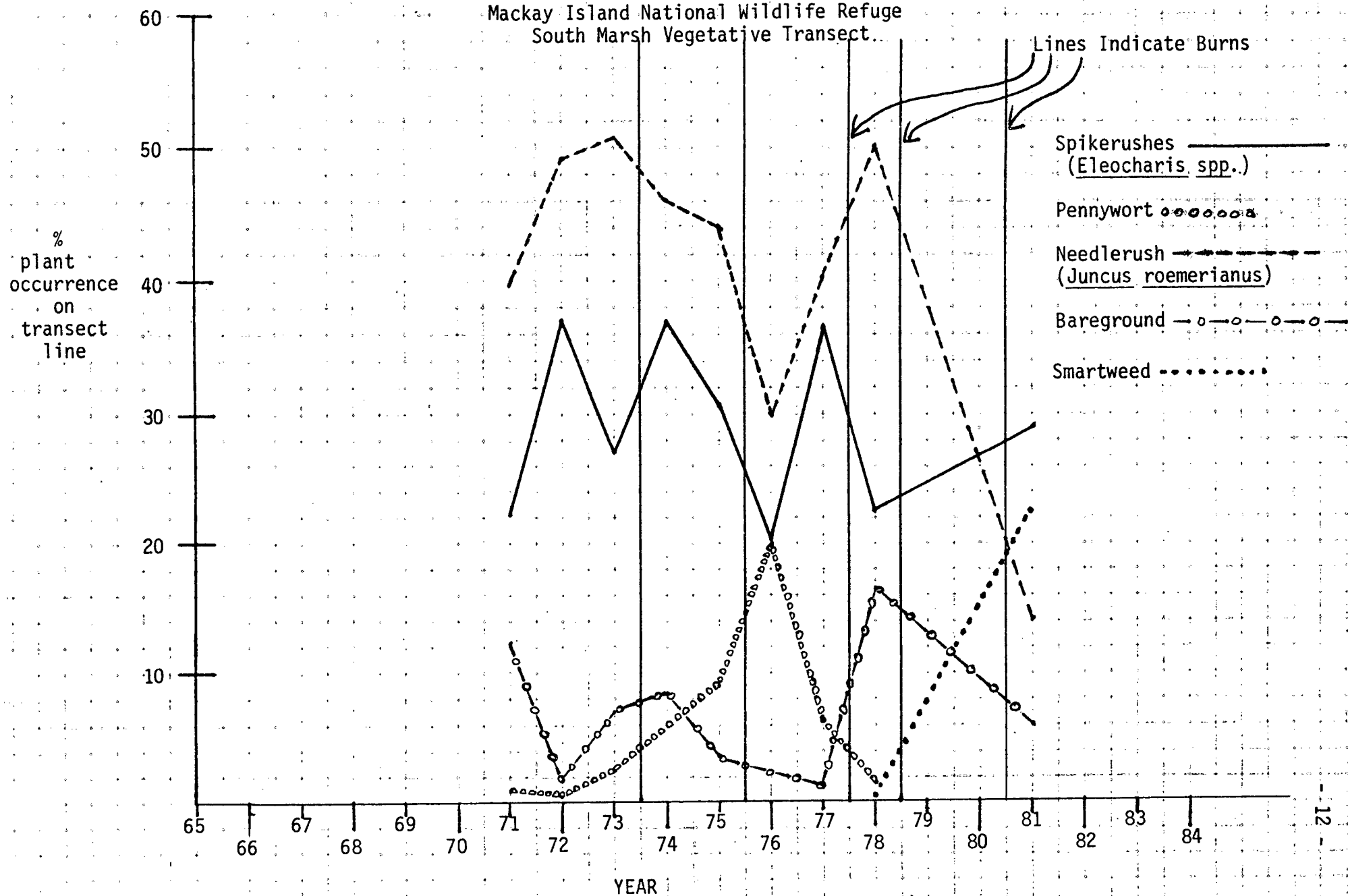
4. Croplands

The Mackay Island NWR cooperative farming program is computed on the basis of local land rental rates. There are only three people who farm on Knotts Island and only one of them is interested in farming on the refuge. Thus, there is no opportunity for competition for the refuge farmlands. This inability to operate a program based on competition reduces the station's bargaining power to get other services accomplished once there is a commitment to allow cooperative farming. Another factor going against a successful cooperative farming program is the low land rental rates on the island of only \$30.00 per acre. Since there are only 121.5 acres of cropland on the Knotts Island portion of the refuge, there is very little services allowance there. Besides keeping the farm fields on Knotts Island open and available for wintering waterfowl, it is also a refuge objective to keep the 50-acre field at Live Oak Point planted to some crop that will be attractive to wintering waterfowl. This year the refuge allowed the farmer (Bonney G. Bright) to plant corn on the Live Oak Point farm field at no charge and no risk to the Government. He was allowed to harvest the whole field except that he had to dry, bag and deliver 100 bushels of corn to the refuge for the Refuge Complex banding quota. There was no charge for planting Live Oak Point to corn because his harvest would be very low. It was 46 bu./acre in 1979, 28 bu./acre in 1980, and he harvested 38 bu./acre in 1981. The corn that was left by his combine helped

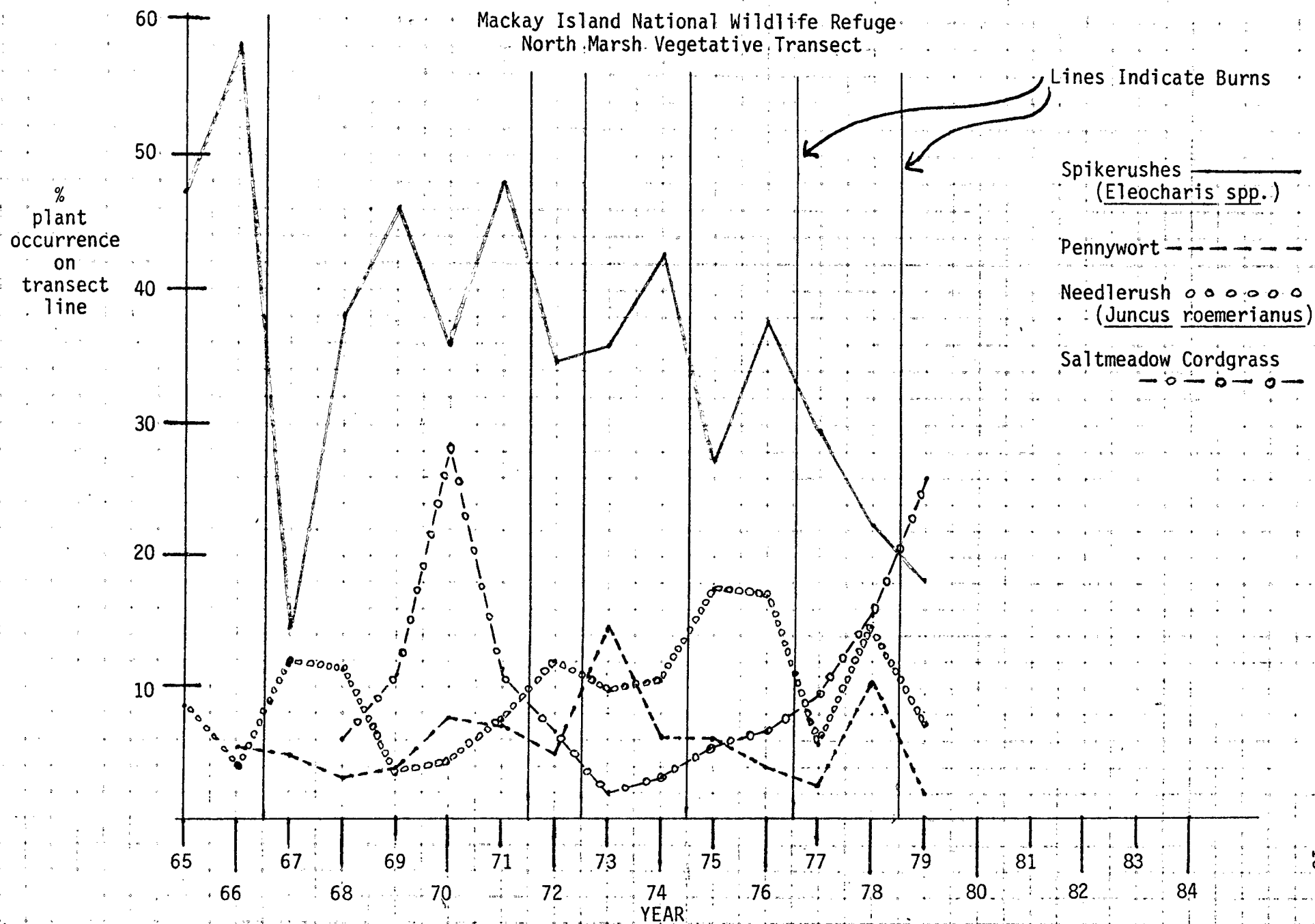
Mackay Island National Wildlife Refuge
Middle Marsh Vegetative Transect



Mackay Island National Wildlife Refuge
South Marsh Vegetative Transect.



Mackay Island National Wildlife Refuge
North Marsh Vegetative Transect



to provide some grain diversity with the wheat which he later planted but did not harvest. The heavy deer use kept the wheat low, but not too low for it to get utilization by snow and Canada geese. The wheat was planted in mid-September which is five weeks earlier than usual. Part was planted by broadcasting with truck and part was drilled in by the refuge. There was no significant difference in germination rates. The earlier planting helped the wheat establish better root systems in spite of the drought conditions. Approximately 600 snow geese and 200 Canada geese fed on this wheat field from mid-October thru November. The geese and deer kept the wheat quite short. In an attempt to improve the growth of the winter wheat, arrangements were made with the cooperative farmer to spread 50 pounds of nitrogen per acre. The cost per acre was \$15.00. Thus, a total of \$600.00 was good for 40 acres.

The cooperative farmer gets three crops from each field every two years. He plants corn, then plants over-winter wheat, and then soybeans. There are 121.5 acres of refuge crop fields on Knotts Island which are separated into four general field groups. During 1981, the cooperative farmer harvested 125.5 bu./acre of corn from the Bonney Fields, and the North Fields. He harvested 39 bu./acre of wheat and 28 bu./acre of soybeans from the coop fields and the office fields. Another year of the farmer doing an excellent job of mowing ditch banks, mowing back woodland encroachment on fields, and preventing Johnson grass from choking refuge fields has passed. Negotiations for the 1982 Cooperative Farming Agreement were begun in December with the first requirement being that the land rental is going up to \$35.00/acre. The same type agreement as 1981 is the objective for the 1982 negotiations.

5. Grasslands

The only grassland on this refuge is the two-acre field just north of Q-72. Strips are mowed in this field usually twice each year to provide diverse habitat for upland species of birds and mammals.

9. Fire Management

Fire is the only tool available to the refuge staff for manipulation of habitat in the Great Marsh. Although it is the only tool available, it is still a tool over which the station has little control. 1981 was a good year for our unsolicited "Cooperative Burning Program". The fire described under the wetlands section is an excellent example of the local attitude towards marsh fire. The local people burn the refuge marsh whenever they feel like burning it. Thus, the three-year rotational burning program is impossible to follow. Prescribed burning in 1981 on the refuge is depicted in the table on page 15.

The burning of Units 5, 6, and 2 was done in March to improve visibility along the ground for the Peregrine Falcon hacking operation, which was taking place in the marsh.

Burn Unit	Date	Wind Direction	Speed	Time	Sky	Build-up Index	Relative Humidity	Water Level	Burn Quality & Coverage
* 8	01/19/81	SW	5-15	12:00	Sunny	32	50%	Very low	Good - 80%
4	03/12/81	E	5-15	14:30	Sunny	43	30%	Moderate	Good - 40%
4	03/13/81	SW	10-20	13:00	Sunny	46	25%	Moderate	Good
2	03/13/81	SW	10-20	13:00	Sunny	46	25%	Moderate	Good - 100%
6 & 5	03/14/81	NW	15-30	12:00	Sunny	49	20%	Moderate	Good - 40% -6 30% -5
7	12/17/81	NNE	15-30	13:00	Sunny	UNK	45%	Moderate	Poor
9	12/17/81	NNE	15-30	13:00	Sunny	UNK	45%	Moderate	Poor

* Wildfire

10. Pest Control

Farmers in this area are not much interested in using biocides to control pests, although the refuge cooperative farmer has consented to test a biocide on the refuge next year. He uses mostly chemical pesticides to maintain his farming program on the refuge.

Pesticides which were approved for use on Mackay Island NWR include the following:

- 1) 2,4,-D for broadleaf weeds in wheat
- 2) Eradicane for Johnson grass in corn
- 3) Atrazine for broadleaf weeds in corn
- 4) Alachlor for broadleaf weeds in corn
- 5) Treflan for narrowleaf weeds in soybeans
- 6) Basagran for cocklebur in corn
- 7) Sevin for army worms in soybeans
- 8) Round-up for Johnson grass and Bermuda in all fields
- 9) Counter 15-G for nematodes in corn
- *10) Lannate for army worms in soybeans

* Lannate (methamyl) was approved in 1981 for an outbreak of army worms, but it was not used and it will not be approved in the future.

There is no other pest control activity carried out on Mackay Island NWR. Although certain species of birds and animals may be considered more desirable than others, there is no manipulation to reduce the population of any species on the refuge except for the furbearer trapping program and white-tailed deer hunt. Both are discussed under Section G.

G. WILDLIFE

1. Wildlife Diversity

An attempt to establish a breeding pair of peregrine falcons by a process known as hacking was used this year. (See Section G. 2)

2. Endangered and/or Threatened Species

Even though over a hundred peregrine falcons migrate down the Outer Banks just two miles east of the refuge, only one was spotted hunting over the refuge marsh.

This was a year of controversy and high hopes for Mackay Island NWR to aid in the reintroduction of peregrine falcons to the United States East Coast.

Five years ago there were no known nesting peregrine falcons east of the Mississippi River. Reintroduction of this species to the U.S. East Coast has been in operation for five years.

The reintroduction is being done by a process known as hacking. This process allows young falcons to be released as close to a naturally wild state as possible. Captive pairs of birds were bred at Cornell University. The eggs are placed in an incubator, after which the parents raise the hatched birds for the first few weeks. About one week prior to fledging, the young are taken to a prepared box. This box may be on a tower or on a building. Food is supplied and the birds can see thru bars and observe the area. At all times human contact is minimal, especially during the

feeding, to prevent acclimation to people. When the birds are ready to fly, the bars are removed. What usually happens is the birds fly off and around that day or the next, but return daily for the next few weeks for the food that is still being provided. As the feeding is tapered off the young start to look for their own prey and hopefully fly off and behave just like wild falcons. Some on the east coast have found mates and have returned to the box in later years to raise young.

The controversy started with the recovery plan that identified this area as a hacking site. The recovery team and North Carolina officials started looking at Pea Island NWR as a site. Region 4 had objections to this site. Their point was that coastal North Carolina was not in the historical range for breeding peregrine falcons. Service policy is that endangered species should be only introduced to areas historically used for that behavior. Peregrines do migrate along the coast, but they are not known to have nested there. Region 4 was in favor of inland city and mountain area hack sites, which is in the historical breeding range of falcons.

The recovery team then turned to Region 5. Mackay Island NWR has 90% of its area in North Carolina, but being a satellite of Back Bay NWR in Virginia, we too are in Region 5. The recovery team already is using several coastal sites to the north. After a series of letters and phone calls, Region 5, North Carolina, and the project leader all agreed that Mackay Island NWR would be used to hack peregrines.

A tower was constructed in the Great Marsh using all volunteer labor and donated material. The refuge provided logistic support and security by closing the immediate area of the tower. No permits were required to build the tower in the marsh.



The Peregrine Falcon Hacking Tower was constructed by volunteers from the local Raptor Society, members of the N.C. Wildlife Resources Commission, and employees from the Norfolk Zoo. The construction was supervised by Tom Nichols, the Southeastern Release Site Coordinator for the Peregrine Fund.

81-03 ACH

Two site attendants were selected to monitor the birds. A location alongside Mackay Island Road near Back Creek was selected for the attendants to put their tent trailer; and the office restroom and shower was made available.

Just as the finishing touches were being made to the hack box on April 26, the young birds arrived by private plane from Cornell University. Dr. Tom Cade, Director of the Peregrine Fund and Jim Weaver, in-charge of peregrine production at Cornell, personally delivered the five young birds, three males and two females which were five weeks old.



81-04 ACH

The majestic Peregrine Falcons arrived in a somewhat unglamorous cardboard box. Note the large female in the center and the black USFWS bands. The black bands should be easier to see at a distance



81-05 ACH

Special delivery of these birds was by Peregrine Fund Director, Dr. Tom Cade.

On May 4, 1982, the hack tower was opened and four birds immediately flew off. By that evening only four birds were back at the box. Several days went by before the fifth bird showed up. The birds were seen regularly up to May 15. The last sighting was May 27. No radio or color markers were installed. The birds were fed pigeons and quail. No kills were observed.

The birds started roosting in the wooded areas surrounding the tower within the first week. After the second week it became impossible to distinguish the birds, and no more than three were seen at one time. In other words after May 27, we had no idea how many survived to move on. Great horned owls nest throughout the area and are a known threat to young peregrines.

It appears this was simply a production and release program. Most all other releases had very careful monitoring with radio transmitters and colored bands. We had all hoped this would be the start of an annual release program or stopped if a pair were to return to set up a nesting territory. But this was not to be. A multiple misunderstanding by Region 5 personnel lead to some tough questions being asked by the Washington Office. It was finally ironed out that Mackay Island NWR was too far from the historical nesting area and that no future releases would be made. At first they wanted the tower removed but at Region 5's request the tower can remain. Falcons may be released at a hacking box located at Back Bay NWR, approximately 12 miles to the northeast next year.

A pair of hacked falcons might find the tower and use it in the future, but most likely it will be found by the annual nesting population of osprey. During the winter, crows, turkey vultures, and black vultures use the tower as a day time roost.

3. Waterfowl

Total waterfowl use-days are dropping at an alarming rate; down 60% from last year and down 80 % from the 19-year average between 1961-1979. This continues a downward trend that has been in progress for the last five to six years. As in the past, our surveys do not cover the excellent waterfowl areas surrounding the refuge. Local sports writers and guides have been publically complaining about the drop in numbers and lower hunter success which corresponds to our refuge figures.

WATERFOWL USE

	1981 use-days	% change from 1980	19-yr.avg. 1961 - 1979	% change from 19-yr.avg. 1961 - 1979
Coot	18,870	- 70%	611,747	- 97%
Swan	22,440	- 70%	136,638	- 84%
Snow geese	138,000	- 70%	793,903	- 82%
Canada geese	8,430	- 57%	230,665	- 96%
Ducks: Diving	28,800	- 77%	187,871	- 85%
Dabbling	408,750	- 48%	1,231,098	- 67%
Ducks:				
Sub-total	<u>437,550</u>	<u>- 52%</u>	<u>1,418,969</u>	<u>- 69%</u>
TOTAL WATER- FOWL USE	625,290	- 60%	3,191,922	- 80%

DUCK USE DAYS BY SPECIES

	1981 Use Days	% change from 1980	% change from 19-yr. avg.
<u>Dabblers</u>			
Black duck	83,100	- 22%	- 52%
Wigeon	78,600	- 43%	- 82%
Gadwall	69,600	- 51%	- 20%
Mallard	55,950	- 62%	- 58%
Pintail	37,800	- 40%	- 75%
Wood duck	35,250	- 37%	+ 10%
Green-wing teal	21,600	- 67%	- 87%
Northern shoveler	7,800	- 69%	- 35%
Blue-wing teal	5,250	- 48%	- 80%
<u>Divers</u>			
Ring-neck	16,500	- 53%	- 58%
Ruddy duck	5,400	- 87%	- 96%
Red head	3,600	+295%	+ 31%
Bufflehead	1,800	- 72%	+390%
Scaup	1,500	- 91%	- 90%

One note on these figures, January and February were very cold with 95% of the refuge frozen for about 20 days. If the water was not frozen, then the constant north wind pushed out the water until only a trickle was left in the canals and ponds. This fall was unusually warm and mild and not many birds moved in. Local watermen say that this year has been a very poor year for aquatic plants in Back Bay and Knotts Island channel. Many blame the water quality, and proposals to open an inlet through the Outer Banks are being made. As with many environmental problems, research is scant at best and most "experts" can't agree to the causes, let alone any action.

Coot

From 3.5 million use-days to 18,000 in only five years warrants an explanation. Looking at the 20-year trend, it would appear the '71 to 77' boom was just that and the high numbers were the abnormal condition for this area.

Swan

Low water and iced-over ponds kept these graceful birds away from the refuge.

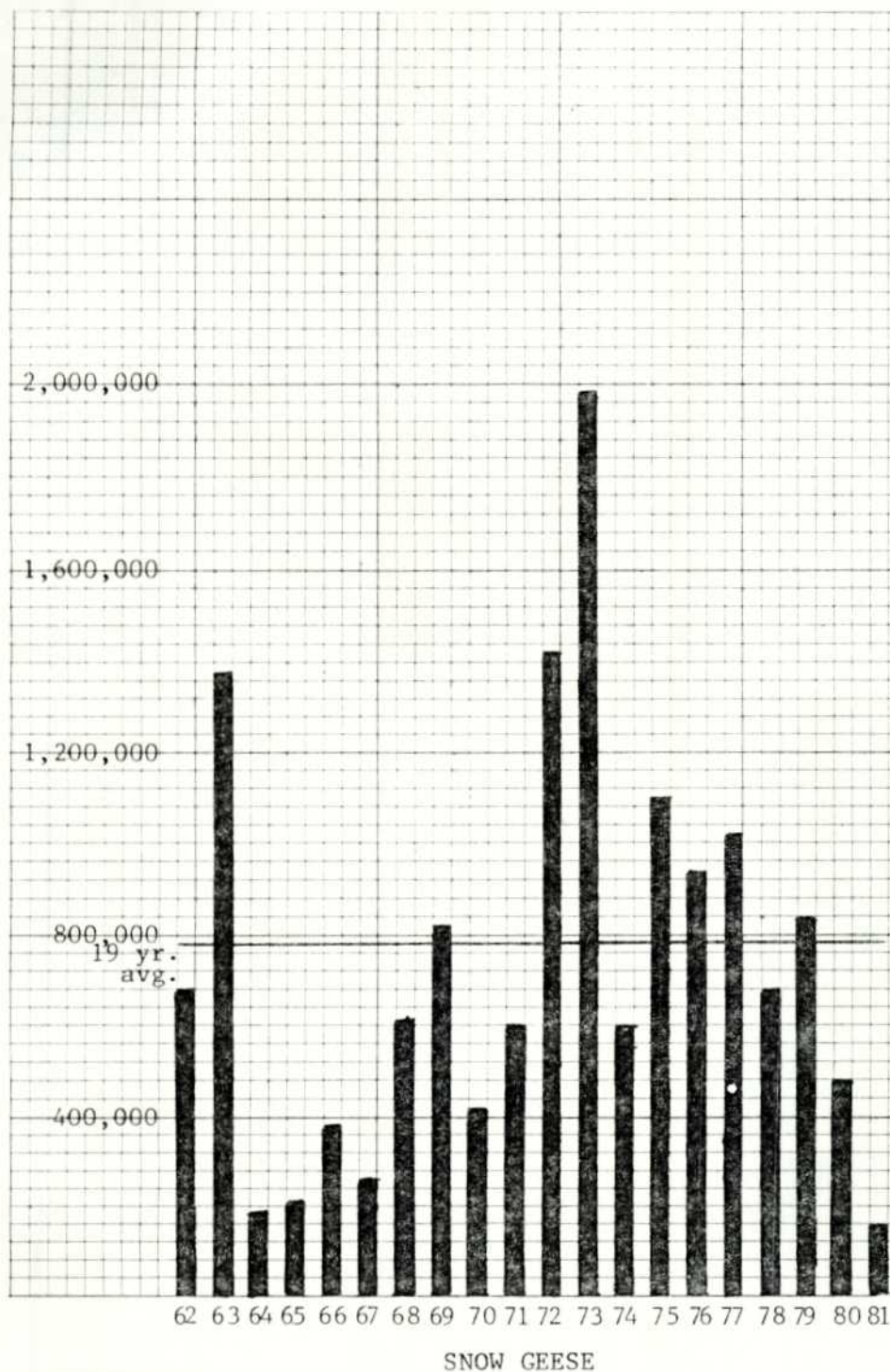
Snow geese

Most of the marsh areas these birds seem to like best were burnt this year, but there is still decreased use.

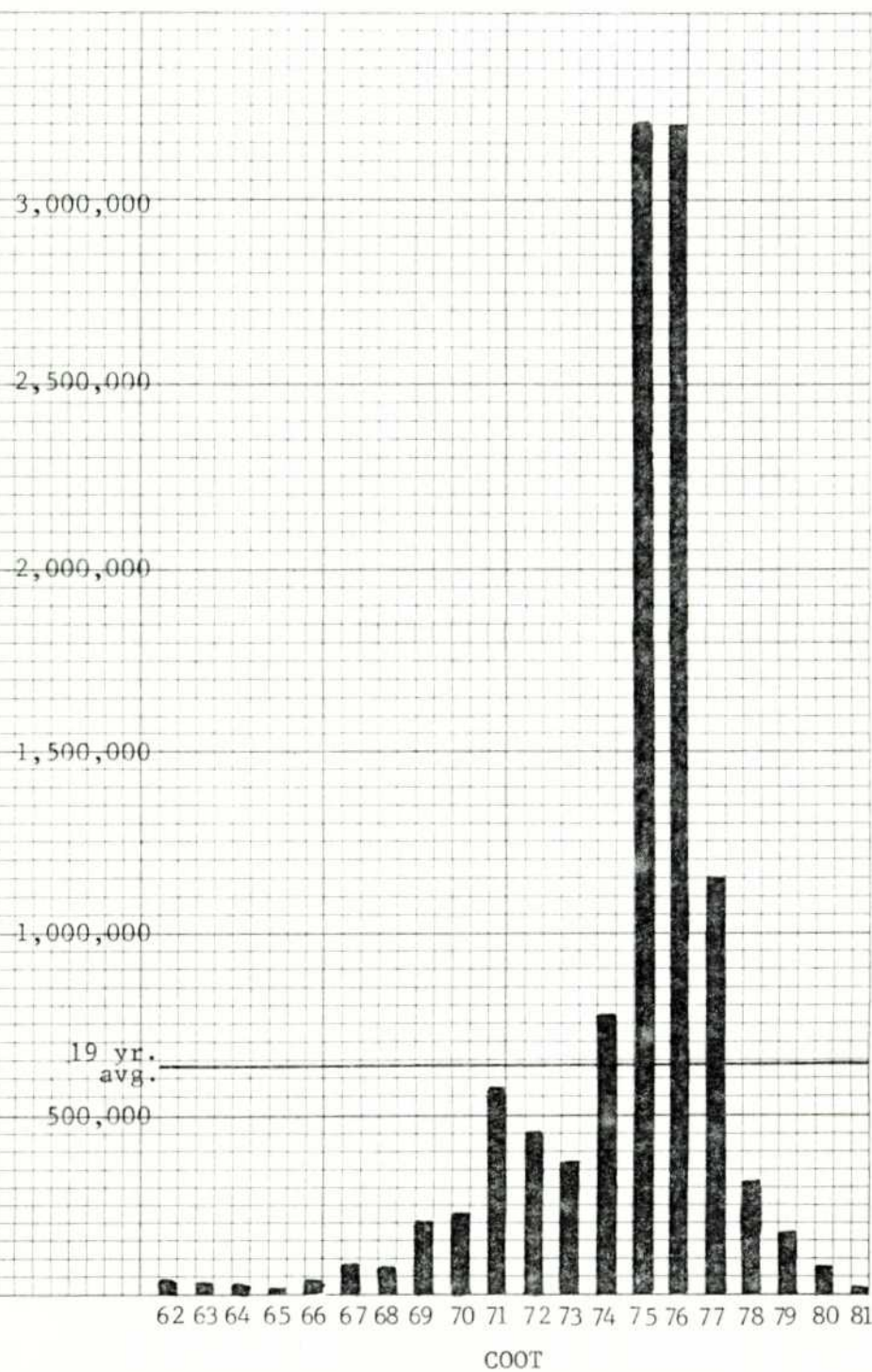
Ducks

Gadwall and wigeon seem to be responding to the changes in aquatic grass. Their numbers started increasing when Eurasian milfoil became established, but apparently, it is not as favorable to them now. Hopefully, weather this year was the major reason for such poor use by waterfowl.

USE
DAYS



USE
DAYS



USE
DAYS

300,000

250,000

200,000

150,000

100,000

50,000

19 yr.
avg.

62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81

SWANS

USE
DAYS

1,200,000

1,000,000

800,000

600,000

400,000

200,000

19 yr.
avg.

62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81

CANADA GEESE

Other

No new sightings of mute swans have been made since last year. One black swan (*Cygnus atratus*) was seen in the company of five whistling swans this year. This apparent escapee was around until spring and has not been seen since.

Wood duck production - 1981

We continued the frequent summer checks started last year, and as shown below, production was down this year. It is suggested that at least one more year of summer checks be made to form a statistical base.

All checks were made by experienced volunteers with results as follows:

1980	Number Nest Hatched	1981	Number Nest Hatched
April 24-28	0	April 25-30	0
May 16	3 (8 screech owls)	June 10-11	26 (2 screech owls)
May 29	11	July 1-6	8
June 23	21	July 24	7
July 14-28	11		
September 16	5		
	<u>51</u>		<u>41</u>

The following data were collected:

Wood duck	1980	1981
Number of eggs hatched	585	386
Number of eggs laid	994	610
Nest attempts	65	49
Successful nests	51 (78%)	41 (84%)
Boxes available	73	77
Mean # hatch per successful nest	11.5	9.4
Mean # hatch per nest attempted	9.0	7.8
Mean # eggs laid per nest attempted	15.3	12.4
% hatched	59%	63%
Percent of total nest started between April 24 - 30	75%	73%

This last figure of 73% of the total nests started by the end of April will, hopefully, allow us to only disturb the boxes one time each year and, using the other data, arrive at an annual production figure. Survival to flight stage is still an unanswered question.

Screech owl data have been moved to the section on raptors. We have no figures on other nesting ducks such as black ducks and mallards. A few broods are seen each year, but the abundance and variety of predators must make ground nesting difficult at best.

4. Marsh and Water Birds

At least 20 species of marsh and water birds use the refuge for all or some of their needs. No known rookeries of the larger species have been recorded until this year, almost. This spring a group of approximately 20 great blue herons started a rookery near the tower on Hog Pen Point. An osprey which

has nested there for several years was also there. Apparently the harrassment by the osprey was too much and the herons left after completing about 50% of each nest.

5. Shorebirds, Gulls, Terns, and Allied Species

The gull and tern use is restricted to the adjacent bays and sounds, with only incidental use of the refuge. Having no tidal mudflats on the refuge, the only regular occurring shorebirds are killdeer, snipe and spotted sandpipers. During the month of May, there were very strong and consistant northerly winds which kept most of the water out of the marsh of the refuge. This steady exposure of mudflats attracted many species of shorebirds which are not normally seen in the area in such quantities. These birds include: purple gallinule, dunlin, semipalmated plover, semipalmated sandpiper, least sandpiper, willet, pectoral sandpiper, whimbrel, black-bellied plover and dowitcher.

6. Raptors

Our winter population was strong again this year and included: kestrels, red-tailed hawks, red-shouldered hawks, great-horned owls, screech owls, and black and turkey vultures. We have four roosts of vultures ranging in size from 25 to 75 each.

Nesting

Red-tail hawk: At least four nesting territories were observed, production is unknown.

Screech owl: (Wood duck box nesting only)

	<u>1980</u>	<u>1981</u>
# owls hatched	19	5
# eggs laid	24	7
Nest attempts	9	3
Successful nest	8	2
Mean # hatch per successful nest	2.4	2.5
Adult color seen on nest	Red 6	1
	Gray 2	2

Screech owls hatch in early May and fledge by the end of May, thus, they are competing with wood duck nesting only marginally.

Osprey

The two nesting platforms installed by YCC in 1978 were pushed down by moving ice. Both were reinstalled in the same location. An additional six platforms were installed by the local raptor society headed by Tom Nichols. The refuge supplied the logistics and some supplies while Tom obtained most of the material.

The existing tree nest on Hog Pen Point was cut down and replaced by a platform in nearby Buck Island Pond. The tree was ready to fall any time. The osprey pair which returned this year did not use the artificial structure, but built a nest on a nearby snag. The five other nests were installed as recommended in 1980. The map on the following page shows location of

platforms and natural active nest sites. The one designated to go into Bull's Bay actually went into Minger's Cove.

	1981 Nest Use	Use	Hatched	Fledged
*	1. Live Oak Point	Active	3	2
*	2. Half Way Point	None	-	-
	3. Hog Pen Point	Active (abandoned)	Unknown	0
*	4. Buck Island Bay	None	-	-
*	5. Bellows Bay	None	-	-
	6. North Indian Creek	Active	Unknown	1
*	7. North Landing River	Active	0	0
	8. Woods Pond	Active	Unknown	Unknown
*	9. Minger Cove	None	-	-
*	10. Barley's Bay	Active	2	Unknown
*	11. Flynn's Folly	None	-	-
* Artificial platforms				

As additional volunteer labor and materials become available, more nesting structures can be erected. The large impoundment and North shore should be given priority for these nesting sites.

Duck blinds in Currituck Sound and Knotts Island Bay were used more often this year than in past years, according to local watermen. We checked some of them and found much destruction and disturbance by fishermen who find these blinds to be excellent fishing areas.

Even though no precise production estimates and rates have been compiled for this refuge, the number of birds and nests has remained the same or slightly increased over the 20-year existence of the refuge.

For many years prior to 1960, sportsmen offered a local bounty of \$.50 an egg for osprey and eagles and \$5.00 for adults. It now appears that there is an interest and some pride in the status of the raptor population in the area. Fishermen are probably the most detrimental factor to nesting, since they come into the area from distant areas and seem to have very little respect for the active osprey nests on the duck blinds. They prefer fishing near these blinds because of the better fishing.



81-02 MJM

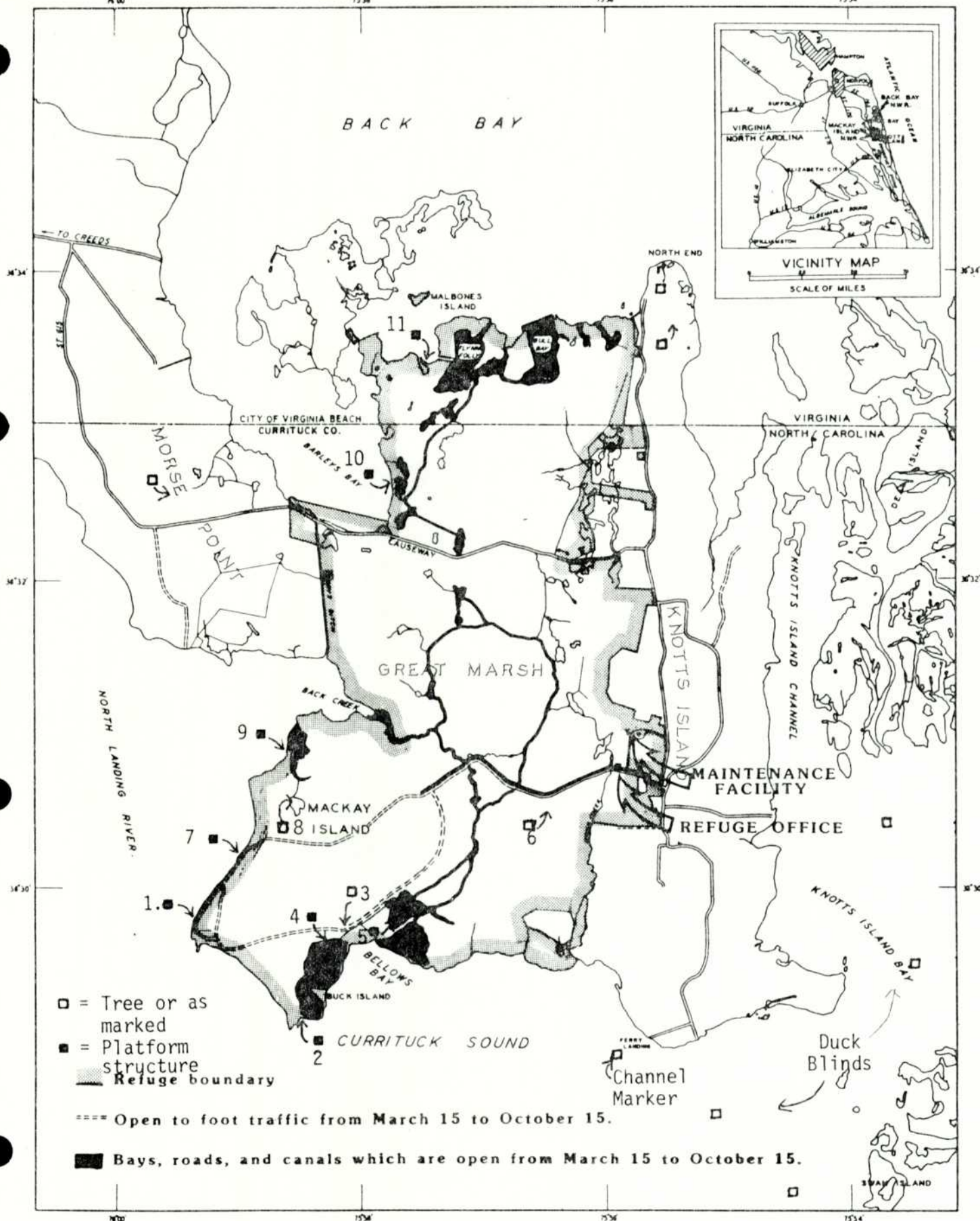
This osprey had some help with its nest. The drift wood at lower right was part of building materials used by Government in this Federal housing subsidy.

MACKAY ISLAND NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

CITY OF VIRGINIA BEACH, VIRGINIA
CURRITUCK COUNTY, NORTH CAROLINA

UNITED STATES
FISH AND WILDLIFE SERVICE



COMPILED IN THE BRANCH OF REALTY
FROM SURVEYS BY G.S. AND
AERIAL PHOTOGRAPHS BY U.S.D.A. AND
U.S.M.C.

NEWTON CORNER, MASS. DECEMBER, 1950

Scale 0 20 40 60 80 100 120 140 160 FATHOMS
0 1/4 1/2 1 1 1/2 2 MILES

MEAN
DECLINATION
1954

Peregrine Falcon - See Section G-2.

7. Other Migratory Birds

The new refuge bird list arrived from the printers in January, and we were very pleased with the final product. The art work is excellent and the general format is easy to read and very pleasing to the eye.

8. Game Mammals

The population trend and associated problems with white-tailed deer have been thoroughly discussed in the last several annual narratives. This year we had the first legal hunt and we hope that this reduction will have a dramatic effect on the herd health and the habitat.

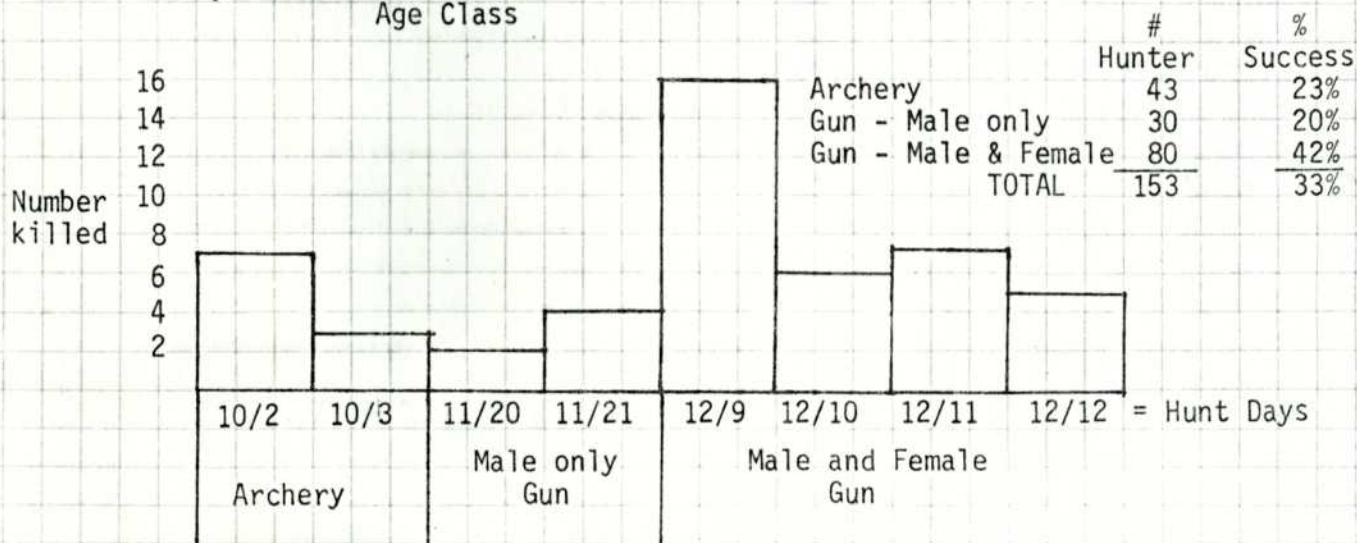
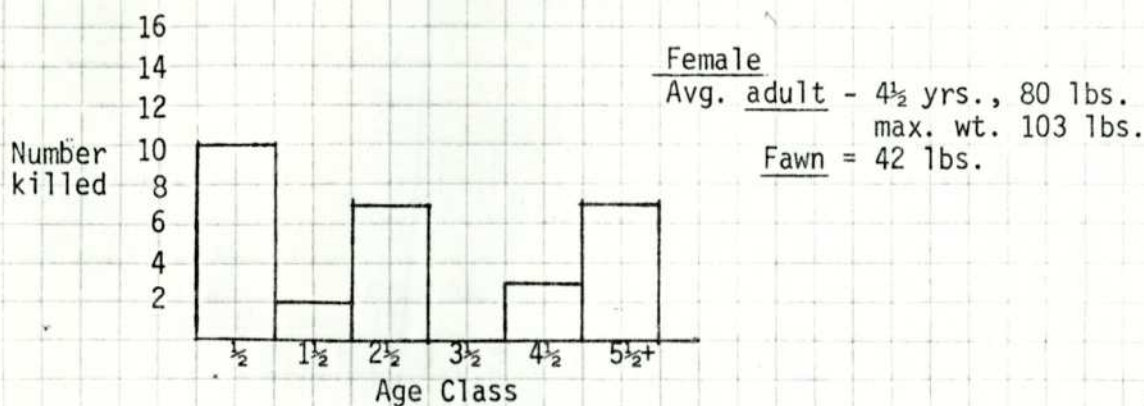
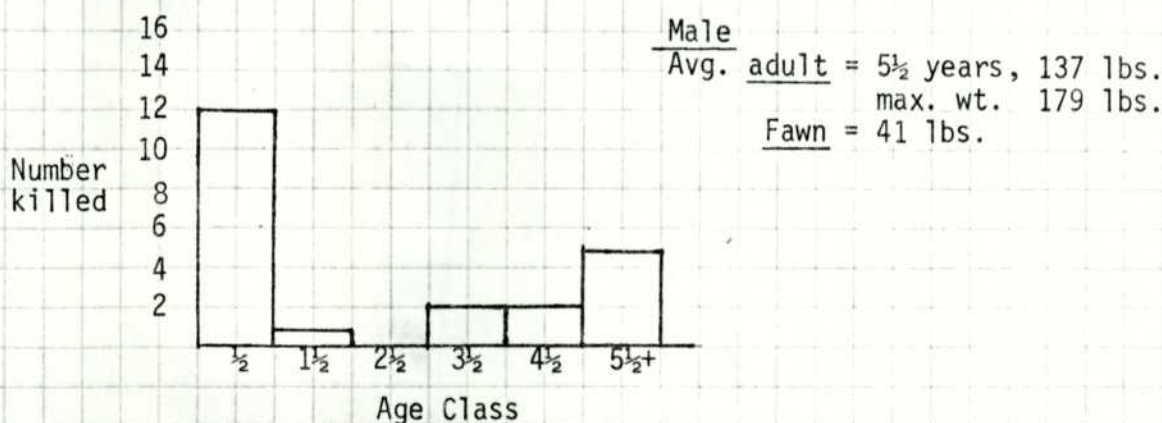
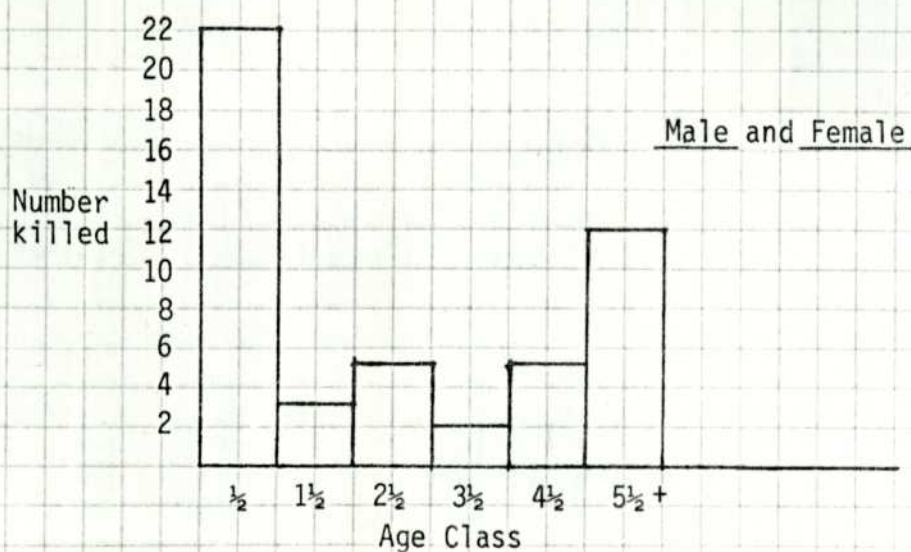


The first legal deer ever taken 81-11 ACH
off of Mackay Island NWR. This
archer was in the woods for about one hour.

Eight days of hunting reduced the herd by 50 animals not including an estimate of up to ten cripples not retrieved. The 1/2 year age class made up 44%. The following graphs and data indicate that the herd was not hunted or controlled to much extent. The Service's East Coast Biologist, Otto Florschutz, reviewed our data and reported that the age structure indicates the need for continued heavy harvest. He also believed that a die-off may have occurred to cause the good production this year. He hopes to supply us with an analysis early next year. All aging was done by pulling one half the lower jaw and comparing tooth development and wear. Only one animal was not aged due to the massive damage done by a 12 gauge slug thru the jaw.

Hunter success was high due to high density of deer and lack of wariness. Details of the hunt are discussed in Section H-8.

No other hunting is allowed.



10. Other Resident Wildlife

This year four gray foxes were seen, none had been seen in the past four years. Other noted species appear the same as past years.

14. Scientific Collections

Mr. Chris Pague from the Norfolk Zoo has a permit to collect herptiles under a permit issued by the project leader, but he did not collect any specimens from Mackay Island this year.



This turtle is experiencing
the refuge manager syndrome.
(You never know what is going
to happen next!)

81-07 MJM

15. Animal Control

Trapping was again used this year to control muskrat and nutria damage to the dikes and roads. This is explained in Section H-10.

This year's trapping results are:

<u>Species</u>	<u># taken</u>	<u>Avg. for '67-'80</u>
Nutria	116	473
Muskrat	1,065	315 ('75-'80*)
Raccoon	40	57

* Prior to 1975 the most taken was 10.

Note: Reported take vs actual is highly suspect.

16. Marking and Banding

As in the past we have attempted to aid Back Bay Refuge in reaching their banding quota of black ducks and mallards. For the first time we were skunked. We had plenty of birds, but if it wasn't frozen solid, the deer were standing around the trap. The deer have learned to eat corn in eight inches of water and to tear up the traps. Next year we hope to at least overcome the problem with the deer.



81-14 ACH

Retired Biological Technician Romie Waterfield, repairing cannon net in Mackay Island shop for the Back Bay banding operation. Always a joy for Romie to visit the refuge to show off his latest hobby of decoy carving.

Assistant Manager McMinn was chosen this year as a crew member on the airboat operating at the St. Johns River banding station in New Brunswick, Canada. Everything went smoothly and they met their quota and finished up in nine nights. They banded 511 black ducks and 846 other ducks of nine species.

H. PUBLIC USE

1. General

Free use permits issued this year were:

Cutting fire wood	40	
Snapping turtle trapping	2	
Cutting sedge grass	5)
Cutting poles	1) for duck blinds
Cutting pine bushes	1)
Hiking during closed season	1	

The refuge benefits from these activities by our controlling the timing and the locations to meet refuge objectives.

The sign plan was completed and approved. The new signs were ordered and we hope to have them next year. Let's hope the new looking signs do not spur renewed interest in vandalism.

4. Interpretive Foot Trails

Late last year, the YCC and YACC completed a self-guided trail on the area that used to be called "Nick's Place". The public reaction has been excellent. No formal means of counting public use has been deployed, but the indications of use such as path wear, trash build up, and usual checks during routine rounds indicates an acceptable use. Minor vandalism to signs is a nuisance, but not to the point of excessive cost. Some people thought we put in the trail to help feed the cotton mouth snakes which den up in the winter along the trail. A few thought it was a motorcross trail for motorcycles.

7. Other Interpretive Programs

Assistant Manager McMinn presented two interpretive talks to the Knotts Island Elementary School. He was also invited to give a talk to the Knotts Island Ruritan Club covering the refuge and its activities and objectives.

Assistant Manager Hundley gave a talk to a group of 50 elderly individuals that came down from Norfolk, Va. for a day's hike.

8. Hunting

The first legal deer hunt to ever be held on Mackay Island occurred this fall. The estimated herd of 175 to 225 animals had 57 animals removed, which included seven that were not recovered.

The system of application-for-drawing worked very well as did the one-day session for weapons qualification held on the refuge. The hunters praised the operation of the hunt and their treatment by the refuge staff. Many hunters said that they regularly hunted other refuges and government lands and nowhere were they treated as nicely as the Mackay Island staff treated them. We received no complaints from any participants in the hunt. There were some on Knotts Island that complained about the \$10.00 recreation fee, but most of those are the habitual "complainers". I recommend that the recreation fee be maintained, since it reduced the pressure on the hunt and served to attract more conscientious hunters.

The hunt was successfully administered by one refuge staff person at a time, using adjustments in work hours to prevent overtime use. The entire Mackay Island staff and Assistant Manager Poetter from Back Bay were utilized in operating the hunt.

The only problem encountered during the hunt was the situation of two hunters being caught trying to circumvent the hunt regulations. These two hunters got their deer, hid them, and left their stands to get more deer. Both hunters were written up and their hunting activities terminated for the day. One hunter returned the next day to hunt, and afterwards, sent a Christmas card to the refuge staff.

An effort will be made to reduce the special regulations for the future deer hunts, but there will be a fine balance between too many regulations and not enough, as evidenced by the violations noted this year. If the special regulations had not been very specific, it might have been impossible to cite these two violators.

The hunting opportunity for handicapped individuals could be improved by attempting to negotiate a non-resident license waiver for them by the state of North Carolina. The greatest number of these people live in the Tidewater Virginia area.

Observations of the staff indicate that the hunt was a tremendous success, and if conditions warrant, recommend that the hunt be held again next year in the same manner.

9. Fishing

The North Carolina Department of Highways has added a pedestrian walkway to the south side of the Corey's Ditch bridge on the Knotts Island Causeway. When the walkway on the north was full of fishermen, people would stand on the road and fish over the south rail. Somehow no one has been injured. This increased availability for fishermen would be great if not for the fact that these people have a tendency to litter. The trash buildup is a disgrace. We feel since the state encourages this use, they should provide the clean up. We'll have to see who can out fumble who.

10. Trapping

Last year, we went from a flat rate fee and a drawing to a bid system.

<u>Unit</u>	<u>1980 ('81 season)</u>	<u>1981 ('82 season)</u>
	<u>BID</u>	<u>BID</u>
North Marsh, Virginia	\$ 233.00	\$ 243.75
North Marsh, North Carolina	401.00	501.00
Middle Marsh, North Carolina	400.00	505.00
South Marsh, North Carolina	175.00	305.00
	<u>\$1,209.00</u>	<u>\$1,554.75</u>

Last year, we had five bidders and this year that has grown to nine bidders. One old-timer trapper is not happy with this system. He had trapped the refuge for years for almost no cost. I suspect he really is upset at the fact that two of the high bidders this year are not 5th generation natives of Knotts Island. Even at this price the demand is there, therefore, we see no reason not to continue with this plan.

17. Law Enforcement

1981 was a quiet year. One exception was a YACC enrollee who was arrested for theft of government property. We had him under observation due to a series of gasoline thefts. Assistant Manager McMinn caught him with a new refuge-owned air conditioner in his personal car. The Currituck County Sheriff was called when the FBI said if it wasn't worth over \$1,000.00 they did not want to hear about it. The sheriff's deputy was going to be a nice guy and let the boy drive his car home; next thing you know he is in Baltimore, Maryland. He was brought back and found guilty. Note: He was only 17, but North Carolina says 16 or older is an adult.

The office was also broken into in March and five antique duck decoys were stolen. We apparently got to the local buyers before the thieves made any deals, and therefore, they were unable to unload them. We knew who had them, but no evidence could be found. Finally a person, who'll remain anonymous and who owned one of the decoys, went to the culprits. Outweighing them by at least 100 lbs., he gave them two days to return them. The next day we found all but one in the office yard. The last one was found in a field by the cooperative farmer. This method may not be in any training manuals at GLYNCO, but it was most effective.

The office was toilet papered in November for no known reason or special occasion.

Five cars went into the causeway ditch on NC 615 Causeway during the year. One car cut a power pole off clean near the bridge on the causeway. Another car cracked a power pole and wrecked a refuge information sign at the Mackay Island Road gate. By some stroke of luck no one was injured in any of these accidents.

The following cases were made this year:

Charge	Number	Disposition
No state fishing license	6	3 = \$25.00 each 2 = Nol Pros 1 = dismissed (deceased)
Trespass after dark	3	3 = \$25.00 each
Deer hunt regulation violations	2	1 = \$75.00 1 = \$125.00
Unsafe driving and failure to obey lawful order	1	1 = \$50.00
Trespass on refuge and driving off designated roadway	1	1 = \$75.00

Reports of night lighting, baiting, and illegal trapping still come in, but nothing timely enough to catch anyone yet. Most of our activities and physical precautions only seem to slow them down or make them more cautious. At least "they" know we are trying and will prosecute where the local residents are afraid to do so due to reprisals.

The North Carolina Game Warden made 21 cases on the refuge that were processed thru Federal Court. All were for no possession of a state license. All, except for three juveniles, were fined \$25.00.

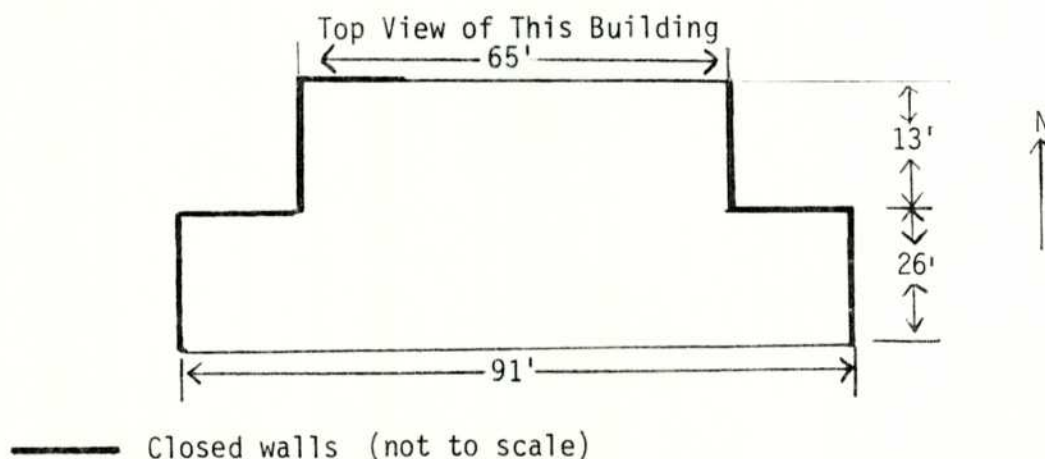
I. EQUIPMENT AND FACILITIES

1. New Construction

The major construction project of 1981 was building of a pole shed, building number 96. The 1980 narrative has some photos of the "chicken coop" before the dismantling was begun. The chicken coop was just that, a 150-foot by 35-foot wood frame, metal covered building which was used for chicken raising by the previous owner. This building was approximately one mile from the refuge maintenance facility and it was not very secure. It was used as a storage facility for materials and small equipment.

Most of the refuge's large equipment was being stored out in the weather. In the Spring of 1980, the YACC from Back Bay NWR and Mackay Island began dismantling the chicken coop and on October 29, 1980, a wooded area adjacent to the shop was cleared and construction of a "new" pole building was begun from the chicken coop materials. Poles for the new building were donated by power companies, telephone companies, and the Navy. The "new" building was completely designed and engineered by maintenance mechanic James Pittman.

Some of the materials of the old "coop" were unusable, so the station had to buy some new materials, which included 1" x 4" and 2" x 10" boards, aluminum and regular nails, and some wood treatment. The total cost of new materials for the building was \$650.00. YACC labor was utilized as much as possible in combination with refuge staff hours. Maintenance mechanic Pittman, with assistance from the refuge laborer, and a YACC enrollee cleared the site, treated the wood, built the building, final graded the site, and graveled the yard area by October 26, 1981. This effort required approximately 750 staff hours which equals a staff hour cost investment by the whole staff of only \$7,500.00. The total cost of this "new" 3,211 square foot building was only \$8,150.00. The building was built with an 11-foot height so all complex equipment fits under it. It provides the station with an excellent facility to protect large equipment, small implements, and supplies.



81-08 ACH

This photo is taken from the west looking towards the northeast as the final touches are being put on the building.



This photo shows the shelter being provided to our largest piece of equipment by this new building. Note the rafter with the implements painted on it, one of the boards from the "coop" walls.

81-09 ACH

A new well was pumped into the ground for building 85 (Quonset hut) in July because the well already there was too badly clogged to continue functioning. The piping was driven down 17' and has a 5' sand point.

The proposed cross-dike which has a \$75,000 A & E price tag (7,700 feet of low level dike with half moon riser or screw gate wcs) which is scheduled for FY '82, is an interesting case study for the government construction business. The refuge staff has made arrangements with the local Soil Conservation Service office for design, engineering, soil examination, cost estimation, and even construction inspection. The Environmental Assessment has been in the Regional Office since late September and the Corps of Engineers permit application has been submitted since April 1981. The proposal to allow the \$75,000 A & E funds go towards actual construction of the project was submitted by the station to the Regional Director in February of 1981. SCS technician Earl Williamson surveyed a transit line along the cross-dike route in February and SCS District Conservationist, Louis Cullipher, examined the soils along the proposed construction site. The future disposition of the cross-dike proposal may be one of those interesting dramas of the Fish and Wildlife Service operations for which everyone may want to stay tuned.

The first .4 miles of Mackay Island Road required extensive rehabilitation during May. Dirt from the "chicken coop" site was hauled in to build up the road. In addition to work here, there were 69 loads of dirt, topsoil, and turf removed from the "coop" site and deposited behind the new bulkheading and along the new perimeter road site. The Case loader, Mack and Dodge 500 trucks, and JD 2640 tractor were utilized for this effort. The bermuda established itself behind the bulkheading very well and finally stabilized that soil.



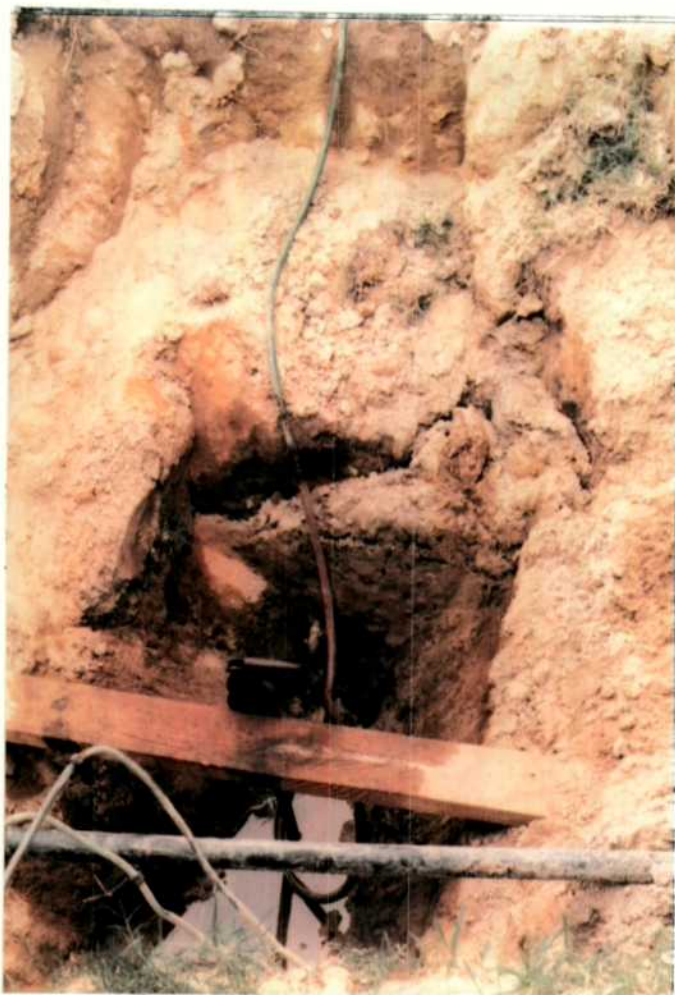
The bermuda established well behind 81-06 ACH the bulkheading and the aggregate base material "set up" very well to make a good perimeter road where there was no road before.

The Mackay Island YACC enrollee drove the Mack truck to pick up and deliver 549 tons of 21A gray aggregate (gravel) to Back Bay and Mackay Island. The aggregate at Mackay Island was used around the new pole building, to improve the shop yard, and to gravel the new perimeter road. The 32 loads of aggregate would have been only 18 loads if we had not been able to haul it ourselves.

A total replacement of all signs was ordered in October. With shipping the cost will be \$2,900.00.

3. Major Maintenance

The kerosene fuel tank for the shop heater developed some leaks this summer. The underground tank was discovered nearly empty, when it should have been holding 400 gallons. Upon digging out the tank, many small holes were discovered to have corroded through the bottom. Assistant Manager Mike McMinn decided to go into the oil business. He figured that all of the kerosene that had leaked from the tank into the ground would flow right into the hole if he gave it a chance. It did! In one week he was able to recover 350 gallons of the original 400 gallons. This fuel is acceptable for treating wood, cleaning, and drip torches. A new tank was purchased and put into the same hole.



81-10 ACH

By digging the hole out and regularly pumping fuel out of the hole, Assistant Manager McMinn salvaged 350 gallons of the lost 400 gallons.

The tower site parking lot has been a mass of potholes for years because the refuge could not keep the area graded because of vandals continually tearing it up with their vehicles. Maintenance Mechanic Pittman used one-half of a clam shell bucket and altered it to fit onto a three point hitch and added a couple of teeth, thus, a soil scarifier. He scarified the parking lot, leveled it, and then a pipe and cable was installed across the middle of the parking area. The effort was to prevent the locals from cutting "doughnuts" in the parking lot with their vehicles. This effort has been 70% successful. As long as we leave room for vehicles to turn a boat around, there will always be some reason for this vandalistic type of behavior. But it is an improvement.

Proclamation boundary posting was done during August. Efforts to maintain permanent spring type structures for this boundary were abandoned this year and gum saplings were installed.

Refuge staff assisted Raptor Society volunteers with placement and repair of osprey structures on the refuge.

4. Equipment Utilization and Replacement

The Mack dump truck was borrowed by Eastern Neck NWR for six weeks and it went to Pea Island NWR for a month and plans are being formed now for it to go spend some time at Chincoteague NWR. This expensive piece of equipment must be utilized regularly for it to be worth the original investment by the government.

Fifty-three sections of 8" pipe, 21' long, were located on surplus and picked up in June.

Hot plugs were installed in the bumpers of the two refuge pickup trucks. The plugs are for the electric winch on the boat trailer.

Routine maintenance of refuge vehicles was carried out as needed throughout the year.

The Evinrude 85 HP engine was tuned up and water pump replaced.

A console and two tank seats were purchased and installed on the 17' Polarkraft boat. Laborer Tim Williams donated two straight back seats which he installed on the tank seats. (The seats are on swivels.) This boat is now very well equipped for all uses.

5. Communications System

Two Regency scanners were purchased and the N. C. Wildlife Resources Commission crystals were installed in them. The scanners give us the capability to keep contact with the State, and they also make it possible for us to always be able to monitor our own frequency. The County agreed to scan our frequency after 4:30 PM each day. Unfortunately, we were unable to buy a radio for communicating directly with the State and County because we were told by our RO Support Services that we could not.

A mobile radio excess to YACC, was installed in the Polarkraft boat. The NC registration and general improvements to this boat make it the envy of the boat oriented Knotts Islanders.

6. Energy Conservation

Storm windows were installed on Q-72 and on Q-94. The increased tightness to both buildings were evident as soon as the winter winds began to blow.

Celotex foam panels were installed in the garage doors of the shop. These R-6 panels provided insulation where before there had been none.

Reduced fuel consumption of greater than 15% was accomplished at Mackay Island NWR in 1981.

A coal burning stove belonging to Assistant Manager Allen Hundley was installed in the refuge office. Coal from a leftover stock pile on Fisherman Island NWR was used for fuel. The office is kept toasty with little effort, little cost for fuel, and utilization of a fuel source which would most likely never have been utilized.

J. OTHER ITEMS

2. Items of Interest

The only formal training this year was a two-day fire behavior course presented by personnel from Jefferson National Forest. Hundley, McMinn and Pittman traveled to Chincoteague NWR along with some of the Back Bay NWR staff in station vehicles. Chincoteague Manager Holland gave us a thorough tour of the refuge facilities, management areas, and a brief outline of ongoing activities.

Hundley, McMin, and Pittman again qualified with their service revolvers at the Chesapeake Police range. SRA Davenport was the range officer.

Dave White and Don Connors from the Newton Corner Regional Office visited the refuge during January to reappraise the refuge land for revenue sharing calculations.

On February 17, Project Leader Glen Bond delivered the Refuge Revenue Sharing Check for 1980, in lieu of property taxes, to the Currituck County Manager Webb Fuller. The payment was \$8,285.00 which for the first time was 100% of the Fish and Wildlife Service appraised land value.

Fee Lands Appraised/ Adjusted Cost	FY	.75% Appraised Adjusted Cost	% of Payment
	71	\$4,409.45	100
	72	\$4,492.45	100
	73		100
\$ 613,492.92	74	\$4,601.20	100
	75	\$4,601.20	100
\$1,104,624.00	76	\$7,534.37	80
	(15 mo.)		
	77	\$6,120.00	74
	78	\$4,292.82 & \$2,201.00	78
P.L. 95-469 effective	79	\$4,084.00 & \$2,202.00	76
	80	\$8,285.00	100
\$1,388,700.00	81	\$9,128.00	88

Payments to the City of Virginia Beach are insignificant for the 800 acres of refuge marsh in that jurisdiction.

3. Credits

Assistant Manager Hundley wrote Sections A, B, C, D, E, F, I, and parts of J and K.

Assistant Manager McMin wrote Sections G, H and parts of J and K.

Hundley reviewed all the sections after which Project Leader Bond reviewed and edited the report.

Ford and Cherry typed and proof read the report.

K. FEEDBACK

Assistant Manager Hundley and McMin attended the 46th North American Wildlife and Natural Resources Conference this year while on annual leave. Both found the experience very interesting and a valuable training session. Apparently some one thought they were on government time and notice was passed down that no one but invited speakers would attend the Northeastern Fish and Wildlife Agencies Conference that was held in Virginia Beach later in the year. The reasons for this action may be hidden somewhere, but because of who was present at the Conference, it is assumed the policy was born out of a misunderstanding. The people "at the bottom" can appreciate these conferences and not embarrass the Service while on annual leave. They definitely would not be wearing a Service uniform. It would seem to violate the rights of employees to make a policy that forbids attendance at such conferences, especially ones that directly relate to their profession.

It is a shame that efforts to stay abreast of happenings in our field are discouraged instead of encouraged as employees in most agencies are.