

GREAT DISMAL SWAMP  
NATIONAL WILDLIFE REFUGE  
Suffolk, Virginia

ANNUAL NARRATIVE REPORT  
Calendar Year 1983

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

7 - 1

GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

1983



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1. Michael Tansy, Asst. Ref. Mgr., GS-11, EOD 08-10-80, PFT.
2. James Oland, Ref. Mgr., GS-12, EOD 09-19-82, PFT.
3. Charles Marshall, ORP-Aid, GS-5, EOD 10-19-81, PFT.
4. Howard Rybolt, Realtor, GS-12, EOD 12-31-78, PFT.
5. Sherman Stairs, Asst. Ref. Mgr., GS-12, EOD 05-15-83, PFT.
6. Allen Carter, Forester, GS-11, EOD 05-04-80, PFT.
7. Dane Winningham, Maint. Wkr., WG-5, EOD 07-24-83, PFT.
8. Charles Pelizza, ORP, GS-5, EOD 04-04-83, PFT.
9. Mary Keith Garrett, Bio., GS-11, EOD 08-05-73, PFT.
10. Michael Bryant, Maint. Wkr., WG-8, EOD 10-21-79, PFT.
11. John Thomas, Laborer, WG-5, EOD 06-12-83, NTE 1 yr.
12. Bailey White, Equip. Op., WG-10, EOD 03-15-78, PFT.

#### MISSING FROM PHOTO

Sally Leary, Sec., GS-5, EOD 01-13-80, PPT.  
 Beverly Merz, Clerk-Typist, GS-3, EOD 10-03-82, PPT.  
 Thomas Gwynn, Bio. Tech., GS-5, EOD 01-08-83, NTE 1 yr.  
 Michael Lane, Laborer, WG-3, EOD 04-03-83, NTE 1 yr.

#### Review and Approvals

<u>James P Oland</u> Submitted By	<u>3/9/84</u> Date	<u>EJ Moses</u> Refuge Supervisor Review	<u>3/30/84</u> Date
<u>Suzanne Mayne</u> <u>4-27-84</u> ARD-Wildlife Resources Review      Date			





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U.S. GEOLOGICAL SURVEY

U.S. Geological Survey's Dismal Swamp field unit is stationed at Refuge headquarters.



(L) Virginia Carter, Biologist stationed in Reston, VA, GS-13,  
PFT  
(R) Pat Gammon, Botanist, GS-11, PPT.

MISSING FROM PHOTO

Brenda Smith - Hydrologic Field Assistant, GS-5  
Susie Briley - Hydrologic Field Assistant, GS-5

## TABLE OF CONTENTS

A.	<u>HIGHLIGHTS</u> .....	1
B.	<u>CLIMATIC CONDITIONS</u> .....	2
C.	<u>LAND ACQUISITION</u> .....	3
1.	Fee Title.....	3
2.	Easements.....	3
3.	Other.....	3
D.	<u>PLANNING</u> .....	
1.	Master Plan.....	4
2.	Management Plan.....	4
3.	Public Participation.....	4
4.	Compliance with Environmental Mandates.....	4
5.	Research and Investigations.....	5
E.	<u>ADMINISTRATION</u> .....	
1.	Personnel.....	7
2.	Youth Programs.....	9
3.	Other Manpower Programs.....	11
4.	Volunteers Programs.....	12
5.	Funding.....	12
6.	Safety.....	13
7.	Technical Assistance.....	14
8.	Other Items.....	14
F.	<u>HABITAT MANAGEMENT</u> .....	
1.	General.....	16
2.	Wetlands.....	16
3.	Forests.....	17
4.	Croplands.....	18
5.	Grasslands.....	18
6.	Other Habitats.....	18
7.	Grazing.....	18
8.	Haying.....	18
9.	Fire Management.....	19
10.	Pest Control.....	22
11.	Water Rights.....	23
12.	Wilderness and Special Areas.....	23
13.	WPA Easement Monitoring.....	23

## G. WILDLIFE

1. Wildlife Diversity.....	24
2. Endangered and/or Threatened Species.....	24
3. Waterfowl.....	25
4. Marsh and Water Birds.....	25
5. Shorebirds, Gulls, Terns and Allied Species.....	25
6. Raptors.....	26
7. Other Migratory Birds.....	26
8. Game Mammals.....	27
9. Marine Mammals.....	27
10. Other Resident Wildlife.....	27
11. Fisheries Resources.....	28
12. Wildlife Propagation and Stocking.....	30
13. Surplus Animal Disposal.....	30
14. Scientific Collections.....	30
15. Animal Control.....	31
16. Marking and Banding.....	31
17. Disease Prevention and Control.....	31

## H. PUBLIC USE

1. General.....	33
2. Outdoor Classrooms- Students.....	33
3. Outdoor Classrooms- Teachers.....	34
4. Interpretive Foot Trails.....	34
5. Interpretive Tour Routes.....	34
6. Interpretive Exhibits/Demonstrations.....	34
7. Other Interpretive Programs.....	35
8. Hunting.....	36
9. Fishing.....	39
10. Trapping.....	39
11. Wildlife Observation.....	39
12. Other Wildlife Oriented Recreation.....	39
13. Camping.....	40
14. Picnicking.....	40
15. Off-Road Vehicling.....	40
16. Other Non-Wildlife Oriented Recreation.....	40
17. Law Enforcement.....	41
18. Cooperating Associations.....	42
19. Concessions.....	42

## I. EQUIPMENT AND FACILITIES

1. New Construction.....	42
2. Rehabilitation.....	47
3. Major Maintenance.....	48
4. Equipment Utilization and Replacement.....	50
5. Communications Systems.....	52
6. Energy Conservation.....	54
7. Other.....	54

## J. OTHER ITEMS

1. Cooperative Programs.....	54
2. Items of Interest.....	55
3. Credits.....	55

## K. FEEDBACK.....56





## CANADA GEESE ON LAKE DRUMMOND

### A. HIGHLIGHTS

The sixth annual controlled public deer hunt drew only half as many applicants this year as last year with the harvest close to last year's. (See Section H. 8)

The 2nd annual "Dismal Swamp Run" half-marathon was held on November 6th. The event, sponsored by the Tidewater Striders, drew 199 runners who participated in either a two mile or 13.1 mile race on refuge roads. (See Section H. 16)

The year was a busy one for construction with six major contracts ongoing and other force account construction completed by the refuge staff. (See Section I. 1)

A fishery inventory project was initiated, the ultimate purpose being to improve fishery for use by man and wildlife populations. (See Section G. 11)

Increased emphasis and responsibility was placed on fire related activities with much planning and training taking place. (See Section F. 9)

On December 17th, a light aircraft crashed in Lake Drummond. The passenger was killed and the pilot seriously injured. The plane has been removed from the lake for accident investigation by the FAA and the state aviation agencies. (See Section E. 8)

The 7th annual Dismal Swamp Bird Count was held May 1st; twenty-nine observers saw a total of 108 species. (G. 7)

#### B. CLIMATIC CONDITIONS

The total amount of rainfall occurring during 1983 was higher than average, however, it was not spread out evenly throughout the entire year. Total rainfall was 66.29 inches compared to the average annual total of 52.84 inches. The summer months of June, July, and August were the most deficient in rainfall, averaging 2.84/month, compared to 5.36/month from the 5 year average. The remaining months averaged 6.42 inches/month compared to 4.08/month from the 5 year average.

Fire danger to the refuge was reduced because of adequate ground-water levels during the dry period. There were just four minor lightning-caused fires during the month of August.

Temperatures throughout the winter/spring/fall months were moderate; however, summer temperatures, particularly in July and August, were above normal. Readings in the high 90's were not unusual during this period. There was no snowfall recorded for the year.

#### RAINFALL DATA FOR 1983 IN THE GREAT DISMAL SWAMP N.W.R.\*

Month	Year						Average
	1978	1979	1980	1981	1982	1983	1978-82
January	5.21	6.46	5.02	1.27	5.28	5.13	4.65
February	1.58	7.71	2.09	2.94	6.18	11.05	4.10
March	6.15	4.49	3.92	2.29	2.66	6.65	3.90
April	3.30	5.18	2.43	2.28	2.19	7.45	3.07
May	8.15	8.69	2.71	2.48	2.48	6.70	4.90
June	8.40	3.81	0.49	4.82	5.33	3.71	4.57
July	2.19	7.07	3.09	7.57	10.67	1.83	6.12
August	3.56	4.31	2.58	7.02	9.55	2.99	5.40
September	0.95	7.33	1.06	2.09	9.59	7.05	4.20
October	1.67	4.16	5.63	3.22	5.66	4.05	4.07
November	3.71	5.50	1.82	1.78	5.35	3.45	3.63
December	2.58	1.28	3.21	7.00	7.07	6.23	4.23
Total							
Rainfall	46.45	65.99	34.05	44.76	72.01	66.29	52.84

\* From the U.S. Army Corps of Engineers Spillway-Lake Drummond.

## C. LAND ACQUISITION

### 1. Fee Title

There was no land acquisition or deletion to the total area of the Great Dismal Swamp National Wildlife Refuge from that reported in 1982, i.e., 102,246 acres.

- a) The acreage managed in Virginia is 77,737.
- b) The acreage managed in North Carolina is 24,509.

### 2. Easements

No additions.

### 3. Other

Nothing to report.

## D. PLANNING

### 1. Master Planning

During this year significant efforts were expended on the development of the Master Plan alternatives and assessment of impacts. As with numerous other activities, priorities were periodically changed so we were unable to meet the deadline for completion of the plan. The initial five alternatives were presented to the public in March and to the State Natural Resources personnel in North Carolina and Virginia in April. No major points of conflict were identified at these meetings. The Master Plan EIS is currently scheduled for completion in June of 1984, barring the inevitable "higher priority" project.

In April of this year, it became apparent that the refuge staff would be seriously short of time to work on the master plan documents because of construction activities and required training. At the same time, the Ecological Services office in Annapolis, Maryland found it was short of funds to pay salaries. To our mutual benefit, Bob Zepp of the Ecological Services office was assigned to assist with the writing of the affected environment and impact section for the master Plan EIS.

Master Plan activities during the year included the following:

- 1. Prepared articles for the Master Plan Newsletter.
- 2. Completed Habitat Matrices and bibliography.
- 3. Arranged for public meetings.
- 4. Interview of Manager by local radio and TV.
- 5. Public meetings held in Deep Creek, VA and Sunbury, NC.
- 6. Meeting held with North Carolina and Virginia Division of Natural Resource personnel.



7. Prepared objective documentation records (ODRs).
8. Prepared impact analysis matrices.
9. Drafted descriptions of the alternatives and affected environment.
10. Prepared cost tally sheets.
11. Revised ODRs.
12. Revised descriptions of alternatives.
13. Cost analysis of all alternatives.
14. Manipulated habitat matrices by computer.

## 2. Management Plans

As a result of the major efforts which were expended on the development of Master Plan documents, management plans received a lower priority than normal. Refuge Forester Carter was able to complete the prescribed burning portions of the fire management plan and made significant progress on the wildfire suppression section. Work was also initiated on the cropland management plan which will be completed in early 1984. The refuge hunt plan was amended to reflect several changes in the hunting program and an environmental assessment covering the opening of the North Carolina portion of the refuge was completed.

## 3. Public Participation

Public meetings were held in Deep Creek and Sunbury to explain the Master Plan alternatives. Approximately 40 people attended the meeting in Deep Creek with 15 attending in Sunbury. In both meetings, the people attending were, in general, supportive of the refuge's proposed alternative.

Manager Oland, Supervisor Moses, and Planner Parkin met with North Carolina Wildlife, Forest, and Parks staff on April 12 concerning the Master Plan alternatives. A similar meeting with Virginia state personnel was held on April 13.

At the Virginia meeting, it was requested that we give consideration to permitting horseback riding on the refuge roads. Apparently the state had been receiving inquiries from organized trail riding groups regarding the availability of trails. During the public involvement the refuge was contacted by only a couple of individuals about this issue.

## 4. Compliance with Environmental Mandates

A major portion of this refuge is considered to be wetlands which fall within the purview of the Corps of Engineers under section 404 of the Federal Water Pollution Control Act.

As a result of the ongoing construction and proposed future work, we had several contacts with the Corps of Engineers and our Ecological Services personnel regarding the proposed projects.

An environmental assessment was prepared for the opening of the North Carolina portion of the refuge to deer hunting.

## 5. Research and Investigations

Two studies under the responsibility of the FWS have been completed. Dr. Robert K. Rose, Ph.D, Old Dominion University, has completed his endangered species work. As described under endangered species, Dr. Rose found the southern bog lemming to have a broad distribution and did not recommend that species for listing. He did however recommend the Dismal Swamp subspecies of the southeastern shrew for threatened listing due to its potential loss through interbreeding with the upland subspecies.

The biological and physical characterization of the Refuge western boundary Transition Zone was also completed by Refuge Biologist Mary Keith Garrett in cooperation with the U.S. Geological Survey. The final report will be completed in 1984. A second methods paper is to be published on the design and operation of soil-air/ground-water oxygen chambers. The measurement of oxygen levels in the root zone is critical in evaluating the adaptations needed by the wetland vegetation species for survival.



BIOLOGIST GARRETT  
MEASURING SOIL  
OXYGEN LEVELS ON THE  
TRANSITION ZONE

## STUDIES CONDUCTED BY OTHERS

1. Productivity and Mineral Cycling in the Great Dismal Swamp. Dismal Swamp NR 83, 83-75-6. Frank P. Day, Jr. Ph.D., Old Dominion University (ODU).

Dr. Day and his students published four papers in 1983 dealing with his work in the Dismal Swamp.

a) "Decay Rates and Nutrient Dynamics in Confined and Unconfined Leaf Litter in the Great Dismal Swamp", The American Midland Naturalist, 1983, 110(1), pp. 37-45.

Decomposition of litter was examined in four different vegetative communities for two years, by two methods (litter bags and unconfined leaf pack). It was found that the cedar community decayed at a faster rate than the mixed hardwood. The unconfined method of testing was faster than the litter base method.

b) "Algal Dynamics and Nitrogen and Phosphorus Cycle in a Cypress Stand in the Seasonally Flooded Great Dismal Swamp". Hydrobiologia, 1983, 106, pp. 115-122.

Periphytic plankton algae are found in the seasonally flooded area of the swamp. The biomass of the algae equaled or exceeded the biomass of the herb layer, making them important nutrient conserves in the surficial litter.

c) "Effects of Flooding on Leaf Litter Decomposition in Microcosms", Oecologia, 1983, 56, pp 180-184.

Decomposition of maple leaf litter was studied in a laboratory controlled environment in order to compare the nutrient dynamics in the field. It was found that external inputs to litter nutrient relations were measurable factors.

d) "An Evaluation of Small Rodents in Four Dismal Swamp Plant Communities", Virginia Journal of Science, 1983, Vol 34, No.1.

Rodents were sampled from four communities in the Great Dismal Swamp. The maple-gum had the most rodents, but the cedar was the only one to have both species. In "cafeteria" tests, the mice were given the fruits of eight tree species. It was found that the greatest weight losses occurred on tupelo, cedar and blackgum fruit with the least losses found on the maple and oak fruit. A comparison of digestible portions of four edible fruits revealed the following: Maple samples are 75% digestible, acorns 43.6%, tupelo gum 13%, and blackgum 0.1%.

2. "Investigations on the Ecology of the Swainson's and Wayne's Warblers in the Great Dismal Swamp and Continuation of the Breeding Bird Survey". Dismal Swamp NR 1983, 51580-83-75-1. Brook Meanley, USFWS, Patuxent, retired.

Mr. Meanley has been working in the Dismal Swamp nearly 20 years. This work is continuing.

3. "Taxonomic Survey of Larval Aquatic Coleoptera of the Dismal Swamp", Dismal Swamp NR 1983, 51580-83-73-5. James F. Matta,



Ph.D., Department of Biological Sciences, ODU.

Dr. Matta has been working on aquatic beetles for 11 years. This past year he and his students developed a new larval rearing method that permitted the development and identification of more larvae than had been associated in the past decade by all Dytiscid workers. Several publications are being prepared for 1984.

4. Peat Resources of the Great Dismal Swamp. Dismal Swamp NR 1983, 51580-83-81-11. Lee J. Otte, Ph.D., East Carolina State University.

Dr. Otte is funded by the USGS Wetland Studies Project. The refuge management implications included a total map of the depth of organic soils, location of prehistoric channels, moisture-holding profiles, mineral content and physical description. This information has been entered in the Dismal Swamp data base and is important in water management, timber management and fire management. This work should be completed in 1984.

5. Survey of Winter Stoneflies of the Great Dismal Swamp. Dismal Swamp NR 1983, 51580-83-83-2. Boris C. Kondratieff, Ph.D., Virginia Polytechnic Institute and State University.

Dr. Kondratieff is continuing his work of the stonefly larvae from the surface inflow in and around the swamp. He has found two new species and will be publishing in 1984.

6. Survey of Lepidopteran Adults and Larvae of the Dismal Swamp-four independent studies; four permitted individuals are recording larval food preferences and seasonal annual fluctuations in species composition and relative densities.

7. Hydrology and Ecology of the Great Dismal Swamp (See Cooperative Programs).

#### E. ADMINISTRATION

##### 1. Personnel

a) The following table shows a five year comparison of staffing patterns, e.g., positions filled and/or authorized:

PERMANENT		TEMPORARY	
Full Time	Part Time		
FY79	6	1	6
FY80	6	2	7
FY81	7	3	8
FY82	8	2	4

b) Personnel Action

Charles Marshall was converted from career-seasonal to permanent-full time on October 3, 1982.

Charles Pelizza entered on duty April 4th as the refuge's Outdoor Recreation Planner, GS-023-5.

Michael Lane entered on duty April 3rd to assist with the Transition Zone study. Mike worked last year for four months on the same project.

Sherman Stairs reported for duty on July 5th with an effective entered on duty date of May 15th. During the interim, Sherman was closing out the FWS operation of the Wytheville NFH.

Dane Winningham was converted from temporary WG-5 to permanent full time WG-5 maintenance helper.

Forester Allen Carter's position description was modified to include his newly assigned responsibilities as fire management officer. Currently his major effort in this capacity is to correct the problem of inadequate fire management training for refuge personnel.

Biological Technician Thomas Gwynn's NTE one year appointment was renewed effective January 8th for an additional year.

c) Training

Refuge staff personnel requiring renewal of their Defensive Driving Certification attended a six hour course at Birdsong Recreation Center in Suffolk on April 5th. The course was administered by an instructor from the Virginia Division of Motor Vehicles.

Charles Marshall, Assistant ORP, participated in an Office of Personnel Management training course entitled "Effective Writing Workshop".

Michael Bryant, maintenance worker, completed a two week Equipment Operator Instructor school held in Moline, Illinois by the John Deere Co.

Forester Allen Carter and Assistant Manager Michael Tansy attended a Fire Management Seminar on September 19 thru 23 in Boise, Idaho. The purpose was to achieve a common level of understanding of agency fire management policies.

Manager James Oland and Assistant Manager Michael Tansy attended Law Enforcement refresher training held in Richmond, Virginia the week of August 22.

Fire Management Officer Carter and Maintenance Worker Bryant attended the week-long course, "Advanced Fire Tractor Operator", offered by the North Carolina Forest Service at Kinston.

Sherman Stairs completed nine weeks of LE Training. He left in October and returned on December 22.

Refuge staff, i.e., Oland, Tansy, Garrett, Carter, Pelizza, Marshall, Bryant, Winningham, and Thomas attended a wildfire simulation course November 29. This was conducted by the Virginia Division of Forestry and hosted by the Suffolk Fire Department.

Forester Carter attended a U.S. Forest Service seminar December 5-9 in Milwaukee on implementation of the NIIMS system (National Interagency Incident Management System).

The following refuge staff members attended the Hunter Education and Training Course offered on September 13th and 14th: Michael Tansy, Sherman Stairs, Allen Carter, Thomas Gwynn, Charles Pelizza, Charles Marshall, Dane Winningham, Michael Bryant, Beverly Merz, John Thomas, and Cheryl Briley, USGS. In addition to hunter education, regulations for hunting on the Great Dismal Swamp NWR were covered.

On October 6, 13, and 20, the Virginia Game Commission sponsored a Hunter Education Instructors' course. Charles Pelizza attended and is qualified with the Virginia Game Commission and the National Rifle Association to teach hunter education.

## 2. Youth Programs

### a. YCC-Youth Conservation Corps

The refuge's 1983 Youth Conservation Corps camp employed 10 enrollees and a group leader for a total of 9 weeks work. The camp began on 19 June and ended on 20 August as a non-residential camp. Enrollees and the group Leader were selected from Suffolk residents.

A total of \$15,300 funding was available with the stipulation not to exceed 360 hours per enrollee. Enrollee salary costs expended totalled \$11,945 with 3332 work hours. Group Leader salary costs were \$2,408 for 392 work hours. Other camp costs totalled \$900. Total camp expenditure was \$15,253.

Primary work projects this year included boardwalk maintenance, boardwalk bench and railing construction, and boardwalk cleanup. Secondary projects included Washington Ditch bulkhead railing construction, pier railing construction, cleanup of newly acquired property (Bass Tract), and lumber stockpile moving and restacking. In addition, other general maintenance and office assistance work duties were performed. The refuge staff was very pleased with Group Leader Mr. Wilburn Wilson's



supervision and the productive work completed by the enrollees.

Environmental awareness opportunities were provided on the job site and during orientation the first week of work.

Refuge safety meetings were attended by all enrollees. The staff alerted enrollees to known hazards as often as practical. Three reported accidents/incidents involving enrollees occurred during the camp; none were serious.



CLEAN UP AT THE BASS TRACT

### 3. Other Manpower Programs

#### SCA-Student Conservation Corps

Two Student Conservation Association groups participated in Refuge work projects this summer. Robert Clark supervised the first work crew and was an excellent supervisor of high school age young people. Greg Anderson supervised the second work crew. He also was well qualified and did an excellent job supervising young people.

Group one began work on 21 June and ended their four week assignment on 19 July. The second SCA group ended their three week program 17 August.

Students participating in the SCA program came from various locations in the mid-west and eastern states, and had varied backgrounds. They expressed interest in doing something in the outdoors for the summer, and to see if they would like conservation work as a career. Both groups were energetic and hardworking. They required little refuge supervision.

Work accomplished this summer included: rehabilitation of antenna and pole foot-bridges across ditches, construction of new pole-bridges, construction of handrails and decking for foot-bridges, trail and road clearing, boat ramp repair, and pick-up of over one mile of hose after two wildfires.

The refuge staff assisted the SCA group leaders and purchased work materials and tools. Several wildlife management and interpretive presentations were given by the staff. Field trips were conducted for the group by refuge staff concerning U.S. Fish & Wildlife Service management programs. Presentations given included topics on careers in wildlife, bird identification, botany, hydrology, geology, safety, wildlife management, and forestry.

The SCA campsite was located on the southwestern shore of Lake Drummond on Interior Ditch. This is about the center of the refuge. The camp consisted of one two-occupant tent and two three-occupant tents. In addition, a 10ft.x 14ft. screened canopy for insect protection was utilized. Both groups experienced very hot, humid weather and biting yellow flies. The environmental impact to the camping area was minimal. The group was conscientious of litter, bathing, and cooking. The camp area was checked for litter daily. Biodegradable soap was used for bathing and dishwashing. Much attention was given to cooking for prevention of peat fires.

Several day trips and hikes were conducted as recreation to get out of the heat, humidity and insects. Visits were made to Williamsburg, Busch Gardens, the Outer Banks, and Pea Island NWR.

In conclusion, the 1983 SCA program was beneficial to both the refuge staff and to the participants.



SCA VOLUNTEERS REST ON FOOT BRIDGE THEY JUST COMPLETED

#### 4. Volunteers Program

The volunteer program is essential to the refuge program to accomplish needed projects which may not be of the highest priority. In some cases, volunteers had other jobs or school commitments which precluded their use for certain refuge activities, but a substantial degree of work was performed by volunteers assisting refuge staff this year. During the year, six volunteers assisted refuge staff in work projects such as: general maintenance of buildings and lands, information and office receptionist, the annual deer hunt, exhibit design or preparation, refuge hunting education, outdoor classroom education, clerical, and offsite presentations. Volunteer assistance was valuable during the 1983 refuge deer hunt. A total of 488 volunteer hours were recorded during the year.

#### 5. Funding

The five year funding pattern for Dismal Swamp is shown in the following table.

FY YEARS	SUBACTIVITIES					TOTAL
	1210	1220	1240	1922(1)	1260	
1980	0	200,000	84,000	0	0	284,000
1981	0	212,000	77,000	36,000	0	325,000
1982	2,000	202,000	67,000	31,500	0	307,500
1983	2,000	349,000(2)	109,000	13,500	0	473,500(2)
1984	0	0	0	0	507,711(3)	507,711(3)

(1) Funds transferred from the Corps of Engineer's Waterways Experimental Station for conducting a study of the "Transition Zone" between uplands and swamp.

(2) Includes \$138,000 special fire funds used for equipment purchase.

(3) Includes \$58,000 special fire funds used for equipment purchase.

Significant portions of the increased funds for FY83 and FY84 were earmarked and expended for equipment and projects associated with fire protection and in preparation for relocation of our administrative complex to an on-refuge site. The move is scheduled for early in FY84.

#### 6. Safety

Safety meeting topics in 1983 included safety around the office, fire prevention in the home, personal protective equipment, heavy equipment operation, poisonous plants of Virginia, eye protection, oxyacetylene safety, electrical safety, heat stress, safety on the fire line, farm tractor operation, hand protection, rabies and vicious dogs, and avoiding muscle strain when lifting and pushing. The safety committee obtained several films and slide-cassette programs from the Virginia Department of Labor and Industry and Virginia Polytechnic Institute Extension Service.

Refuge personnel requiring renewal of their Defensive Driving Certificates attended a 6 hour course at Birdsong Recreation Center in Suffolk on April 5. The course was administered by an instructor from the Virginia Division of Motor Vehicles.

Safety materials purchased with station funds included a first aid kit and eyewash station for the new shop building, hearing and eye protection devices, protective fire clothing, flashing vehicle lights and wide-load flags, rain gear, hip boots, and individual and 10-man crew first aid kits.

A total of four job-related injuries were reported in 1983. Temporary maintenance worker John Thomas, while kneeling to



hammer a nail on the shop floor, placed his knee on a bag of nails and received a puncture wound. Three YCC summer workers also received minor injuries: Darryl Butler, while mixing sand and cement in a mortar machine, placed his right arm inside it, and received abrasions and bruises; Vondrae Hicks, while working on the boardwalk trail, was struck by a splinter in the left eye; and Jeanette Goodwyn contracted a severe case of poison ivy which required medical attention. All YCC enrollees had been issued protective equipment and were instructed in safe work practice at daily tailgate safety briefings.

## 7. Technical Assistance

Mary Keith Garrett, biologist, spent two days working with Charles Rhodes, ecologist, Environmental Protection Agency, and Patricia Gammon, botanist, U.S. Geological Survey, reviewing Cooper's Creek watershed in Chesapeake, Virginia. A permit request by the city to dredge and fill wetlands became a volatile political issue when the Corps, EPA, and Ecological Services questioned the developments taking place in the Cooper's Creek watershed above the proposed dredge site.

Mary Keith, Charles, and Pat conducted a number of vegetative transects through the watershed in an effort to determine the presence or absence of wetlands in those areas being developed.

## 8. Other Items

One fatality occurred on the refuge this year as a result of a light plane crash. At approximately 5:45 PM on December 17, 1983 Timothy B. Dutcher (pilot) and Andrew T. Calhoon (passenger) departed the Chesapeake Airport in a Cessna 172M. The plane went down in Lake Drummond at about 6 PM. As a result of the impact, the airplane broke in the middle with the front portion inverted mostly under water, and the tail portion remaining upright. Mr. Calhoon died at the time of the accident from head injuries or from drowning (autopsy not yet available).

The pilot, Mr. Dutcher, sustained head injuries and hypothermia. Three campers who were spending the night at the Corps of Engineers spillway campsite went to look at the lake by moonlight about 7:30 PM. They turned off the engine of their boat and were able to hear Mr. Dutcher call for help. The campers (James Waits, Elizabeth Klein, and James White) carried Mr. Dutcher back to the campsite where they attempted to warm him by their fire. They broke a window in the office building at the Corps of Engineers site and used a telephone to call for assistance.

A Coast Guard helicopter from Elizabeth City was dispatched to assist Chesapeake Police Department personnel with the search for the passenger (Calhoon). Police department divers removed Calhoon's body from the plane. The airplane was removed from Lake Drummond on December 21.

The incident is being investigated by:

Charles T. Fouts  
Air Safety Specialist  
National Transportation Safety Board  
1720 Peachtree Street NW, Suite 921  
Atlanta, GA 30309  
(404) 881-7385

Ron Hendricks  
Aviation Safety Inspector FAA  
Executive Terminal  
Byrd Terminal  
Sandston, VA 23150  
(804) 222-7494

Virginia State Police  
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WRECK OF N4275R

## F. HABITAT MANAGEMENT

### 1. General

The Great Dismal Swamp National Wildlife Refuge was established in February, 1973, with the donation of 49,100 acres by the Union Camp Corporation to the U.S. Fish and Wildlife Service through the Nature Conservancy.

The refuge, presently at 102,246 acres, offers important ecological, educational, historical, and recreational values and is a peaceful contrast to nearby heavily populated urban areas.

The Dismal Swamp, which is actually a forested palustrine wetland, has been greatly altered by miles of drainage ditches, repeated lumbering operations, and wildfires. A drier habitat has resulted, and red maple now dominates much of the forest which was once covered with large stands of cypress, Atlantic white cedar and tupelo gum.

The swamp contains a complexity of plant communities, including freshwater marsh, evergreen shrub, Atlantic white cedar, mixed hardwoods, red maple/black gum, pine, and bald cypress/tupelo. Due to the geographic location of the swamp, there is an overlap of species, both plant and animal, that reach the southern or northern limits of their ranges. For this reason, many species that are seldom seen together are found in close association within the Dismal Swamp.

### 2. Wetlands

#### a) Water Management: Water Control Structures

Rehabilitation of seven water control structures was continued in 1983. None of these were completed prior to the winter "wet" season.

Even though we had a summer drought that hurt the agricultural production in the region, the refuge had too much water for the road construction contract. All the water control structures were opened to the maximum and we set up two 7,000 gallon per minute pumps to reduce the water in East Ditch and Jericho Ditch. The pumping was to no avail. The groundwater discharge was too high and we could not reduce the water enough to salvage the road contract. The water stayed within 10"-30" below the road surface and with the organic base in the dike roads, water moved to the surface after only 8 or 10 trucks passed. The eleventh truck invariably broke through and had to be unloaded by hand before it could be pulled out. The contractor was given an extension and hopefully the water levels will permit completion of the work next year.

#### b) Wetlands Management: See Wildlife Diversity, G. 1.



CONTRACT WORKERS LOADING FILL FOR WATER CONTROL STRUCTURES

### 3. Forests

Very little on-the-ground forest management was conducted in 1983. A great amount of time was spent, particularly in the first half of the year, on the master planning process. An alternative was selected by the staff, which included a long-range forest management strategy with specific proposals in terms of acres, methods, and costs for maintaining and expanding desirable



habitat types. There will be no large-scale forest management program at Dismal Swamp until the master plan is written and approved.

Contributing to the lack of forestry activity was the higher priority given in 1983 to fire management. Forester Carter was informed in June that one of his primary responsibilities would be as Fire Management Officer. Much of his time was occupied in fire-related business (See Fig. 9, Fire Management).

#### 4. Croplands

In the acquisition of one tract in 1980, the refuge acquired 60 acres of cleared land along with the forested swamp in an all-or-nothing deal. Negotiations began in 1981 for an exchange of the property for 190 acres of forested swamp, but an agreement could not be reached. Early in 1983 a decision was made to keep the 60 acres and negotiations were ended. From the time of acquisition through the 1983 growing season, the cropland was cash-leased. In 1983, the cooperator planted 26 acres of corn, 20 acres in peanuts, and 12 acres in the PIK program. A cropland management plan will be developed in 1984 and the property will be farmed by a standard cooperative farming agreement.

#### 5. Grasslands

Nothing to report.

#### 6. Other Habitats

Nothing to report.

#### 7. Grazing

Nothing to report.

#### 8. Haying

Nothing to report.



BEAR DAMAGE OF COOPERATIVE FARMING LAND

#### 9. Fire Management

Preparations were under way in April for the upcoming fire season. All firefighting equipment and personal protective gear were inventoried, and orders were placed to bring supplies up to full inventory level. Pumps and other equipment were given routine maintenance checks and repaired as needed. The annual pump training day was held April 14 at Lake Drummond, with refuge staff reviewing the operation of all portable and trailer-mounted pumps.

During summer drought conditions, surveillance of the refuge by airplane is done at least once a week to check for smoke. A total of four small wildfires were spotted on the refuge on July 30, July 31, and August 31. All fires were caused by lightning striking large cypress trees and igniting the dry peat soil. The Cat D6 tractor with KG blade, working in radio contact with refuge aircraft observers, was able to push a path to each fire and circle it with a control line. YCC, SCA, and refuge workers were put to good use laying hose lines and rolling up after. Only qualified personnel were allowed on the fire line. The fires ranged from 1/2 to 3/4 miles from the nearest ditch and required the laying of over 9,000 feet of hose.

Specifications were developed for equipment purchased from fire funds. Items ordered included a new transport truck with hydraulic lift bed, portable firefighting pumps, improvements to the communications system, crawler tractor, fire plow, and all-terrain vehicles.

In August we received a new Case 850C low ground pressure crawler tractor. Some modifications will have to be made to prepare the tractor for fireline plowing, such as attachment of a C-frame. A Hester fire plow was received in June and will be mated to the Case for fire control work. A new Chevrolet 4x4 one ton dual wheel pickup was received in October, for transporting fire control equipment and supplies. Other items obtained from fire funding included two Gorman-Rupp 6 1/2 portable water pumps, two Honda ATV's, and a 600 gallon relay tank.

New buildings obtained with fire funds included a flammables storage building and a metal equipment storage building. Rehabilitation projects for improved fire control access consisted of road upgrading on East Ditch, and new bridges at Portsmouth Ditch and Weyerhaeuser Ditch. The Equipment and Facilities section describes the successes and failures of these projects.

Fire Management Officer Carter attended an S-211 "Portable Pumps/Water Use" course put on November 7-10 by the North Carolina Forest Service in Southern Pines, North Carolina. This course is required for the Crew Boss rating in the NIFQS fire organization system. Other fire training attended in 1983 were the "Advanced Fire Tractor Operator" course offered by the North Carolina Forest Service and attended by Carter and Bryant; a North Carolina Forest Service program October 12 at which hazard reduction burning was discussed was attended by Carter; a wildfire simulation exercise put on November 29 by the Suffolk Fire Department and the Virginia Division of Forestry was attended by nine refuge employees; and a U.S. Forest Service interagency seminar on December 5-9 in Milwaukee on implementation of the NIIMS system (National Interagency Incident Management System) was attended by Carter.



#### BAILEY CHECKING OUT THE REFUGE'S NEW CASE TRACTOR

Several meetings were held during the year with North Carolina Forest Service personnel. Oland, Tansy, and Carter attended a fire cooperators meeting sponsored by the North Carolina Forest Service in Elizabeth City in February. Readiness plans, availability of retardant planes, and smoke management were the main topics of discussion.

Carter met with Bill Miller, Jim Sain, and Ted Banner of the North Carolina Forest Service to look at the evergreen shrub area north of Corapeake Ditch as a possible prescribed burning area. Fire is believed necessary to maintain the pond pine-gallberry community. The Forest Service strongly advised us not to attempt a burn in this area because of the heavy fuel loads and explosive nature of the ericaceous shrubs. They felt that either the fire could not travel because of the lack of surface fuel, or if conditions were right, the fire could explode and escape control. Roads and 30 foot cleared strips are apparently inadequate to contain fires of this type. They stressed the lack of knowledge and experience at all levels (NCFS, FWS, and USFS) in prescribed burning of pocosin fuels. In pine stands on organic soils, they felt that prescribed burning could be done if conditions were



right, including a water table 1-3 inches from the surface.

The fire management plan was rewritten in 1983. Carter visited NCFS District Forester Bill Miller on October 11 at Elizabeth City to discuss a number of items related to the management plan such as the cooperative agreement, burning prescriptions, and training. Our cooperative agreement is in need of revision, but will probably remain as is pending resolution of the Pungo situation.

Carter visited the Virginia Division of Forestry office in Charlottesville on October 28 to collect information in the files on the history of Dismal Swamp wildfires. This information was used in the fire history section of the fire management plan.

Carter and Tansy participated in the Fish and Wildlife Service Fire Management Workshop at the Boise Interagency Fire Center in September.

Ken Eichelman from the Office of the Inspector General visited the refuge April 26 and 27 to conduct an audit of the refuge fire management program. He did a quick equipment audit and reviewed fire reports and the fire management plan. Eichelman found the fire management plan to be satisfactory (though in need of revision), but was concerned about the low level of fire suppression training and physical fitness among the refuge staff.

Since his visit, contacts have been made with fire management and training officers in the National Park Service, U.S. Forest Service, and North Carolina Forest Service. Course schedules have been obtained from these sources and a training plan developed for refuge personnel.

Results of the 1982 prescribed burning were evaluated. Burning was successful in reducing wildfire hazard by consuming pine straw and needle drape, stimulating fresh herbaceous growth for wildlife, and reducing small hardwood reproduction. It was recommended that in the future, burning be done during or closer to the growing season to take advantage of drier conditions and effectively reduce understory and midstory hardwoods. Prescribed burning of the three sites planned for the winter of 1983 was cancelled due to wet weather.

#### 10. Pest Control

Pesticide use proposals were approved for our cooperating farmer to apply chemicals to 26 acres of corn and 20 acres of peanuts on refuge lands. Corn herbicides applied included Dual 8E, Atrazine, and Dyfonate 10G for rootworms. Peanut chemicals consisted of the fungicide Bravo W-75, the insecticide Dyfonate 10G, and herbicides Dynap and Dual 8E.

The gypsy moth surveillance program entered its second year. New milk carton traps were placed at Five Points, the boardwalk

trail parking lot, Interior Ditch near Lake Drummond, Corapeake Ditch and Forest Line Ditch. This program was undertaken in cooperation with the U.S. Forest Service insect and disease surveillance team. Some moths were trapped in the mixed oak stands along the western boundary, but the population was down somewhat from 1982. Apparently the moth is maintaining its presence but is not yet abundant enough to cause defoliation problems.

A southern pine beetle outbreak was spotted from the air about one mile west of the Dismal Swamp Canal near Southeast Ditch. An estimated thirty trees were affected. No control or salvage effort is planned, since the stand is three miles from the nearest access road and is surrounded by hardwoods.

The herbicide Roundup was sprayed by hand at the boardwalk trail wildlife opening to kill or suppress tree sprouts or seedlings. This treatment is necessary annually to prevent succession back to forest.

A fifteen acre test plot near Corapeake Road was treated for release of Atlantic white cedar seedlings using helicopter application of Roundup (glyphosate). The test should indicate whether the herbicide is effective in killing competing red maple without also destroying the cedars. Roundup has been successfully used for pine release but has never been tried for Atlantic white cedar. Maple removal, whether by chemical or mechanical means, is important in maintaining the viability of remnant cedar stands in the swamp.

Approximately six miles of roadside along East Ditch were sprayed with Krenite (fosamine) for woody brush control. This chemical is one of the safest herbicides available and has proven to be effective in killing or suppressing growth of trees and brush. Application was done with a pick-up mounted spray boom in a ten foot wide strip along the road.

11. Water Rights

Nothing to report.

12. Wilderness and Special Areas

Nothing to report.

13. WPA Easement Monitoring

Nothing to report.

## G. WILDLIFE

### 1. Wildlife Diversity

Road rehabilitation has provided extensive high quality habitat for those species preferring openings and early regeneration. Sorex longirostris fisheri, the Dismal Swamp subspecies of the southeastern shrew, a candidate for listing as a threatened species (see below), was found to prefer grassy to shrubby areas on organic soils. The road rehabilitation work consists of removing 20 to 50 feet of mature trees' from the roads' edge with plans to maintain the regeneration phase every 3 to 5 years. It is hoped that this and other species will follow these improved corridors into the swamp.



ROAD CLEARING

### 2. Endangered Species

Robert K. Rose, Ph.D., Old Dominion University, has completed a study for FWS Endangered Species office. He has reviewed the status and habitat preference of Synaptomys cooperi helaletes, the Dismal Swamp subspecies of the southern bog

lemming, and Sorex longirostris fisheri, the Dismal Swamp subspecies of the southeastern shrew. Dr. Rose found the bog lemming had a wide distribution in grass-dominated habitats, but he recommended the southeastern shrew for threatened status due to potential loss through interbreeding with the upland subspecies. The final determination on its status is expected in 1984.

### 3. Waterfowl

Waterfowl use of the refuge is generally restricted to Lake Drummond and is relatively low and sporadic, often depending upon regional climatic conditions that may force waterfowl from the surrounding coastal and river areas inland. The largest concentrations of waterfowl occur in the refuge during the months of January and February when portions of Lake Drummond are free of ice and the rivers and creeks near the refuge freeze. A baiting station was set up in Lake Drummond using corn and floating traps to hopefully capture and band mallards and black ducks to assist Back Bay NWR in fulfilling their quota. However, only ring-necked ducks and American coots were captured. Species of waterfowl observed within the refuge during 1983 included:

American coot, tundra swan, Canada goose, mallard, black duck, pintail, American wigeon, wood duck, ring-necked duck, canvasback, lesser scaup, bufflehead, ruddy duck, common merganser, red-breasted merganser, hooded merganser, and American goldeneye. Mallards, black ducks, wood ducks and hooded merganser all nested within the refuge in 1983. The hooded merganser nesting was the second record for the refuge since 1973.

### 4. Marsh and Water Birds

The most common marsh or water birds in the refuge are the great blue heron and green-backed heron. Both of these species breed within the refuge. The great blue herons have a rookery located in the North Carolina section of the refuge while the green-backed herons nest throughout the refuge wherever suitable habitat is available. Other species in this group observed on the refuge in 1983 included:

Pied-billed grebe, common loon, double-crested cormorant, glossy ibis, American bittern, great egret, and black-crowned night heron.

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

Most species in this category are observed on, around, or over Lake Drummond with a few exceptions. American woodcock, spotted sandpiper, solitary sandpiper, and killdeer are sometimes observed along refuge roads and ditches. Shorebird numbers as well as number of species observed was down from previous years



due to high water levels during peak shorebird migration periods. Species in this category observed on the refuge included great black-backed gull, herring gull, ring-billed gull, American woodcock, solitary sandpiper, spotted sandpiper, and killdeer.

## 6. Raptors

Bald eagle sightings were reported from around the refuge, however no observations were reported from within the refuge. A pair of osprey was reported for a three week period during late April and early May in the vicinity of Lake Drummond. Observations of turkey vulture, black vulture, sharp-shinned hawk, Cooper's hawk, red-tailed hawk, red-shouldered hawk, broad-winged hawk, American kestrel, osprey, barn owl, barred owl, great horned owl, and screech owl were consistent with previous years. Several red-shouldered hawks nested within the refuge and were observed on numerous occasions by refuge staff and visitors.

## 7. Other Migratory Birds

### Results of the 7th Annual Dismal Swamp Spring Bird Count

The results of this count will follow 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. Example: common loon 4 (5, 19), indicating that a total of 4 common loons were observed on routes 5 and 19.

Great Dismal Swamp National Wildlife Refuge, Suffolk, VA , 5/1/83, clear-AM, clear-PM, Temp. 55-85F, Wind 5-15 mph, water open, wild food crop excellent. Twenty-nine observers in 10 parties. Total party hours, 146 (5 on foot, 141 by car): total party miles, 38 (2 on foot, 36 by car.)

common loon 4 (5, 19); double-crested cormorant 24 (5, 19); duck: mallard 2 (3), American black 1 (3), wood 48 (1-5, 8, 10, 12, 13, 15); vulture: turkey 28 (All), black 10 (1-3, 5, 8, 12); hawk: sharp-shinned 2 (3, 12), red-tailed 1 (1), red-shouldered 14 (2, 5, 8, 10, 12, 13), broad-winged 4 (1, 5); osprey 1 (19); northern bobwhite 2 (16); heron: great blue 14 (1, 2, 4, 5, 8, 19), green-backed 27 (1-5, 8, 10); spotted sandpiper 2 (19); gull: herring 2 (19), ring-billed 25 (8, 13, 19); dove: mourning 38 (1-5, 10, 12, 13, 15), rock 6 (1); yellow-billed cuckoo 28 (1-5, 8, 10, 12, 13); owl: great horned 1 (2), barred 1 (12); chimney swift 22 (1-3, 5, 8, 13); ruby-throated hummingbird 25 (1-5, 10, 12, 13, 15); belted kingfisher 2 (2, 3); northern flicker 18 (1, 2, 5, 8, 12); woodpecker: pileated 81 (All), red-bellied 52 (103, 5, 8, 10, 12, 13), hairy 2 (1, 8), downy 11 (2-5, 12, 13); eastern kingbird 1 (19); eastern phoebe 3 (3, 10, 12); flycatcher: great crested 82 (All), Acadian 40 (1, 2, 4, 5, 8, 10, 13); eastern wood pewee 68 (1-5, 8, 10, 12, 13, 15); swallow: tree 5 (1, 5), northern rough-winged 1 (19), barn 5 (1, 13, 19); purple martin 2 (4, 13); blue jay 30 (1-5, 8, 13, 15);

crow: American 66 (105, 8, 10, 12, 13), fish 9 (1, 2, 3, 8); Carolina chickadee 149 (All); tufted titmouse 141 (All); nuthatch: white-breasted 18 (3, 5, 8, 10, 13), red-breasted 1 (8); wren: house 4 (1), Carolina 121 (All); northern mockingbird 1 (1); grey catbird 112 (1-5, 8, 12, 13, 15, 16, 19); brown thrasher 1 (1); American robin 18 (1-3, 8); thrush: wood 185 (All), hermit 2 (3, 8); veery 3 (3, 12); blue-gray gnatcatcher 61 (All); ruby-crowned kinglet 8 (1, 3-5); cedar waxwing 21 (1-3); European starling 12 (1); vireo: white-eyed 174 (All), yellow-throated 7 (1, 5, 19), solitary 3 (1, 8), red-eyed 194 (All), warbling 2 (8); warbler: black and white 29 (1-5, 8, 12, 13, 15), prothonotary 333 (All), Swainson's 26 (1-5, 8), worm-eating 20 (3-5, 8, 13, 16), blue-winged 9 (4, 12), Tennessee 1 (12), northern parula 78 (3-5, 8, 10, 12, 13), yellow 5 (3, 8), black-throated green 21 (3-5, 8, 12, 13), black-throated blue 19 (1-5, 8, 13), yellow-rumped 155 (All), yellow-throated 5 (3, 8, 13), blackpoll 46 (1, 3-5, 8, 12, 13), pine 19 (1-3, 8, 12), prairie 166 (All), palm 1 (8), Kentucky 3 (1, 4, 8), hooded 121 (All); ovenbird 175 (All); waterthrush: northern 11 (1, 3-5, 8), Louisiana 40 (1-5, 10, 13, 15); common yellowthroat 191 (All); American redstart 17 (3, 4, 10, 13); bobolink 101 (3-5, 13, 15); red-winged blackbird 78 (1, 5, 8); common grackle 229 (All); brown-headed cowbird 100 (1-5, 8, 12, 13, 15, 16); oriole: orchard 1 (5), northern 2 (8); tanager: scarlet 8 (4, 5, 8, 15), summer 8 (5, 8, 10, 15); northern cardinal 86 (All); rose-breasted grosbeak 6 (1, 3, 5, 8); indigo bunting 14 (1, 2, 3, 5, 8, 12); purple finch 7 (1, 3); American goldfinch 1 (10); rufous-sided towhee 47 (All); sparrow: chipping 3 (1, 3), field 2 (3), white-throated 43 (1, 3-5, 8, 10, 12, 13, 15, 16), song 1 (16). Total Species -107; about 4, 276 individuals.

#### 8. Game Mammals

Sightings of white-tailed deer, black bear, bobcat, grey squirrel, and cottontail rabbit were consistent with previous years. The 1983 deer hunt took seven less deer than in 1982 with a total of 105. The beaver colony appears to have moved on for better waters after the summer drought. The number of otter sightings and presence of otter scat on the ditch banks has decreased from previous years. This reduction could be attributed to fewer staff in the field, or fewer otters using the refuge due to outside trapping pressure or to reduction of food inside the refuge.

#### 9. Marine Mammals

Nothing to report.

#### 10. Other Resident Wildlife

Nothing to report.

## 11. Fisheries Resources

Gary Swihart, FWS, Fishery Resources, Gloucester Point, Virginia, began a Fisheries study in 1983. The following is his report.

The emphasis on increased fishery management on National Wildlife Refuges was initiated in FY83 with the objective "to optimize fishery opportunities on specific refuges offering such opportunity, provided these activities are conducted in a manner so as not to conflict with the primary mission of the individual refuge."

Initial field sampling on Great Dismal Swamp NWR commenced during the fourth quarter of FY83. A holistic approach of evaluating the fishery parameters on the Refuge is being used.

The following projects were initiated during FY83 and will be completed in FY84.



CHECKING FOR JUVENILE FISH IN LAKE DRUMMOND

## I. Qualitative Fishery Survey

Fish samples were collected from Lake Drummond, Washington Ditch, Weyerhaeuser Ditch, Williamson Ditch and Feeder Ditch. In an attempt to determine what species of fish are present, samples were collected using trap nets, gill nets, boat and backpack electro-shocking equipment. Sampling to date has produced the following fish species:

Chain Pickerel	<u>Esox niger</u>
Redfin Pickerel	<u>Esox americanus</u>
White Crappie	<u>Pomoxis annularis</u>
Yellow Bullhead	<u>Ictalurus natalis</u>
Brown Bullhead	<u>Ictalurus nebulosus</u>
Yellow Perch	<u>Perca flavescens</u>
Flier	<u>Centrarchus macropterus</u>
Pumpkinseed	<u>Lepomis gibbosus</u>
Black Crappie	<u>Pomoxis nigromaculatus</u>
White Catfish	<u>Ictalurus catus</u>
Bowfin	<u>Amia calva</u>
Eastern Mudminnow	<u>Umbra pygmaea</u>
Pirate Perch	<u>Aphredoderus sayanua</u>
Bluespoted Sunfish	<u>Enneacanthus gloriosus</u>
Blackbanded Sunfish	<u>Enneacanthus chartodon</u>
Golden Shiner	<u>Notemigonus crysoleucas</u>

Additional sampling in FY84 will most likely produce more species.

## II. Pesticide and Heavy Metal Analyses of Fish Samples

Fish specimens from Lake Drummond, Weyerhaeuser Ditch and two sites from Washington Ditch were collected and sent to the Analytical Bio-Chemistry Laboratories, Inc. (ABC Lab), Columbia, MO for analyses. Laboratory results for the heavy metal analyses have been received with results of pesticide analyses due the end of February 1984. Results are in parts per million. (ppm)

## III. Age and Growth Studies

Scale samples from yellow perch, flier, chain pickerel and black crappie have been collected and sent to the Virginia Cooperative Fishery Research Unit, VPI, Blacksburg, Virginia for analysis. The Unit has developed a computer program which will provide the following nine items:

1. Tables of length and age frequencies.
2. Correlation analysis of scale radius and length.
3. Backcalculated length histories in which linear, quadratic, and cubic predictive regressions, and geometric mean (GM) functional regression are used.



4. A table of mean length at capture vs. predicted mean length at capture.
5. Least-square estimates of von Bertalanffy growth parameters with a plot of the growth curve.
6. A scatter plot of length and weight.
7. Plots of each of the four regressions for backcalculated length.
8. A Ford-Walford plot.
9. A condition factor plot.

Additional scale samples need to be collected in FY84 before this portion of the evaluation can be completed.

#### IV. Water Quality Analyses

Attempts were made during FY83 to conduct water quality analyses on nine parameters: total hardness, alkalinity, pH, tannic acid, carbon dioxide, sodium chloride, chlorine, phosphates, and nitrates. However, due to the strong staining of the water by peat which produces "black water", the results which were obtained using the Hack kit's colorimeter cannot be determined to be accurate. Water quality analyses can best be accomplished under laboratory conditions where adequate filtering of water samples can be done prior to analysis.

#### Conclusion

Completion of the projects initiated in FY83 and the proposed projects for FY84 which include 1) determining spawning areas, 2) conducting creel censuses, and 3) evaluating spawning success of fish in Lake Drummond will provide sufficient data to complete the Fishery Management Plan for Dismal Swamp National Wildlife Refuge.

#### 12. Wildlife Propagation and Stocking

Canebrake rattlesnakes are still arriving from Northwest River State Park. This year Gary Williamson released two adult males and 14 hatchlings in a non-public use mesic area of the refuge.

#### 13. Surplus Animal Disposal

Nothing to report.

#### 14. Scientific Collections

Robert K. Rose, Ph.D., Old Dominion University, completed a two year small mammal study in and around the refuge. This work was funded by the Fish and Wildlife Service Endangered Species contract. Dr. Rose investigated 39 sites of various habitats using 0.25 hectare plots with pitfalls set on 125 meter grid. The effort yielded 680 small mammals in a total of 101,624 trap nights. Eleven species were captured, 8 of which were found on

the refuge. These species included: Synaptomys cooperi (southern bog lemming), Sorex longirostis (southeastern shrew), Blarina brevicauda (short-tailed shrew), Reithrodontomys humulis (harvest mouse), Cryptotis parva (least shrew), Peromyscus leucopus (white-footed mouse), Microtus pinetorum (woodland vole), Ochrotomys nuttalli (golden mouse).

As discussed earlier, this study produced the recommendations to the Office of Endangered Species not to list the southern bog lemming and to list the southeastern short-tailed shrew, Dismal Swamp subspecies, S.l. fisheri as threatened.

#### 15. Animal Control

Nothing to report.

#### 16. Marking and Banding

The winter of 1983 marked the first year of waterfowl(duck) banding on the Dismal Swamp's Lake Drummond. The site was baited for two weeks and up to 600 mallards and 200 black ducks were using the area. When the traps were placed, the blacks and mallards left; six ring-necks were captured in 14 trap days.

#### 17. Disease Prevention and Control

A major die-off of raccoons and opossum occurred in the region this past year and several hundred raccoon were observed in and around the refuge sick or dead. The state game commission District Biologist, Donald Schwab(ex-FWS), had a number of them diagnosed; most deaths were attributed to distemper. It is generally believed that overpopulation permitted the disease to take so many animals. State biologist Don Schwab has also conducted blood surveys from selected swamp populations and has found the raccoons and opossums free of Brucellosis, Leptosprosis and Tuleremia.

A controlled study conducted by the state and VPI co-op unit on deer serum found tick-borne Babesia (red water fever) in the Dismal Swamp herd. The significance of this finding is not yet known. This disease has long been found in the cattle industry of the southeast, and a proposal for further study has been submitted.



THIS WHITE-TAILED DOE WAS BROUGHT TO A REFUGE CHECK STATION DURING THE REFUGE HUNT. IT WAS TAKEN ON LAND ADJACENT TO THE REFUGE. THESE CUTANEOUS FIBROMAS CAUSED IMPAIRED VISION AND LOCOMOTION. ADDED NOTE: THESE WARTS ARE ONLY SKIN DEEP, LEAVING MEAT DISEASE FREE AND EDIBLE.

## H. PUBLIC USE

### 1. General

#### a) Visitation

Public use activities remained relatively constant from FY82 to FY83. (See Figure 1)

A number of reasons were responsible for a lower number of visitors during FY83. These reasons included a smaller number of people involved in public tours. We had quite a few "no shows" on organized events. Decreased water levels during the fall limited the number of boats entering the refuge. Our method of collecting public use figures improved in FY83; this reduced some estimated figures from previous years.

One change deserves special notice. The refuge began obtaining detailed reports concerning Environmental Education figures from Old Dominion University's Dismal Swamp Tour Program. Up until August of 1983, ODU never separated students from teachers in their Environmental Educational programs. Outdoor Recreation Planner-Aid Marshall and Outdoor Recreation Planner Pelizza met with Beth Hahn, the Dismal Swamp Programs new coordinator, and set up new guidelines for submitting public use data. As a result, we have an enlarged Environmental Education figure of teachers.

All things considered, the refuge had a "status quo" year.

#### b) Program Information

A total of eight news releases pertaining to tours, wildlife, and special events were prepared during the year. Forty off-site programs were held during the year totalling 2407 participants with 2825 activity hours recorded. Refuge oriented programs were presented to various members of civic and professional organizations, residents of special care facilities, and schools in the Tidewater area.

Since our off-site programs have increased substantially, it seems the word has been passed around to various organizations that the refuge gives lectures that are informative, enjoyable, and free.



### 2. Outdoor Classrooms-Students

The refuge and Old Dominion University educational programs during CY83 totalled 1319 students and teachers for 5813 activity hours. ODU's Dismal Swamp Program had a larger number of tour guides certified in the program and were able to work with more visitors than could refuge personnel.

One National Wildlife Federation Eco-trek camp was conducted by ODU tour guides.



REFUGE VISITATION  
CY 82 vs 83

Key: 1982   
1983 

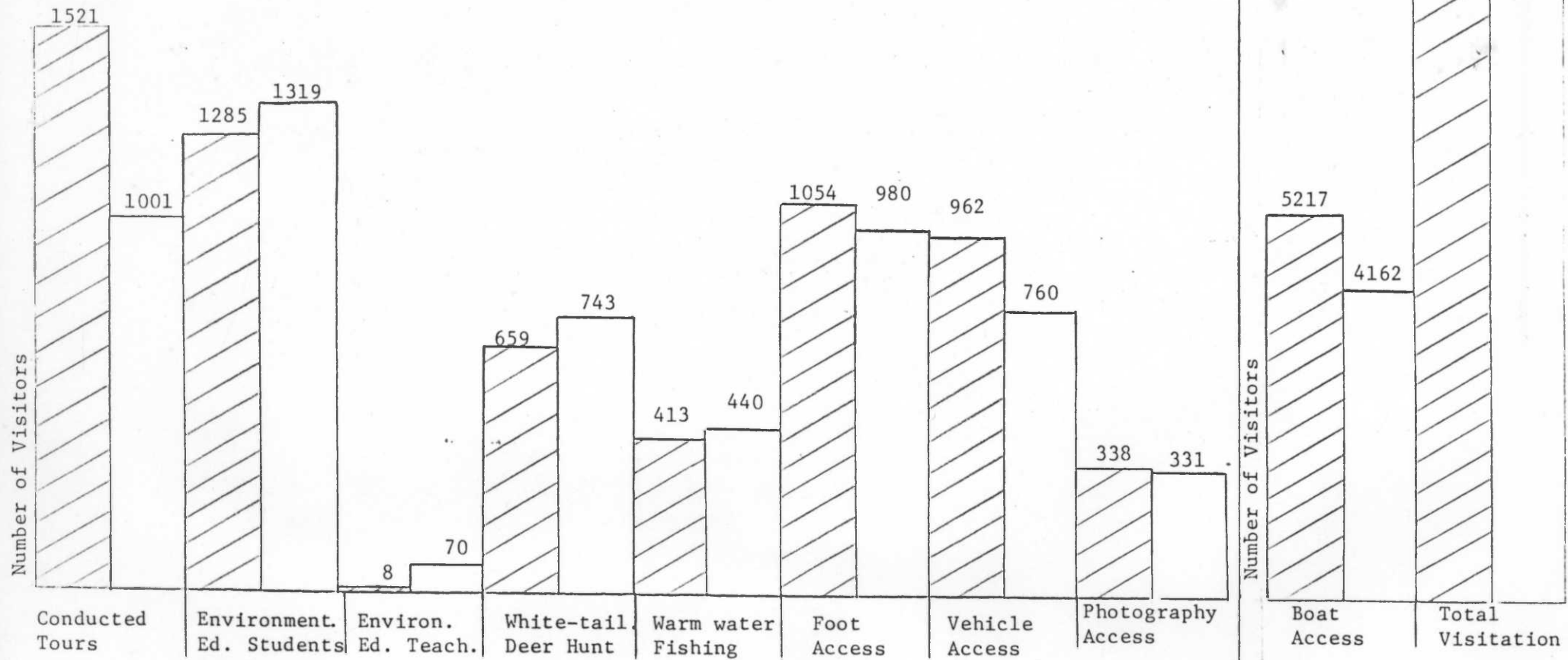


Figure 1

Fifteen visits accounted for 70 activity hours that were recorded by teachers and professors who held educational permits to utilize the refuge as an outdoor learning site.

### 3. Outdoor Classrooms-Teachers

As mentioned previously, the refuge upgraded their monitoring of ODU's Tour Program which resulted in a greater number of visitor and activity hour use by teachers. Past teacher use had been incorporated into the student Environmental Education figures and never showed up in the Public Use figures. We feel the teachers were always there, but were never accounted for. Hopefully, the subdivision of student and teacher figures will continue.

### 4. Interpretive Foot Trails

Refuge staff and Old Dominion University (ODU) tour guides continued conducting interpretive tours along the boardwalk trail. The .75 mile boardwalk trail stretches from the Dismal Town parking lot to Washington Ditch Road. Visitor participation totalled 1001 visitors during the year. Tours were conducted for students, scouts, civic and professional organizations.

YCC enrollees completed handrailing, decking, and benches for 300 feet of boardwalk. This completed all unfinished sections of the existing walk. Future planning may extend to its proposed three mile length. A leaflet and corresponding interpretive stops are being planned for visitor convenience.

An estimated 140 miles of spoil bank roads are accessible by foot or bike for visitors during the daylight hours. Visitation has increased via refuge entrance points, however no accurate visitation figures are presently available for entrance points.

### 5. Interpretive Tour Routes

No interpretive tour routes exist at this time. All vehicular access into the refuge is prohibited, causing visitors to either walk, bike, or boat into the area. Special use permits authorized by the refuge manager are issued occasionally on accessible roads. Proposals for future interpretive tour routes are being addressed in the Master Planning process.

### 6. Interpretive Exhibits/Demonstrations

The refuge participated in four off-site exhibits during the year. Exhibits included the City of Suffolk's Parks and Recreation's Magnolia Festival and Lone Star Lakes opening dedication.

The refuge also participated in the National Hunting and Fishing Day festivities sponsored by the city of Portsmouth. The city of Suffolk's Harvest Festival was also attended. Activities and events were conducted for four days.



#### REFUGE DISPLAY AT THE MAGNOLIA FESTIVAL

A newly purchased display panel was prepared detailing refuge information and was utilized during each exhibit.

An audio viewer projector was purchased and incorporated into the exhibit materials. In addition, leaflets, mounts, and information panels were used during the Harvest Festival and the Hunting and Fishing Day exhibits.

#### 7. Other Interpretive Programs

Three evening owl hoots were sponsored by the refuge during the year. Participants included the general public, ornithologist David Hughes of the Cape Henry Audubon Society, and members of the Hampton Roads Bird Club.

Assistant Outdoor Recreation Planner Charles Marshall was interviewed on tape by Mrs. Reba Fox, a representative of radio station WCNC-AM in Elizabeth City, North Carolina. Discussion concerned general refuge information such as tours, wildlife activities, entrance locations, and regulations.

Refuge manager James Oland was interviewed by several local radio stations requesting information on scheduled public meetings concerning the Refuge Master Plan Alternatives. Judith Baroody, from television station WVEC-13 in Norfolk, filmed segments of locations in the swamp with comments related to scheduled public meetings from Manager Oland.

A taped news interview was given by Assistant Manager Michael Tansy to reporter Kellen Beck from WVEC-13 TV in Norfolk, Virginia. The interview involved the origins of the name Dismal Swamp.

Forester Allen Carter was invited by the Suffolk Chamber of Commerce to participate in Career Day programs at Forest Glen High School and Nansemond-Suffolk Academy. Carter discussed the nature of forestry work and career opportunities in forestry.

Special thanks go to two volunteers who gave excellent off-site programs. Cheryl (Susie) Briley presented a slide program to 213 students of Ivor Elementary School. Michael Lane also conducted a slide program for 20 members of the Virginia Polytechnic Institute Chapter of the Wildlife Society.

Assistant Outdoor Recreation Planner Charles Marshall and State Forester Carl Garrison presented environmental talks to students participating in ODU's Dismal Swamp Ecology Camp.

An off-site Environmental Education program was requested by a Suffolk High School biology teacher for 35 students. Outdoor Recreation Planner Charles Pelizza conducted a two hour program for this special interest group. Herpetology was the study subject and fortunately live specimens were available to encourage interest.

## 8. Hunting

The 1983 controlled deer hunt was held on November 5, 8, 11, 12, 15, 17, and 19. Our scheduled November 11 hunt was cancelled due to rain.

Virginia hunters were allowed one deer per day, two per license year. North Carolina hunters had a two deer per day, four deer per license year limit. No doe tags were issued this year.

Hunting was allowed with bow and arrows and shotguns in both Virginia and North Carolina.

There were increases in the areas open this year. An additional 5,158 acres were open to Virginia hunters allowing for 35,675 acres to be open to hunting in Virginia. An increase of 2,826 acres in the 1982 North Carolina hunt area gave North Carolina hunters 11,450 acres in which to hunt.



Four hundred and six questionnaires were completed by hunters visiting the swamp. Comments were made on 118 of these questionnaires. Fifty percent were favorably impressed with the hunt. Only six percent of the comments were not favorable. The remainder of the comments were suggestions on how the hunt may be improved. Some of the comments included:

- 2 or 3 day hunts
- rain dates
- open up a squirrel season
- use dogs to hunt deer
- use of doe tags
- have a special swamp license, in addition to the regular state license
- Special seasons and areas for bow hunting and handicapped hunts
- rifles

Virginia State Game Biologist Don Schwab, along with the refuge staff, worked the two check stations operating on the refuge. Deer were aged, sexed and weighed. Little data was gathered on the fat content since hunters were encouraged to field dress their deer before they were brought to the check station. Overall, 105 deer were taken - 66 bucks and 39 does. The largest deer was a 127 1/2 pound, eight point buck.

Public Use Hunt Data is summarized in the following table.

#### DISMAL SWAMP DEER HUNT DATA-PUBLIC USE

HUNTS	HUNT DAYS	PERMITS ISSUED	HUNTER VISITS	HUNTER HOURS	DEER HARVESTED	% SUCCESS PER VISIT	ACRES OPEN
1983 VA	6	337	685	6432	93	14	35675
1983 NC	6	38	58	549	12	20	11450
Total VA & NC 1983	6	375	743	6981	105	14	47125
Total VA & NC 1982	6	605	659	6479	114	17	39141
Total VA & NC 1981	7	654	757	7574	83	11	27592
						VA	2307
						NC	4521
Total VA & NC 1980	8	789	528	586	75	14	29521
						VA	25000
						NC	4251



OPENING DAY-FOUR HUNTERS, FOUR DEER, ONE DOG (COURTESY OF REFUGE PERSONNEL)-ALL WEARING BLAZE ORANGE (EXCEPT THE DEER)

There were several changes in our regulations this year. A Hunter Education Course was mandatory this year. Due to comments from hunters, we feel this reduced the number of hunters who applied for permits. Hunting was on a first come, first serve basis on the day of the hunt. This did not cause problems, but we did have a few hunters camping at our gates. Operating two check stations benefited the hunters, but it occupied most of our staff time every day of the hunt.

The hunt proposal for the 1984 season will try to alleviate the problems encountered this year. We would like to see more hunters utilizing the swamp. With the exception of opening day, the number of hunters in the swamp did not approach the limits we had established.

In order to increase the deer harvest, we will conduct a campaign to promote the hunt and the hunter education requirements.

## 9. Fishing

Public participation in fishing on the refuge is observed and noted by Army Corps of Engineers personnel located at the Feeder Ditch Spillway. Fishing is permitted year round on Lake Drummond, a 3,100 acre lake, from sunrise to sunset to anyone holding a Virginia fishing license. Previous data collected was estimated from the total numbers of visitors boating. Data collected for fishing during CY83 was taken from information collected by Army Corps of Engineers personnel.

## 10. Trapping

Nothing to report.

## 11. Wildlife Observation

The new refuge bird leaflet was returned from the Regional Office and was approved for distribution. The new leaflet includes 207 species that have been observed on the refuge, with 94 species listed as breeding on the refuge.

A new refuge general information leaflet was submitted to the Regional Office for approval. A standard leaflet on the refuge will be a big improvement over the current information sheets passed out to visitors. The information included will omit the use of several leaflets prepared by staff and duplicated by the overworked clerk and copy machine.

## 12. Other Wildlife Oriented Recreation

Activities such as hiking, biking, boating, photography, and permitted vehicular access accounted for 6,249 visits resulting in 22,380 activity hours. Data collected for visitors participating in hiking, biking, and photography cannot be accurately identified at present. Staff personnel take visitor counts when possible and then estimate total visitor participation in these activities.

Refuge roads are quite open and are often long and wide. They provide excellent areas for wildlife observation, with animals sometimes seen in ditches and feeding along road edges.

White-tailed deer can be observed browsing along road edges, as well as an occasional black bear feeding in blackberries, or an otter playing in the ditches. When roads are in good shape, biking is an excellent way to see more of the swamp on a single trip.

Boat access onto the refuge is permitted by way of the Feeder Ditch, which connects Lake Drummond with the Dismal Swamp Canal running parallel to U.S. Highway 17. A public boating ramp is located on Highway 17 just north of the Feeder Ditch/Dismal Swamp Canal intersection. To enter Lake Drummond, boats must be transported across the Corps of Engineer's spillway or the Feeder

Ditch by way of a small motorized tram. There is a 1,000 pound weight limit on all crafts using the tram.

A group of four canoeists applied for a special use permit for canoeing in some of the ditches in the refuge. Their plans were to canoe the Feeder Ditch to Lake Drummond, travel north up to Portsmouth Ditch, travel east on Big Entry ditch, and return south on the Dismal Swamp Canal. In return for their trip, they outlined their trip in detail, documenting wildlife, water depths, obstructions, distances traveled, and time spent canoeing.

### 13. Camping

Camping is not permitted on the refuge, although the Army Corps of Engineers contracts the operation and maintenance of a campground located on the Feeder Ditch near Lake Drummond. Access to the campground is by water only. This campsite has a capacity for approximately 50 tents.

Two campsites are conveniently located near the refuge to accommodate visitor needs and both are privately owned. One is located north of the Feeder Ditch on Highway 17. A recently opened campground is located on Highway 13 near the city of Suffolk.

### 14. Picnicking

No facilities exist on the refuge for picnicking, although individuals and groups do bring bag lunches with them. Visitors eat lunches on the boardwalk or the parking lot at Dismal Town, or at the pier at Lake Drummond. This use is minimal, and is not encouraged.

### 15. Off-Road Vehicling

Nothing to report.

### 16. Other Non-Wildlife Oriented Recreation

The Second Annual Dismal Swamp half marathon and two mile race were run in and out of the refuge on November 6. The race was sponsored by a group located in North Carolina, the Holly Grove "Oddfellows" and the Tidewater Striders. Approximately 200 runners and numerous spectators gathered for the event. The start and finish were off the refuge with most of the run within the refuge. After the event, only tracks were left behind.





### "THE DISMAL SWAMP RUNS"

#### 17. Law Enforcement

Three staff members had law enforcement authority at year's end. Assistant Stairs completed the nine week FLETC training just a few days before Christmas. Manager Oland and Assistant Manager Tansy completed the annual one week refresher training in August.

Due to the size of the refuge, the number of gates and entrance points, and other responsibilities, limited time is spent on law enforcement activities. Major problems that we were aware of during the year included violations of special use permits (hunting dog retrieval permits), vandalism of gates and equipment, unauthorized entry (especially with motorcycles), night hunting, and a wide variety of violations of special hunting regulations.

State wardens from Virginia and North Carolina worked cooperatively to catch night deer hunters without success.

Virginia Game and Fish Commission wardens worked with the refuge staff early in the hunting season and wrote violations for

three firearm trespass cases on the refuge. Just before the refuge deer hunt began, one of the members of the Commission along with a Congressman and others were cited by Special Agents for hunting doves over bait. Shortly thereafter local Virginia wardens were instructed by their superiors to stay off the refuge and not to enforce any refuge regulations. Good relations still exist between the local wardens and the refuge staff, it just appears the decision makers in Richmond do not want state wardens assisting federal refuges. Until this year, Virginia wardens have always provided valuable law enforcement assistance throughout the year and their assistance was missed.

A summary of all violations for 1983 is as follows:

Number	Offense	Disposition
4	Firearm Trespass	\$50 each(3 by VA Wardens)
3	Loaded firearm on road; Refuge Deer Hunt	\$50
1	Failure to wear Blaze Orange	\$50
1	Vehicle Trespass	Pending
1	Violation of SUP Vehicle Trespass	Pending

#### 18. Cooperating Associations

Nothing to report.

#### 19. Concessions

We do not have a concession contract in force during 1983, however the groundwork has been laid for a contract relative to the "Boat Tours " of Lake Drummond. Other closely related activities desirable at the east access to the refuge may be included in the bid package. Additional paperwork and decisions are required but with a little luck we should be able to advertise for bids in 1984.

### I. EQUIPMENT AND FACILITIES

#### 1. New Construction

##### a) Shop at Desert Road

Work was continued from last year by station personnel to get facilities ready for occupancy and use. Projects completed this year include installation of 1) a heating and cooling system, 2) plumbing system, 3) work benches, 4) sheetrocking the

office, and 5) a woodstove.

b) Water Control Structures By Management Unit(See Map)

1) Woodington Electric Company was authorized to begin construction on six structures covered in a contract let in 1982. It would take many pages to describe their self-inflicted problems. Most descriptive of work completed is two units almost completed, and one additional unit in various stages of construction through 1983. A summer of frustration for both contractor and refuge began with several changes in their general foreman and crew. Those workers who survived early summer learned the job well and much was accomplished in August and September. Other delays were caused by wet weather, unavailable construction supplies, and two cases of theft of contractor equipment and supplies, i.e., 1) September 1-two hydraulic cylinders were taken from a backhoe owned by the company, and 2) October 18-loss of several power and carpenter's tools. The structures themselves are concrete and steel monsters erected to replace simple pipe culverts. Dam boards and shut-off valves will enable us to control water levels within the swamp ditches. The contract was increased in 1983 by \$14,276.98 to \$429,276.98 for six structures in Management Units 1 and 3.

2) Sanford Construction began work on two water control structures in November. A contract was awarded to them to build four structures in Management Unit 1 for \$226,150. Work was discontinued the first part of December.

3) Glover Construction Company has been awarded a contract to erect three structures in Management Unit 4. Value of the contract is \$295,000. The work will start in the spring of 1984.

4) Woodington Electric Company was awarded the contract to erect two water control structures in Management Unit 5. The value of the contract for these two units is \$256,000. Work will begin in the spring of 1984.

The total value of contracts for 15 control structures is \$1,206,426.98. When completed, 25% of our total control structures will be repaired or replaced. We had hoped to get more for 1.2 million dollars.

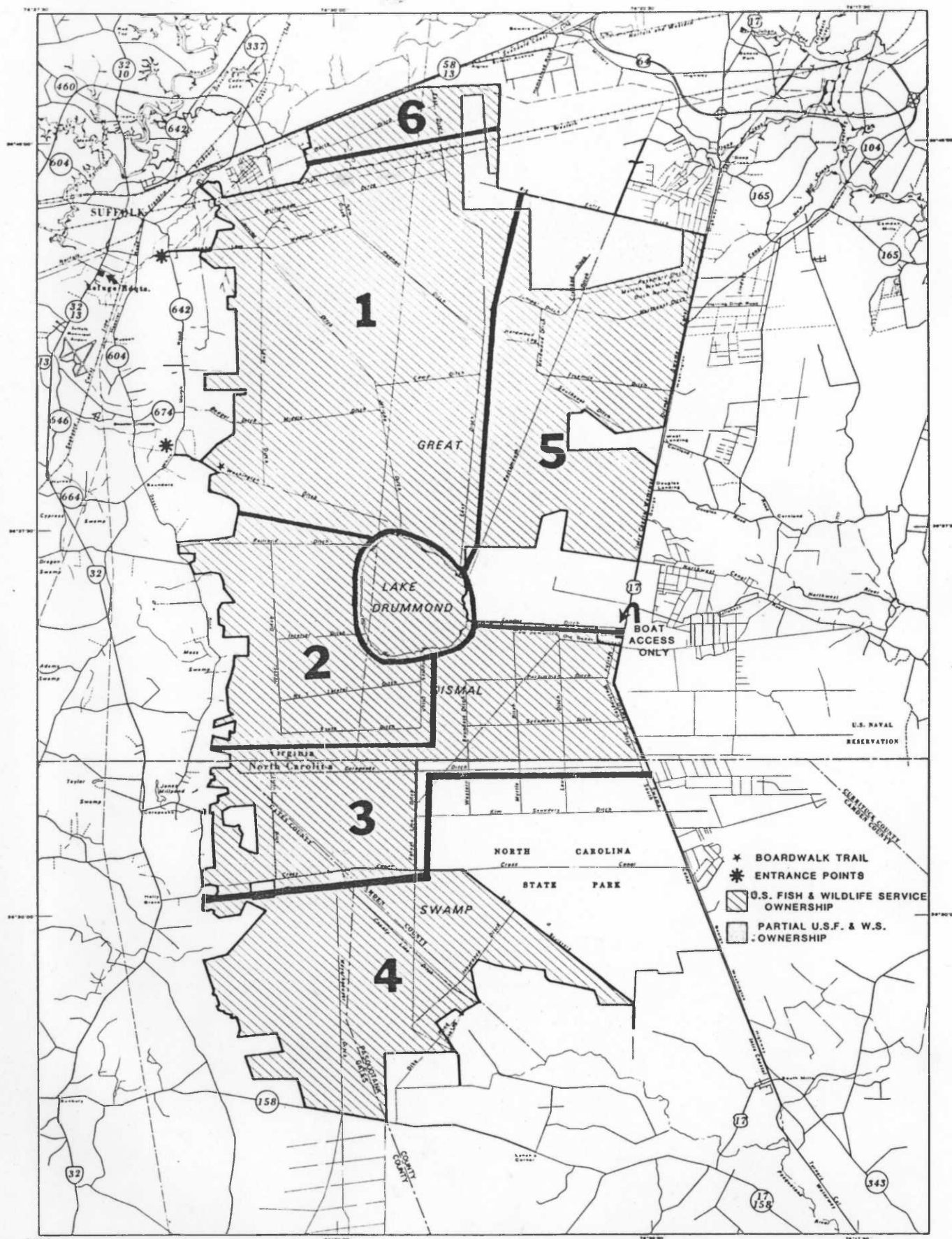
c) Portsmouth Access Structure

A replacement bridge structure across Big Entry Ditch that permits access by fire equipment via Portsmouth Ditch road was undertaken and completed in late 1983. This was not a regular "bid-contract" situation because of fire danger, therefore the contract was negotiated with Continental Bridge Company of Minneapolis, Minnesota. The entire process took about two months, from choosing a contractor to bridge completion. Value of the contract was \$74,950. Daily access to Portsmouth ditch was maintained during construction. This was a job well done.

## GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE

UNITED STATES  
DEPARTMENT OF THE INTERIOR

VIRGINIA AND NORTH CAROLINA

UNITED STATES  
FISH AND WILDLIFE SERVICECOMPILED IN THE OFFICE OF REALTY  
FROM SURVEYS BY THE U.S.G.S.

KEY: Unit Boundary

BOSTON, MASSACHUSETTS DECEMBER 1976  
POSTED: MAY 1983

SR MA. 858

501



d) Weyerhaeuser Access structure

The Glover Construction Company was awarded a contract to remove old pipe culverts and wood bridge parts and replace them with two 72 inch corrugated metal pipe culverts, gabions, guardrails and other related work. This project, valued at \$80,322.50, was undertaken in October and finished, except for final seeding, in December. We are pleased with the results of the project.

e) Fuel Storage and Distribution System

The Cavanaugh Corporation began and completed construction on the fuel station in October. The station consists of three 1000 gallon tanks, concrete pad and pump island, and pumps to meter the fuel. Cost of this project was \$20,108. This was one project started and completed as scheduled.



WORK ON THE REFUGE GAS STATION

f) Equipment Storage Building

Don Bilbo Building Contractors were chosen to do the entire package of work projects relative to erecting our equipment storage building. This project, awarded in August for \$67,365, is to provide us with a prefabricated metal building capable of giving cover to much of our motorized and non-motorized equipment. The building, because of unacceptable concrete work on the slab, has not been erected yet. Some corrective work is expected in January, and hopefully there should be some movement toward completion in February or March.

g) Road Rehabilitation

A contract to improve East Ditch road was let to J.H. Lee Construction company for \$115,000, with work to begin in late September. The main thrust of the work was to install geotextile material over organic soil roadbed and cover with sand fill. However, the efforts of the contractor to move fill material resulted in the destruction of portions of Jericho, Williamson, Camp and East Ditch roads. Most of the fill being hauled was needed to patch holes being made by the trucks themselves. The project was stopped until next summer when hopefully the access roads will be drier.

h) Flammable Storage Building

A 32 X 24 X 12 foot block building to store flammable materials was erected by station personnel with YCC assistance. This force account project is valued at approximately \$10,000. Work to improve storage, i.e., shelves, etc. still remains to be done inside the building.



SCREEDING THE CONCRETE



LAYING THE BLOCKS





#### PUTTING UP THE TRUSSES

### 2. Rehabilitation

#### a) Gates

Three steel pipe gates were fabricated and installed at the major entrance points of Railroad, Jericho, and Washington ditches. The gates are constructed of 4 inch and 8 inch steel pipe and are a considerable improvement over the previous gates. Due to vandalism, gate maintenance and rehabilitation is an annual problem.

#### b) Roads

Approximately 40 feet of timber was cleared back from the road's edge on East Ditch south of Camp Ditch (4 miles). All stumps and debris were removed and windrowed and the road shoulders reshaped. Gates Custom Milling Inc. removed the timber in advance of our D-6 in order to reduce the slash and debris that had to be pushed. The East Ditch roadbed always seemed to take forever to dry out after a rain, and now that sunlight can reach the road, it dries out quickly.



A strip of encroaching brush and trees 10 to 15 feet wide was removed from 16 miles of road by the Case 850C. The brush and leaning trees had become so severe that vehicles could barely pass, and mowing equipment could not operate without losing exhaust pipes and suffering other damage. Roads cleared back were County Line, Myrtle, Laurel, Sycamore, and Persimmon.

### c) Office Trailers

Rehabilitation of a double wide 24 X 55 foot mobile home neared completion during the year. Early in 1984 the refuge headquarters will vacate rented space in Suffolk and set up in the mobile home. Considerable time was required to bring it up to an acceptable standard for office space. It required new linoleum, bathroom repairs, cabinet repairs, furnace overhaul, new water lines and a water heater, storm windows, and the carpet required cleaning.

### d) Lake Drummond

Cabin 11 on Lake Drummond was burned to improve the aesthetics of the Lake. Only two cabins remain that require removal. Both have sunk into the water and cannot be burned. The only way to finish the removal of these cabins is to wait for a dry year.

## 3. Major Maintenance

### a) Roads

Approximately 149 miles of roads within refuge boundaries and over 10 miles of roads outside the boundary are maintained.

During 1983 road maintenance included:

Grading	48 miles
Mowing	
Boom Axe	54 miles
Woods mower	120 miles
Hardee mower	18 miles
Disking	40 miles
Spot-filling holes	Throughout

After the Lee construction road work was stopped in October, road maintenance activities concentrated on repairing the severe damage the contractor did to the roads. One of our best roads, Williamson, was rutted through the mineral surface down to organic muck (about 3 feet). Portions of East, Camp, and Jericho also were damaged and repairs were not completed before winter weather set in. Lee is due to complete the project next summer. He will be watched closely during the summer of 1984 to assure he does not finish the destruction of roads he began in 1983.

#### b) Disking

Several infrequently used sand roads were disked this year instead of graded. The disk cut down the high center portion of the roadbed and spread the material uniformly over the rutted portions. It also cut the vines and roots in the road that give the grader so much trouble. The disk proved much faster than the grader and did an equally effective job with one exception; until the disked roads were completely settled and packed by a few good rainfalls, they were impossible to drive when wet.

#### c) Mowing

There never seems to be enough available staff or equipment to keep mowing throughout the dry summer and fall period. To keep up with mowing on 153 miles of roads that pass through densely forested habitat requires the full time attention of two operators on two farm tractors with mowers. Given breakdowns, vandalism and the weather, it just can't be done. Contracting of some mowing was looked into in 1983. In 1984, a contract for mowing a portion of the refuge will be given a try. If a contractor can do the job right for a reasonable cost, some of our energy can be directed at other pressing maintenance needs.

#### d) Cleanup

As soon as the final decision was made to move the headquarters from GSA rented space in Suffolk to the refuge owned maintenance complex, cleanup of the storage yard began. During the course of the summer and fall, over 26 tons of trash and junk were hauled to the dump. It was amazing how much worthless material accumulated over the seven year stay in the rented space. As of year's end, the cleanup was 99% complete.

#### e) Boundary Lines

Forester Carter with YCC assistance located, signed, and painted three miles of boundary during the summer. At the rate we are going, the entire boundary should be posted in about 40 to 50 years. Unfortunately most of the boundary was not surveyed when acquired, and the exact location along most lines is unknown. It will require surveyors and time to establish the exact boundary along much of the western edge.

#### f) Miscellaneous

Building materials left over from the YACC program were transported from Paint Bank NFH to Rachel Carson NWR by White and Bryant. The trip took six staff days to complete.

Approximately 170 yards of fill were hauled, spread, leveled and compacted at the new storage building site. In the initial stages of planning it looked as if the refuge would be required to prepare the site and pour the slab. By preparing the site in advance, the bids received for the building were just within the

funding limitations for the job.

#### 4. Equipment Utilization and Replacement

During the year the refuge received the following vehicles and equipment:

- a Case 850C (a low ground pressure tractor-firefighting funds)
- a Hester Fire Plow (to be matched with the Case 850C-firefighting funds)
- a 1983 4x4 Chevrolet one ton dual wheel pickup (firefighting funds)
- two Gormann-Rupp portable pumps were purchased to replace the aging Hale pumps (firefighting funds)
- a Gormann-Rupp Backpack Fire Pump
- an oil-fired pressure steam cleaner
- a commercial model table saw, 3 hp with a 12 inch circular blade
- a 2 hp 10 inch bench grinder
- a 300 amp AC/DC arc welder
- an electric chain saw sharpener
- two Honda "Big Red" all terrain vehicles, with a 250cc engine and three wheel high flotation tires (firefighting funds)
- a John Deere 12 hp lawn tractor with a 48 inch mower deck
- a trailer, with fuel tank and DC electric pump, to permit fueling diesel vehicles at worksite
- hydraulic cable cutter
- key storage, identification and retrieval system
- gill nets, seines, and catfish traps

As is to be expected with vehicles and equipment, there are always general repairs, motor maintenance, and other improvements to equipment. Such is the case as documented by the following.

- Major motor repairs were needed to the tractor-mounted auger.
- The D-4 crawler-dozer repairs needed were removing and repacking the blade cylinders. At a later date the old tractor "blew" an engine that will not permit repairs; it will be listed as surplus-good for scrap/parts only.
- The motor grader required motor repair to the final drive seals. This took an authorized company mechanic four days to complete. Other mentionable items were brake repair and battery procurement.
- Terrain King boom axe required rehabilitation to various parts; it was used thereafter during the entire summer season.
- An alternator replacement was required on the dump truck.
- Wheels and axle were moved on the Hale mobile pump. This was accomplished to get better balance and have the weight over the wheels. It is safer trailing this unit after the modifications.

- Work on a tow-bar for vehicles was undertaken and completed. The project included mounts for attachments to each vehicle.
- A new cab top for the 8700 tractor was fabricated, welded, painted, and installed. The end result is a safer, more secure place from which to work.
- The deck of the GMC dump body was resurfaced with smooth metal to replace the rough walk plate surface that gave so much trouble in dumping fill. A new dump gate was installed also.

#### Other

The D-6 with low-boy was loaned to Mackay Island NWR for several weeks. The low ground pressure tracks permitted access to otherwise inaccessible areas.

Equipment was utilized for road grading, road widening, spraying, mowing roads and rights-of-way, "mowing" trees and brush from ditches, spreading fill material, repair to boat ramp, fabrication of steel pipe gates and pipe racks and other earth moving projects. There were numerous small projects not documented.



GETTING RID OF THE OLD





#### BRINGING IN THE NEW

##### 5. Communications Systems

In 1982, when our assessment of fire equipment needs was sent to Washington, the importance of upgrading the refuge radio system was expressed. It was felt that the existing system provided insufficient and erratic coverage for the refuge as a whole, and the signal was often weak or had too much interference.

A number of steps were taken in 1983 to try and correct these problems. We decided to change from a single channel to a two channel system, with one channel being a pair of repeater frequencies. Hopefully the repeater pair will eliminate some of our interference problems, extend range and coverage for some parts of the refuge, and improve mobile-to-mobile communications.

Merritt Island NWR generously provided us with their excess equipment consisting of a repeater station with antenna, three multi-channel mobile radios, four multi-channel portable radios, and three portable radio chargers.

Mr. Dick Astley, Chief of Communications Management at Boise Interagency Fire Center, visited the refuge in July to assess our communications system. Mr. Astley advised moving our transmitter and antenna from its current leased space on a downtown building to our new shop facility, converting to a repeater system, converting to dual squelch operation to reduce skip, and negotiating a radio maintenance contract with a local dealer.

Two new Motorola 100w mobile radios were purchased with fire funds. These units are multi-channel and are already set up with repeater frequencies. More will be added in 1984.

Charles Rainey and Son, a local contractor, submitted the low bid to erect our 120 foot radio communications tower at the Desert road shop complex. Work was completed in November, including installation of two antennas (repeater and talk-around) and heliax cable connecting the antennas to the office.

A radio maintenance contract was developed in December between the refuge and Motorola. The contract provides for two preventive maintenance checks of all radio equipment each year.



THE NEW ANTENNA GOES UP

## 6. Energy Conservation

The refuge remains energy conscious even when one looks at our increased gasoline and diesel fuel use. If you reflect back upon other years, we have had a tremendous increase in total operational activities. Our increase in fuel use was up 27 %, a large part of which was diesel. The increased diesel use reflects increased activity in such projects as road grading, fire access, roadside clearing and youth programs. The following reflects use by category.

	<u>1983</u>	<u>1982</u>
UNLEADED	2895	-----
LEADED	2369	-----
TOTAL GASOLINE	4994 (\$5948.64)	-----
DIESEL	5264 (\$5751.93)	-----
TOTAL OF ALL FUEL	10,258	7502

## 7. Other

There were various small items acquired during the year for buildings, firefighting, public use, shop and equipment. A couple of areas worth mentioning include a large tool order from GSA, supplies for firefighting, and motion picture projector and a slide/tape projector for I and R.

### J. OTHER ITEMS

#### 1. Cooperative Programs

The U.S. Geological Survey established a field unit at the Dismal Swamp in 1976 to conduct wetland research and continue with the remote sensing investigations begun during the PL 92-478 Study. This field unit is staffed by a botanist and various field assistants, and is under the direction of the Project Chief for Wetlands Studies, Northeastern Region, Water Resources Division. Research is being done on ecological parameters of the Dismal Swamp and the Western Boundary Transition Zone (See Section D. 5).

Through the years, the USGS and the FWS have had an excellent cooperative relationship working toward studying and understanding the Great Dismal Swamp. The USGS has provided personnel and equipment to many FWS endeavors. Currently, for example, USGS has two 4-wheel drive vehicles, two microcomputers with a printer and modem, an IBM typewriter, various office and field equipment and supplies, all of which are available and are used by FWS personnel. Ongoing consultation and assistance from USGS personnel are always available to FWS staff.

The FWS has provided office space and general support services to the USGS. Essentially, services and supplies are

exchanged on a regular basis to the benefit of both agencies.

This is perhaps a rather unique arrangement not formalized by specific paperwork, but is so effective in a working sense. The cooperation of both agencies has made many things possible, beyond the mere trading of goods and services.

## 2. Items of Interest

Manager Jim Oland delivered five refuge revenue sharing checks for Great Dismal Swamp totaling \$161,884 to the respective cities/counties in Virginia and North Carolina.

A fishery plan for Lake Drummond and various ditches is in the planning/data gathering stages. Gary Swihart, Fishery Biologist at Gloucester Point Fisheries Station, is leading this effort. The refuge has supported this effort by providing funds and station labor. A comprehensive plan is expected in FY85; much groundwork remains.

Assistant manager Tansy was selected for the manager position at Ottawa National Wildlife Refuge. In February 1984, he will be leaving trees and warblers for marshes and ducks.

Biologist Mary Keith Garrett received her 10 year Length of Service Certificate and pin in August, 1983.

Maintenance worker Dane Winningham received his 10 year Length of Service Certificate and pin in December, 1983.

## 3. Credits

Drafts of the various sections were prepared as follows:

James P. Oland--D 1,2,3,4; E 5; K.

Michael Tansy--D 5; F 4; H 17; I 2,3.

Sherman Stairs--A; B; C 1-3; E 1,8; H 19; I 1,4,6,7; J 2,3.

Mary Keith Garrett--D 5; E 7; G 1-17; H 18; J 1.

Allen Carter--E 6; F 1,2,3,9,10; I 5.

Charles Pelizza--E 4; H 1-16.

Charles Marshall--E 2,4; H 1-16.

Word Processing--Beverly Merz, Susie Briley (USGS)(FWS volunteer)

Proof reading--James Oland, Sherman Stairs, Mary Keith Garrett, Allen Carter, Charles Pelizza, and Pat Gammon (USGS).





BRINGING IN THE BIG "4 0"

HAPPY BIRTHDAY SONG/DANCE-O-GRAM: COURTESY VERNE OLAND

## K. FEEDBACK

For the past several years we have been provided with the opportunity to comment on just about any subject which comes to mind in the feedback section. Most of the time the subjects we remember most are those that cause the most aggravation. With the large number of contracts for construction this year, the Dismal staff had plenty of aggravation. For example, there was a road contractor who virtually destroyed several miles of pretty good roads and accomplished nothing at the project site. We also had an alcoholic foreman who may have been the best his company ever hired (he was fired). Then there is the building contractor who started with a concrete slab (too bad the forms and reinforcing rods weren't complete when he poured). Inspectors and engineers are earning their pay on this one and he isn't done yet. These types of problems may cause headaches, ulcers, apoplexy or other minor symptoms but they are not really significant in the long term. Anyway, they keep us from becoming bored or complacent.

We also have our share of "special interest" public involvement type problems. The regional hiking club would like us to put more emphasis and dollars into trail development, hunters want more days and more species, hunt clubs want dogs to be allowed (but they don't want anyone else hunting where their dogs are running), and everybody wants more and improved access. Everything is perfectly normal.

Yet another set of problems arises from the reams of correspondence, memos, directives, questionnaires, and information received on a daily basis. At times the paper seems to arrive three times faster than it can be read let alone understood.

All the problems created by our inevitable dealings with the public, special interest groups, landowners, contractors, superiors, inferiors, and paper, at times tend to make us lose track of why we're here. Certainly, these time consuming encounters are a major part of our jobs and more than justify our outrageous salaries and benefits. But they leave us with a need to reaffirm our knowledge that management of the refuge is worthwhile and justifies the mental anguish. To accomplish this, we need to occasionally take a few minutes to inspect the lower 40 or 4,000 or whatever. I'm sure that somewhere on the trip we'll find evidence of a plan that's been accomplished, a goal that's been met or more likely another problem that needs to be solved.

NANSEMOND NATIONAL WILDLIFE REFUGE  
Suffolk, Virginia

ANNUAL NARRATIVE REPORT  
Calendar Year 1983

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

# TABLE OF CONTENTS

	<u>PAGE</u>
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. <u>PUBLIC USE</u>	Nothing to report
I. <u>EQUIPMENT AND FACILITIES</u>	Nothing to report
J. <u>OTHER ITEMS</u>	Nothing to report
K. <u>FEEDBACK</u>	Nothing to report



## B. CLIMATIC CONDITIONS

The climate is oceanic, subject to fogs and storms, but is tempered by the moderating effect of the Atlantic Ocean. Temperature extremes range from 8 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 3 inches in one 24-hour period the maximum rate. Average annual snowfall is 8 inches, with 210 frost-free days. The last frost averages April 1 and first frost October 15.

## E. ADMINISTRATION

Routine inspections of Nansemond Refuge were conducted on three occasions during 1983. (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 secure naval transmitter station for refuge personnel.

### 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 grasses to tide bush and low value trees.

### 4. Cropland

About two acres (1 %) of the study area is upland. It is a portion of a cropped 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 important acres of excellent potential nesting habitat for osprey and bald eagle. The entire study area is excellent 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 rail, Virginia rail, and soras were observed and/or heard in the area,. Also seen were green-backed heron, common egret, and great blue heron. Several black-crowned night herons were in the timbered edge areas.

### 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 grey 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.