

GREAT DISMAL SWAMP
NATIONAL WILDLIFE REFUGE
Suffolk, Virginia

ANNUAL NARRATIVE REPORT
Calendar Year 1985

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

REVIEW AND APPROVALS

GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE
NANSEMOND NATIONAL WILDLIFE REFUGE

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ANNUAL NARRATIVE REPORT

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<u>James P. Claul</u>	<u>2/27/86</u>	<u>Edward S. Mow</u>	<u>3/13/86</u>
Refuge Manager	Date	Refuge Supervisor Review	Date

<u>Donald Young</u>	<u>3/17/86</u>
Regional Office Approval	Date

TABLE OF CONTENTS

	<u>PAGE</u>
A. <u>HIGHLIGHTS</u>	1
B. <u>CLIMATIC CONDITIONS</u>	1
C. <u>LAND ACQUISITION</u>	2
1. Fee Title.....	2
2. Easements.....	Nothing to report
3. Other.....	Nothing to report
D. <u>PLANNING</u>	2
1. Master Plan.....	Nothing to report
2. Management Plan.....	2
3. Public Participation.....	Nothing to report
4. Compliance with Environmental and Cultural Resource Mandates..	3
5. Research and Investigations.....	3
6. Other.....	Nothing to report
E. <u>ADMINISTRATION</u>	9
1. Personnel.....	9
2. Youth Programs.....	13
3. Other Manpower Programs.....	14
4. Volunteer Program.....	17
5. Funding.....	18
6. Safety.....	18
7. Technical Assistance.....	Nothing to report
8. Other.....	Nothing to report
F. <u>HABITAT MANAGEMENT</u>	20
1. General.....	Nothing to report
2. Wetlands.....	20
3. Forests.....	22
4. Croplands.....	24
5. Grasslands.....	Nothing to report
6. Other Habitats.....	24

	<u>PAGE</u>
7. Grazing.....	Nothing to report
8. Haying.....	Nothing to report
9. Fire Management.....	25
10. Pest Control.....	28
11. Water Rights.....	29
12. Wilderness and Special Areas.....	Nothing to report
13. WPA Easement Monitoring.....	Nothing to report
4. Equipment Utilization and Replacement.....	57
5. Communications Systems.....	60
6. Computer Systems.....	30
<u>G. WILDLIFE</u>	
7. Energy Conservation.....	Nothing to report
8. Other.....	Nothing to report
1. Wildlife Diversity.....	30
2. Endangered and/or Threatened Species.....	31
3. Waterfowl.....	31
4. Marsh and Water Birds.....	32
5. Shorebirds, Gulls, Terns, and Allied Species.....	Nothing to report
6. Raptors.....	32
7. Other Migratory Birds.....	33
8. Game Mammals.....	34
9. Marine Mammals.....	Nothing to report
10. Other Resident Wildlife.....	Nothing to report
11. Fisheries Resources.....	36
12. Wildlife Propagation and Stocking.....	Nothing to report
13. Surplus Animal Disposal.....	Nothing to report
14. Scientific Collections.....	Nothing to report
15. Animal Control.....	Nothing to report
16. Marking and Banding.....	36
17. Disease Prevention and Control.....	Nothing to report

<u>H. PUBLIC USE</u>		38
1. General.....		38
2. Outdoor Classrooms - Students.....		39
3. Outdoor Classrooms - Teachers.....		40
4. Interpretive Foot Trails.....		40
5. Interpretive Tour Routes.....		41
6. Interpretive Exhibits/Demonstrations.....		41
7. Other Interpretive Programs.....		42
8. Hunting.....		44
9. Fishing.....		47
10. Trapping.....		Nothing to report
11. Wildlife Observation.....		47
12. Other Wildlife Oriented Recreation.....		47
13. Camping.....		47
14. Picnicking.....		48
15. Off-Road Vehicling.....		Nothing to report
16. Other Non-Wildlife Oriented Recreation.....		48
17. Law Enforcement.....		48
18. Cooperating Associations.....		Nothing to report
19. Concessions.....		49



NR-85-1

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INTRODUCTION

Great Dismal Swamp National Wildlife Refuge (NWR) was established in 1974 by an Act of Congress following the donation of 49,000 acres to the Nature Conservancy by the Union Camp Corporation. The refuge currently includes 105,275 acres located within the cities of Suffolk and Chesapeake in Virginia (VA) and the counties of Gates, Camden and Pasquotank in North Carolina (NC).

The primary purpose of the refuge as directed by Congress is to "Preserve and protect a unique and outstanding ecosystem and the diversity of animal and plant life therein".

Dismal Swamp is a forested wetland lying in the outer shelf of the Atlantic Coastal Plain. The topography is flat with elevations generally within 18 to 25 feet above sea level. The surface of the swamp slopes gently eastward; thus, water flows through the swamp in a general west to east

direction. Drainage is primarily through Lake Drummond to the Dismal Swamp Canal bordering the eastern boundary of the refuge. In the southern part of the swamp the ditches empty into the Pasquotank River in North Carolina.

Lake Drummond is located in the center of the refuge and encompasses approximately 3,100 acres. The origin of the lake is unknown and it has the distinction of being one of only two natural lakes occurring in Virginia.

Great Dismal Swamp has been severely affected by man's activities during the past 200 years. The Dismal Swamp Land Company began timbering operations in the eighteenth century and since that time the entire swamp has been logged at least once. Over 140 miles of roads and ditches have been constructed primarily to transport timber resulting in altered surface and ground water patterns. Wildfires starting in cutover areas destroyed thousands of acres of forest in the nineteenth and early twentieth centuries. A policy of total wildfire suppression since 1940 has largely ended the destruction of large fires; however, it has also eliminated an important natural phenomenon necessary for the regeneration of preferred vegetative species.

As a result of these various influences the Dismal Swamp is currently quite different from what it was 200 years ago. Cypress-tupelo gum and Atlantic white cedar, formerly the prevailing habitat types of the swamp, now occur on a fraction of the area they historically occupied, being replaced by red maple in association with red bay and swamp black gum.

The following list provides habitat type acreage occurring on the refuge.

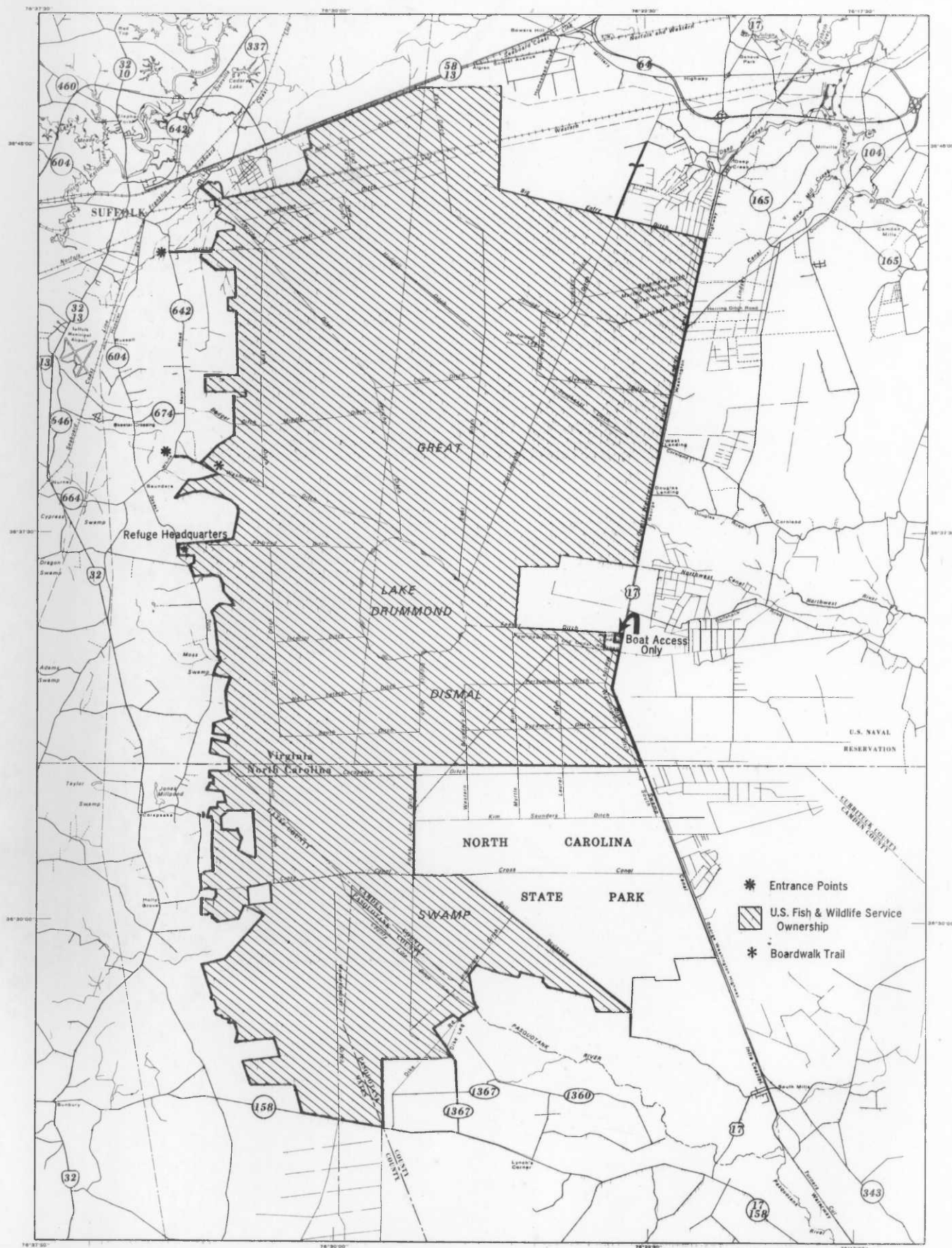
Red maple	-	63,000
Loblolly pine	-	16,000
Cypress-tupelo gum	-	12,000
Atlantic white cedar	-	7,000
Lake Drummond	-	3,000
Roads	-	1,500
mesic hardwoods	-	1,000
evergreen shrub	-	1,000
marsh and bog	-	500

GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

VIRGINIA AND NORTH CAROLINA

UNITED STATES
FISH AND WILDLIFE SERVICE



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

BOSTON, MASSACHUSETTS DECEMBER 1976
REVISED: 5/88

Scale 0 8000 16000 24000 32000 Feet
0 1 1/2 2 Miles

MN
GN
7°
0°53'
MEAN
DECLINATION
1973

SR MA. 858

A. HIGHLIGHTS

- In 1985 3,190 acres were obtained in fee title at a total cost of \$2,353,764 bringing the refuge acreage to 105,275 acres (Section C.1).
- By year's end 16 water control structures were operational following six years of planning and three years of construction. For the first time there is the capability to direct 41 square miles of inflow into 23,000 acres of the refuge (Section F.2).
- The Black Bear Study Team ended the year with 93 captures of 81 bears (Section D.5).
- The Dismal Swamp subspecies of the southeastern shrew was formally proposed for threatened species status (Section G.2).
- In March a refuge contractor's equipment was vandalized with damages totalling \$12,500 (Section H.17).
- During the 1985 deer hunt, 2,216 hunter visits resulted in 211 deer being checked out by refuge personnel (Section G.8 and H.8).

B. CLIMATIC CONDITIONS

Climatically, 1985 was quite normal when comparing total annual rainfall and average annual temperature with long term averages. When analyzed by seasons and/or months the year was quite atypical. Precipitation for the year totalled 51 inches compared to the long term 50 inch average yet it was more than six inches below the five year 1981-85 average (See annual and monthly rainfall graphs).

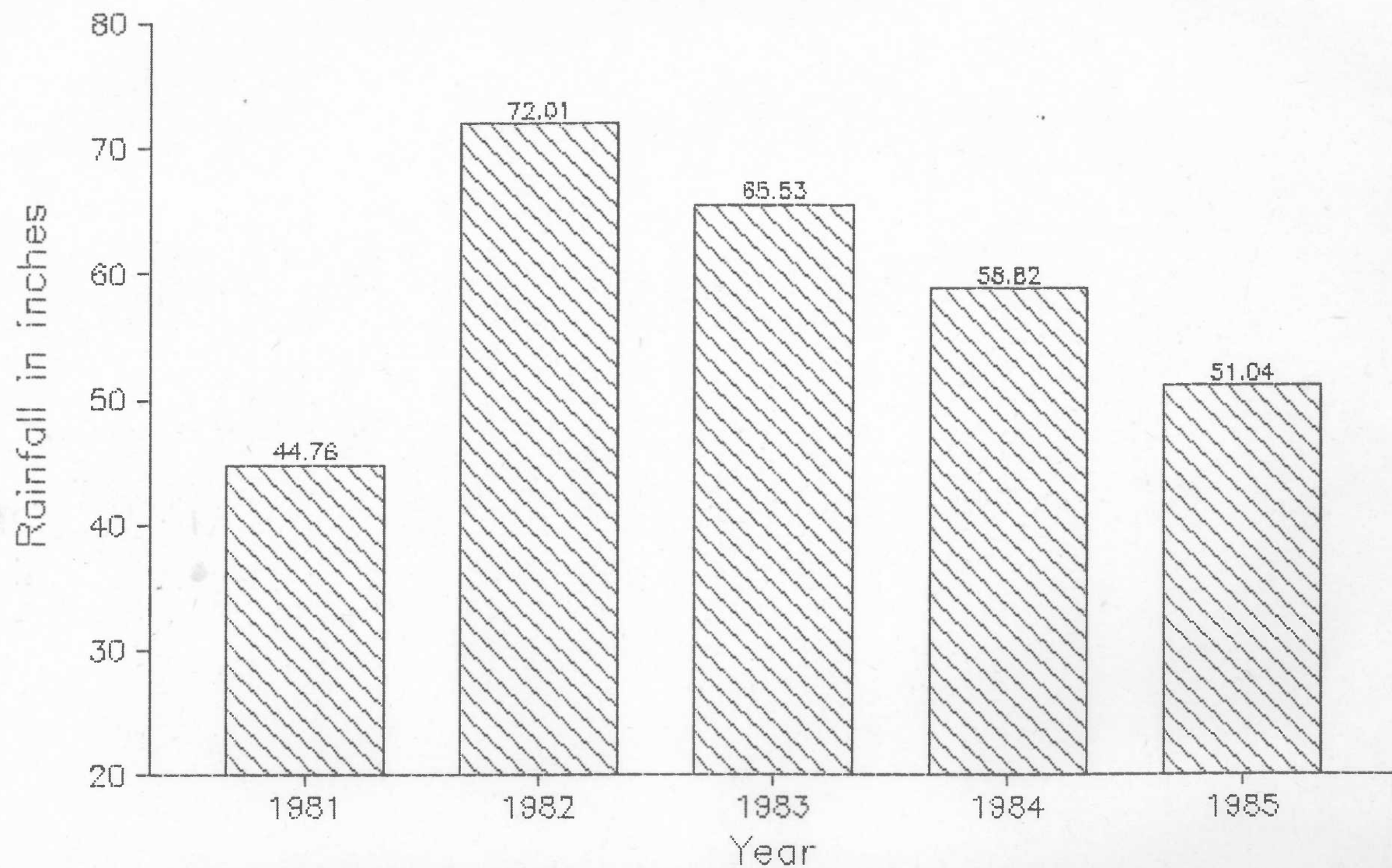
Below normal rainfall March through May coupled with an unusually warm spring resulted in a fairly severe drought in the summer. Of primary concern was the danger of wildfire. There were a rash of fires in Virginia and North Carolina including the 100,000 acre fire at Pungo NWR; however, luck was with us and only one small fire occurred in July.

The Dismal Swamp Canal was closed to navigation on July 3, the result of low water levels; and diminished flow in the Northwest River resulting in brackish water intrusion prompted the City of Chesapeake to request use of water from the Dismal Swamp Canal to supplement their water supply. In a nutshell use of the water in the Dismal Swamp Canal for any reason during low water periods would result in the depletion of water levels in the swamp.

As is always the case, the effects were not all negative as conditions were conducive for road maintenance, on-going construction and youth program projects.

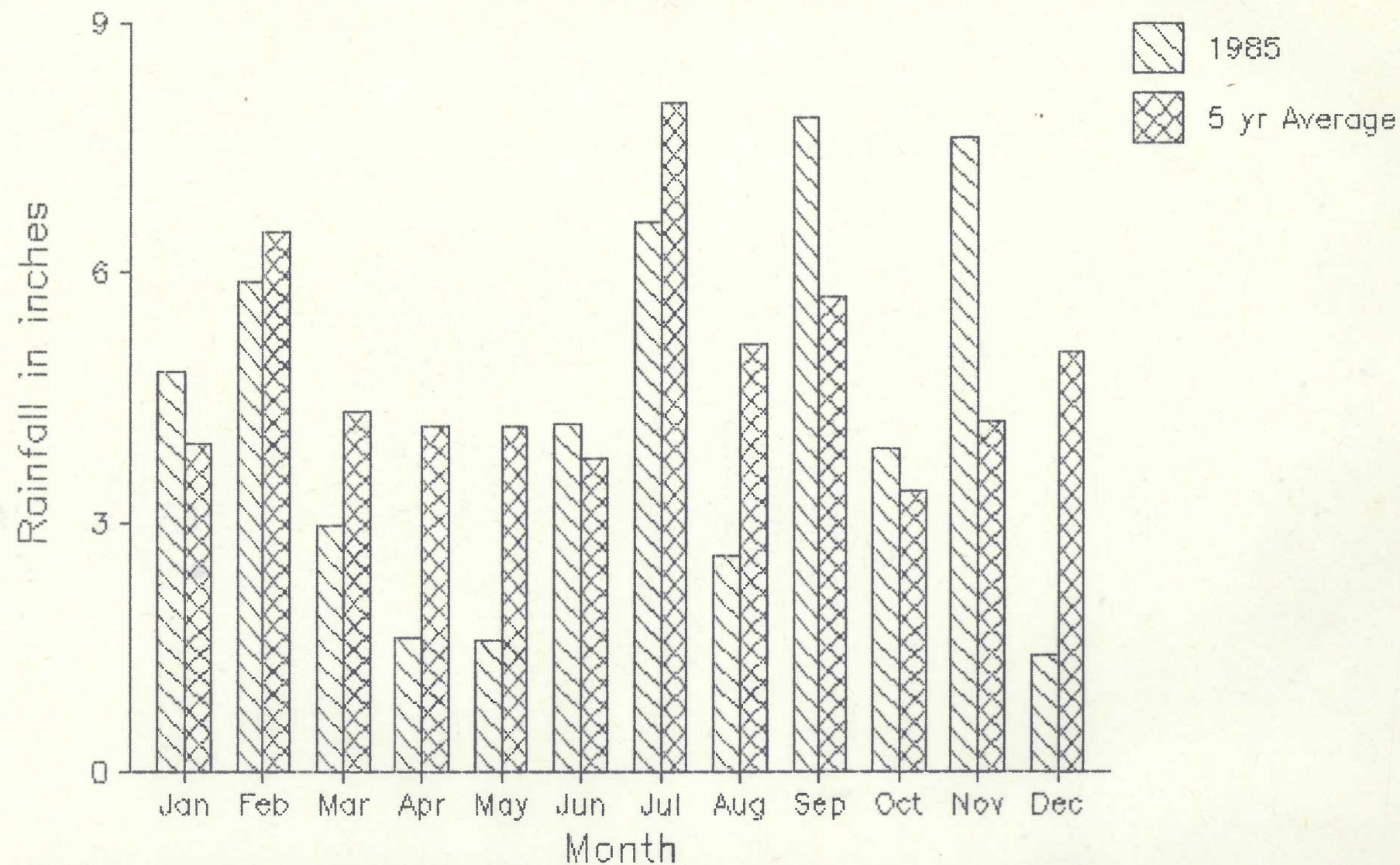
Drought conditions were broken with above normal rainfall September through November. Though a blessing in some respects, precipitation resulted in the cancellation of two hunt days during the refuge's eleven day deer hunt in October and November. The end result being fewer deer harvested than

ANNUAL RAINFALL GREAT DISMAL SWAMP NWR



MONTHLY RAINFALL

GREAT DISMAL SWAMP NWR



anticipated.

The year ended with an extremely dry December and abnormally low water levels in the swamp.

C. LAND ACQUISITION

1. Fee Title

Refuge area as of 12/31/85 was 105,275 acres. North Carolina contains 24,556 acres, or 23 percent of the total. Of the 80,719 acres in Virginia, 34,164 are in Suffolk and 46,555 are in Chesapeake.

In 1985 3,190 acres were purchased at a cost of \$2,353,764 as depicted below:

Name	Tract Number	Acres	Purchase Price
<u>Virginia</u>			
1. Raymond Brinkley	55,R	38.4	\$32,448
2. Atlantic Farms	13b,c	220.5	131,200
3. Fermer Perry	61	128.5	77,100
4. Fermer Perry	61b	310	298,340
5. Fermer Perry	61a	304	274,208
6. Edge et al	11,a,R	1,531.63	1,072,141
7. Hathaway	57,R	16.8	13,787
8. Old	18	525	363,500
9. Judith Brinkley	59	79.5	47,700
		<u>3154.33</u>	<u>\$2,310,424</u>
<u>North Carolina</u>			
1. Wilson White	44	23.6	\$35,000
2. Henry Mathias	41b	12.0	8,340
		<u>35.6</u>	<u>\$43,340</u>
	Totals	3189.93	\$2,353,764

D. PLANNING

2. Management Plans

A significant amount of staff time was spent to complete several management plans as directed in the FY 85 Annual Work Plan Advices.

The Search and Rescue Plan, written by Assistant Refuge Manager Trainee Terry Villanueva, was submitted to the RO on 9/24/85 and to our amazement

received RO approval on 10/2/85. Talk about a fast turnaround rate!

A justification to exclude Great Dismal Swamp NWR from preparing a Waterfowl Disease Contingency Plan was prepared and submitted to the RO in October. The RO concurred with our rationale and waived the need for this plan.

Work was intermittently accomplished on the station's Law Enforcement (LE) Plan, however personnel changes and higher priority projects kept this task on the backburner most of the year. Although it is 90% complete the LE plan was not finished in 1985. The plan will be completed in 1986.

4. Compliance with Environmental and Cultural Resource Mandates

Considerable efforts were expended by refuge and Regional Office (RO) Staff to complete the Master Plan's Environmental Impact Statement (EIS) in 1985; however, once again we came up short of our goal.

Mary Parkin, RO Planning, visited the refuge March 14-15 to initiate the year's efforts with a status review of where things stood and obtain staff input needed for completion of this project. Following this visit Refuge Manager Jim Oland attended a meeting in the RO on March 29 with Refuge Supervisor Ed Moses, Mary Parkin and Deputy Regional Director William Ashe to ensure all parties concerned understood and agreed upon the course of action needed to complete the EIS.

Intermittently throughout the remainder of the year draft sections of the EIS were reviewed by the refuge staff when received from the RO.

5. Research and Investigations

"ECOLOGY AND POPULATION CHARACTERISTICS OF THE BLACK BEAR IN THE GREAT DISMAL SWAMP"

The study of black bear ecology funded by the Fish and Wildlife Service (FWS) and conducted by the Virginia Cooperative Fish and Wildlife Research Unit under the supervision of Dr. Michael R. Vaughan continued into its second year in 1985. Project objectives are to investigate bear population dynamics, to identify seasonal habitat preferences of bears in relation to habitat availability, and to describe black bear winter behavior in a southeastern swamp environment. Investigation of swamp bear physiology and genetics is also being conducted. Field work will continue until August 1986 and will provide data essential to manage the bear population of Great Dismal Swamp NWR.

The first three months of 1985 were spent searching for dens of radioequipped bears and monitoring four bears (2 male, 2 female) which failed to become dormant during the winter. Data on home range, movements, and other life-history attributes of these four "winter-active" individuals have been summarized in a manuscript to be presented at the VII International Conference on Bear Research and Management in Williamsburg, VA in February 1986. This paper will be the first to describe winter ecology of active black bears. The mild climate, lack of snow cover, and moderate food

availability found in the Swamp during winter apparently "allows" bears to remain active. The eight radioequipped bears (5 male, 3 female) which did den had emerged by April 1, with the exception of adult female five, who emerged on April 20 with two cubs. This female was handled in her den on April 15 and the cubs were eartagged. She died between April 26 and April 28 of unknown causes, perhaps related to handling. Den types used by Swamp bears in the winter of 1985 were three ground nests, four excavated ground cavities, and two basal cavities of black gum trees.

Trapping began again in mid-April and continued through early October. Traps were opened again from late November to mid-December. A total of 55 captures of 46 individuals (24 male, 22 female) were made in 1286 trapnights (23 nights/capture). Trapping improved in sex ratio (nearly a 1:1 male:female ratio versus a 4:1 ratio in 1984), quantity (55 captures versus 38) and efficiency (23 trapnights/capture versus 32) over 1984. This improvement can be attributed to greater familiarization with the study area and Technician Mike Lane's excellent trapping skills. A total of 81 bears (52 male, 29 female) in the Swamp have now been tagged. Ten marked bears were known to have died during 1985 including four to hunting, one roadkill, two research-related, and three unknown; Fourteen (17%) of the tagged bears are now known dead. In addition, four radioequipped individuals are now missing, presumably from collar failure or illegal harvest.



The capture,...

NR-85-2

MCK 4/25/85



...data collection....

NR-85-3

MCK 4/25/85



...tattooing and

NR-85-4

MCK 4/25/85



...radio collaring.

NR-85-5

MCK 4/25/85

The first set of 32 premolars from marked bears were sectioned and aged by cementum annuli. Average age of the sample was 4.5 years. Weights of 1985 captured bears ranged from 75 to 345 pounds for males and 55 to 165 pounds for females. The 1984 giant of 435 pounds remains the heaviest bear tagged in the Swamp.

Radiotracking of collared bears was a main priority this year and more than 1500 relocations were made by ground and aerial tracking. Gross seasonal trends in habitat use were noted. Bears are widely distributed in spring and early summer, and begin aggregating at sources of soft mast such as blackberry and wild black cherry in July. By late September most radioed bears are found in extensive black gum-red maple or gum-baldcypress swamps or in small mesic areas harboring a variety of oak species. During November and December activity begins decreasing with the transition into winter dormancy, although some bears stay active in pocosin areas dominated by inkberry into January and beyond. Scat analysis (250 were collected in 1985) will be used to relate the above changes in habitat use with seasonal shifts in food habits.

Winter behavior of 21 radioed bears (19 female, 2 male) is currently being monitored during the winter of 1985-86. Information on denning chronology, den requirements, and reproduction will be obtained in the upcoming months. Six radioed females are believed pregnant, three females are denned with yearlings, seven appear to be nonbreeding subadults and three are unknown.

Studies Conducted by Others:

1. Survey of Bats of the Dismal Swamp. Dismal Swamp NR 85-74-2; Robert K. Rose, PhD, Old Dominion University.

Dr. Rose and his student Thomas Padget are preparing a series of journal papers on the bats collected from the Dismal Swamp. Not only have they found a new record for the state of Virginia and two records for the swamp, but some very interesting ecological data will also be reported. The seasonal sex ratios of some species have shown extreme variation and the red bat appears to have few inhibitions for flying in freezing weather when its cousins are hibernating.

2. Vegetation Productivity in Hydric Environments. Dismal Swamp NR 85-75-3. Frank P. Day, Jr., PhD, Old Dominion University.

Dr. Day has three students funded under a National Science Foundation grant investigating root production and response in various water regimes. Susan K. West and Jerry Tupacz are the field researchers, each working toward their masters' degree in biology. Four study sites in the Dismal Swamp were selected on the basis of water regimes and different vegetative cover. Root production and breakdown are being quantitatively investigated and important physical and environmental parameters are being recorded. Data analysis is expected to begin next fall with the preliminary reports published in 1986-87.

3. Ecology of The Swainson's Warbler. Dismal Swamp NR 85-75-4. Brooke Meanley, USFWS, Patuxent, retired.

Mr. Meanley has worked on the song birds of the Dismal Swamp for over 20 years and has published numerous monographs on the habits of specific species as well as many popular articles on the swamp and its inhabitants. He is continuing his work on the habitat preference and territory size of the nesting Swainson's warbler.

4. Survey of Lepidoptera of the Dismal Swamp. Dismal Swamp NR 85-81-5, 85-84-7, 85-84-8. William Garnett, George D. Krezek, MD., Andrew F. Beck.

These three individuals have worked on different aspects of the butterflies and moths of the Dismal Swamp for the past five years. Dr. Krezek has just completed a major photographic publication on the butterflies of North America including many specimens from Dismal Swamp. Misters Garnett and Beck are working on specific hybrids of the Lycaenid group of butterflies.

5. Ecology of the Herptafauna of the Dismal Swamp. NR 85-84-6. Christopher A. Pague, PhD candidate, Old Dominion University.

Mr. Pague began his work in the Dismal Swamp a year ago under a funded study for the State of Virginia to conduct a statewide survey of reptiles and amphibians. He recognized the Dismal Swamp as an excellent location for in-depth studies of reproductive capacities and limiting factors that dictate population range limits. The Dismal Swamp is at the outer range limits for many reptiles and amphibians, and the seasonal collection of these species will contribute immeasurably to the understanding of the ecology of this interesting group of animals.

The capture success to date includes six of 18 species of frogs and toads, four of nine salamanders, three of five lizards, 11 of 21 snakes and all of the eight species of turtles expected in the Dismal Swamp. In addition to those expected species, Mr. Pague has added the red-spotted newt to the Dismal Swamp list and more significantly, has added the lesser siren to the Virginia State list.

E. ADMINISTRATION

1. Personnel



10 9 5 8 2 1
3 6 7 4

1.	James P. Oland	Refuge Manager	GS12	EOD 9-19-82	PFT
2.	Martin C. Kaehny	Refuge Manager	GS11	EOD 3-03-85	PFT
3.	Lydia T. Villanueva	Refuge Manager	GS7	EOD 5-15-85	PFT
4.	Allen Carter	Forester	GS11	EOD 5-04-80	PFT
		Fire Mgmt. Officer			
5.	Mary Keith Garrett	Biologist	GS11	EOD 8-05-73	PFT
6.	Sally Leary	Secretary	GS5	EOD 1-13-80	PFT
7.	Susie Briley	Clerk-typist	GS3	EOD 10-1-84	PFT
8.	Bailey White	Equipment Operator	WG10	EOD 3-15-78	PFT
9.	Dane Wunningham	Maintenance Worker	WG5	EOD 7-24-83	PFT
10.	Wendell Swanner	Maintenance Helper	WG5	EOD 8-19-85	TFT
	Howard Rybolt	Realty Appraiser	GS12	EOD 12-31-78	PFT
	Charles Pelizza	Outdoor Rec. Planner	GS7	EOD 4-04-83	PFT
				Transferred 8-3-85	
	John Thomas	Laborer	WG5	EOD 6-12-83	TFT
				Terminated 7-17-85	



Realty Appraiser Howard Rybolt



Bear Study Team - Mike Lane and Eric Hellgren



11271 - Windy
 9999 - Staff gauge
 98765 - Boss Lady
 6542 - Lever Snatcher
 33308 - Lowboy
 000 - Bwana
 1 - Doodlebug
 0101 - Pay-Purse Lulu

4321 - Su-sue
 0000 - Wild Turkey

On March 3, Marty Kaehny entered on duty as primary assistant. Marty transferred from Region 4, Pee Dee NWR, North Carolina.

On May 15 Terry Villanueva entered on duty as Assistant Manager Trainee, transferring from the U.S. Forest Service. Terry was District Biologist at the Green Mountain National Forest in Manchester, Vermont.

Biological Science Student Trainee Buddy Johnson, a wildlife management graduate student at the University of Maine in Orono, worked at Dismal Swamp from July 8 through October 25.

Temporary Maintenance Helper John Thomas resigned from the Fish and Wildlife Service (FWS) effective July 17, 1985. John had previously worked at this station for a number of years in the YACC program, for the U.S. Geological Survey and as a technician on the swamp's Transition Zone Study Project.

Outdoor Recreation Planner Charlie Pelizza transferred to Bombay Hook NWR, Smyrna, Delaware as Assistant Refuge Manager Trainee effective August 4, 1985.

Louis Wendell Swanner was hired to fill the vacant temporary Maintenance Helper's position effective August 19, 1985.

On August 21 Assistant Refuge Manager Marty Kaehny received a \$300 (less taxes) special achievement award in recognition of his superior performance while stationed at Pee Dee NWR, though by year's end he still had not received the certificate.

In December Marty was presented a 10 year Government Service pin and Certificate. My how time flies when you're having fun!

The following table provides a five year comparison of on-board employee strength (including coop students) and actual full time equivalents (FTEs) utilized. The chart excludes Youth Conservation Corps (YCC) and Student Conservation Association (SCA) personnel. The FTEs were calculated on a monthly basis rather than number of hours. Though rough, the figures are sufficient to show the decrease in staff over the last five years.

ON-BOARD REFUGE EMPLOYEES

	Permanent		Temporary	Actual FTEs Utilized
	Full Time	Part Time		
1985	10	0	2	9.1
1984	12	0	2	10.9
1983	10	2	3	13.3
1982	6	2	4	10.8
1981	7	3	8	12.4

2. Youth Programs

Great Dismal Swamp NWR hosted an eight week, 14 enrollee complement with two group leaders, Youth Conservation Corps (YCC) Program in 1985 that began June 21 and ended August 9. In addition five of the enrollees worked an additional 264 hours due to termination and absenteeism. Enrollee hours for the program totalled 4,416.

Several worthwhile projects were completed during 1985.



Parking lot rehabilitation by YCC

NR-85-6

MCK 7/25/85

The construction of an information kiosk at Washington Ditch entrance was the major project completed this year. The Enrollees devoted a great deal of time and effort to this project and were quite proud of the finished product. (Section I.1)

The following list details other major projects completed during the summer:

- Repair of the Perry Cabin and adjacent pier which sustained ice damage.
- Installation of numerous shallow-water wells for monitoring the water table within the swamp.
- Painting and posting refuge boundary lines.
- Improving the Dismal Town parking lot.
- Constructing wood duck and bat boxes.
- Stockpiling materials at the Bass property.
- General road maintenance.
- Clearing debris from ditches and water control structures.
- Maintaining vehicles (cleaning, checking fluid levels, etc.)
- Refuge headquarters maintenance.
- General office assistance.
- Assisting the bear study project.
- Assisting with a research project on root development and decomposition in the swamp.
- Rehabilitating an ATV bridge at Cross Canal.

Willie Ricks and Frank Roundtree, local high school teachers, returned this year as YCC Group Leaders. Unfortunately, both men were unable to complete the program. Frank Roundtree resigned July 5 due to a non-job related injury and Willie Ricks resigned July 24 to attend summer classes required for the retention of his teaching certificate. Co-op student Buddy Johnson took over as coordinator of the program and the entire refuge staff shared supervisory responsibilities for the remainder of the program.

Environmental topics were discussed on the job site throughout the summer and included hydrology, fire management, poisonous snakes, and the life histories of various wildlife. Safety was stressed and the refuge staff reviewed the safety aspects of each project including the appropriate personal protection gear.

One injury was reported during the program, involving an enrollee who suffered a minor back injury from lifting heavy materials, resulting in one lost work day.

3. Other Manpower Programs

The Student Conservation Association (SCA) Program involved two high school work groups, a leader and six participants per group. These young adults who volunteered their services are highly motivated, intelligent, hard working youths and have been an asset to this station's program. The first group worked from June 25 to July 13 and the second group worked from July 23 to August 13. For housing, the groups camped at Lake Drummond and to their credit left the site with no evidence of their occupation.

As in past years, we were pleased with the quality and quantity of work from the participants. The crews worked independently with only general

directions from the refuge staff. Projects accomplished included the following:

- Constructing an ATV bridge on East Ditch at Juniper to provide access to the Portsmouth Ditch area from the western side of the refuge. (Section I.1)
- Constructing a footbridge on South Ditch.
- Rehabilitating and maintaining footbridges at Hudnell, Williamson, New, Jericho, Railroad, Lynn, and Washington Ditch Roads.
- Boundary posting.
- Assisting with the bear research project.
- Road maintenance.
- Removing the pilings at Badger Cabin and brushing a trail to the cabin.

Safe work habits and use of tools were emphasized in all work projects. No on the job injuries were reported.

Total cost for the program was \$10,433.18, \$948.47 per participant for three weeks. Although we were pleased with the work accomplished and believe that SCA is a valuable program, during these times of austerity we can not justify the cost of this "volunteer" program. The high 1985 costs were attributed to the addition of 61% administrative cost for SCA overhead in Charlestown, New Hampshire. The contract stipulated an estimate of \$875 per participant and 40% administrative cost. These costs are hard to justify for the three weeks of work. The Washington office has been negotiating a new contract to provide a set cost, however it is unlikely that SCA will be cost effective.



"An enjoyable job on a hot day"

NR-85-7

MCK 7/14/85



"Engineers of tomorrow"

NR-85-8

MCK 7/30/85

Another SCA program used at this refuge was the Park and Forest Resource Assistant Program. Hugh Dinkler, a student from the University of Florida in Gainesville, assisted on work projects this summer from June 3 to August 16. Projects he assisted on during his twelve week tenure included boundary posting, dozer and tractor operation for road maintenance, the bear study, fire suppression, and forest inventory.



"Hugh doing his thing"

NR-85-9

LTV 8/12/85

Total cost for this program was \$1,463.78. We feel that this twelve week program is much more cost effective than the high school group.

4. Volunteers Program

Volunteers were used to assist in implementing a number of refuge programs in 1985. Twelve people contributed about 1067 hours and assisted on such projects as staffing biological check stations during the deer hunt, public tours, bear telemetry study, spring bird count, designing and staffing displays and exhibits, office receptionist and clerical work, volunteer program coordination, clearing roads and report writing.

Participants in the volunteer program this year were Susie Briley, Bruce Caler, Betsy Carter, Russell Hopkins, Mike Lane, Ronnie Leary, Ronald Leary Sr., Kathleen Meddleton, Tom Padgett, Don Schwab, John Thomas, and Sue West.

We would like to express our thanks to these people who donated their time

and energies to enhance the refuge's programs.

5. Funding

In Fiscal Year (FY) 85 Dismal Swamp NWR was initially appropriated \$368,000 in 1260 funds. This allocation was short lived and following the usual decreases and increases we ended the year with a base funding of \$365,400 plus \$30,000 in 1520 (YCC) monies for a grand total of \$395,400, a 16 percent (%) decrease below FY 84 funding.

Despite the 16% decrease in funding, salary savings due to personnel changes permitted enough discretionary monies to replace two worn out vehicles, a rotary mower, new tracks for our Case 850 dozer and a small water control structure. So when all is said and done it was not such a bad year after all.

Funding for FY 86 is another story. The allocation of \$334,300 in 1260 monies is enough to cover salaries, fixed cost and blanket purchase agreements. After that we are broke!

The following table compares the funding status from FY 82 - 86.

FUNDS						
FY	1210	1220	1240	(1) (2) 1922/1520	1260	TOTAL
82	2000	202,000	67,000	31,500	-	302,500
83	2000	349,000	109,000	13,500	-	473,500 (3)
84	-	-	-	-	470,000	470,000 (4)
85	-	-	-	30,000	365,400	395,400 (5)
86	-	-	-	-	334,300	334,300

1) U.S. Army Corps of Engineers Fund for Wetland Transition Zone Study conducted in Dismal Swamp.

2) YCC Funding

3) Includes 138,000 special Fire Funds (1510) for equipment purchases

4) Includes 58,000 Fire Funds (1510) and \$93,000 in ARMM Funds

5) Includes 11,900 ARMM Funds

6. Safety

Safety meetings were held periodically during the year. Topics covered included the following:

- fire safety hazards and grease fires,
- welding hazards,
- handling treated lumber,
- Lyme disease,
- safety in working with youth crews,
- reporting of injuries for workman's compensation,

- close calls,
- firefighting clothing and equipment and physical fitness requirements,
- radio use,
- a vehicle check for safety equipment,
- safety glasses,
- search and rescue operations,
- an eight hour multimedia first aid course, and
- S212 chainsaw safety and operation course.



"Demonstrating the head tourniquet technique"

NR-85-10

JPO 7/31/85

YCC and SCA high school crews had frequent tailgate sessions to discuss potential job hazards and safe working habits. Topics covered included poisonous snakes, ticks, working in the heat, safe tool use and protective clothing.

There were four reportable accidents this year. On January 25, Clerk/Typist Susie Briley sustained a knee and ankle injury while assisting with the removal of a display from the Holiday Inn (Scope) in Norfolk. A previous injury (a bum knee) apparently gave out while she was walking on a smooth carpeted surface.

A YCC enrollee pulled a muscle while lifting. He missed one day of work as a result of this injury. (Section E.2)

Assistant Manager Villanueva sustained an eye injury when a piece of dirt blew into her eye while she was operating a bulldozer. A physician removed the particle and treated scratches on the cornea. She was wearing goggles over glasses when the accident occurred.

In November, Biologist Garrett cut the back of her wrist while sharpening a knife at the refuge deer check station. Five stitches were required.

The Refuge Search and Rescue Management Plan was written by Assistant Manager Trainee Villanueva and approved by the Regional Office on October 2, 1985. The plan emphasized prevention, procedures for search and rescue operations, and contacts for assistance. (Section D.2)

Four search and rescue operations involving five hunters were carried out by refuge personnel during the refuge deer hunt.

This is a record number of people lost since the refuge hunts were established. This increase was attributed to hunters not being required to take a hunter's safety course and the number of first time refuge hunters who were not familiar with the swamp and its extremely thick vegetation cover.

F. HABITAT MANAGEMENT

2. Wetlands

Six years of planning, three years in construction, and nearly two million dollars of construction costs have resulted in 12 new water control structures on the refuge securing less than 10% of the water resources. To date, one water management unit of 10,000 acres now has all water outflows controlled with these new water control structures. Of the five remaining water management units representing 90% of the refuge, two have no water control at all, one needs a minimum of two structures and two need one structure each to permit minimal water conservation. Unless construction funds appear likely, the refuge staff plans to install several flash board riser structures similar in design to those installed by the previous corporate owners and currently being installed in ditches throughout the

region. Unlike FWS designed structures, these locally built structures use three to five foot diameter corrugated steel pipe with flash board risers. Instead of trying to support tons of concrete on batter piles as the FWS designs call for, the corrugated metal pipe rests on wooden sheetpiling and is tied down with cable. The life expectancy of the structure is limited by the steel pipe, making both designs exactly the same in amortization schedule but less than 25% of the cost!



Installing staff gauges at structures

NR-85-11

PTG 4/19/85

In June, the diversion structure on Washington Ditch was completed enough to divert much needed water into Lynn Ditch. This was a day of some reflection as it was the first time in 200 years that 41 square miles of upland inflow was returned to 23,000 acres of swamp land. George Washington himself dug the ditch that diverted these waters directly to Lake Drummond, thus depriving this vast acreage of its normal sheetflow of water. The first water quality samples were taken at this time, even though they were recommended prior to construction and, sadly enough, high chlordane was found in the water. We are now faced with diverting potentially polluted water. This single test must be confirmed with further verification and plans are underway to conduct additional testing on sediment samples, fish and earthworms found within the watershed.

Testing is also planned for the water adjacent to three automobile junk yards. Solid waste including tires, doors and hoods are regularly observed in the ditch and we fear that runoff is providing the refuge with antifreeze, oil, transmission fluid and other similar incompatible substances. The Virginia water control board has not responded to several requests to review the junk yard operations. As a result the FWS has scheduled additional water quality tests for that location.

3. Forests

The forest management program currently being developed at Dismal Swamp has three primary objectives. One is to provide habitat for particular wildlife species or groups of species. Examples are maintaining inkberry pocosins for black bear feeding and denning; managing mast-producing stands of oak and blackgum for bear, deer, squirrels, and wood ducks; and creating early successional habitat for small mammals such as the Dismal Swamp southeastern shrew.

A second objective is to provide a more balanced distribution of habitat types and age classes, in the theory that greater habitat diversity will result in a greater diversity of wildlife species. Presently over 60% of the refuge habitat is the red maple-gum type, and less than 5% of the habitat is in the regeneration or old growth age classes.

The third reason for forest management is to maintain or restore ecosystems characteristic of the Dismal Swamp. Atlantic white cedar, for example, is rapidly declining throughout its range along the Atlantic coast. The Dismal Swamp contains some of the largest remaining stands of cedar. Management tools such as timber cutting, prescribed burning and/or planting can help to regenerate this forest type. Baldcypress is another species formerly abundant in the swamp but now declining. Management could encourage restoration of this species.

The management strategy now being defined in the master planning process is to begin with a series of observation and demonstration plots in various habitat types. Each plot will test a method or group of methods for reaching objectives. For example, in the cedar type one plot might try a strip clearcut followed by prescribed burning to encourage natural regeneration. A second plot would try removal of maple by drum chopping, followed by planting cedar seedlings to see if cedar could be restored to some areas. After an initial five year trial period, recommendations will be made for proceeding on an operational basis.

Refuge Forester Carter developed a draft five-year experimental and demonstration phase forest management proposal for Great Dismal Swamp NWR. The primary objective of the proposal is to develop and determine the most cost effective and practical methods for restoring and/or maintaining specific plant communities such as Atlantic white cedar, bald cypress, etc. where they historically occurred. The experimental plots will also serve as demonstration areas for interested parties concerned with developing or maintaining these desired vegetation types.

A number of meetings with a diverse group of professional foresters and biologists were held to solicit recommendations concerning management of the preferred habitat types in the swamp. Preliminary field work was also conducted to initiate the start of the five year trial period.

Regional Office Landscape Architect Mary J. Parkin visited Great Dismal Swamp NWR March 14-15 to discuss the Environmental Impact Statement (EIS) section of the master plan (Section D.4) Forest management proposals were discussed in detail including the five year experimental and demonstration proposal.

On January 23, 114 foresters from Virginia, North Carolina, and South Carolina with the Society of American Foresters, Appalachian Chapter held its annual winter convention in Norfolk and visited Dismal Swamp on a field trip. Allen Carter gave a slide presentation on the natural history of the swamp and current management under the Fish and Wildlife Service. Following slides and refreshments, the entire group was taken to the boardwalk site on Washington Ditch for a look at Dismal Swamp forest types and to discuss management possibilities.

George Henderson, a forester with Atlantic Forest Products in Edenton, North Carolina visited the refuge February 19 to look at a possible Atlantic white cedar timber sale area on Lynn Ditch. This visit is part of an effort to find interested bidders to clear an area of about 30 acres prior to establishing a series of observation and demonstration plots. The plots will test various methods of establishing white cedar regeneration.

Bob Heeren from the Woodlands Division of Union Camp Corporation in Franklin, Virginia and Dr. Bob Kellison, Professor of Forestry at North Carolina State University, Raleigh, NC visited the refuge on November 19 to discuss habitat management problems in the swamp. The day was very informative and provided a new perspective on some of the problems. The importance of water level management for plant regeneration was strongly emphasized. Kellison sent a written summary of the tour and some suggestions for management.

Forester Carter hosted 21 members of the Southeastern Hardwood Cooperative on a tour of the refuge. Cooperative members are foresters from state and federal agencies and private industry interested in management of hardwood forests. The group was shown several forest types within the refuge and their recommendations concerning management options to meet wildlife objectives were solicited at each stop.

The following field work was accomplished with regard to the previously discussed five year test plots.

Three areas on the refuge were planted with baldcypress seedlings obtained from the North Carolina Forest Service nursery in Goldsboro. Two quarter acre plots, one at the boardwalk and the other at Washington and Lynn Ditches, were planted with 100 seedlings each. A third area off West Ditch was planted with 125 trees. These test plots will determine whether baldcypress can be regenerated by hand planting under an existing tree canopy.

Forester Carter and SCA Resource Assistant Hugh Dinkler visited a large Atlantic white cedar stand north of Corapeake Road June 6 and 7 to collect forest inventory data prior to a possible timber sale in 1986. Purpose of the sale would be to test methods of naturally regenerating white cedar.

Seed collection was undertaken as time and conditions permitted. Refuge objectives include regenerating preferred tree species which are declining in the swamp including oaks, white cedar, and cypress. Acorn production was excellent this year while seed production of cypress and cedar was poor. About 2000 acorns of white oak, swamp chestnut oak, cherrybark oak, and willow oak were collected and refrigerated.

4. Croplands

This is the second year of the cooperative farming agreement and it was complicated once more with the confusion of trying to separate government subsidized programs from the refuge land. Local farmers have a feed grain program and a peanut allotment, both of which apply to the refuge land. The cooperative farmer would have jeopardized his standing in the feed grain program if he did not declare the corn acreage he was planting on the refuge. This acreage was subtracted from the farmer's base when he applied for loans or submitted his acreage for guaranteed price support. Similarly, the peanuts were grown without other government guarantees even though they fell within the prescribed quota. We do not permit peanuts to be grown on refuge land because the chemical needs exceed our standards, but the Department of Agriculture permits an allotment assigned to one piece of land to be grown on another piece of land. So the bureaucracy goes...our job is to protect the environment and the investment of the taxpayer who paid for the allotment when the land was purchased. If the peanut allotment had not been used by the cooperative farmer, it would have been divided among other farmers and the chemicals would still be used but the taxpayers would lose part of their investment.

This year, the cooperative farmer planted the entire periphery of the cropland with VA 70 shrub lespedeza and established a good stand of hairy vetch on a rotation plot. These plantings combined with some much needed mowing used all of the rental value of the land. Next year we plan to convert a portion of the cropland into a pond/impoundment for fish and waterfowl (funds permitting). The Soil Conservation Service is scheduled to assist in the project.

6. Other Habitats

Road edges are being treated as the valuable habitat that they are for the first time this year. Like other rights-of-way, the road's edge dominant vegetation phase is maintained by mowing. Until this year, the mowing

operation was viewed as a road maintenance activity of limited environmental consequence. When the trees shading several roadways were recently removed and the right-of-way subsequently widened, this area was recognized to have management potential.

The previous mowing methods consisted of total clearing of both sides of entire road systems resulting in an immediate loss of habitat and valuable wildlife cover over many continuous miles. This condition improves after the first growing season but still limits diversity that vegetation age differences provide.

This year we started mowing in quarter-mile increments, mowing every third segment. The mowing will be a 3 year rotation, permitting the maximum diversity in both composition and height along each road. Each newly mowed quarter-mile area will have a one-year-old segment and a two-year-old segment next to it, thus reducing stress on local wildlife.

9. Fire Management

Fire Management Officer (FMO) Carter attended a meeting on prescribed burning presented by the Virginia Division of Forestry on January 7 in Waverly, Virginia. Items discussed included fire safety and smoke management.

Carter and Heavy Equipment Operator Bailey White attended the annual cooperators fire suppression meeting put on by the North Carolina Forest Service in Plymouth on January 30. Of particular interest were slide presentations and discussions of several forest fire fatalities which have occurred in the Southeast and Midwest since 1980. Reasons for fatalities were discussed as well as ways to prevent deaths or injuries in the future.

Carter met with Jim Murphy of International Fire Management consultants and Denny Holland, Refuge Manager at Chincoteague NWR, January 16 to discuss preparations for the Region 5 fire training course held in February. Fire Management Officer Carter participated as instructor and service chief.

An unusually warm, dry spring encouraged a rash of fires in Virginia and North Carolina. Great Dismal Swamp's two Crisafulli high volume pumps were delivered to Pungo NWR to assist in suppressing a 95,000 acre surface and ground fire on both refuge and private lands. Six Gorman Rupp portable pumps and 5,500 feet of hose were loaned to the North Carolina Forest Service Office in Elizabeth City to help them suppress two ground fires burning in Pasquotank and Camden counties. The N.C. Forest Service also borrowed our Honda ATVs for patrolling and laying hose. Most equipment was returned in better condition than it was received.

In return for the use of some of our fire suppression equipment, the North Carolina Forest Service radio expert assisted in installing radios in the Cat D6 and Case 850C dozers.

Allen Carter was detailed to Jamestown, North Dakota April 13-20 as a member of the instructor cadre teaching the new FWS Basic Fire Management course for Region 6 employees. The course was well-received by the 30 students who participated.

Fire Management Officer Carter was unexpectedly summoned to Moosehorn NWR May 1 through May 4. Carter's presence was requested by the Fire Management Coordinator at Boise Interagency Fire Center (BIFC) through the RO in response to a 1,000 acre wildfire which included 400 acres within the Edmunds unit of Moosehorn. The purpose of Carter's involvement was to observe Maine Forest Service suppression tactics and expenditures, advise the Refuge Manager on fire related matters, assist where needed, and gain experience on fires. Following control of the fires Carter wrote a rehabilitation plan for the refuge enabling them to repair roads, culverts, and equipment staging areas damaged by the suppression efforts.

Allen Carter was summoned to BIFC on July 10 to assist in fire suppression training of soldiers of the Sixth Army at Fort Ord, California. The Army was trained for firefighting because the extremely high level of wildfire activity in the West resulted in national resources being exhausted. Approximately 700 soldiers of the Seventh Light-Infantry Division were trained July 11-12.

Rains in June relieved the spring drought so the incidence of fires in the refuge was low in 1985. However, a small peat fire was spotted by Eric Hellgren on July 24. Refuge staff responded immediately and put it out the same day. Although the fire did not pose a major threat to the resource, it provided a good training opportunity and a test of refuge fire preparedness.

The S212 Powersaw course was given to 17 Service employees from five refuges at Dismal Swamp headquarters October 1-2. The course was oriented toward fire suppression but also provided basic instruction in chain saw operation and maintenance. The instructor was Mr. Ed Smith, a U.S. Forest Service Fire Management Officer from George Washington National Forest.



"Sure cuts better with the switch on!"

NR-85-12

MCK 10/2/85

Carter provided S190 Fire Behavior and S130 Firefighter training to Villanueva, Johnson and SCA student Hugh Dinkler. Training was largely self-study and in no way intended to replace the Basic Fire Management training required by the Service. Purpose was to provide a minimum level of training needed to assist in fire suppression and prescribed burning in 1985. Villanueva is scheduled to receive Basic Fire Management training in 1986.

Five people on the staff (Oland, Kaehny, Villanueva, White, Carter) met the minimum step test requirements established as the interim Service policy for 1985. These individuals have met minimum training and physical fitness standards, qualifying them to work on refuge fire suppression and prescribed burning.

The refuge has, on several occasions since its establishment in 1974, attempted to negotiate a cooperative agreement for fire suppression with the State of Virginia. Both the Service and the State have recognized the need for an agreement but failed to reach an understanding on the amount the Service would pay the State for detection and suppression of refuge fires. The Service therefore decided to develop its own fire control capability independent of the State. Since 1978 the refuge has had the capability (equipment and trained personnel) necessary to take care of its own fires.

In 1984 all Region 5 refuges were asked by the ARD to initiate negotiations for fire control agreements where they were lacking. We once again approached Virginia, but this time from a position of strength since we possessed better equipment for swamp fire suppression. This time an agreement was drafted which permitted real cooperation between the two agencies, rather than a one way street. Either agency could request assistance from the other, but the agency receiving the request could decline if its resources were unavailable or needed at the station. The agreement recognizes that most of the time both agencies can handle their own fires, but on occasion might benefit from outside help. Reimbursement to the State would be for suppression costs only, rather than a fixed cost per acre per year. The agreement was approved by the Regional Director in June, 1985 and by the State of Virginia in July.

Our cooperative agreement with North Carolina has been in effect since 1976, and neither agency sees a need to change. We have enjoyed a good working relationship with the North Carolina Forest Service.

Prescribed burning plans for FY 1986 were submitted to the RO and approved. Three forty acre plots were selected in a variety of habitat types for trial burning in the late fall and winter. Two other areas are scheduled for burning in late spring or summer. In addition, road and ditch bank burning will be tested as an alternative or supplement to mowing.

An amendment to the fire management plan was approved by the DRD in November. The amendment allows for certain annual recurring expenses to be charged to the 1510 emergency fire presuppression account. Annual expenses totalling \$34,000 were approved including aerial fire detection, two-thirds (2/3) of the Fire Management Officer's salary, seasonal fire crews, normal unit strength level maintenance, and fire break construction and maintenance. Additional expenses such as emergency road and bridge repairs and equipment leasing or rental could be incurred as needed, subject to the

approval of the Service Fire Management Coordinator.

Items obtained from fire money in 1985 included six new 100 watt mobile radios with repeater system capability, and a MT500 5 watt portable radio. \$2,650 was spent to replace the pyramid tracks on the Case 850C dozer with standard grouser pads. The pyramid pads were fine for road work but were unsuitable for work in the woods where more traction is required. They were also a hazard when loading the tractor on the tilt bed transport truck.

Emergency presuppression fire money (1510) totalling \$3,000 was spent in 1985 to repair a road wash out on Insurance Ditch. Failure to repair this road would have denied access to a large portion of the swamp for fire control and other management activities.

10. Pest Control

A roadside spraying program was initiated at the request of manager Keel in 1981. It was felt that if an environmentally safe herbicide could be found spraying might kill or suppress woody brush enough to reduce or eliminate annual mowing of roadsides. Du Pont Krenite was found to be the safest herbicide currently available, having little or no effect on wildlife, little soil movement, rapidly degraded with a half-life of less than ten days, and LD50 greater than 10,000 parts per million. It is a contact herbicide with only those parts of the plant actually sprayed being affected and it is supposed to kill woody vegetation but not herbaceous plants.

Test spraying was conducted from 1982 to 1984 as follows:

1). 1982 - Both sides of Williamson Ditch, about 9.4 miles total or 17 acres, were sprayed in September with a 3% solution of Krenite at three gallons per acre. Cide-Kick, a citrus by-product, was used as a surfactant. The application rig was a 15 ft. spray boom with a 200 gallon aluminum tank mounted on the M37. Examination the following summer indicated a mortality of 80% or better on broad-leaved deciduous species such as maple or sweetgum with poorer results on evergreen species. Ferns and grasses appeared to be unaffected.

2). 1983 - Krenite and Cide-Kick were applied in a 2.5% solution to a five mile stretch along the bank of East Ditch. The strip averaged ten feet wide and encompassed six acres. Examination the following June indicated that woody growth had been suppressed.

3). 1984 - A 2.5% solution of Krenite S (surfactant included, Cide-Kick not used) was applied to a ten mile strip along the ditch banks of Lynn, Jericho, and a portion of Jericho Lane. Examination in 1985 indicated that some of the ferns and herbaceous plants had been killed, but most of the maples were only suppressed or unaffected.

A 1985 evaluation of the three year program drew the following conclusions:

- The chemical is expensive - about \$150 to \$200 per mile of roadside.
- New spray equipment would have to be purchased if we were to spray on an annual operational basis.

- There are still unanswered questions about the environmental effects of Krenite, e.g. what is its effect on invertebrates and other aquatic life in the ditches?
- There is a general reluctance among most of the refuge staff to handle or apply pesticides.
- The chemical often kills herbaceous vegetation, which is not the intended effect.
- The effect of Krenite on woody vegetation is unpredictable. Often it only suppresses trees but does not kill them. It does not seem to be as effective on freshly mowed areas or on larger trees. It was most effective when combined with the surfactant Cide-Kick and applied 2-3 months after mowing. It does not kill evergreen species such as greenbrier, sweetbay, and holly.

In conclusion, it does not appear that broadcast application of Krenite on an operational level is justified. Other options need to be explored, including rotational mowing, prescribed burning, and spot application of herbicides using backpack sprayers.

11. Water Rights

A potential impact identified in 1984 concerning an adjacent landowner pumping water from Badger Ditch, thus using water the refuge is trying to conserve, became a reality in 1985.

Completion of the water control structure at the Washington and Lynn Ditch junction in 1985 permitted diversion of 41 square miles of upland inflow from Washington Ditch into 23,000 acres of the refuge including Badger Ditch.

The adjacent landowner and farmer dredged approximately 1800 feet of Badger Ditch during the summer of 1984. Irrigation of their fields utilizing water from Badger Ditch became a reality this summer during our first diversion effort, and for all practical purposes they drained more than eight miles of ditches. Not only does this affect the ecology of the swamp by draining the water we are trying to conserve; the potential for a wildfire with no water for suppression efforts also is of great concern.

A solicitor's opinion received in December states a riparian proprietor has an equal right to reasonable use of water running through his land, but only when after such use there is no diminution or alteration of natural flow. To make a long story short, we can dam the ditch at our boundary to protect against damage to the refuge from improper water use by other landowners.

Drought conditions in the Hampton Roads area this past summer prompted the City of Chesapeake to study potential alternative water sources, as the City's pumping station on the Northwest River was taking in water with high chloride levels (a problem identified prior to construction)! The extremely low water levels in the Northwest River resulted in brackish water intrusion. The Dismal Swamp Canal which borders the eastern boundary of the refuge was one of the potential water sources identified by the city.

The refuge has priority rights to the water in the swamp; however once in the Dismal Swamp Canal, where the greater portion of the refuge's drainage

empties, the Corp of Engineers has water rights. In a nutshell, the problem is that the water in the canal maintains the water level in the swamp. Lowering the level by pumping from the canal would result in lateral movement of the water from the refuge through the peat soils into the canal.

This prompted a meeting on July 11 with the COE and representatives of the City of Chesapeake to discuss their proposal. The refuge staff with assistance from Dave Westerling (EN) and in consultation with Karen Mayne and Bob Zepp, Ecological Services, developed criteria under which we felt the canal water could be used.

Luckily the COE would not permit withdrawal of water from the canal because navigational needs have to be met first before water could be diverted for other uses.

G. WILDLIFE

1. Wildlife Diversity

The occurrence of five different forest cover types and a marsh, bog and evergreen shrub areas provides a good variety of habitats that support a diverse array of wildlife species.

Mammals	-	46 species
Birds	-	209 species (92 nest within the swamp)
Amphibians and reptiles	-	62 species
Fish	-	24 species (Lake Drummond)



"Diversity, canebrake rattlesnake"

NR-85-13

JPO 9/85

Historically both the endangered red-cockaded woodpecker and bald eagle nested in the swamp. The Dismal Swamp Southeastern Shrew is currently being proposed for listing as a threatened species.

It is the primary objective of this refuge to manage the Dismal Swamp to protect and preserve this unique, outstanding ecosystem with its diversity of animal and plant life for future generations to enjoy.

2. Endangered Species

The Dismal Swamp subspecies of the Southeastern Shrew was formally proposed for threatened status. The proposal is the culmination of some four years of study by Dr. Robert F. Rose of Old Dominion University. In 1982-83, Dr. Rose was funded by the FWS Endangered Species Office, Annapolis, MD.

Unlike most threatened or endangered species that have attained their rare status through habitat loss, the Dismal Swamp Shrew may become genetically extinct as a result of interbreeding with the more widespread upland species.

The Dismal Swamp Shrew is highly adapted to the wetland environment that existed in the swamp for over 3,500 years. Recent environmental and developmental changes have permitted the swamp ecosystem to dry enough to provide marginal habitat for the upland form of the shrew. Intergrades have resulted from the interbreeding of the two subspecies. If this continues, the Dismal Swamp Shrew will be lost, not because the individuals died but because their adaptations to wetland environments were no longer needed.

The final rule on this designation is expected in 1986.

Refuge management plans that may help the shrew include conservation and manipulation of water, and forest management practices to increase the quality and quantity of early regeneration habitat. (Section F.6)

With the help of Dr. Rose and three of his students, five different habitats were sampled for small mammals. Prescribed burning or clearing was planned for these different vegetation types and it was important to have pretreatment evaluation of the sites prior to treatment. A total of 16 Sorex longirostris were found and all sites had at least one specimen in 25 trap nights. Further laboratory work is needed to determine which subspecies they are or if they are intergrades between the two.

3. Waterfowl

For the first 11 years of the refuge's history, the staff tried to develop a reasonably consistent counting and reporting method for waterfowl use of refuge lands. Unlike other coastal refuges that were established as part of the flyway and managed to provide habitat for the wintering migrants, the Dismal Swamp's mission is to manage a forested wetland. The waterfowl use of Lake Drummond, though occasionally diverse in species and high in numbers, has no food to support wintering populations and cannot be managed to produce any. However, Lake Drummond is locally important as a protected loafing area. The highest numbers of waterfowl are seen when the surrounding waters are frozen or a severe storm is in the area. It is

impossible to identify all the birds on the 3000 acre lake much less get a reasonably accurate count. The staff decided this year that the use day statistics compiled under the current reporting system implied trends that could be managed; i.e., fewer canada geese.. plant more winter wheat. The birds are being accurately counted once a month by the state biologists when they fly the coastal regions under state jurisdiction and are being reported through those channels. When the proposed pond/impoundment is completed near the office complex, some management will be possible and we will begin reporting waterfowl use at that time.

4. Marsh and Water Birds

On March 1, Biologist Garrett and 14 science club students completed the mapping of the heron rookery located in the North Carolina portion of the refuge. The trip was planned to avoid disturbing the birds, but much to her surprise some 45 birds were busy selecting, protecting and putting their "nest in order". Nine trees with 74 nests were mapped with known bearings and distances. Seven additional nests were found on the ground, the result of winter storms.

6. Raptors

On March 1, refuge personnel erected an osprey nesting platform in Lake Drummond. In May, state biologist Don Schwab observed two ospreys carrying sticks to the structure; however, the ospreys apparently gave up the effort. Oh well, maybe in 1986.



"I'm not being paid to get wet!"

NR-85-14

MCK 3/21/85

The local raptor rehabilitation center located at the Norfolk Zoo is doing an exceptional job caring for and placing injured hawks, owls and vultures. With increased public awareness as well as assistance of city and state law enforcement personnel, the refuge staff is not called for as many rescues as in past years. An example of public involvement happened last May when a VERY big VERY burly truck driver stopped his 18 wheeler and all other traffic for 15 minutes for an injured screech owl. The state police ferried the bird to the state biologist. The bird recovered and was released.

The refuge staff handled only four raptors this year, three owls and one hawk. The two great horned owls were found dead but one was fresh enough for mounting. The red-tailed hawk and barred owl were delivered to the raptor rehab center.

7. Other Migratory Birds

Results of The 9th Annual Dismal Swamp Spring Bird Count

The results of the 1985 count follows the format used for the National Audubon Society's Christmas Bird Counts, with the following exception: all routes on which a particular species was recorded are listed after the total number of individuals recorded for each species. For example: Turkey Vulture 23 (1,4,5,8,10,12,13,15), meaning a total of 23 Turkey Vultures were recorded from routes 1,4,5,8,10,12,13, and 15.

Great Dismal Swamp National Wildlife Refuge, Suffolk, Virginia 4/28/85, Clear-AM Clear PM, Temp. 60-85 degrees F, Winds 0-5 mph, water open, wild food crop excellent.

Twenty-six observers in 9 parties. Total party hours 41 (all by car). Total party miles 36 (all by car).

Double-crested Cormorant 23 (3,5); Heron: Great Blue 6 (1,2,4,5), Green-backed 17 (1-4,12,15); Snowy Egret 1 (10); Mallard 5 (2,10,13); Wood Duck 72 (all); Turkey Vulture 23 (1,4,5,8,10,12,13,15); Hawk: Sharp-shinned 2 (1,5), Red-tailed 4 (1,2,13), Red-shouldered 11 (1,2,4,5,8,10); Osprey 1 (10); Bobwhite 2 (1); American Woodcock 1 (5); Spotted Sandpiper 2 (10); Gull: Herring 7 (10), Ring-billed 5 (1,10), Laughing 5 (1,5); Dove: Rock 1 (8), Mourning 43 (2-5,8,10,12,16); Yellow-billed Cuckoo 24 (1,3-5,8,10,12,13); Barred Owl 6 (1,3,8,10,12); Chimney Swift 38 (1,3-5,8,10,12); Ruby-throated Hummingbird 22 (1-5,8,10,12,13); Belted Kingfisher 7 (1-3,5,12); Common Flicker 14 (1-3,5,8,16); Woodpecker: Pileated 52 (1-5,8,10,12,16), Red-bellied 64 (1-5,8,10,12,15), Hairy 8 (3,4,8,10), Downy 24 (1-5,8,10,12); Flycatcher: Great Crested 89 (1-5,8,10,12,13,16), Acadian 65 (1,3-5,8,10,13,15,16); Eastern Phoebe 1 (3); Eastern Wood Pewee 14 (3-5,8,10); Swallow: Tree 1 (1), Roughwinged 1 (4), Barn 6 (10,12); Purple Martin 3 (12,15); Blue Jay 25 (1,3-5,8,10); Crow: Common 60 (1-5,8,10,12,15), Fish 4 (2,3,16); Carolina Chickadee 112 (all); Tufted Titmouse 96 (all); White-breasted Nuthatch 27 (1-5,8,10,12); Carolina Wren 99 (all); Grey Catbird 103 (all); American Robin 10 (3,8,12); Thrush: Wood 148 (all), Swainson's 1 (5); Eastern Bluebird 1 (12); Blue-grey Gnatcatcher 14 (1,3-5,8,10); European Starling 2 (2,3); Vireo: White-eyed 148 (all), Yellow-throated 4 (1,10,12); Red-eyed 130 (all); Warbler: Black and White 36 (1-5,8,10,12,13), Prothonotary 300 (all), Swainson's 13 (1-5), Northern Parula 34 (1,3-

5,8,10,12,16), Yellow 1 (2), Magnolia 3 (1,5), Black-throated Blue 38 (1,2,4,5,8,10,12,15), Yellow-rumped 62 (1-5,8,10,12,13,15), Black-throated Green 19 (1,3-5,8,12,13), Cerulean 1 (1), Yellow-throated 4 (1,3,8,13), Blackpoll 1 (10), Pine 16 (1-3,5,12), Prairie 107 (all), Palm 1 (10), Kentucky 2 (1,5), Hooded 157 (all); Ovenbird 179 (all); Waterthrush: Northern 1 (3), Louisiana 29 (1,3-5,8,10,12,13); Common Yellowthroat 182 (all); American Redstart 35 (3-5,8,10,13); Bobolink 2 (3); Red-winged Blackbird 1 (2); Orchard Oriole 2 (8,12); Common Grackle 54 (1-5,8,10,12,15,16); Brown-headed Cowbird 47 (1-5,8,13,15,16); Tanager: Scarlet 5 (1,5,10), Summer 4 (10); Northern Cardinal 43 (1-5,8,10,12,13); Grosbeak: Rose-breasted 1 (4), Blue 1 (3); Indigo Bunting 2 (12); American Goldfinch 1 (4); Rufous-sided Towhee 50 (all); Sparrow: Chipping 2 (3), White-throated 20 (1,3-5,8,10,12), Swamp 2 (4,5).

Total species - 97; 3,172 individuals. Species seen in the count area during count week but not on count day included the Common Loon, Black Vulture, Mockingbird, Brown Thrasher, Yellow-breasted Chat, Eastern Meadowlark, and Song Sparrow.

Ratio of Birds Seen/Heard		Species Recorded Each Route		
Route Number	Seen/heard	Route Number	Species	Individuals
1	3:1	1	54	355
2	1:2	2	39	318
3	1:3	3	55	528
4	1:2	4	51	367
5	1:3	5	58	339
8	1:5	8	49	468
10	1:1	10	50	295
12	1:3	12	45	186
13	1:2	13	32	88
15	1:3	15	25	118
16	1:2	16	25	102

8. Game Mammals

Each year the deer hunt gets bigger and better but the deer herd continues to deteriorate. The biological data collected this year reflects the efficiency of last year's hunt and the range of conditions in the intervening months. Last year we increased the kill by 36% to a total of 188, and 46% of those were does. We were hoping to see some improvement in herd parameters over previous hunts.

Working closely with state biologist Don Schwab, the refuge staff sampled only a portion of the deer taken from the refuge this year. Check stations were staffed at three of the four hunt areas for four hunt days. The remainder of the days one check station was operated at the refuge office. A statistically adequate sample of 155 deer were aged, sexed and weighed with selected measurements completed on antlers and teats.

The following tables illustrate the lack of progress in managing the Dismal Swamp herd. Much of the improvement observed in the 1 1/2 year olds over

1984 is attributed to an exceptional mast year but the condition still did not equal that of 1983. The herd still contains too many older deer, demonstrating a continued deterioration of the age structure. This condition suggests high fawn mortality.

SUMMARIES FOR 1 1/2 YEAR OLD DEER

	1983	1984	1985
Buck - hog dressed weight in pounds	73.1	58.4	69.8
Number of points	2.2	1.2	1.8
Antler beam diameter in mm	15.5	5.6	8.5
Does - hog dressed weight in pounds	60.0	49.3	55.4

PERCENT ABOVE 3.5 YEARS

1979-----34.6
 1980-----50.7
 1981-----32.9
 1982-----33.4
 1983-----48.0
 1984-----46.0
 1985-----51.0

The check stations were operated for the convenience of the hunter once we completed the needed biological sample. As a result, we must extrapolate the total number of deer taken for the season. Using the five year hunter success value, it is estimated the take this year was approximately 300 deer.

Looking at the tables in Section H.8 it can be seen that hunter visits nearly doubled over last year as did the number of acres opened. At 300 deer for the season harvest is still only 1 deer per 280 acres, hardly enough to manage a herd.

The black bear study (Section D.5) has produced some of the better observations of other game mammals. The two bear research personnel are on the refuge 6 out of 7 days and travel 35-60 miles within the refuge each trip. More bobcats were seen than ever before twelve observations, including sightings of kittens, on Williamson, Western Boundary and Sherrill Ditches. Two kittens were playing in a puddle of honey placed in the road for bear bait. A 30 pound male bobcat was captured on Bull Boulevard on May 27 in a bear snare. He was sedated, measured, weighed and released.

Don Schwab reports that raccoon sightings are up; and finally, after repeated die-offs, they are looking better (full coat and good weight). Weasels, marsh rabbits and muskrats are doing well.

The bear study people saw fewer otter in 1985 than in 1984 but they thought it was due to the fact that the preferred bear habitat does not overlap with the otter. Don Schwab, who spends more time in the preferred otter habitat,

felt that they were doing as well or better than last year. The bear folks did have the rare sighting of three otter within 10 meters of one of our infamous beaver.

The beaver are making their presence known more effectively each year. Only three recorded sightings of the critters, but three dams, one lodge and hundreds of trees in ditches and roads attest to their efforts to set up housekeeping in the Dismal for the first time in over 50 years. Maybe they heard about Gramm-Rudman and decided to give us a hand in water conservation.

11. Fisheries

The quality of fishing in Lake Drummond has declined through the years of federal ownership due to lack of stocking. Historically, one of the cabin owners on the lake operated a minnow farm and had all the aeration trucks needed for moving fish about the countryside. Many regional hatchery managers appreciated the help when the final cleaning of ponds was scheduled, and Lake Drummond received a token of their appreciation. Of all the different species of fish tried, the black crappie was the hands-down winner. This vigorous fish may have invaded the hatchery ponds from the surrounding waters and were moved along with the target bass and bream. Little natural reproduction of the crappie has been found in Lake Drummond so the fishing has been dependent upon the introductions....after the fourth year it's all two pounders!

Largemouth bass have not historically survived well in Lake Drummond but, after checking the physical parameters, Gary Swihart, Fishery Assistance, Gloucester Point, felt that it was worth another try. Seven thousand bass arrived in late October. Most of them were three quarters of a pound. We are going to have some pleasantly surprised fishermen this spring if they survive.

16. Banding and Marking

For the past four years the staff of the Dismal Swamp Refuge have tried to make their mark in waterfowl banding. The 1984/85 post season banding program was the most successful after generally marginal results the first three years. A total of 118 ducks were trapped and banded. Unfortunately, only two ducks were those with regional quotas-one wood duck and one red head. The remaining 116 ducks included 77 ring-necked ducks, 32 lesser scaup and 7 greater scaup.



"Hot dog, roast duck for lunch!"

NR-85-15

CAP 2/85

Even though the flyway council has identified the ring-necked duck as a species whose population numbers are fluctuating, no regional efforts are being made to track them through banding. It was decided before the 1986 season to abandon banding efforts on the diving ducks until such time as a need to band ring-neck or scaup is identified. The mallard and black ducks make limited use of the refuge early in the season and are usually gone prior to post-season banding.

The staff is continuing to help Virginia State Biologist Don Schwab with goose banding on local ponds. 118 Canada geese and four tundra swans were cannon-netted in January and February. In addition, an experimental cannon net site along the west shore of Lake Drummond for wood ducks is being developed.

H. PUBLIC USE

1. General

Public visitation in 1985 increased 16% above last year. The following table shows a summary of public use over the last five years.

PUBLIC USE IN NUMBER OF VISITS, GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE, 1981-1985

<u>ACTIVITY</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>	<u>1981</u>
Conducted Tours	1225	1071	1001	1521	2662
Environmental Education Students	748	430	1319	1285	1623
Environmental Education Teachers	146	54	70	8	66
Deer Hunt	2216	1451	743	659	757
Warm Water Fishing	544	482	440	413	1207
Foot Access	1935	717	649	716	*
Vehicle Access	1363	700	760	962	*
Photography	396	355	331	338	*
Boat Access	1644	2722	4162	5217	*
Total	10,217	7,982	9,475	11,119	8451

* Information not available.

The major areas of increase were in the refuge deer hunt and foot access during the scouting period. Boat access continued to decline as it has over the last two years since the 1983 termination of public boat tours provided by a private operator.

Outdoor Recreation Planner Charles Pelizza left the refuge in August for an Assistant Manager Trainee position at Bombay Hook National Wildlife Refuge in Delaware. The staff shared the duties of this position including leading tours, presenting slide programs, providing information to the media, and setting up displays. Major portions of the duties were picked up by Susie Briley who is currently assigned as an acting recreation aid.



"Susie telling it like it is"

NR-85-16

LTV 5/18/85

Nine news releases were sent to the local media announcing public tours, deer hunt, and other refuge activities. In addition, refuge personnel were interviewed for three radio talk shows, three newspaper feature articles and a piece for cable TV. Discussions covered natural history, folklore, and management of the swamp. The bear research team also appeared on TV and newspapers several times this year, discussing the telemetry project in the swamp.

2. Outdoor Classroom - Students

Environmental education programs reached 748 students through refuge outdoor programs for a total of 2116 activity hours.

Groups included students from local primary and secondary schools and college students from Old Dominion University, Paul D. Camp Community College, Dabney Lancaster Community College from Clifton Forge, Virginia and the Peninsula Nature and Science Center.

This increase over the 430 visits from the previous year reflects a partial recovery from the decline in 1984 when tours through Old Dominion University (ODU) were discontinued. Many groups which had taken tours through the ODU program in the past are now contacting the refuge directly. Increased publicity about programs available at the refuge through TV and radio and such activities as "Refuge Awareness Month" have also encouraged interest in the refuge for environmental education.

3. Outdoor Classroom - Teachers

Teachers participated in several outdoor workshops or accompanied their students on outdoor environmental education programs for a total of 146 visits and 407 activity hours.

A teacher workshop was held in June for eight teachers from Chesapeake who in turn conducted programs for 250 students.

4. Interpretive Foot Trails

The main contact point for visitors on the refuge is the three-quarter mile boardwalk trail off Washington Ditch Road.

Visitation via foot access is estimated based on random sampling at entrance points, the number of visitors who stop in at refuge headquarters, weather conditions, and season. A vehicle counter will be placed on Washington Ditch Road to improve accuracy of reporting.

Efforts were made to improve visitor access on the refuge by upgrading parking areas at Washington Ditch Road and Jericho Lane.

Improvements at Washington Ditch included:

- construction of a kiosk with interpretive information
- installing a large entrance sign at the boundary and an informational sign at the parking lot,
- placing bumper logs around the parking lot, and
- spreading woodchips in the median.

Improvements of the Jericho Ditch Parking lot at five points included removing excess material from the site, spreading gravel, and installing an iron gate and fence. When the parking area is completed it will provide an access point to Lynn, Jericho, and Hudnell Ditch Roads.



"The do's and don'ts of the refuge"

NR-85-16

MCK 3/13/85

5. Interpretive Tour Routes

No interpretive tour routes exist at this time. All vehicular access in the refuge is by special use permits. Future interpretive tour routes are being considered in the Master Plan.

6. Interpretive Exhibits/Demonstrations

The refuge reached thousands of people through eleven displays at events including the dedication of the Eastern Shore of Virginia National Wildlife Refuge, the Suffolk Peanut Fest, Career Days at Elizabeth City State University, two local schools, National Museum Day in Edenton, North Carolina, and the Indian Summer Festival at Hertford, North Carolina.

This increased coverage was due in most part to the efforts and talents of Clerk/Typist Susie Briley who received a plaque for "Best All Around Display" at the National Hunting and Fishing Day Exhibit sponsored by the City of Portsmouth.



"Susie did an excellent job with limited resources"

NR-85-17

CAB 9/85

7. Other Interpretive Programs

Refuge interpretive tours hosted 1225 people for 3404 activity hours. This included tours for the general public and for scheduled organized groups including classes from local primary and secondary schools, Great Fork Church, boy scouts, girl scouts, residents from Virginia Beach Crisis Center, Sierra Club, American Association of University Women, Audubon Society, Nature Conservancy, Museum of the Albemarle, and the Appalachian Trail Club.

The Refuge also hosted several professional workshops including 114 foresters from the Society of American Foresters, 21 foresters from the Southeastern Hardwood Cooperative, (Section F.3) and 55 members of the Geological Society of America and Geologic Petroleum Engineers.

August was declared "Refuge Awareness Month" at Great Dismal Swamp NWR to provide the public with opportunities to visit and learn about the the swamp and on-going management activities. Refuge personnel were stationed at the Washington Ditch Parking lot each Saturday and Sunday throughout the month to greet the public, discuss the natural history of the swamp, answer questions, and permit visitors to drive to Lake Drummond. About 360 visitors took advantage of this opportunity.

The program was well received by the locals who hadn't had the opportunity to drive to the lake since the land was administered by Union Camp Corporation. We also drew visitors from the Tidewater area, Hampton, Newport News, and Richmond, Virginia.

Press releases about the event were sent to area newspapers and generated several interviews and feature articles about the refuge.

A new public use program was given national publicity this summer as shown below:

SHOE

by Jeff MacNelly



In March, Outdoor Recreation Planner Charles Pelizza initiated weekly evening tours of the refuge known locally as "Owl Hoots". A presentation of the history and folklore of the refuge was given to acquaint visitors with the refuge. As an encore, attempts were made to attract the nocturnal raptors to the tour group using taped calls and/or Pelizza's own imitation of an owl. Four owl hoots were held in February and attended by 45 people and a few barred and screech owls.

Refuge staff presented 14 outside programs during the year to 450 people. Groups included the Society of American Foresters, Suffolk Garden Club, local elementary and secondary schools, the Marine Resources Center at Roanoke Island, NC, Museum of the Albemarle at Elizabeth City, NC and several Kiwanis clubs.

8. Hunting

The 1985 refuge deer hunt was the largest program ever. Two hundred eleven deer were checked at the refuge biological check stations during the nine day season. Hunt dates were scheduled for October 30, November 8, 9, and 11 - 16. Hunt days on November 2 and 5 were cancelled due to rain and very poor road conditions.

Bag limits included one deer (either sex) per day, three per license year in Virginia and two deer (either sex) per day, five per license year in North Carolina as per state regulations. Weapons were restricted to shotguns or bow and arrow.

In past years hunters were required to attend a hunter safety course and pass a weapons qualification test. This year hunters were only required to give their name, address, and telephone number to receive a permit. This resulted in the refuge issuing 2284 permits, a 300% increase from the 593 permits issued for the 1984 hunt.

Pre-season scouting days were held on October 19 and 27.

Approximately 670 hunters participated in the two scouting days for a total of about 2000 activity hours.

Table 1 shows a comparison of public use data for the refuge deer hunt from 1981 to 1985.

Table 1- PUBLIC USE DATA FOR DEER HUNT 1981-1985, GREAT DISMAL SWAMP
NATIONAL WILDLIFE REFUGE

	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>	<u>1981</u>
Hunt Days	9	7	6	6	7
Permits Issued	2284	593	375	605	654
Hunter Visits	2216	1247	743	659	757
Hunter Hours	21,052	10,738	6,981	6,479	7,574
Deer Checked-In	211	188	105	114	83
Percent Success Per Visit	*	15	14	17	11
Acres Open	84,000	47,125	47,125	39,141	27,592

* Hunters were not required to check deer at the refuge headquarter; therefore, percent success would not be valid.

Table 2 shows public use data for the 1985 refuge deer hunt, separating Virginia and North Carolina for comparison.

Table 2-COMPARISON OF PUBLIC USE DATA FOR 1985 DEER HUNT, GREAT DISMAL SWAMP
NATIONAL WILDLIFE REFUGE, VIRGINIA AND NORTH CAROLINA

	<u>Virginia</u>	<u>North Carolina</u>	<u>Total</u>
Hunt Days	9	9	9
Permits Issued	2,065	219	2,284
Hunter Visits	1,867	349	2,216
Hunter Hours	17,737	3,315	21,052
Deer Checked-In	163	48	211
Acres Open	59,500	24,500	84,000

Hunters checked in at four access points: Jericho Ditch, Railroad Ditch, Corapeake Ditch, and Big Entry Ditch. The Railroad Ditch entrance continued to be one of the more popular areas. This area reached capacity on two hunt days. Total hunter use for the refuge varied from 111 to 457 hunters per day.

Hunter use was lower than expected. This was probably due to the fact that many hunters requesting permits had not made definite plans to hunt. Some

may have been discouraged from hunting on the refuge when they were informed that the daily hunter capacity was 690 while 2300 permits were issued. Many hunters remarked that warm weather kept them away because they thought the deer would not be moving around much and mosquitoes made it difficult to stay in the woods.

The area available to hunt increased to 84,000 acres from 47,125 acres in 1984. As a result, hunter capacity was increased to 690 hunters per day from 450 hunters per day the previous year.

The expanded hunt area included the Suffolk Escarpment. Adjacent landowners, including hunt clubs, were able to obtain a hunt permit and allowed access onto the refuge from their land without checking in. About 300 permits were issued to hunt club members. Hunt club data was not available at the time of this report; therefore, this information is not included in this narrative.

Total cost for the hunt was \$18,600. This included staff time to prepare for the hunt, working on hunt days, and cost of materials.

Total staff time increased 36% compared to the 1984 deer hunt. The increase was attributed to preparations for the hunt including issuing permits, answering phone inquiries, taking names, and preparing and mailing permits. Additional time was required to prepare the expanded hunt area including posting the closed area around the boardwalk trail, signing roads, and building hunter check-in stations.

A great deal of staff time was required on hunt days with many people working long days successively. Most of this was in response to the expectation of higher hunter densities and only two enforcement officers for this 105,000 acre refuge. This increased the cost of running the hunt and caused "wear and tear" on staff. Assistance was received from officers from Back Bay and Eastern Shore of Virginia NWRs. Their help was really appreciated.

Most hunters said they liked the way the hunt was run and appreciated the opportunity to hunt on the refuge. Many hunters expressed a concern about safety due to the lack of requirement for wearing blaze orange or taking a hunter safety course.

Some hunters suggested designating an area for hunting with dogs. Others suggested designating an area or special day for bow hunting. The known deer harvest was lower than anticipated.

This was attributed to the two cancelled hunt days and possibly lower hunter densities than expected, especially on weekdays.

Some suggestions for improving future hunts and reducing costs include:

- Schedule more hunt days on Saturdays to increase hunter use and spread out staff time.
- Recruit and use more volunteers to assist with hunter check-in and biological check stations.
- Handle hunter check-in and out on a self-serve basis.
- Reinstate the requirements for a hunter safety course and blaze orange.

- In press releases about the hunt, list a phone number with a recording giving information about the hunt, instructions for acquiring a permit, and announcements of cancellations.
- Require written requests for permits.
- The refuge should receive printed information about the hunt and permits in June and use YCC enrollees to collate and stuff envelopes.

9. Fishing

Fishing is permitted year round from sunrise to sunset on Lake Drummond as per state regulations. Success is highest during the spring season with speckles (black crappie), fliers, yellow perch, and bullheads being caught.

Total public use for warm water fishing was 544 visits and 2673 activity hours.

Fifty three fishing permits were issued for individuals to use the boat ramp on Interior Ditch during April and May. Warm water fishing from this access point accounted for 134 visits and 590 activity hours.

Warm water fishing from the Feeder Ditch access point accounted for 410 visits and 2083 activity hours. Public use from this access point is observed and noted by Army Corps of Engineers contract personnel located at the Feeder Ditch Spillway.

11. Wildlife Observation

Most public use activities on the refuge involve wildlife observation, particularly during use of the boardwalk trail at Washington Ditch.

The annual spring bird count held on April 28th brought 26 observers for 41 activity hours driving 36 miles. They counted approximately 3170 individuals representing 97 species of birds. See (Section G.7)

12. Other Wildlife Oriented Recreation

Hiking, biking, photography, boating, and permitted vehicular access accounted for 5,734 visits and 18,233 activity hours. Data on the first three items is estimated based on random counts taken at access points. Also included are the 670 people who participated in the two scouting days in preparation for the hunt, accounting for approximately 2000 activity hours.

The 140 miles of refuge roads provide good opportunities to view wildlife along the ditches and in the brushy vegetation along roadsides. Deer, bear, otter, turtles, snakes, herons, ducks, and songbirds are seen along these areas. The swamp is also popular for observing spring and fall warblers during migration.

13. Camping

Camping is not permitted on the refuge. The Corp of Engineers contracts the operation and maintenance of a campground located on the Feeder Ditch near

Lake Drummond. Access to this 50 tent site facility is by water only.

Two privately owned campgrounds located near the refuge serve most visitor needs. One is located north of the Feeder Ditch on Highway 17. The other is located on Highway 13 near the city of Suffolk.

14. Picnicking

No picnicking facilities exist on the refuge although individuals and groups bring bag lunches with them to the boardwalk. This use is minimal and is not encouraged.

16. Other Non-Wildlife Oriented Recreation

Joggers frequent the refuge, particularly Washington and Railroad Ditch roads. The refuge roads provide a relatively open and quiet area on which to jog and though not encouraged, these users do no apparent harm to the resource so we allow this activity to occur.

17. Law Enforcement

Law enforcement activity at Great Dismal Swamp is greatest during the months of October through November when the refuge deer hunts are scheduled. At other times of the year efforts are concentrated during peak use periods such as long holiday weekends and in response to information concerning specific problems. Numerous access points, 140 miles of roads, many miles of unmarked boundaries and other higher priority responsibilities dictate the amount of time spent in this activity. With only two personnel with enforcement authority on the refuge throughout the better part of 1985, the amount of time devoted to law enforcement was minimal.

Incidents encountered throughout the year included vandalism, breaking and stealing the locks on refuge gates, vehicle trespass and the usual infractions of refuge hunting regulations.

The most costly incident involved vandalism to a refuge contractor's equipment. Damages included dumping a 55 gallon drum of diesel fuel, destroying the handrail on the water control structure the contractors were building, and pouring dirt in the fuel tanks and crank cases of a boom crane, air compressor (and started the engine), front end loader/ backhoe and ditch trenchers. Estimated damages according to the Chesapeake Police Department totalled \$12,500.

There were three incidents of vandalism to refuge equipment. Though not nearly as costly as the previous incident, serious injury could have resulted to the employees operating the equipment.

- A cable sleeve on the boom ax broke during mowing operations, the result of being cut halfway through with a saw or file.
- All of the hydraulic connections on the 6600 tractor were loosened
- The lugs on the front wheel of the 8700 tractor were loosened resulting in the wheel coming off the tractor during mowing operations.

Stakeouts were conducted in the hopes of apprehending the individual(s) responsible for the above but the only things encountered were "skeeters, ticks and red bugs".

During the refuge deer hunts the following violations were documented:

Loaded Firearms in a Vehicle	16
Vehicle trespass	2
Illegal Weapon	3
Illegal off road vehicle	2
No hunting permit	1
Transporting untagged deer	1
Hunting in a state park	3
Hunting without a license	2

Not all the above cases are being prosecuted due to jurisdiction, extenuating circumstances or the result of hunting permit conditions not being printed in the Federal Register. Concerning the latter, we have no problems prosecuting cases in Virginia since 50 CFR 32.2e addresses hunting permit conditions. However, we cannot prosecute cases in North Carolina unless the regulation is specifically printed in the federal register. We have a real problem with inconsistencies, such as where in part of a refuge you can enforce the law but down the road a ways you cannot! Hopefully we can work this out prior to next years hunt. If not, "c'est la Vie"!

Several ground checks and aerial detection flights for marijuana were conducted by refuge personnel in July and August. The inspections were negative (or positive from our standpoint depending on your point of view).

Clerk-typist Susie Briley organized a meeting between the refuge staff and the Suffolk Police Department to discuss their authority on the refuge and to develop a good working relationship for future cooperative efforts. Susie's contacts with P.D. employees have helped us to maintain good communications with the Suffolk Police.

19. Concessions

The concession contract drafted in 1984 and submitted to the Regional Office for approval has been placed on the "back burner" pending the outcome of the Corps of Engineers Dismal Swamp Canal Study.

I. EQUIPMENT AND FACILITIES

1. New Construction

A fire break, three tenths (.3) of a mile long, was constructed between East and Juniper Ditches. This cleared strip enables refuge personnel to travel from the western to the northeastern portion of the refuge by off road vehicles without leaving the swamp. The trail is most useful for law enforcement and bear study activities when utilizing ORVs. A three wheeler bridge was built by the SCA High School work group across East Ditch to the new trail.



"Yep, should hold a three wheeler"!

NR-85-18

LTV 8/5/85

Three water control structure construction contracts involving two contractors, Glover Construction Company and Woodington Electric Corporation, were on-going in 1985. Major construction activities were accomplished on three water control structures, and minor punch list items were required on six other structures though for all practical purposes these six structures were completed and operational.

By year's end all major construction activities were completed and most punch list items corrected despite the usual weather delays, vandalized equipment (Section H.17) and contract related problems.

The three contracts were still not finalized pending the outcome of appeals concerning liquidated damages assessed by the Government (\$100 a day for 60 days against Glover and \$178 a day against Woodington, totalling \$6,000 and \$17,800 respectively).

With the construction completed in 1985, there are 16 operable water control

structures throughout the refuge. Total costs for these units is in the neighborhood of \$2,500,000, yet this is only 25% of the structures needed to have water management capabilities throughout the refuge. We now have complete water management capabilities on one of six water management units (Section F.2).



"Quite a structure for holding water in a ditch"

NR-85-19

MKG 6/6/85

A six panelled 12X20 ft. kiosk was designed and constructed by Maintenance Worker Dane Winningham with assistance from our YCC enrollees. The kiosk is located adjacent to Washington Ditch, set back in the woods with a boardwalk providing access from both the parking lot and boardwalk trail. We believe this is probably one of the best looking kiosks, bar none.



"Okay Dane, where's the rest of it"

NR-85-20

MCK 6/18/85



"Here Dane, catch"

NR-85-21

MCK 6/85



"Starting to take shape"

NR-85-22

MCK 6/24/85



"Nearly done" thanks to Dane and the YCC

NR-85-23

MCK 7/8/85

Glover Construction Company installed a 48" corrugated metal culvert (CMC) and gabion connecting Corapeake and Sherrill Ditches. Pilings were driven upstream of the culvert to prevent floating debris from clogging the culvert. To provide water conservation capabilities in Sherrill Ditch, refuge personnel installed a 72" Type D flashboard riser on the culvert. It will be interesting to see how this \$6,000 force account structure compares to the \$100,000 concrete structures.

The same contractor also installed six bridge pilings at the Myrtle and Corapeake Ditch intersection for placement of two galvanized bridge sections obtained from excess property in February. (Section I.4)

2. Rehabilitation

Two new heavy duty gates were built for the entrance points at Portsmouth Ditch and Jericho Lane. A 184 foot fence of four inch pipe was also constructed and installed at the Jericho Lane parking lot to prevent vehicles from going around the gate.

A washout on Insurance Ditch Road was graded and filled with 45 tons of railroad ballast to prevent washing and provide an all weather crossing.

South Ditch road was cleared of vegetation utilizing the Case dozer with a KG blade. The trail will be used by the bear study team for trapping and telemetry work. We are also hoping the old road bed is sufficient to support the equipment necessary to build a water control structure at the junction of South and Riddick Ditches, a required structure for water conservation in that management unit.

The entrance road to the Bass Tract, an area used for storing materials, was gravelled and the entrance gate was relocated approximately 100 feet from Desert Road to allow big trucks to pull up to the gate without having to stop in the curve on Desert Road, a potential safety hazard.

The portion of Jericho Ditch Road above Williamson for all practical purposes was destroyed, thanks to a contractor who was installing a new power line system on the right-of-way through the refuge. The power company was informed of the problem; however, their lack of action resulted in refuge personnel rehabilitating the half-mile of road with the Case 850 tractor.

Maintenance Worker Dane Wunningham installed security lights in the open faced equipment storage shed.

3. Major Maintenance

Approximately 150 miles of roads are maintained throughout the refuge. Road maintenance including discing, grading, graveling, mowing and boom-axing is a major on going project May through October.

The following provides approximate miles of roadwork completed:

Grading	55 miles
Discing	5 miles
Mowing	46 miles
Boom axing	15 miles

The D-6 and Case 850 crawler tractors were utilized to clear a 50 foot right-of-way along three (3) miles of refuge roads including portions of Camp, Jericho, Middle, Lynn, Corapeake and Sherrill Ditches. The major benefits to be derived from the work include creating additional early successional stages of vegetation for wildlife and allowing more sunlight to reach the road surface to dry faster, thus requiring less maintenance.

The passing of Hurricane Gloria on September 27 left numerous downed trees across the 150 miles of roads throughout the refuge. Refuge personnel, with the assistance of the bear study team and the U.S. Geological Survey staff and special use permittees, spent a couple of days clearing the debris off the roads. The same scenario was repeated in November following heavy rains and gale force winds on November 5.



"Honed to a razor's edge"

NR-85-24

MCK 8/22/85



"Bailey in his natural environment"

NR-85-25

MCK 8/22/85

Art-Ray Corporation of Suffolk submitted the low bid to survey 2.4 miles of refuge boundary at a cost of \$2,743.49. Work included locating, surveying, flagging, and clearing trees and brush. The surveyors were closely followed by Carter, Dinkler, and the YCC crew who signed and painted the lines.

Approximately 11.7 miles of refuge boundary were posted in 1985, more than any other year. Of this total, 2.4 miles were posted following preliminary surveying work, 3.8 miles of new lines were located without surveying, and 5.5 miles were previously posted lines which were improved with additional signs and/or paint. This work involved 15 staff days, 35 YCC enrollee days, and 28 SCA participant days.

This was the first year in which the signs were bolted to 2X4 backing and nailed directly to trees. This method is far superior to carrying metal sign posts through the woods. Aluminum nails were utilized to ensure no hard metal would be embedded in the tree.



"Another job well done by YCC!"

NR-85-27

MCK 6/85

As required in the Regional Office memo of August 14, twenty new fiberglass boundary signs were field tested at four locations on the refuge. Eight signs were posted on two 4X4 posts at the refuge office and four signs were placed at three locations along the refuge boundary. These signs will be evaluated every six months for the next three years to determine their suitability. We expect that the public will provide free "buckshot" tests in the near future.

4. Equipment Utilization and Replacement

"The year of repairs" would be an appropriate slogan for 1985 at this refuge. Routine maintenance and major repairs to refuge vehicles and heavy equipment (both force account and contracting) totalled approximately \$35,000 (10% of O&M Funding).



At his salary, no wonder we spent \$35,000

NR-85-27

MCK 9/85

Refuge vehicle repairs and maintenance cost totalled \$16,000. This included such thing as replacing axles, universal joints, starters, exhaust systems, brakes, radiators, carburetors, windshield, batteries, a rebuilt front end on the refuge tour bus, tune ups and numerous other nickle and dime repairs. The most costly vehicle was the 1971 International bus, requiring \$3,600 in repairs. Though this cost is more than the bus is worth it is the only vehicle available to carry large YCC crews and conduct tours of the refuge.

Heavy equipment maintenance and repairs costs totalled \$19,000 (including staff salaries). Examples of work performed include the following:

- replacing the spindle (\$450) on the boom ax and numerous other hoses and parts.
- replace and/or repair tie rods, seals, wheel bearings, o rings, lights, hydraulic lines on the tractor.

- sand-blast and paint D-6 KG blade
- replace tracks, radiator and construct custom radiator shield (\$5000)
- numerous belt and hose replacement on all equipment
- replacing all fluids and filters of equipment (annual maintenance)
- replace air conditioning coil in the 1985 Jeep Cherokee

Equipment replaced or newly acquired during the year included the following:

- 1985 Jeep Cherokee (4X4) replaced a 1978 Chevy Suburban
- 1985 Chevy Blazer (4X4) replaced a 1977 Chevy Suburban
- John Deere Model 1408 rotary mower with a 13'8" cutting width replaced a Woods 14' rotary mower
- A 6000lb. capacity Ramsey direct drive winch for the Jeep Cherokee
- The pyramid tracks on the Case 850C dozer were replaced with standard grouser pads to improve its capability to work in the swamp.

Equipment and supplies obtained from Department of Defense excess included the following:

- 24 galvanized bridge sections
- two hoists (4000 lb capacity)
- Baker fork lift (4000 lb capacity)

The following equipment was obtained from Eastern Shore of Virginia NWR:

- two Remington 1100 semi automatic shotguns
- four small tin buildings.

Equipment excessed and transferred from this station included the following:

- Ferguson tiltravator (to Eastern Shore of Virginia NWR)
- 1 1/2 ton trailer (to Eastern Shore of Virginia NWR)
- International stake-bed truck (to Eastern Shore of Virginia NWR)
- Hardee mower (to Back Bay NWR)
- Brush chipper (to Booker T. Washington National Park)
- 1/4 ton cargo trailer Model M 416 (to Back Bay NWR)
- two Hale pumps (to Back Bay NWR)
- Woods offset mower (to Back Bay NWR)
- Cat D-4 Dozer w/hydraulic blade (to Virginia Federal Surplus Property)
- Calculator (to FWS Realty)

On numerous occasions throughout the year Dismal Swamp's equipment was in demand by other refuges and agencies.

- The new Ford 9000 tilt bed truck and Case 850 dozer were loaned to Presquille NWR and Harrison Lake National Fish Hatchery in March.
- The Ford 9000 tilt bed truck, Case 850 dozer, Ford 8700 tractor with front end loader, Hardee mower, three point hitch 10' disc and tractor lowboy were detailed to Eastern Shore of Virginia NWR in April for use in the Heavy Equipment Training course.

- Two Crisafulli high volume pumps were loaned to Pungo NWR in March to assist in suppressing a 95,000 acre wildfire. They were returned in August with a new paint job and new tubing. (Section F.9)
- Six Gormann Rupp portable pumps and 5500 feet of hose were loaned to the North Carolina Forest Service in March and returned April 7. In return for the favor their radio man installed radios in the D6 and Case 850 dozers. (Section F.9)
- In October Heavy Equipment Operator Bailey White and Maintenance Helper Wendell Swanner, utilizing our lowboy, picked up an excess motor grader for Eastern Shore of Virginia NWR.
- In November Eastern Shore of Virginia borrowed the Case 850C dozer and lowboy to prepare for their dedication ceremony on November 16.

5. Communications Systems

In April, six new 100 watt Motorola radios equipped with repeater system capabilities were installed in refuge vehicles. The repeater system improves long range communication and eliminates outside interference.

6. Computer Systems

The Digital Rainbow 100 computer has functioned well as a word processor, unfortunately we are still electronically isolated and must continue to depend upon the U. S. Mail. Our rural telephone lines are apparently too "noisy" to use the electronic mail effectively.

The repair record has been a bit painful with a \$700.00 disk drive problem and now a \$52.00 per month service contract. The maintenance costs combined with the required electronic mail rental payments of \$700.00 per year (even though we cannot access it) make for a pretty expensive glorified typewriter.

We are hopeful that our Washington office will begin to provide technical coordination and support needed to take advantage of the computer's labor saving strengths. From a simple data base management system all of our monthly, quarterly, and annual reports could be generated; from the same software all of the station's financial transactions could be automatically typed on the needed hard copy and internal records could generate instant budget totals. The applications possible for the computer in the field stations are only as narrow as our imagination!

J. OTHER ITEMS

1. Cooperative Programs

A unique ten year cooperative relationship with the U. S. Geological Survey (USGS) came to a close this year. The USGS Wetland Studies project maintained a field unit in association with the refuge office. Ms. Patricia Gammon, Botanist, has headed this field office since 1976. The mission of

the field unit was to contribute to the understanding of wetlands through specific studies in the Great Dismal Swamp. Needless to say, the refuge benefited immeasurably from these efforts.

Ms. Virginia Carter, Biologist and Project Chief, started her work in the Dismal Swamp in 1973 with the substudy report on remote sensing applications pursuant to Public Law 92-478. This initial work spawned numerous coordinated projects with NASA and EROS Data Center that produced an exceptional data base of seven separate flights of seasonal high and low altitude color infrared photography, and some of the nation's first classified Landsat imagery of forest wetlands. From this photography, Pat Gammon produced the vegetative cover map still in use today for all station and regional needs including the Dismal Swamp Master Plan.

In addition to the vegetation mapping, the USGS office conducted in-depth ecological studies on the soils, hydrology and many physical parameters including soil oxygen, pH, and oxidation-reduction potential. All of these studies focused on the contribution of these factors to the integrity of the wetland ecosystem. The refuge has benefited from the national exposure resulting from more than 25 journal papers, 9 major symposia and numerous abstracts on research conducted in the Dismal Swamp.



"A real loss to the swamp"

NR-85-28

UNK

It is with gratitude we acknowledge the exceptional contribution the USGS Wetland Studies Project has made to the Fish and Wildlife Service and management of the Dismal Swamp Refuge. Special thanks to Pat Gammon who, on a daily basis, shared her knowledge and enthusiasm for the swamp with an infectious professional commitment.

In cooperation with the USDA Forest Service a gypsy moth surveillance program was again undertaken for the fourth consecutive year. Traps were set out in four locations along the refuge's western boundary and maintained for a three month period. This was the first year in which no gypsy moths were trapped.

The North Carolina Forest Service's Goldsboro nursery sent their bucket truck to the refuge in November to collect Atlantic white cedar seeds. Apparently there has been an increasing demand from private landowners, and the Dismal Swamp is the only available seed source they can locate. Unfortunately it was a poor seed year and most of the seed produced had already been dispersed. They will try again next fall, hopefully a little earlier. We have requested up to 10,000 of the seedlings for planting on the refuge in the spring of 1987.

On September 20, Assistant Refuge Manager Trainee Terry Villanueva, White, Maintenance Helper Swanner and Coop Student Buddy Johnson attended a fire simulator training exercise sponsored by the

2. Items of Interest

On January 15 Refuge Manager Oland met with City of Suffolk officials and Diane Eckles, Ecological Services, Annapolis to discuss a proposed bypass which would go through refuge lands. The City is trying to revitalize this project which was under study during the late 1970's, however it had been a low priority project for state funding.

Refuge Manager Oland and Assistant Manager Kaehny requalified with their Carter attended a one day workshop in Franklin, Virginia on November 6 for recertification as a commercial and public pesticide applicator. The workshop was presented by the Virginia Tech Extension Service.

Forester Carter was detailed to Chincoteague NWR on March 25-27 at the request of Refuge Manager Denny Holland to recommend methods for minimizing tree mortality resulting from Southern pine bark beetle infestations, and improving and providing habitat for the endangered Delmarva fox squirrel prior to the writing of a forest management plan. Carter's recommendations were submitted in writing in April.

Refuge Manager Jim Oland and Assistant Refuge Manager Marty Kaehny were detailed to Chincoteague NWR, Chincoteague, VA on July 13 and 14 to assist law enforcement personnel regarding the closure of the north beach area to public use. The closure was in response to a request for a special use permit by a Washington based nudist group, the National Capital Naturists, to conduct a variety of activities on the beach at Chincoteague NWR. The north beach area was closed to protect the wildlife resource from an unusual influx of people. No major problems were encountered and the majority of the visitors gave their full cooperation.

Refuge Manager Oland delivered revenue sharing checks totally \$190,777 to the cities of Suffolk and Chesapeake in Virginia and Gates, Pasquotank and Camden Counties in North Carolina.

Refuge Manager Oland and Maintenance Worker Winningham attended the Pesticide Application Training session held at Chincoteague NWR on February 20.

Forester Carter and Laborer John Thomas completed an eight hour Defensive Driving Course at Kempsville High School, Virginia Beach, Virginia.

Heavy Equipment Operator White and Maintenance Worker Winningham completed the heavy equipment training course at Eastern Shore of Virginia NWR April 15-19. They received certification to operate farm and crawler tractors, frontend loaders and backhoes and motor graders.

Assistant Refuge Manager Kaehny and Laborer Thomas completed the two day farm tractor training course April 22-23 at Eastern Shore of Virginia NWR.

Refuge Supervisor Ed Moses visited Great Dismal Swamp April 4-5.

On April 2 Nature Conservancy Director of the Virginia Coast Reserve John Hall visited the refuge.

On September 20, Assistant Refuge Manager Trainee Terry Villanueva, Equipment Operator White, Maintenance Helper Swanner and Coop Student Buddy Johnson attended a fire simulator training exercise sponsored by the Virginia Division of Forestry.

Biologist Mary Keith Garrett completed a week long fisheries training course at Montezuma NWR in New York in September.

Refuge Manager Oland and Assistant Manager Kaehny requalified with their firearms at Eastern Shore of Virginia NWR in December.

4. Credits

Credit for this narrative goes to the following people:

Jim Oland - Editing and Feedback

Marty Kaehny - Sections A; D.2, 4; E.1, 5; F.11; G.1,4,12,14; H. 17,19, I.1,2,3,4; J. Feedback and editing

Allen Carter - Sections C.1,; F.3,9,10

Mary Keith Garrett - Sections D.5; F.2,4,6; G.2,3,5,6,7,8,10,11,12, 16; I.6; Feedback

Terry Villanueva - Sections E.2,3,4,6; H.1,2,3,4,5,6,7,8,9,11,12,13,14,16

Susie Briley - Typing and patiently deciphering the hieroglyphics commonly

known as staff scribble.

Sally Leary - Insuring the rest of the staff had time, by fending phones and walk-ins.

K. FEEDBACK

Each year we are provided this opportunity to present our problems, solutions and comments on how to "improve" the organization.. This year, just as before, I started several times to draft comments for the feedback section. And as before, after thinking about some problem, I realized that most of our problems aren't really very significant. So I won't bother to bore anyone who has managed to read this far (or even anyone who has looked at the pictures and then decided to read the "Feedback" section).

On the positive side (for those who keep score), it seems that the level of communication we have achieved with the regional office, whether from Personnel, Engineering or Wildlife Resources, has improved. Feedback sections for narratives don't hurt at all and since we get a scorecard later, somebody must be reading them. That is not necessarily communication but it's a start.

Another item which is weighing lightly on my mind has to do with the need for formal agreements between the FWS and other agencies. Whether its for fire suppression, law enforcement assistance or maintenance of roads, I would hope that we will be able to work with the minimum tool necessary. (note to the scorekeeper: I consider this neutral.) The point of this comment is that while there are many operations that would benefit from the presence of a formal agreement, there are many other working arrangements which might deteriorate if formality were enforced. If somewhere in our organization an instruction is being written that says "draft an agreement", "reevaluate our relationship", "formalize our working arrangement" etc., I hope the bottom line will be "if it ain't broke, don't fix it."

The following comments were drafted by other Dismal staff members, so I won't take credit or edit.

Jim Oland

Much ado could be stirred regarding pay/pers, funding and its effects on refuge operations, the present cold weather uniform coat compared to the good looking, better quality silver tip of years past and a whole array of topics that have been covered in past feedbacks. Rather than repeat negative aspects that have been discussed a thousand times, it is time to give thanks to those employees who work their hearts out to keep refuge programs above water. This is especially true during these times of austerity when there is no money for overtime or temporary help, yet again and again the staff pitches in to get the job done on their own time. Usually our secretaries and clerical help, in our case Sally and Susie, tend

to go unmentioned in our reports, not because their jobs are unimportant but due to the fact that it is not very glamorous to write about accounting, bill paying, typing, payroll and the hundreds of other duties they perform as compared to the bear study, new construction, habitat management or the like. When a manager, assistant, ORP, biologist or forester goes on leave or departs a station, the work goes on with the staff picking up the slack. When our secretary or clerk-typist are absent on extended leave we sink slowly as typing, filing, inquiries, bills, reports, etc. become backlogged and we say to ourselves, "Dang, I wish Sally or Susie were here to find it, type this, get that, handle this, pay them, get the phone, clean the office, make arrangements etc. etc. etc." We pay our clerical help peanuts yet they are worth their weight in gold.

Susie and Sally often come in early and stay late to make sure we meet deadlines; they handle public inquiries, conduct tours, staff exhibits, work hunter check stations, file, type, write letters, reports and memorandums, keep our payroll and leave straight, serve as radio dispatchers, make sure we are not in trouble when we are late returning to the office, assist in search and rescue operations, make travel arrangements and on and on etc. etc.

This narrative is an excellent example of the obscurity that envelopes our secretaries. Except in the staff photo pose (and cute it is), Sally Leary's name was not mentioned throughout this narrative. Yet, Sally and Clerk-typist Susie Briley's roll in the mechanics of operating a refuge are invaluable.

So, this is just to give special thanks to Susie and Sally for their dedicated efforts throughout the year.

And finally once again thank you Mary Keith, Allen, Terry, Dane, Bailey and Wendell for your dedicated efforts and making 1985 an extremely satisfying, productive year.

Marty Kaehny

It is proving to be painfully frustrating for the refuge staff of an agency committed to the welfare of migratory waterfowl not to be able to seriously participate in waterfowl management programs. We need to redirect these energies and skills into wetland management and preservation - the Dismal Swamp provides an excellent training facility because of its extraordinary needs as a highly altered ecosystem. Maybe the regional and national offices can assist with incentives similar to banding, like quotas of so many acres of cypress/gum to be reestablished.

Mary Keith Garrett

NANSEMOND NATIONAL WILDLIFE REFUGE
Suffolk, Virginia

ANNUAL NARRATIVE REPORT
Calendar Year 1985

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

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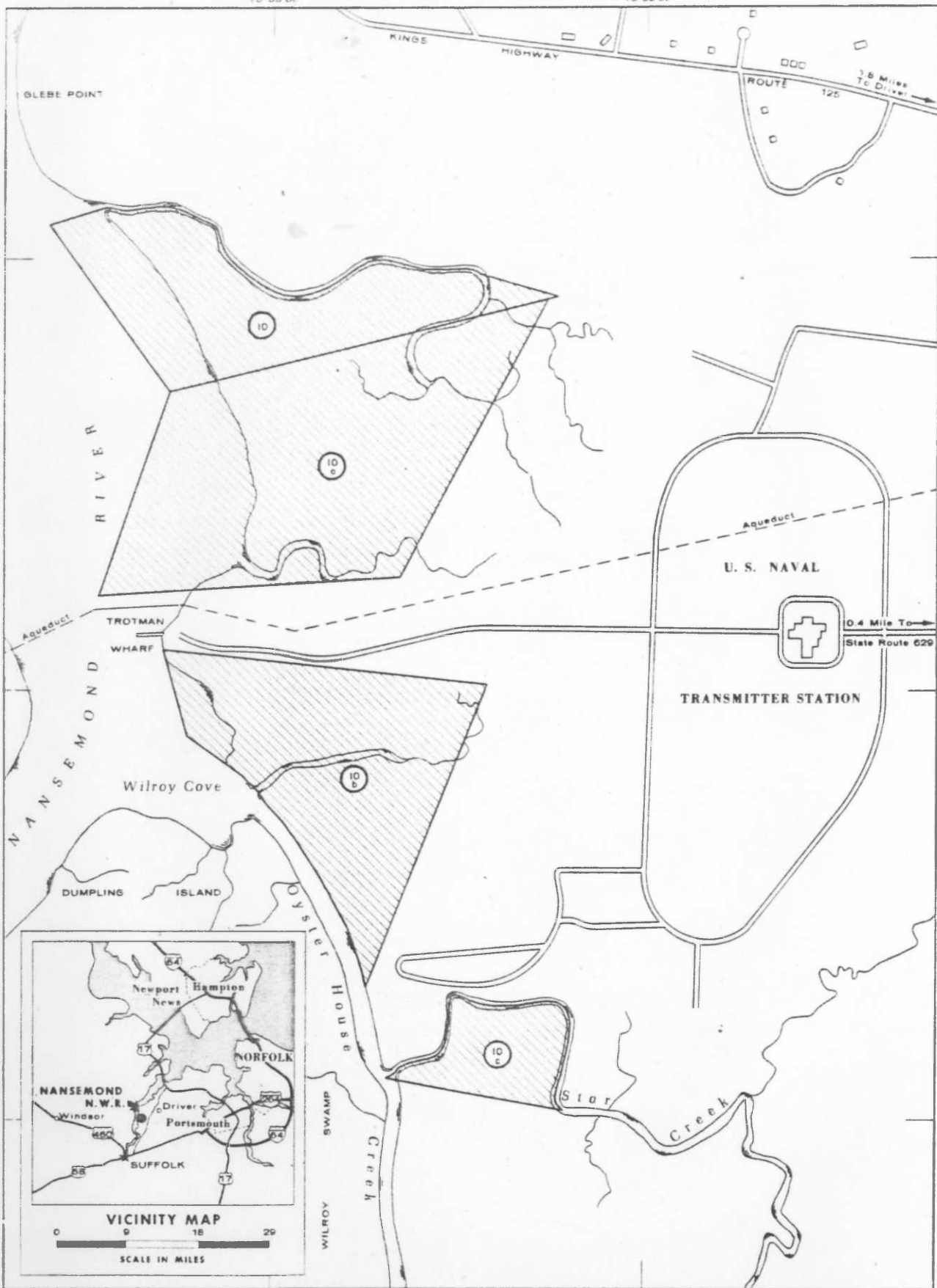
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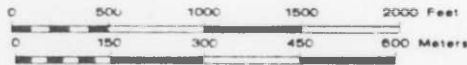
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COMPILED IN THE DIVISION OF ENGINEERING
FROM SURVEYS BY O.S. AND B.S.F. & W.

BOSTON, MASSACHUSETTS FEBRUARY 1974
POSTED 12/77



M. N. DECLINATION
1972

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TABLE OF CONTENTS

PAGE

A. <u>HIGHLIGHTS</u>	Nothing to report
B. <u>CLIMATIC CONDITIONS</u>	1
C. <u>LAND ACQUISITION</u>	Nothing to report
D. <u>PLANNING</u>	Nothing to report
E. <u>ADMINISTRATION</u>	1
F. <u>HABITAT MANAGEMENT</u>	1
1. General.....	1
2. Wetlands.....	1
3. Forests.....	Nothing to report
4. Croplands.....	1
5. Grasslands.....	Nothing to report
6. Other Habitats.....	Nothing to report
7. Grazing.....	Nothing to report
8. Haying.....	Nothing to report
9. Fire Management.....	Nothing to report
10. Pest Control.....	Nothing to report
11. Water Rights.....	Nothing to report
12. Wilderness and Special Areas.....	Nothing to report
13. WPA Easement Monitoring.....	Nothing to report
G. <u>WILDLIFE</u>	2
1. Wildlife Diversity.....	Nothing to report
2. Endangered and/or Threatened Species.....	2
3. Waterfowl.....	2
4. Marsh and Water Birds.....	2
5. Shorebirds, Gulls, Terns, and Allied Species.....	Nothing to report
6. Raptors.....	Nothing to report
7. Other Migratory Birds.....	2
8. Game Mammals.....	2
9. Marine Mammals.....	Nothing to report
10. Other Resident Wildlife.....	2

11. Fisheries Resources.....Nothing to report
12. Wildlife Propagation and Stocking.....Nothing to report
13. Surplus Animal Disposal.....Nothing to report
14. Scientific Collections.....Nothing to report
15. Animal Control.....Nothing to report
16. Marking and Banding.....Nothing to report
17. Disease Prevention and Control.....Nothing to report

H. PUBLIC USE Nothing to report

I. EQUIPMENT AND FACILITIES Nothing to report

J. OTHER ITEMS Nothing to report

K. FEEDBACK Nothing to report

B. CLIMATIC CONDITIONS

The climate is oceanic, subject to fogs and storms, but tempered by the moderating effect of the Atlantic Ocean. Temperature extremes range from eight degrees to 95 degrees. The average summer temperature is 80 degrees, and average winter temperature is 50 degrees. Average annual rainfall is 48 inches with three inches in one 24-hour period the maximum rate. Average annual snowfall is eight inches, with 210 frost-free days. The last and first frosts averages April 1 and October 15 respectively.

E. ADMINISTRATION

Routine inspections of Nansemond Refuge were conducted on three occasions during 1985. (It's still there.)

F. HABITAT MANAGEMENT

1. General

No active habitat management is underway at this time. However, this section will be used to describe the natural communities present on the refuge.

The only open public access to the refuge is by water. Land access is possible through a Naval transmitter station for refuge personnel only.

2. Wetlands

The Nansemond Refuge is nearly 100 percent tidal marsh. The marshes are salt to brackish of excellent quality. Parcels A, C, and D have over a mile of frontage and some bottom along the Nansemond River and Oyster House Creek. Parcel B is bounded on three sides by Star Creek, feeding into Oyster House Creek and then into the Nansemond River. Adjacent property is owned by the U. S. Navy. There are no developments encroaching upon these marshes.

The dominant vegetation is Spartina patens with Spartina alterniflora in the lower areas. There are numerous tidal guts, pans, and potholes providing excellent interspersions of types. Edge vegetation grades from salt marsh to tidal bush and low value trees.

4. Cropland

About two acres (1%) of the study area is upland including part of a farm field with a natural hedge of timber on its west, north, and east sides. The field is level and the soil is sandy loam, sand, and gravel with small cobbles.

G. WILDLIFE

2. Endangered and/or Threatened Species

The area offers of excellent potential nesting and food hunting habitat for osprey and bald eagle.

3. Waterfowl

Oyster House Creek and the Nansemond River are wintering areas for black ducks and some divers. Limited census records indicate the area appears to be excellent wintering and migration habitat for Canada geese, black ducks, canvasbacks, and other waterfowl species.

4. Marsh and Water Birds

Common gallinule, clapper, Virginia, and sora rails have been observed and/or heard in the area. Also seen were green-backed, great blue, and black-crowned herons and the common egret.

7. Other Migratory Birds

Mourning doves are abundant along the edges of the marsh and in the small upland field.

8. Game Mammals

White-tailed deer, cottontail rabbit, and eastern gray squirrel use the timbered field edge.

10. Other Resident Wildlife

Bobwhite quail are found along the field edge. Mammals using the refuge include mink, striped skunk, muskrat, river otter, raccoon, red fox, weasel, meadow vole, white-footed mouse, opossum, and shrews.



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE



THE GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE

The Great Dismal Swamp National Wildlife Refuge is presently 106,000 acres of heavily forested land and water in the cities of Suffolk and Chesapeake, Virginia; and Gates, Camden, and Pasquotank counties, North Carolina. Much of the refuge was once owned by George Washington, Patrick Henry, and other prominent Virginians.

At Dismal Swamp a varied assortment of insects, frogs, birds, mammals, and plants - many at the northern edge of their range - combine to form a unique community. There are forms of life, such as the Dismal Swamp short-tailed shrew and the Dismal Swamp log fern, that are seldom seen elsewhere. Remnants of a once great Atlantic white cedar forest can be found on the refuge. Black bear, white-tailed deer, bobcat and otter inhabit the swamp, and 203 species of birds have been reported with 92 nesting in the swamp.

Lake Drummond, a circular lake covering approximately 3,000 acres within the refuge, is in the heart of the swamp. Its average depth is only six feet, but the unusually pure waters, preserved by the tannic acids from the bark of the juniper, gum, and cypress, are essential to the swamp's survival. Survivors of the majestic cypress forest that once dominated much of the swamp stand at the edge of the lake, reflected in the dark stained waters.

Through three centuries the Dismal Swamp endured the attentions of people who challenged, cursed, covered, claimed, celebrated, or cared for it. Today the Fish and Wildlife Service manages the refuge to retain the essential natural character of the Swamp. At the present time, the Refuge is open to the public from sunrise to sunset for the purposes of nature study, photography, hiking, boating, and sightseeing. Travel by bicycle or on foot is permitted on spoil bank roads which border the numerous ditches. Vehicular access is prohibited. An interpretive boardwalk trail is currently under construction on Washington Ditch Road and is available for visitor use.

To enter the swamp, travel south on White Marsh Road (S.R. 642) from Suffolk. Off of this road are the main entrance roads, Jericho Ditch Lane and Washington Ditch Road. Proceed down Jericho Lane until you reach the refuge gate and park your vehicle along the shoulder of the road so that other vehicles may pass. When entering by way of Washington Ditch Road, visitors may drive in to the parking area at the boardwalk trail during daylight hours.

Boat access is permitted by way of the Feeder Ditch, connecting Lake Drummond with the Dismal Swamp Canal and U.S. Highway 17. To enter Lake Drummond, boats must be transported across the Corps of Engineers spillway on the Feeder Ditch by way of a small motorized tram, on which there is a 1000 pound weight limit.

Fishing in the refuge is restricted to Lake Drummond, where it is open from sunrise to sunset to anyone holding a Virginia State fishing license. Fishing success is highest during the spring season with speckles (crappie), fliers, blue gills, and catfish being the primary species caught.

Best views of Lake Drummond are no longer available.

Fires are not permitted on the Refuge due to fire hazards which are enhanced by the peat soils. Camping or overnight stays are also prohibited; however, private and public campgrounds near the swamp are convenient to refuge visitors. One campground is located near the Refuge, and is under the control of the Army Corps of Engineers (Phone: 804-421-7401). This campground is located at the spillway on the Feeder Ditch and is free on a first come basis. Access to this area is by water only.

At present, hunting within the Great Dismal Swamp National Wildlife Refuge is limited to a controlled public white-tailed deer hunt held in the fall of the year. If you are interested, contact the Refuge.

Smoking is allowed on the refuge, but is discouraged in the interior portions of the swamp, again due to the potential fire hazard of the peat soils. Dogs are permitted in the refuge only when on a leash.

The Refuge offers free tours to the general public and to organized school, professional, and civic groups as weather and staffing permits. There is a limit of 20 people per tour and reservations are required.

The Great Dismal Swamp National Wildlife Refuge Headquarters is located at 3216 Desert Road. Travel Route 32, south from Suffolk, and follow the brown signs to the Refuge Headquarters.

Questions regarding the Refuge should be directed to the following address.

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE
GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE
P.O. BOX 349
SUFFOLK, VIRGINIA 23434

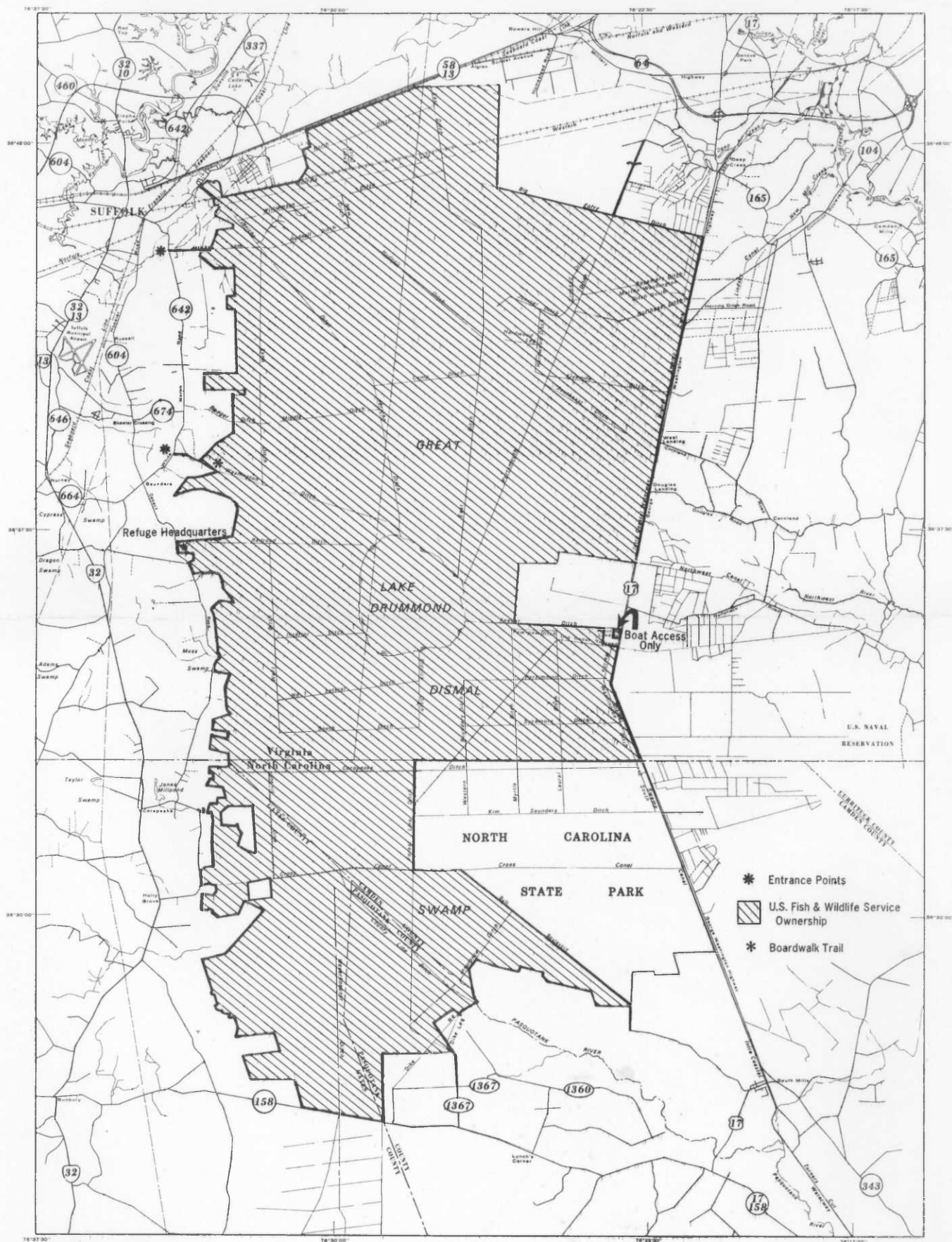
Telephone No.: 804-986-3705

GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

VIRGINIA AND NORTH CAROLINA

UNITED STATES
FISH AND WILDLIFE SERVICE



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

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