

GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE
Suffolk, Virginia

ANNUAL NARRATIVE REPORT
Calendar Year 1981

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

SEP 7 1982



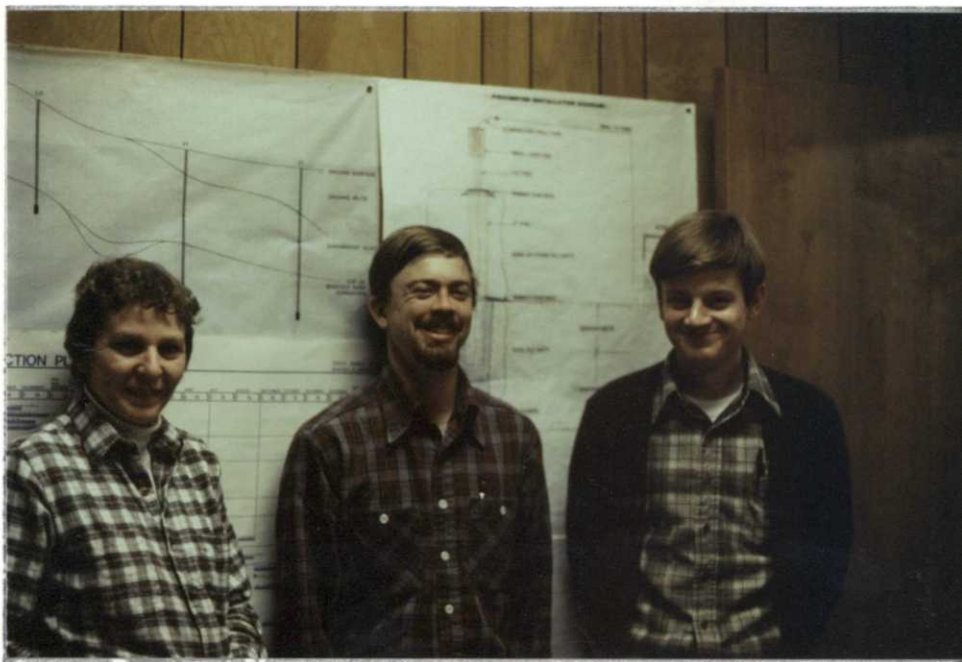
Personnel

1.	Ralph Keel	Refuge Manager	GS-12	E.O.D.	4-24-77	PFT
2.	Michael Tansy	Assistant Refuge Manager	GS-11	E.O.D.	8-10-80	PFT
3.	Allen Carter	Forester	GS-11	E.O.D.	5-04-80	PFT
4.	Mary Keith Garrett	Biologist	GS-9	E.O.D.	8-05-73	PFT
5.	Kathy Zeamer	Outdoor Recreation Planner	GS-9	E.O.D.	6-15-80	PFT
6.	Howard Rybolt	Realtor	GS-12	E.O.D.	12-31-78	PFT
7.	Bailey White	Equipment Operator	WG-10	E.O.D.	3-15-78	PFT
8.	Michael Bryant	Maintenance Worker	WG-8	E.O.D.	8-23-81	PFT
9.	Sally Leary	Clerk-Typist	GS-3	E.O.D.	1-13-80	PPT
10.	Dorothy Hudson	Clerk	GS-5	L.D.O.D.	10-04-80	PPT
11.	Charles Marshall	Recreation Aid	GS-4	E.O.D.	10-19-81	PPT
12.	Thomas Gwynn	Bio-Technican	GS-5	E.O.D.	4-19-81	NTE 1YR
13.	Karen Terwilliger	Biologist	GS-5	L.D.O.D.	10-04-81	180 DAY
14.	Joyce Williams	Maintenance Worker	WG-4	L.D.O.D.	6-02-81	NTE 1YR
15.	Dane Winningham	Maintenance Worker	WG-5	E.O.D.	8-10-81	NTE 1YR
16.	John Thomas	Laborer	WG-4	E.O.D.	6-15-81	NTE 1YR
17.	Michael Boatwright	Laborer	WG-4	L.D.O.D.	9-19-81	NTE 1YR
18.	Michael Bryant	Maintenance Worker	WG-5	L.D.O.D.	8-22-81	NTE 1YR
19.	Marie Ecton	Coop-intern	GS-5	L.D.O.D.	9-04-81	COOP
20.	Murray Parker	YACC Group Leader	GS-5	L.D.O.D.	9-19-81	PFT

Review and Approvals

Michael G. Tansy 8/31/82
Submitted By Date

Edward S. Moore 9-2-82
Regional Office Review Date



In top picture l to r,
Pat Gammon, Kip Gardner and
John Thomas



Lower picture - Cheryl
Briley

U.S. Geological Survey's Dismal Swamp field unit is stationed at refuge headquarters and their staffing was as follows:

1. Pat Gammon	Botanist	GS-11	PFT
2. Tom Gwynn	Hydrological Field Asst.	GS-5	Intermittent
3. Kip Gardner	Hydrological Field Asst.	GS-4	Intermittent
4. Susie Briley	Hydrological Field Asst.	GS-4	Intermittent
5. Mike Lane	Laborer	GS-4	Intermittent
6. Paul Loaney	Hydrological Technician	GS-5	TDY, USGS-Madison, WI
7. John Thomas	Laborer	GS-4	Intermittent

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A. HIGHLIGHTS

Cooperative efforts began between the refuge and Suffolk schools to develop curriculum materials for use with elementary grades, (Section H.1)

The refuge's fourth consecutive deer hunt was held in October and November resulting in hunters removing eighty-three deer. The unfortunate death of one hunter occurred on the third day of the Virginia hunt. (Section H.8)
(Section E.6)

Master Planning process got underway. (Section D)

The discovery of a great blue heron rookery on the Weyerhaeuser tract in the North Carolina portion of the refuge by the forester and assistant manager was an occurrence of note. (Section G.4)

Sighting of adult bald eagles over Lake Drummond in January and August were interesting, and possibly indicate that bald eagles have taken up residence near the refuge, probably along the Nansemond river. (Section G.6)

The Refuge received \$39,050 (FY 81) from the Corps of Engineers, Waterways Experiment Station to conduct a study on wetland boundary determination along the western edge of the swamp. An additional \$35,000 has been allocated for the completion of the study in FY 1982. (Section D.5)

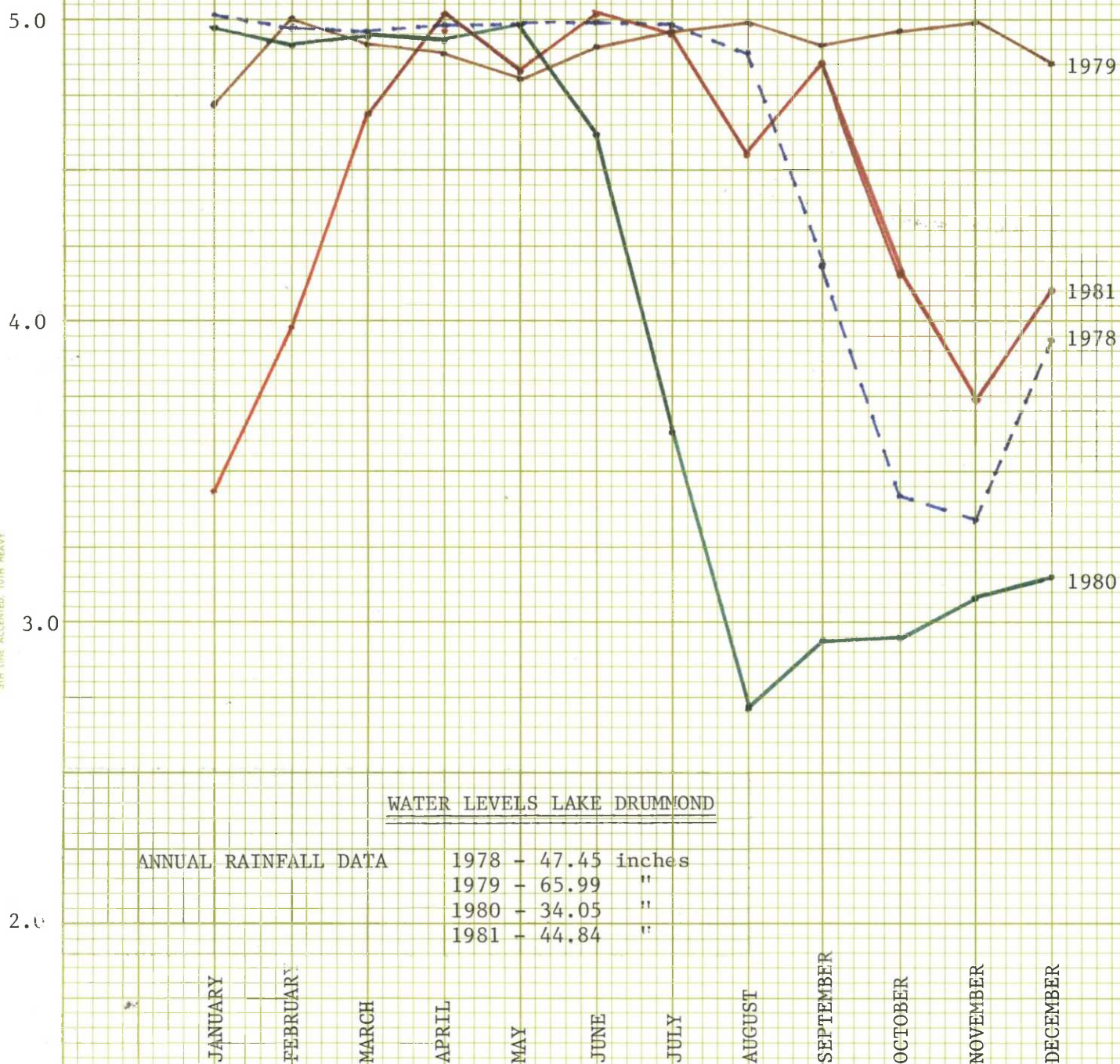
B. CLIMATIC CONDITIONS

After two years of abnormal climatic activity, going from one extreme to the other, the refuge was rewarded with a year of relatively normal conditions. In 1979 the refuge received 65.99 inches of rain, an amount equalling the 100 year record for the area. In 1980 the refuge and the tidewater area entered a drought, during which the rainfall was only 67% of the yearly average. The drought continued through the first five months of 1981 with rainfall being well below the monthly averages for the area. In June the drought was broken, when above normal rainfall occurred on the refuge and in the surrounding area. The rainfall in June of 1981 was 1.15 inches greater than the average and in some areas surrounding the refuge up to 10 inches of rain fell in 48 hour period. The total rainfall for 1981 as recorded at Lake Drummond was 44.84 inches, 6.5% below the yearly average. Due to the above normal rainfall that occurred in June and July and the resulting accumulation of surface water, three of the refuge staff saw the swamp under wet conditions for the first time. Unfortunately the high water levels (at least when compared to 1980) produced by those rains also had a somewhat less desirable effect, as two years of mosquito eggs hatched out, making the period between mid-June and mid-July miserable for refuge staff, visitors, and wildlife.

Temperatures throughout the year were relatively normal, as was the amount of snowfall the area received.

Rainfall Data for 1981

Month	Average 1975-1981	1981
January	4.62 inches	1.27 inches
February	3.54 "	2.94 "
March	4.18 "	2.29 "
April	3.18 "	2.28 "
May	5.38 "	2.48 "
June	3.77 "	4.82 "
July	5.27 "	7.57 "
August	3.29 "	7.02 "
September	3.18 "	2.09 "
October	3.98 "	3.27 "
November	3.11 "	1.78 "
December	3.97 "	7.00 "
Total Rainfall	47.47 "	44.81 "



C. LAND ACQUISITION

1. Fee Title

The total area of the Dismal Swamp Refuge increased by 618 acres in 1981 to 101,992. The Virginia increase was from 76,995 to 77,783 with the addition of Wallace (385) along the Dismal Swamp Canal and Rountree (61), Perry (44), and King (98) along the western boundary.

North Carolina acreage increased from 24,379 to 24,408 with the addition of the Hobbs tract (29).

All cabins within Refuge boundaries are now owned by the Service.

2. Easements

A permanent easement on the Washington Ditch right of way was secured to facilitate expanded visitor access. The easement involves approximately 3.7 acres and is wide enough to accommodate a 24 ft. gravel road now being constructed.

D. PLANNING

1. Master Plan

The master planning process was begun in October. Comprehensive planning for refuge management is long overdue at Dismal Swamp. Initial planning efforts in 1981 have included the development of an "action plan" for the upcoming year; identification of major issues and information needs; compilation of all resource information on the swamp; and the conduct of scoping meetings with key individuals and state and local officials. The "action plan" for the planning process indicates completion in late 1982 with several additional months to compile and complete an EIS on the plan. First RO estimates of staff days to complete the entire process began at 120 staff days but by the end of the year the refuge estimate exceeded 260 staff days. The core planning team for the project consists of Assistant Refuge Manager Michael G. Tansy, Assistant Area Manager for Refuges Paul Daly, and Regional Office Landscape Architect Mary J. H. Parkin.

The major objectives of refuge master planning for Dismal Swamp are to:

- Document and classify refuge resource information
- Identify important data gaps and update data
- Identify which refuge areas are presently or potentially suitable for various uses.
- Identify refuge limitations and constraints
- Identify public and environmental issues and initiate resolution
- Develop and evaluate comprehensive plan alternatives for the preservation, conservation, and utilization of refuge land/water resources, working toward 1) Refuge System goals and 2) a defined ecosystem

2. Management Plan

As defined by the draft refuge manual the refuge does not have a "Refuge Management Plan". The master planning process and resulting plan should provide the guidance for general management plan development next year. Water and forest management plans were started during the past year with the water management plan nearing completion.

3. Public Participation

The only public involvement that occurred during the year involved the master planning process. Scoping meetings were held with key individuals, state, and local officials in an effort to identify what the public perceives as important issues and problems in refuge management. A master planning public workshop is scheduled to be held early in 1982.

4. Compliance with Environmental Mandates

Two environmental assessments were prepared, one on the road improvement work at Washington Ditch entrance, the second on the proposed U.S. Highway 17 visitor contact station. A draft assessment covering the development of a maintenance complex (YACC shop building, storage building refuge pole shed) is nearing completion and should be submitted in 1982.

5. Research and Investigations

The USFWS had responsibility for two studies.

The Office of Endangered Species funded Dr. Robert K. Rose, Department of Biological Studies, Old Dominion University to determine the distribution and habitat preference of the southern bog lemming in and around the Great Dismal Swamp. The preliminary findings of Dr. Rose's work indicate that the animal is neither as rare nor as habitat specific as once believed. He has found populations in two open marsh-like habitats within the swamp as well as several locations outside the swamp in upland pine regeneration.

The refuge was funded \$40,000 this year from the Corps of Engineers Waterways Experiment Station to characterize the upland/wetland boundary along the Suffolk Escarpment. The Escarpment is also the western boundary of the refuge and lies within the proposed acquisition as per PL 92-478. The refuge is responsible for the cooperative study with the U.S. Geological Survey in characterizing the vegetation, hydrology, and soils of the transition zone. In 1981 seven employees completed a year's worth of work from June 12 to September 19. The work accomplished included 1) determination of geologic stratigraphy to the shallow aquifer using logged cores 2) installation of 69 observation wells, 3) installation of 8 piezometers 4) installation of 63 redox probes, and 5) quantitative vegetation sampling of twelve 400 meter transects for canopy, shrubs and herb layers. In addition, all instruments were read weekly. This study has been funded with an additional \$35,000 for 1982. The final report will be completed in 1983.



U.S.G.S. "Oxygen expert", Wayne Webb and FWS Biologist Garrett measure dissolved oxygen in a observation well on the transition zone study.



Transition zone staff installing observation well. Left to right - Steve Forsythe, Corps WES Contract supervisor, FWS Biologist Garrett, USGS-Mike Lane, FWS-John Thomas; USGS on assignment to FWS Paul Looney. 7-81

Studies conducted by others:

Dismal Swamp NR 81 "Species composition and distribution of mosquitoes and spiders in the G.D.S. " (51580-81-1) Mr. James K. Rindfleish, Biologist with the Chesapeake mosquito control, is continuing an ongoing survey of mosquito production from the Chesapeake portion of the refuge. This work relates to Regional Public Health.

Dismal Swamp NR 81 "Survey of potential cross country hiking trail locations, investigating fuel types, quantities, soil types and water depths" (51580-79-2). Appalachian Trail Club Tidewater Region club members have spent two years reviewing the concerns expressed by the FWS regarding the potential resource loss and limited quality of a cross country trail traversing the refuge from north to south.

Six major subprojects were engaged in 1981 under Dr. Frank P. Day, Jr., of ODU. Most of the research was conducted on the four sites which have been studied for the past seven years.

- (1) Leaf litter decomposition and nutrient turnover -
The first phase of this project has been completed and a paper is in press in Ecology.
- (2) Decay of confined versus unconfined leaf litter -
Fred Yates has completed this study, a thesis has been written, and a paper submitted to Amer. Mid. Nat.
- (3) Influence of flooding on decomposition rates -
A microcosm study has been completed and a paper submitted to Oecologia.
- (4) Log decay - Five red maple trees were cut along Railroad Ditch in April and sectioned into logs. These logs were weighed and placed at each of the four sites. Observations are being made and photographs taken every six months to examine the stages of decay in detail. Sample logs will be removed periodically to determine weight loss.
- (5) Algal dynamich in the cypress stand -
Joe Atchue has completed the study, a thesis has been written, and one is in press in Castanea and another one will be submitted to Hydrobiologia.
- (6) Foliage nutrient levels - Bruce Bandle has completed the study and a thesis is presently being written.

Reports on papers will be submitted when copies are available.

Dismal Swamp NR 81 "Investigations on the ecology of the Swainson's and Waynes warblers in the Dismal Swamp and continuation of the breeding bird survey (51580-75-4). Mr. Brooke Meanley USFWS, Patuxent, Retired, has been working in the Dismal Swamp nearly 20 years. This work is continuing.

Dismal Swamp NR 81 "The Lycaenid Butterflies of the middle Atlantic states (51580-81-81-5). Mr. Andrew Beck, Dept. of Entomology, VPI and SU is continuing his survey on the disjunct population of Mitoura Nesseli and the investigation of Strymon melinus with the subspecies S. melinus humeli.

Dismal Swamp NR 81 "Chlorination of aquatic humic substances from the waters of Lake Drummond" (51580-81-79-8). Dr. R.F. Christman, School of Environmental Health and Engineering, University of North Carolina, is continuing his studies on the production of toxic and carcinogenic substances during treatment processes for public water supplies.

Dismal Swamp NR 81 "Species composition and relative abundance of butterflies and moths of the Dismal Swamp". (51580-81-74-7). Mr. William Hartgroves is in his 7th year of survey. He is working closely with the USFWS endangered species office regarding the status of these invertebrates.

Dismal Swamp NR 81 "Biological controls on trace gas exchange with the atmosphere in the Dismal Swamp" (51580-81-79-6). Dr. Robert C. Harris, NASA Langley Research Center is continuing his work on soil organisms production and consumption of methane gas. The presence of methane reflects the very low oxygen levels present in the swamp soils and indirectly measures the stress on the surface vegetation. Dr. Harris has found the greatest methane output during the Dormant seasons indicating an extraordinary amount of methane consumed during the growing season.

Dismal Swamp NR 81 "Taxonomic survey of larval aquatic coleoptera of the Dismal Swamp" (51580-81-23-9). Dr. James F. Matta, Dept. of Biological Sciences, Old Dominion University, has worked on aquatic beetles in the Dismal Swamp for 9 years. He has observed a number of range extensions and possibly one new species. He is now capturing the immature stages for development of new taxonomic keys and rearing them to adult stage for confirmation of species.

Dismal Swamp NR 81 "Genetic characteristics of Centilavchios (Sunfish) from Lake Drummond(51580-81-81-10). Dr. Stephan R. Larrick, Dept. of Biological Sciences, Old Dominion University. Dr. Larrick is investigating the possibility that some of the fish in Lake Drummond may be undergoing specific genetic adaptations for the particularly harsh environmental conditions of Lake Drummond.

Dismal Swamp NR 81 "Biosystematics of Dyopteris (log fern) in the Dismal Swamp". Dr. Lytton J. Musselman, Dept. of Biological Sciences, Old Dominion University. Dr. Musselman is continuing his work on the mechanisms of fertile hybridization of the log ferns. The Dismal Swamp has the worlds only population of D.Australis (Dismal Swamp Log Fern).

Dismal Swmap NR 81 "Peat Resources of North Carolina". Dr. Roy L. Ingram, Dept. of Geology, University of N. Carolina. Dr. Ingram was funded by the Dept. of Energy to investigate the potential energy resources. The refuge management implications included a total map of the depth of organic soils, lication of prehistoric channels, moisture holding profiles, mineral content and physical description. This information has been entered in the Dismal Swmap data base and is important in water management, timber management and fire management.

Dismal Swamp NR 81 "Geologic stratigraphic study of the Dismal Swamp and Suffolk Escarpment". Dr. Genie Raper, Virginia State Geologist, Dr. Gerald H. Johnson, Dept. of Geology, William and Mary University, and Ms. Pamela Peebles, Ph.D. candidate VIMS conducted extensive geologic surveys in and around the Dismal Swamp. This work is providing criteria information regarding the characteristics of the shallow aquifer that sustains the swamp.

Dismal Swamp NR 81 "Hydrology and Ecology and Remote Sensing Application in the Dismal Swamp" (51580-81-74-11). Ms. Virginia Carter and Ms. Patricia T. Gammon, U.S. Geological Survey. The study to evaluate the relationships of vegetation, hydrology and soils using observation wells in five vegetation type is proceeding. Due to the extreme drought this year, it was felt that the water levels were not representative and we have planned for another year of measurements. A USGS open file report is planned for 1982 to make available all data from the preceding year's data collection.

Remote sensing investigations. A cooperative project was initiated with USGS EROS Programs to evaluate the use of ancillary data to improve Landsat Classification. A Digital data base has been developed which includes elevation data, peat depths, the digitized vegetation maps and roads and ditches within the swamp. These data sets are registered to a 50 meter UTM grid and can be manipulated in a variety of ways. Phase I of the project has been completed with excellent results. A demonstration project was done to show the type of information obtainable. The data base was used to establish quality of wood duck habitat in the swamp using food availability, nest site availability and flooding as criteria for wood duck use. This initial project demonstrated the ways in which the digital data base can be used to assist the FWS in making management decisions. In addition, the data base was used with Landsat data to provide an improved classification of the swamp.

There will be three more Phases, during which additional data sets will be added (e.g., seasonal surface and ground water levels), and work will continue on Landsat improvement and management applications.

E. ADMINISTRATION

1. Personnel

Staffing during calendar year 1981 totalled 7 permanent full-time employees, 3 part-time employees, and 8 temporary employees.

Ralph Keel was selected as manager of Koyukuk NWR, a new duty station in Galena, Alaska. Ralph will complete his tour of duty at Dismal Swamp in January 1982.

Charles Marshall, a YACC Group Leader from Chincoteague Refuge, transferred in October as a career seasonal recreation assistant. His appointment will involve working with the Interpretation and Recreation Program.

Dane Winningham was appointed to a temporary NTE 1 year maintenance appointment that was effective August 10, 1981.

Maintenance worker Michael Bryant was converted from a NTE 1 year maintenance position to a permanent WG-8 employee effective August 1981. Laborer John Thomas was reappointed October 4, 1981 to a temporary NTE 1 year appointment. Biological Technician Tom Gwynn was reappointed April 1981 to a 180 day appointment.

Employees completing temporary appointments during the year were Biologist Karen Terwilliger, Maintenance Worker Joyce Williams, and Laborer Mike Boatwright.

The resignation of permanent part-time Administrative Clerk Dorothy Hudson was accepted in October 1981. Dot had worked for the Refuge since 1975.

Marie Ecton, a graduate student in Biology from Tennessee Technological University, entered on duty June 22, 1981. Marie completed her Biological Technician Student Trainee appointment in September.

The table below shows a five year comparison of on board strength in staff personnel from 1977 to 1981:

	<u>PERMANENT</u>		
	<u>FULL TIME</u>	<u>PART TIME</u>	<u>TEMPORARY</u>
FY77	5	2	7
FY78	6	1	7
FY79	6	1	6
FY80	6	2	7
FY81	7	3	8

2. Youth Programs

YCC

The Dismal Swamp National Wildlife Refuge Youth Conservation Corps Camp did not operate during the summer of 1981. Staff were selected but the station did not receive approval for the program until a week before the starting date. By then, the chosen Director and Group Leaders had accepted other positions.

YACC

The 1981 non-residential camp, Young Adult Conservation Corps began the year with an enrollment of eleven enrollees and one Group Leader. Enrollment remained constant through the year until summer. Program hiring freezes and budget cuts made it impossible to replace lost enrollees. Murray Parker, the station's Group Leader, was terminated in September due to program cuts. The YACC crew continued working under refuge personnel supervision but dwindled to two enrollees by the end of the calendar year.

Work projects for 1981 involved refuge assistance, hydrological assistance, boardwalk construction, safety activities, refuge and YACC equipment tenance, transition zone assistance, custodial road maintenance, water control structure maintenance, razing and burning of cabins, fire equipment training and maintenance, Dismal Town parking lot development, footbridge rehabilitation and YACC shop building construction.

The two remaining enrollees will complete their one year appointments in early 1982.

5. Funding

A five year funding pattern is shown in Table 1 below. The \$276,000 level for FY 82 reflects budget reductions from approved annual work planned levels. For the first several months of FY 82 the refuge operated without a firm funding level with continuous rumors and warnings that cuts were coming. With a funding level of \$276,000, no Pay Act funds available, rising fixed costs, an increasing cyclical maintenance project list, new water control structures coming on line, and growing refuge acreage the refuge cannot adequately protect structures, improvements and wildlife resources. Due to fixed and salary costs there will be few discretionary dollars left in FY 82 to get the job done.

Table 1: 5-Year Funding

YEAR	MB	N&NMB	I&R	TOTAL	JOB ORDERS/ (BLHP)
FY'78	0	\$134,000	\$81,300	\$215,300	\$371,018
FY'79	0	\$154,000	\$86,000	\$240,000	\$163,000
FY'80	0	\$200,000	\$84,000	\$284,000	\$442,000
FY'81	0	\$212,000	\$77,000	\$289,000	\$800,000
FY'82	0	\$207,000	\$67,000	\$276,000	*\$500,000

*carryover from FY'81

6. Safety

Safety meeting topics in 1981 included programs on defensive driving, chainsaw operation, hand tool use, safe operation of heavy equipment, allergic reaction to insect bites, canoe and small power boat operation, personal self defense, and hypothermia.

Three Refuge personnel and nine YACC enrollees successfully completed the eight hour multimedia first aid course presented by the American Red Cross; fifteen individuals took the American Heart Association CPR course; and six refuge personnel, three USGS people, and six YACC enrollees completed and passed the SI30 Basic Firefighter training and safety program.

One automobile accident involving a refuge employee occurred in 1981, when a vehicle slammed into the rear of the government vehicle at a stop light. The employee was not at fault and fortunately there were no damages or injuries. A YACC enrollee incurred \$670 in damage to a refuge pick-up truck when the truck went out of control on an icy refuge road and slid into a ditch bulkhead.

Two minor job-related injuries were reported by refuge employees in 1981. One involved an eye scratch caused by a piece of switch cane, the other an abrasion injury to the left elbow when a chain binder on a lowboy trailer was released too quickly. Three other injuries involved refuge visitors. An elderly woman riding on the refuge tour bus fell out of her seat and suffered a pulled back muscle when the bus hit a pothole on a city road. Since that accident the pothole has been repaired by the city and seat belts have been installed on the bus. A North Carolina deer hunter fell asleep in his tree stand and dropped about 15 feet to the ground. After being taken to the local hospital emergency room, he was found to have multiple contusions. All deer hunters using tree stands on the refuge are encouraged to use safety belts. The most serious accident occurred in October during the Virginia deer hunt. A hunter was reported missing the evening of October 24 by his hunting companions. After two days of searching involving Refuge, Navy, Police, Rescue Squad, and Virginia Game Commission personnel, the body was found October 26 with a buckshot pellet in the forehead. After a two month investigation police arrested one of the hunting companions and charged him with involuntary manslaughter with negligence. The death apparently was the result of the hunter's negligence and poor visibility due to the dense brush.

7. Technical Assistance

ORP Zeamer has been working with the Elizabeth City State University Cluster Public Relations Task Force to offer assistance in the area of trail, leaflet, and educational activity development. The University recently received a 639 acre swamp area acquired from HEW by the state of North Carolina. The University would like to have teachers and researchers utilize the area so the swamp environment may be studied in its natural state.

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 101,992 acres, offers important ecological, educational, historical, and recreational values and is a peaceful contrast to the 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

Water Management: The beginning of 1980 marked the end of the worst drought in over 100 years. With only one functioning water control structure out of 57, refuge staff and YACC enrollees spent weeks sandbagging pipes to conserve what little water was available. The drought broke in June and the rains averted a severe fall fire season.

A test was conducted during the spring to determine our ability to store water in Jericho Ditch above the level of the groundwater head. The Jericho Ditch structure was receiving water from almost 8 miles of ditches and a water shed of over 5,000 ac. The flow to the structure should have filled the ditches in less than 2 days. An observation well was placed east of the structure across the road to establish the ground water level. It was found that the ditch level could not be elevated more than 0.1 foot above the groundwater level. The preliminary conclusion is that it will not be possible to flood areas surrounding Jericho Ditch but we are capable of recharging the groundwater aquifer at that location.

Marsh Management: The once 300 acre freshwater marsh has been reduced to less than 15 acres. Red maple is now occupying the majority of the marsh. Refuge staff with the help of YACC and USGS staff hand cut the maples and treated the stumps with tordon herbicide on approximately 1 acre within the marsh. This effort was designed as a test to determine the effects of slash on marsh regeneration. Additional tests are planned for 1982 to determine the effectiveness of removal and prescribed burning. An 8 acre circular plot was layed out for the variety of tests in an effort to quantify the maple cover. Dr. Roy Mead, Dept. of Forestry, VPI and SU, assisted in a color infrared overflight of the marsh.

3. Forests

With the refuge fire management plan approved in 1980, plans were developed in 1981 to begin using prescribed fire as a forest management tool. Four areas of 40 acres each were selected for burning in loblolly pine forests along the northern and western periphery of the swamp. After gaining experience in the upland areas, we anticipate burning on organic soil sites under specified conditions. Reasons for burning are to lessen wildfire hazard by reducing heavy fuel accumulations, improve wildlife habitat by reducing woody growth in favor of green herbaceous plants, prepare the site for natural seeding of pine, and maintain pine areas through reduction of hardwood competition. To carry out our mandate of preserving and perpetuating all habitat types within the swamp, including the fire dependent communities, we expect to expand the use of fire in the future to include the remnant marsh area, cutover Atlantic white cedar stands, evergreen shrub areas, and possibly conversion of maple types to other species.



Fire line being plowed by the refuge D-6D off Railroad ditch. 10-81

Heavy work loads, inclement weather, and the complicated Section 404 permit process delayed actual burning so that we could not begin in late 1981 as we had hoped. Two of the four sites were judged to contain wetlands soils and therefore a 404 permit was required from the Corps of Engineers for construction of plowed control lines. In the course of the 404 process, it was brought to our attention that archaeological surveys were required for all actions on the refuge involving disruption of the soil surface, including fire line construction.

An archaeologist, hired to survey our lines, certified that no areas of interest were being disrupted. Due to the unexpected delays and winter weather, burning was attempted on only one site with limited success.



Prescribed burning success was limited in 1981 due to unexpected delays. Wait until next year! 12-81

Draft chapters of the forest management plan were written on management of Atlantic white cedar, endangered species and black bear habitat management, silvicultural methods, and forest history of the swamp. Considerable time was spent on preparation of the plan including reviews of existing literature and correspondence with university and U.S. Forest Service experts. There is a critical need for basic forest inventory information on species composition, age and size classes, and understory vegetation. Some information was collected by the Forester in 1981 but severe restraints on personnel and funding do not allow extensive inventory programs.

1981 was the fourth consecutive year of infestation, and the worst one yet, for the forest tent caterpillar. Stands of water tupelo were completely defoliated, with some damage occurring to nearly all hardwood species. Fortunately most

trees had refoliated by July so that the only damage was loss of growth and some branch killing. It is not known how many successive years of defoliation the trees can withstand before they finally die or succumb to diseases because of weakness.

The firewood permit program was expanded in 1981. All trees within a one acre area on Lynn Ditch were marked for cutting as was a 1/2 acre plot on the boardwalk trail. The intent was to let the public create wildlife openings by removing the wood for their own use. In addition, trees were marked for cutting along Middle Ditch and Hudnell Ditch. Each party was allowed to remove four pickup loads. 83 permits were issued in the summer of 1981. People cooperated well for the most part, although there were some problems with tree tops being left on roads and in the ditches.

4. Croplands

In the acquisition of one tract in 1980 the refuge acquired 60 acres of cleared land along with forested swamp in an all or nothing deal. The agricultural land was leased to an adjacent landowner with whom negotiations are ongoing for an exchange of the 60 acres for 190 acres of forested swamp.

9. Fire Management

Relief from the severe drought of 1980 resulted in very little fire suppression activity in 1981. Only one small fire was suppressed on the refuge itself, however on five separate occasions we provided assistance to the Virginia Division of Forestry for wildfire suppression on private or Corps of Engineers lands which threatened adjacent refuge property. Upon request of the North Carolina Forest Service, we transported our two Crisafulli high volume pumps to Pungo National Wildlife Refuge to assist in combatting a serious peat fire in that area; other than transportation time, no personnel support was requested or provided. Fire suppression costs totalled \$2858 in 1981, in addition to \$195 in presuppression fire detection flights. Unlike 1980, the entire cost had to be carried by the refuge budget, since the BLM reimbursable account was discontinued.

Because of the hectic 1980 fire season, major emphasis was placed on firefighting training in 1981. Keel, Carter, and Zeamer received S130 Basic Firefighter training from the North Carolina Forest Service, and Carter in turn provided the training to refuge, USGS, and YACC personnel. Carter and Tansy took the week-long S390 Fire Behavior course in Charlottesville in cooperation with the U.S. Forest Service, National Park Service, and Virginia Division of Forestry. All refuge and YACC people were given the step test to measure aerobic physical fitness. A one day outdoor exercise provided training to all personnel in the operation and use of fire fighting equipment.



Two additions to the refuge's fire equipment inventory in 1981 included a portable bridge and a truck to pull the bridge. The bridge will permit rapid access across ditches to fires.

Dismal Swamp is fortunate in having modern pumping equipment, hoses, a D6 tractor and other firefighting tools. Additions to the fire equipment inventory for 1981 included protective Nomex clothing for all personnel; protective fire shelters; a 600 gallon portable relay tank; 25 sprinkler irrigation units; a portable bridge enabling heavy equipment to cross ditches; a surplus Ford truck to pull the bridge; a lightweight Homelite pump for drawing water from temporary wells; and an assortment of hand tools including rakes, beaters, and a backpack hand pump.



All firefighters received the standard step test to measure aerobic physical fitness for firefighting. It's a difficult test to pass. 3-81

10. Pest Control

The only chemical spraying done in 1981 was a test application of Krenite along Corapeake Road to control red maple brush. Krenite is the least toxic effective herbicide manufactured by DuPont for woody brush suppression. A trailer-mounted spray application rig was furnished by DuPont. Results of the spraying will be evaluated in 1982. Herbicide spraying may be a cost effective alternative to the continuous mowing along roadways.

G. WILDLIFE

2. Endangered and/or Threatened Species

In January, refuge personnel found possible evidence of a red-cockaded woodpecker activity in a strip of mature loblolly pine located along the west bank of the Dismal Swamp Canal. The evidence consisted of several possible start holes and resin flows appearing to be consistent with red-cockaded woodpeckers. Since red-cockaded woodpeckers had occurred in the same general vicinity in the past (1960's) it was hoped that a small population had remained in this area. In June, refuge staff and William and Mary Biologist Ruth Beck returned to the area to check for red-cockaded woodpecker activity. From this investigation it was determined that the woodpecker evidence was the result of pileated woodpeckers. It was decided that this area is marginal red-cockaded habitat due to the height of the understory, however with proper management techniques the area could be rated as excellent habitat for the red-cockaded woodpeckers.

Several breeding populations of red-cockaded woodpeckers occur outside the refuge, the nearest being on private land in the Whaleyville area.

Bald Eagles were observed twice in the Lake Drummond area this year. One sighting was reported in February and the other in August, both of adult bald eagles. Eagles are rarely seen in the refuge, with the last confirmed active nest being seen in 1961. These eagle sightings can probably be attributed to bald eagles utilizing the Nansemond River.

3. Waterfowl

Waterfowl use of the refuge is relatively low and sporadic, depending on regional climatic conditions that may force birds from the surrounding coastal areas inland. Largest concentrations of waterfowl occur 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 over. These waterfowl concentrations are primarily composed of Canada Geese, Mallards, and Black Ducks, with an intermingling of Canvasbacks, Ruddy Ducks, American Wigeon, Hooded Merganser, and an occasional Whistling Swan or Snow Goose. Low water levels in the ditches, due to the continuing drought, decreased wood duck survival this year. During low water periods wood duck predation by river otters and snapping turtles was high, greatly reducing the number of fledged birds.

4. Marsh and Water Birds

A large number of Common Loons (35) were reported from Lake Drummond in April of this year. A rookery of Great Blue Herons was discovered in the North Carolina section of the refuge during a fire spotting flyover in July. The rookery is in several large bald cypress and contains 50-60 nests.



The heron rookery west of Weyerhaeuser ditch. Several of the nest trees are not in the photo. Those dominant cypress trees act as lighting rods and are the source of most refuge wildfires. 7-81

5. Shorebirds, Gulls, Terns and Allied Species

Spotted Sandpipers were commonly observed around the margins of Lake Drummond during spring migration with a high count of 45 occurring in early May. Several Solitary Sandpipers were reported from the Washington Ditch area during the same period.

6. Raptors

Two sightings of adult bald eagles (see endangered species section) were reported from the Lake Drummond area, in January and August. Osprey were observed on a regular basis in the vicinity of Lake Drummond during the latter part of April through the first two weeks in May. A Northern Harrier was reported on the 5th annual spring bird count, a report of note in that the harrier is very uncommon within the swamp boundaries. Observations of American Kestrel, Merlin, Cooper's, Sharp-shinned, Red-shouldered, and Redtailed hawks, as well as Great Horned and Barred owls were consistent with previous years.

7. Other Migratory Birds

The refuge spring bird count followed the format used for the National Audubon Society's Christmas Bird Counts, with the following addition; all routes on which a particular species was recorded are listed after the total number of individuals recorded for each species. Example: Green Heron 36 (1-5, 10, 19), meaning a total of thirty-six Green Herons were recorded from routes 1 through 5, 10, and 19.

Great Dismal Swamp National Wildlife Refuge, Suffolk, Va., 5/3/81, Clear-AM Clear-PM, Temp. 50-78° F, Wind 5-10 mph, water open, wild food crop excellent. Forty-two observers in 13 parties. Total party-hours, 70 (10 on foot, 56 by car, 4 by boat): total party-miles, 45.5 (8 on foot, 30.5 by car, 7 by boat).

Common Loon 7 (13); Double-crested Cormorant 1 (19); Mallard 6 (1,9,10); Wood Duck 56 (1-5,8,12-14); Vulture: Turkey 17 (4-6,10,12-14,19), Black 5 (5,10,14); Hawk: Sharp-shinned 2 (14), Red-tailed 2 (5,12), Red-shouldered 23 (1,3-5,8,12-14); Northern Harrier 1 (3); Osprey 1 (9,13,19); Bobwhite 8 (5,13); Heron: Great Blue 3 (6,14,19), Green 28 (1-5,8); Spotted Sandpiper 15 (9,10,19); Gull: Herring 5 (10,12) Ring-billed 7 (10,13); Caspian Tern 1 (10); Mourning Dove 51 (2-6,9,10,12-14); Cuckoo: Yellow-billed 44 (1,2,4-6,8-10,12-14), Black-billed 2 (12); Owl: Great Horned 1 (8), Barred 1 (1); Chimney Swift 9 (4,5,8,10,14); Ruby-throated Hummingbird 25 (1-6,9,10,12-14,19); Belted Kingfisher 11 (1-6); Common Flicker 14 (1,3,4,10,12,14,19); Woodpecker: Pileated 38 (1-6,8,10,12-14), Red-bellied 31 (1-5,8,10,12,13) Hairy 2 (1,3), Downy 13 (1,2,4,5,9,12,13); Eastern Kingbird 7 (1,2,13,19); Flycatcher: Great Crested 103 (1-6,9-10,12-14,19), Acadian 43 (1,3-6,9-10,12-14); Eastern Phoebe 3 (3,9,10); Eastern Wood Pewee 30 (1-5,9,10,13,19); Swallow: Tree 78 (2,4,9,10,14,19), Rough-winged 1 (8), Barn 43 (1,3,5,6,9,13,19); Purple Martin 1 (5); Blue Jay 42 (1,3-6,9,10,12,13); Crow: Common 42 (1-5,9,10,12-14,19), Fish 1 (3); Carolina Chickadee 133 (All); Tufted Titmouse 102 (1-5,8-10,12-14,19); White-breasted Nuthatch 10 (5,8,10,14,19); Wren: House 4 (2,3,5), Carolina 33 (1,2,4,8,10,12-14,19); Gray Catbird 117 (1-6,8-10,12-14); Thrush: Wood 139 (1-6,8,10,12-14,19), Hermit 1 (3), Swainson's 4 (1,3,13); Eastern Bluebird 1 (3); Blue-Grey Gnatcatcher 23 (1,2,4,5,9,13,14,19); European Starling 19 (1,9,19); Vireo: White-eyed 141 (1-6,10,12-14,19), Yellow-throated 3 (10,13); Red-eyed 184 (All), Warbling 1 (2); Warbler: Black-and-White 53 (2-6,8,10,12-14,19), Prothonotary 297 (All), Swainson's 15 (1,3-5,13,14), Worm-eating 8 (3-6), Golden-winged 1 (12), Blue-winged 25 (1-6,8,10,12,13), Tennessee 3 (4,5,12), Parula 119 (1-6,8-10,12,13,19), Yellow 2 (10,12), Magnolia 1 (12), Black-throated Green 31 (1-6,8,10,13), Black-throated Blue 52 (1-5,10,12,13), Yellow-rumped 126 (1-6,8-10,12-14), Bay-breasted 1 (5), Blackburnian 1 (5), Chestnut-sided 1 (3), Blackpoll 62 (1-6,9,10,12-14), Pine 15 (1-3,8,9,12), Prairie 119 (1-6,8,12-14,19), Palm 2 (4), Kentucky 2 (8,13), Hooded 139 (1-6,8-10,12-14), Wilson's 1 (13); Ovenbird 177 (All); Waterthrush: Northern 13 (3-5,10,13), Louisiana 48 (1-6,8,10,12-14); Common Yellowthroat 180 (All); Yellow-breasted Chat 7 (1,5,6,12,19); American Redstart 46 (4,5,10,12,13,19); Bobolink 238 (1,3-5,12); Red-winged Blackbird 7 (1,3,4,10); Common Grackle 125 (1-6,8-10,12,14,19); Brown-headed Cowbird 24 (1,2,5,10,12-14); Oriole: Northern 2 (5), Orchard 1 (10); Tanager: Scarlet 17 (1-5,8,13), Summer 5 (1,5,10,13); Cardinal 58 (1,3-5,8-10,12-14,19); Grosbeak: Rose-breasted 15 (1-3,5,8,13), Blue 1 (13), Evening 6 (5);

Indigo Bunting 20 (1,3-5,8,10,12,13); American Goldfinch 3 (5); Rufous-sided Towhee 34 (1,3-6,8,10,12,13); Sparrow: Chipping 8 (3,13), White-throated 22 (1,3,5,9,10,12-14), Swamp 3 (2,12). Total species - 107; about 3901 individuals. Seen in count area during count week but not on count day; American Bittern, Solitary Sandpiper, Chuck-will's-Widow, Whip-poor-Will, Cerulean Warbler, Yellow-throated Warbler, Canada Warbler, Pine Sisken, Field Sparrow, Song Sparrow, Long-billed Marsh Wren.

RESULTS OF THE 1981 DISMAL SWAMP SPRING BIRD COUNT

Route No.	Miles/Route	Number Participants	Birds Seen/Heard	Ratio Seen/Heard	Individuals Per Route	Species Per Route
1.	2.75	2	99/366	1:4	465	55
2.	4.70	2	141/79	1:2	220	40
3.	2.00	3	106/166	1:2	272	57
4.	3.20	2	67/182	1:3	249	54
5.	3.90	2	150/224	1:2	374	67
6.	2.30	5	40/208	1:5	248	32
8.	2.90	5	50/99	1:2	149	35
9.	2.70	2	128/6	21:1	134	31
10.	3.25	4	128/202	1:2	330	53
12.	3.60	2	198/181	1:1	379	51
13.	4.10	6	317/453	1:1	770	57
14.	3.50	5	81/112	1:1	193	39
19.	7.00	2	115/43	3:1	158	33
<u>Totals</u>	13	42	1620/2321	1:1	3,941	107

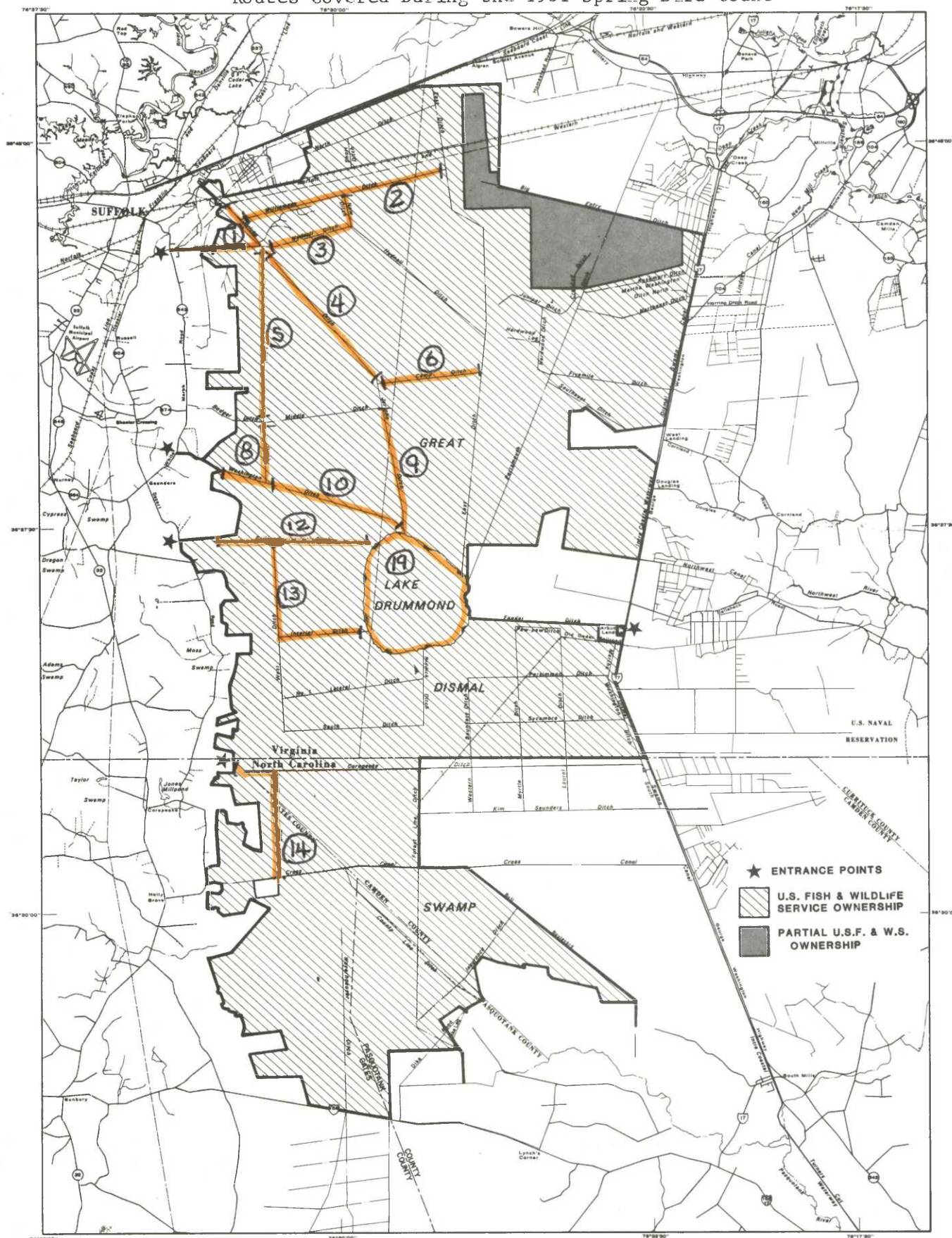
GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

VIRGINIA AND NORTH CAROLINA

UNITED STATES
FISH AND WILDLIFE SERVICE

Routes Covered During the 1981 Spring Bird Count



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

BOSTON, MASSACHUSETTS DECEMBER 1976
POSTED: MARCH 1982

8. Game Mammals

Several sightings of bobcat, grey fox, and beaver on the refuge were reported by refuge staff and permittees during the 1981 CY. The numbers of reports for these species were consistent with previous years. Observations of black bear were comparable to past years, with the typical increase in reports during the months of June, July, and August. Several observations of females with young were reported from various sectors of the refuge. Virginia and North Carolina game officials reported seventeen black bears killed on the margins of the refuge. The majority of bears were taken under depredation permits. Observations of white-tailed deer throughout the refuge were consistent with previous years. During the refuge hunt 83 deer were taken, an increase of 10.6% from the 1980 hunt.

10. Other Resident Wildlife

During the 1981 refuge deer hunt, many hunters utilizing the Virginia sections reported observations (both visual and auditory) of wild turkey, a species that had not been reported from the Virginia portion of the refuge since 1977. During the summer and fall of 1981, the refuge staff reported several observations of canebrake rattlesnakes within the refuge. Fortunately, none of these encounters resulted in any injury to either reptile or staff. Canebrake rattlesnakes are extremely well camouflaged and have a disconcerting habit of not rattling until either the last possible moment or not at all, thus increasing the possibility of a close encounter.



A well camouflaged canebrake rattlesnake, four to five feet long—a real beauty. 10-76

12. Wildlife Propagation and Stocking

Several canebrake rattlesnakes were released in less traveled areas of the refuge by Chesapeake Park Ranger Gary Williamson. These canebrakes come from Northwest River Park, an area of extremely high public use, where the snakes are a hazard to the public and are in turn threatened by human activities. Instead of killing these rattlesnakes, Ranger Williamson removes them from Northwest River Park and releases them (in areas designated by the refuge manager) in the Dismal Swamp. A black bear was released on the refuge after it had been captured by Newport News wildlife officers in a residential area. The bear was released in a remote area of the refuge to reduce the probability of any bear/human interaction prior to the bear's acclimation to the area.

14. Scientific Collections

Dr. Rose of Old Dominion University has collected specimens of the southern bog lemming (Synaptomys cooperi helaletes), a mammal that had not been reported from the Dismal Swamp since 1898. Dr. Rose has successfully collected specimens from several locations within the refuge, both in Virginia and North Carolina (for additional information see item D 5).

15. Animal Control

Dr. Rose and Assistant Manager Tansy established a raccoon and dog trapping program in one of Dr. Rose's study areas after several instances of animal depredation occurred. The problem stemmed from the fact that the dogs would disturb the traps and the raccoons would eat the southern bog lemmings that were in Dr. Rose's traps. The trapping program was successful and was discontinued when the problem had been alleviated.

17. Disease Prevention and Control

An outbreak of distemper was observed in the raccoon population in the refuge and surrounding areas with the carcasses of over 500 raccoons being reported from the general vicinity of the refuge. The accuracy of the reported die off is questionable but there does appear to be a disease problem in the raccoon population. A disease study of raccoons will begin in early 1982.

H. PUBLIC USE

1. General

a. Visitation

Refuge visits during CY 81 totalled 8,451 and represented an increase of 986 visits over CY 80. The prime birding month of May accounted for the largest number of monthly visits at 1,507. December, January, and February continued to be a period of low use. Visitation levels have ranged from 2,000 visits in 1974 to a high of 9,300 visits in 1978.

b. Future Use

Potential use at this refuge is extensive due to the area's ecological and historical significance and the close proximity of six major cities in or near the Tidewater area. As the development of facilities and services outlined in the 1979 Public Use Development Plan are initiated, use will probably increase.

c. Program Information

A total of 24 news releases pertaining to tours, wildlife, and special events were prepared during the year. Several seasonal stories were also reported by a number of area newspapers.

Thirty two offsite programs were held during the year involving 1,091 people. Fourteen of these programs were held for special care facilities in accordance with International Year for Disable People. Several of these groups later toured the refuge.



Residents of Johnson's Home for Adults visit the refuge. This group participated in a number of programs presented during International Year for Disabled People. 10-81

ORP Zeamer was featured on several radio programs during the year including WKAR FM, WFOG AM, WORK, and WKAZ. Tours, programs, and other refuge opportunities were discussed as well as basic facts about the swamp. A film crew associated with WHRO T.V., a local educational station, visited the refuge in December to film part of a special three part series dealing with black/white relations in lower Tidewater. The section concerned with the swamp portrays runaway slaves activities and the early role of blacks in the area. One scene of particular interest deals with Moses Grandy, a black shake (shingle) maker who worked in the swamp.

Outdoor Classroom

The majority of refuge outdoor classroom activities are carried out by Old Dominion University's Office of Dismal Swamp Programs. This group is composed of undergraduate and graduate students who have completed a one credit tour guide training course administered by O.D.U. and refuge staff.

A cooperative agreement has been developed which outlines efforts to be taken by O.D.U. and the refuge to achieve mutual objectives in the areas of research, outdoor classrooms, and interpretation of the natural resources of the swamp. Copies of the agreement have been reviewed and approved (with minor revisions) by the refuge and O.D.U. The final document is currently being finalized and should be completed in early 1982. When implemented, the agreement will result in closer association and coordination between O.D.U. and the refuge.

In January, Zeamer and O.D.U. coordinator Debbie McElveen selected several sites on the refuge for outdoor classroom use. Four small bridges spanning low areas were constructed near the Boardwalk trail to permit access to the sites during periods of high water.

One of the more worthwhile developments this year was the beginning of cooperative efforts between the refuge and the Suffolk schools to develop educational material and activities for use with the Suffolk elementary schools. On September 11 ORP Zeamer met with Science Superintendent Jim Thorsen to discuss the possibilities of teacher workshops and educational aids. Thorsen visited the refuge later that month to obtain a first hand look at the available potential of the refuge for outdoor classroom use.

Further meetings were held with Thorsen and a group of eighteen elementary teachers to determine curriculum needs and the feasibility of incorporating the swamp into educational materials for teacher use. It was determined that work should be initiated at the kindergarten level.

Several meetings are scheduled for early 1982 to begin development of this project. It is hoped that as materials for each grade level are produced, workshops will be held for the teachers who will be utilizing these materials. There are twenty eight kindergarten classes in Suffolk.

Approval was received this year to refurbish the Perry Cabin on Lake Drummond for use as a temporary facility for outdoor classrooms and general group use.

To date, work has been slow as weather, reduction in YACC enrollees and other management projects have hampered progress on the building. Much work such as scraping, painting and rebuilding of walkways will hopefully be accomplished during 1982.

In July Zeamer met with North Carolina Naturalist Louise Kessel at Merchant's Mill Pond State Park to tour the area and discuss educational programs.

2. Students

ODU's involvement with refuge educational programs during CY 81 involved 1,306 youngsters and accounted for 4,322 activity hours. The refuge worked with 284 children totalling 499 activity hours. Activities included use of OBIS, Forest Service, and USFWS materials; water and soil analysis; canoe trips; environmental awareness; and action socialization experiences. The majority of these visits were made by school and youth groups.

An additional 47 visits accounting for 286 activity hours were recorded by teachers and professors holding educational permits who utilized the refuge as an outdoor learning site.

All groups combined totalled 1,623 visits and 5000 activity hours.

One event of special mention was a three day environmental education program for children between the ages of 8 and 12. Forty one children participated in the event which was held on July 20, August 6, and August 26. Activities included action socialization experiences, predator/prey relationship games, environmental awareness activities, food web basics, animal adaptations, aquatic environments, and creating art using natural materials.

3. Teachers

During the year the refuge worked with 66 teachers (including ODU tour guides) totalling 149 activity hours.

ORP Zeamer conducted two tour guide training sessions during the CY for a total of 21 ODU students. These programs included a presentation on the basics of interpretation and environmental education in the USFWS and a tour of the refuge emphasizing interpretive and educational techniques for use with groups. After completing approximately twenty additional hours in other areas (ie. history of swamp, first aid, legends, etc.) and assisting a seasoned guide with several tours, the new guides are able to handle groups on their own.

A six hour workshop was held on November 13 for eleven teachers enrolled in an Elizabeth City State University (North Carolina) course entitled "Educational Techniques". The group was oriented to the refuge, became acquainted with available educational material and equipment, and participated in discussion and activities involving approaches to outdoor classroom learning.

4. Interpretive Foot Trails

All conducted interpretive tours of the refuge are recorded under this area since the majority of the visitor's time is spent along the boardwalk trail located on Washington Ditch Road. A total of 1,313 individuals compiling 4,227 hours were involved in conducted tours handled by refuge employees during the CY. This number includes public tour participants, students, scouts, members of civic and professional organizations, and residents of special care facilities.

Interpretive tours handled by ODU's office of Dismal Swamp Programs accounted for 1,359 visits totally 2,649 activity hours. Total use for the year was 2662 visits accounting for 6,876 activity hours.

Work on the boardwalk trail which was begun in 1976 has been halted due to the phasing out of the YACC program. Currently at .75 mile, it was hoped that the planned length of 3 miles would be completed in 1984. Platforms were constructed at the ends of two unfinished loops of the trail to give it the appearance of "completion" until further work can be initiated. Benches will be added to the platforms in hopes of encouraging birders to use these sections of the trail.

Two tours of particular interest during the year included 38 participants of the Northeastern Fish and Wildlife Conference held in Virginia Beach, VA. and 74 members of the Society of American Foresters. Highlights of the SAF tour included a trip to North Carolina to visit one of the few remaining stands of Atlantic White Cedar, a discussion of cedar management methods, a guided walk on the boardwalk trail, and a catered lunch at Lake Drummond.

On November 23, Biologist Mary Keith Garrett toured the swamp with author Susannah Lawrence. Ms. Lawrence is currently working on a book that deals with natural areas available to the public.

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. Future plans, as outlined in the public use development plan prepared in 1978, propose a motorized tour route from the planned Wildlife Interpretive Center on Washington Ditch Road to the proposed Lake Drummond visitor contact station and back, a round trip of 8 miles. It is recommended that the Fish and Wildlife Service purchase and operate shuttle buses along the route. Also proposed is a motorized wildland tour beginning on Corapeake Road in North Carolina and looping for twelve miles along Sherrill, Cross Canal, and Forest Line. See attached public use development plan for additional information regarding future developments.

6. Interpretive Exhibits/Demonstrations

Six exhibits regarding the refuge, its programs, and wildlife were on display at various events during the year. An exhibit on wildlife was set up at the Kilby Shores Elementary School in Suffolk during National Wildlife Week. The refuge participated in Hunting and Fishing Day at the Portsmouth City Park on September 19 and 20. ORP Zeamer staffed the display which dealt with hunting, fishing, and nonconsumptive recreation activities. The refuge was selected to receive the "President's Award" for an outstanding exhibit. During the Suffolk Harvest Festival the refuge staffed a display October 8, 9, 10, and 11. Forester Carter, Biological Technician Gwynn, and ORP Zeamer were alternately available to answer questions and distribute information to the public. Approximately 40,000 people attended the festival.



Suffolk Harvest Festival display prepared by refuge. 10-81

7. Other Interpretive Programs

On October 1 the refuge participated in Career Day at Elizabeth City State University, North Carolina. ORP Zeamer was on hand to answer questions and distribute career information to interested students. A table top display on various FWS positions prompted a variety of questions from the more than 1000 students in attendance.

An owl hoot conducted by two members of the Cape Henry Audubon Society was held on January 24 and involved 13 individuals. Although the evening was cold and windy several owls were attracted for the group to view.

8. Hunting

The refuge's fourth consecutive deer hunt was held in October and November involving a total of eight days and 27,592 acres, 23,071 in Virginia and 4,521 in North Carolina. The either sex hunt (see attached regulations) allowed participants to take two deer per day in North Carolina and two deer per day in Virginia (with an antlerless tag). Shotguns and bows were permitted in Virginia and shotguns only in North Carolina.

A total of 654 hunters accounted for 757 visits with the largest turn out occurring on the first days of both the Virginia and North Carolina hunts. Activity hours for the entire eight days of hunting totalled 7,574 with 5,538 in Virginia and 2,036 in North Carolina. Last year's hunt involved 300 hunters accounting for 528 visits and 4,693 activity hours, an increase of 229 visits and 2,881 activity hours.

Eighty three deer were taken in all - 68 in the Virginia section of the refuge and 15 in North Carolina. Hunter success was approximately 12% in Virginia and 8% in North Carolina. The sex ratio of 1.0 buck to 0.6 doe is significantly better than 1.0 buck to 0.3 doe experienced in 1980. It appears that the antlerless deer tags issued created increased incentive to remove does.

After analysis of this year's hunt FWS Biologist Otto Florschutz has recommended an annual harvest of approximately 200 animals per year.

All hunters were required to pass a weapons qualification test before being issued a hunt permit. The Izaak Walton League of Suffolk, Virginia Beach Rifle and Pistol Club, and Gunnery Sergeant W. E. Bodarte of Camp Elmore assisted the refuge on August 29 and September 12 and 13 with only thirteen individuals qualifying.

Prior to the hunt, scouting dates were held on October 3 and October 10. More than 100 hunters took advantage of this early opportunity to visit the swamp, become familiar with the roads, and locate a prime hunt site. Although the hunt was considered a success, it was marred by the unfortunate death of one hunter who was killed on October 24. He was reported "lost" at 6:30 p.m. on the 24th day of October by his two hunting companions who had last seen him around 7:00 a.m. that morning. Search activities were organized that night and road patrol was carried out in the event that he walked out on his own. Search activities were begun at daybreak the following day with approximately 48 searchers involved. Groups spread out and spaced themselves 75 to 100 yards apart and proceeded south through unit 7, the area he was last seen entering (see map attached to regulations). When the search was unsuccessful it appeared that he was probably not conscious and perhaps dead. A request for additional searchers from the military was made.

The following day, Monday October 26, searchers were divided into two groups with approximately 60 individuals making a detailed search of the area where he was last seen. The remaining 270 searchers spread out into other areas of the refuge where he may have walked. After searching for only 15 minutes his body was found 1/4 mile east of the intersection of Lynn and Middle ditches, about 100 yards south of the road. He had died from a single buckshot wound to the forehead.

Interviews were held with all hunters who had hunted on the refuge that day with extensive questioning carried out with hunters who had been in the vicinity of the fatality. Approximately two months later it was determined from ballistics tests that he had been shot with the gun used by one of his two hunting companions. When confronted with the results of the test, the hunter confessed and was charged with involuntary manslaughter and negligence.

Special use permits to retrieve hunting dogs were issued to adjacent hunt clubs and landowners this CY.

9. Fishing

One thousand two hundred and seven fishing visits resulting in 4,806 activity hours were recorded during the year. Fishing is permitted year round on Lake Drummond from sunrise to sunset to anyone holding a Virginia fishing license. Success is highest during the spring season with speckles, fliers, bluegills, and catfish being caught.

Fishing access is by boat through the Feeder Ditch to Lake Drummond. However, during the past season a number of day permits were issued to allow access from the Suffolk side of the swamp. Daily limits on vehicles were never reached, reflecting a small demand at this time.

11.&12. Wildlife Observation and Other Wildlife Oriented Recreation

Activities such as hiking, biking, boating, photography and permitted vehicular access accounted for 4,887 visits resulting in 17,550 activity hours. Most of this use was associated with boating, biking, and visits by land vehicles. Vehicular access is permitted for individuals holding educational, public relation, and research permits.

Although the roads are quite open and are often long and wide, they provide excellent areas for wildlife observation where animals are sometimes seen in ditches and feeding along road edges. Many of the roads are difficult for bicycling due to their sandy composition. However, when roads are good, biking is an excellent way to see more of the swamp on a single trip. The refuge and Dismal Swamp Programs sponsored a 20 mile bike hike into the swamp on November 7. Due to cold weather conditions the event drew only 11 participants.

Boat access into 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 boat 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 Engineers 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.

13. Camping

Camping is not permitted on the refuge although the Army Corps of Engineers operate and maintain a campground on the Feeder Ditch near Lake Drummond. This facility is used by refuge visitors and has the capacity to serve 50 tents. Another privately owned campground is located north of the Feeder Ditch on U.S. Highway 17.

14. Picnicking

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

17. Law Enforcement

Only two refuge employees had law enforcement authority during the year. Due to the size of the refuge, the number of gates and entrance points, and other responsibilities refuge staff can only address some of the enforcement problems. Major problems include boundary encroachment; vandalism of gates, signs, and equipment; unauthorized entry (especially with motorcycles); night hunting; hunting in closed areas; and probably others we are not aware of.

Good cooperation is received from both Virginia and North Carolina wardens.

A summary of all violations and dispositions for 1981 is as follows:

<u>Offense</u>	<u>Disposition</u>
1 Hunting in a closed area	\$25.00
1 Failure to wear blaze orange	\$25.00
1 Unplugged shotgun	\$50.00
1 Discharging loaded firearm on road	\$50.00
1 Hunting in a closed area	\$25.00
26 Loaded firearms on road	\$25.00 each
2 Pending	
2 Illegal transfer of hunting license	\$25.00 each

18. Cooperating Associations

Nothing to report at present although the potential for a cooperative sales outlet exists in the future pending construction of the Wildlife Interpretive Center on Washington Ditch Road.

19. Concessions

Nothing to report at this time although the USFWS currently has a memorandum of understanding and general plan for permit agreement between itself and the Secretary of the Army. This document outlines efforts to be taken to increase environmental education, interpretative education, and wildland oriented recreation opportunities associated with lands and water on the eastern periphery of the swamp. One element of the plan states that the service will establish a concessionaire agreement with a public boat tour service to operate boat tours originating and terminating on the Dismal Swamp Canal and incorporating the Feeder Ditch, Lake Drummond Reservation, and Lake Drummond. A private boat tour service currently has court approval to operate tours until the Fish and Wildlife Service provides for a contract operated service.

I. EQUIPMENT AND FACILITIES

1. New Construction

a. Water Control Structures

Hubert Engineering completed a contract for soil borings at planned water control structures sites to determine ground structural characteristics.

Crowder Contracting Co., Inc. began work on a contract for five new water control structures in April. Within one month problems developed. There was insufficient ground bearing to support the designed structures. The contract was cancelled with one pipe in the ground at one site and a big hole in the road at the second site.

Due to the extreme drought at the time the refuge staff installed the pipe at the second site in an effort to stop water loss. The refuge's old Garwood crane broke down several times during the project, and with wet weather and groundwater discharge causing bank sloughing the project required considerable more time than planned. Over 400 cubic yards of fill were required to replace the organic muck and provide a firm base for the pipe. Peter Back, FWS Construction Inspector, provided valuable assistance in installing the pipe.

Bill Tate Construction Company completed a contract that involved driving 23 49' piles at 13 locations. Information obtained in the pile driving tests was used by R.O. engineering in the redesign of water control structures. At the end of 1981 the plans for redesigned structures were being reviewed by R.O. and the refuge with a contract to be issued for construction to start in the spring of 1982.

b. Washington Ditch Road Rehabilitation

James H. Lee and Sons Construction Company was awarded a contract for rehabilitation of Washington Ditch Road that involved widening and graveling the road for one mile, and replacing culverts. The project was near completion at the end of 1981.



View of Washington Ditch Road before rehabilitation. The road was very narrow, impassable during high water, and the culverts under the road were falling apart. 1/81



The view from the same point after rehabilitation. 12/81

c. YACC - Refuge Shop

The Young Adult Conservation Corps program provided the refuge with a 40' x 64' Agway building that included a building kit of fixtures and improvements. YACC enrollees and refuge maintenance staff erected the building and poured a 50 cubic yard concrete floor. YACC purchased 920 feet of security fence, septic system installation, insulation, plywood and sheet rock for the walls, gravel for a parking lot, water well and pump. When complete the shop will provide a needed addition to current shop and storage space.

2. Rehabilitation

a. Roads

Over the past ten years trees and brush have overtopped many miles of refuge roads and ditches. Mowing has not been able to keep pace with the work load. Approximately eleven miles of brush and trees were cleared along Cross, Corapeake, Sherrill and Weyerhaeuser Road with the D-6 and KG blade. The trees were cleared back to 40 feet on the off ditch side of the road and between the road and ditch. The cleared roadside is to be planted on an experimental basis with several different legumes and grasses in the spring of 1982.

b. Lake Drummond

The refuge has acquired in the past few years 19 cabins on Lake Drummond. In addition to distracting from the aesthetics of the lake the cabins are a hazard to the visiting public. Five cabins were either dismantled or burned in 1981. Burning the cabins required little

effort but removing the tin roofing material and pilings after burning required considerable time. One cabin was dismantled for salvage but took too much time and was too dangerous. The remaining cabins will be burned in 1982.



Cabin burning on Lake Drummond. Four were burned in 1981 with 12 more scheduled to go in 1982. 11-81

c. Equipment and Facilities

A used portable bridge was purchased for \$2000 with BLHP funds and completely reworked. All rust was removed, some steel I-beams were replaced, a 5th wheel hitch point was replaced, new oak decking and safety guides were installed and the bridge was painted. Total acquisition and rehabilitation costs were less than \$4,000 with a comparable new bridge costing over \$15,000. The bridge will provide quick access over ditches for fire fighting and other management activities.

3. Major Maintenance

Within the refuge boundary there are approximately 140 miles of roadways, 60 water control structures, several wooden bridges, and many miles of boundary. During 1981 73 miles of road were mowed and 26 miles of road graded. Most roads are sand with organic soils and log debris underneath. As log debris decays severe blow-outs can develop. Spot filling of the worst holes with sand and gravel was completed on Washington, Lynn, East, Jericho, Cross, and Corapeake Roads. Two miles of boundary lines were cleared, signs posted and trees painted with yellow bands to identify the property line.

4. Equipment Utilization and Replacement

During the year the refuge received three new vehicles, a GMC dump truck, a Chevrolet pickup, and a Dodge Diplomat Station Wagon. The pickup and station wagon were replacements and the dump truck was a needed addition. A 1963 Ford truck tractor was also obtained off NASA surplus to transport the portable bridge. Other major equipment purchased in 1981 included

a heavy duty tiller and a 14' woods mower. The tiller is to be used to chop and mix roots and vines from graded spoil after the grader makes its first pass. After the tiller, the grader can spread the spoil evenly across the road. The 14' woods mower will permit more rapid mowing of roadways.



The new woods mower attached to the 6600 Ford has been a welcome addition to our mowing equipment. This unit can mow both the roadway and ditch bank. 9-81



Additions and replacements to vehicle fleet. 12-81

In addition to routine maintenance and repairs the following major maintenance was accomplished on vehicles and heavy equipment:

Garwood crane - rebuilt magnet, replaced fairlead
Motorgrader - replaced final drive seals, replaced tie rod
D-6D - constructed engine guard, replaced winch cable
D-4 - rebuilt clutch, pony engine, carburetor and magneto
Lowboy Trailer - painted, modified ramps replaced solenoid and switch on pony engine.
Hardee offset mower - replaced boom
Boom Axe mower - replaced most hydraulic hoses
M-37 - complete brake system replaced

With a maintenance staff of two PFT's and one temporary working on maintenance of structures and improvements there is little time available for repairs of vehicles and heavy equipment. In the past few years more and more equipment and vehicle repairs have been done by local shops, but due to reductions in discretionary funds in FY 82 most repairs will have to be done by refuge staff. This could result in our keeping most equipment running but not getting anything done. Several pieces of equipment are scheduled to be parked if repairs are necessary but some equipment, such as fire fighting pumps, must be kept in running condition.

5. Communications Systems

There were no major changes or improvement in the refuge's communications system in 1981.

6. Energy Conservation

The refuge received an energy conservation award for reducing energy use by 25% in FY 1981. This reduction reflects an energy conservation effort on the part of the staff, reduced grading needs due to weather, and reduced mowing time due to construction activities. It is hoped that in the future the base year used in calculating energy use will not change to FY 81 because the refuge could be penalized for reducing energy use as requested.

7. Other

Other equipment acquired during the year included a lightweight Homelite pump for firefighting, 25 sprinkler units for fire suppression, an air compressor, an air powered grease gun and a water pump for the new shop.

J. OTHER ITEMS

1. Cooperative Programs

Old Dominion University's Office of Dismal Swamp Programs has been cooperating with the refuge since its establishment to encourage, support, coordinate, and initiate research and education programs in the swamp. They currently offer environmental education activities and tours, present slide shows to area schools, and sponsor hikes and canoe trips in the Dismal Swamp. A cooperative agreement has been developed between ODU and the USFWS and is discussed under outdoor classroom

2. Items of Interest

ORP Zeamer attended the day long workshop "Long on Imagination--Short on Supplies" presented by the Suffolk Department of Parks and Recreation on June 18.

Manager Keel delivered five refuge revenue sharing checks for Dismal Swamp totaling 173,334 to the respective cities/counties in Virginia and North Carolina on February 17 and 18. The payments were given press coverage in three local newspapers.

Charles Roe, coordinator for the North Carolina Natural Heritage Program, presented a framed plaque to Refuge Manager Keel on February 19. The plaque recognizes the designation of some 24,000 + acres in the refuge as a National Heritage Area. This designation does not impose restrictions on refuge management activities.



Manager Keel accepting plaque recognizing the North Carolina section of the refuge as a National Heritage Area. 3-81

Mike Vaughan, Assistant Leader of the Cooperative Wildlife Research Unit and Garland Pardue, Unit Leader of the Cooperative Fishery Research Unit at VPI and SU visited the refuge on April 20.

3. Credits

- a. Highlights - Michael Tansy
- b. Climatic Conditions - Thomas Gwynn
- c. Land Acquisition - Allen Carter
- d. Planning - Michael Tansy and Mary Keith Garrett
- e. Administration - Michael Tansy, Charles Marshall, Kathleen Zeamer, Allen Carter
- f. Habitat Management - Mary Keith Garrett, Allen Carter, Thomas Gwynn
- g. Wildlife - Mary Keith Garrett, Thomas Gwynn
- h. Public Use - Kathleen Zeamer

- i. Equipment and Facilities - Michael Bryant, Sally Leary
- j. Other Items - Kathleen Zeamer, Michael Tansy
- k. Feedback - Michael Tansy
- l. Editing - Michael Tansy
- m. Photographic Section - Kathleen Zeamer

K. FEEDBACK

1. Engineering

In engineering and designing buildings and structures, the NWRS sometimes seem to lose sight of a primary responsibility to protect the natural resources of refuges. The next time you see a \$500,000 + office or visitor center, consider the rehab needed on facilities such as water control structures and dikes, which could have been accomplished with those dollars. New offices and visitor centers are needed but modern metal "Butler Type" buildings could serve that function. The aesthetics of metal buildings have improved considerably in the last few years. The private sector has just about completely gone to pre-engineered buildings. Metal buildings are not aesthetically pleasing (in most cases) as architectural monuments but construction dollars can only go so far. There also is a need to take a close look at the very expensive concrete water control structures that are being designed and built. Simpler, less expensive pipe structures can in many cases do the same job.

2. GSA Office Shop-Space

Currently office, shop, and storage space is rented seven miles from the refuge. Rental charges amount to over \$25,000 per year. A safety inspection conducted by the regional safety manager found a long list of safety hazards most of which are due to the physical layout of the facilities and lack of storage space. In addition to the poor physical layout of the office the landlord does not properly maintain the facilities as per the rental agreement. Requests made to GSA concerning the problem have not been acted on. The refuge is at present keeping detailed records of the landlord's failure to comply with the conditions of the rental agreement and is building a case.

The possibility of FWS construction of a metal office building at the new shop site was considered during the year. A "Butler Type" building could be constructed on FWS property at a cost near the value of three years rental. There could be substantial savings to the FWS after the third year and the staff would be out of substandard housing. Due to funding reductions the idea could not receive serious consideration in 1981.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
DISMAL SWAMP NATIONAL WILDLIFE REFUGE
SUFFOLK, VIRGINIA 23434

DEER HUNT REGULATIONS - 1981

The deer hunting areas as shown on the attached maps and as posted will be open to public hunting for white tailed deer only. Hunting shall be in accordance with applicable State and Federal regulations subject to the following conditions:

1. Bag Limit: Virginia- One deer per day, either sex.
North Carolina- Two deer per day. At least one must be antlerless.
All deer killed must be checked out at the check station.
2. Season: October 17, 21, 24, 28, 31 in Virginia and November 6, 7, 13, 14 in North Carolina. Entry and exit via Jericho Lane and Corapeake Road. Hunt may be cancelled during extended drought due to high fire hazard, or if inclement weather renders the roads impassable. Closure shall be a prerogative of the Refuge Manager, Great Dismal Swamp National Wildlife Refuge.
3. Weapons: Shotguns- 20 guage or larger. Hunters may use and have in their possession only buckshot and/or rifled slugs.

Bows- Long bow, recurve, or compound bow permitted in Virginia hunt area only. All arrows in the archer's possession while hunting must be permanently marked with the hunter's name. Bow hunters are permitted to hunt throughout the entire hunt area. However, area three - a 4,300 acre section is set aside for archers only.
4. Weapon Qualification: Applicants must have written certification from a range officer (civilian or military), police officer or State or Federal Wildlife Agency employee stating that they have performed the following qualifications test or tests:

Shotgun: Place three consecutive rounds in a 12-inch bullseye at 30 yards for slugs, or 5 or more pellets in a 20-inch target at 30 yards for buckshot. This is a life-time qualification.

Bow: Place three out of five shots using broad-heads in a 9"x14" chest area of a standard size deer target at 25 yards. This qualification is required once every three years.

Hunters who qualified for previous hunts at other refuges or at Dismal Swamp should state this on the qualification form and if other than Dismal Swamp, send proof of qualification.

5. Application: Forms are available from the refuge office and will be accepted beginning September 1, 1981. All forms must be properly completed and accompanied by the qualification sheet. Incomplete applications will be returned to the applicant. Up to five people may apply together as a party by enclosing applications and qualification sheets for each person in one envelope marked "Party Hunt". Please indicate party leader for mailing purposes.
6. Permits: Federal permits will be mailed to applicants on a first-come, first served basis as applications are received. During the Virginia hunt two hundred permits per day will be issued to gun hunters and fifty permits per day will be issued to archers. In North Carolina, one hundred permits per day will be issued to gun hunters only. The entry points will be open by 5:00 a.m. each day. All hunters must check out at the check station by 6:30 p.m. Permits are non-transferable and are valid only for the persons to whom they were issued. All hunters will be requested to complete a questionnaire at the end of each hunt day.
7. Required Clothing: All hunters will be required to wear a minimum of 400 square inches (total) of blaze orange on the chest, shoulders, and back during the hunt. A Blaze orange hat is required also.
8. Age Limits: Each hunter under age 18 must be accompanied by an adult and remain under their immediate supervision at all times.
9. Scouting: Hunters will be permitted to scout the Virginia hunt area on Oct. 3 and the North Carolina area on October 24. Rain-dates will be October 10 for Virginia and October 31 for North Carolina. Hunters may enter the refuge at the Jericho Lane and Corapeake entrances at 8:00 a. m. and must leave the refuge by 3:30 p. m. No firearms will be permitted during the scouting period and all hunters must have their permits with them in order to enter the refuge by vehicle.
10. Prohibited: Unauthorized entry outside of the hunt area. Possession of loaded and/or uncased firearms in or on a vehicle. Possession of loaded firearm on refuge roads, including right of ways and ditch banks. Driving motorized vehicles off of established roads. Using nails, wire, screws, or bolts to attach stands to trees. Rifles, pistols, dogs, fires, camping, and littering.
11. Fire Danger: You are asked to be especially careful when smoking. This refuge has the potential for "ground fires" which can burn as deep as three (3) to four (4) feet. If, in the event you discover a fire or notice smoke by sight or smell, please notify a refuge employee as soon as possible.

For further information, contact the Refuge Manager, Great Dismal Swamp National Wildlife Refuge, P. O. Box 349, Suffolk, Virginia 23434 or phone 804-539-7479.

HAVE A SAFE AND ENJOYABLE HUNT!

U.S. Fish and Wildlife Service
Department of the Interior
Great Dismal Swamp National Wildlife Refuge
P.O. Box 349, Suffolk, Virginia 23434
804-539-7479

QUALIFICATION FORM

(Last Name) (First Name) (Middle Initial)

(Street Address, Route, or Box No.) (City) (State) (Zip Code)

Type of weapon used for qualification (Check one)

Shotgun ☐

Bow ☐

☐ I would like to waive the qualification standards test since I have qualified previously. I qualified at _____ in ____ (year).

1. Shotgun: Place three consecutive rounds in a 12-inch bullseye at 30 yards for slugs or 5 or more pellets in a 20 inch target at 30 yards for buckshot.
2. Bow: Place three out of five shots using broadheads in a 9"x14" chest area of a standard size deer target at 25 yards.

I certify that I witnessed the above named individual qualify in accordance with the preceding standards.

(Signature)

(Date)

U. S. Fish and Wildlife Service
Department of the Interior
Great Dismal Swamp National Wildlife Refuge
P. O. Box 349, Suffolk, Virginia 23434
804-539-7479

1981 Deer Hunt Application

Please complete this application as well as the qualification information on the reverse side and mail, to the Refuge Manager, Great Dismal Swamp National Wildlife Refuge, P.O. Box 349, Suffolk, Virginia 23434.

Name: _____

Address: _____

Phone: _____ home

Social Security _____

_____ work

Type of hunt (check one)

Type of weapon (check one)

Individual ☐

Shotgun ☐

Party ☐

Bow ☐

Rank choice of hunt dates (ie. 1st, 2nd, etc.): Oct. 17 _____

Oct. 21 _____

Oct. 24 _____

Oct. 28 _____

Oct. 31 _____

Nov. 6 _____

Nov. 7 _____

Nov. 13 _____

Nov. 14 _____

GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

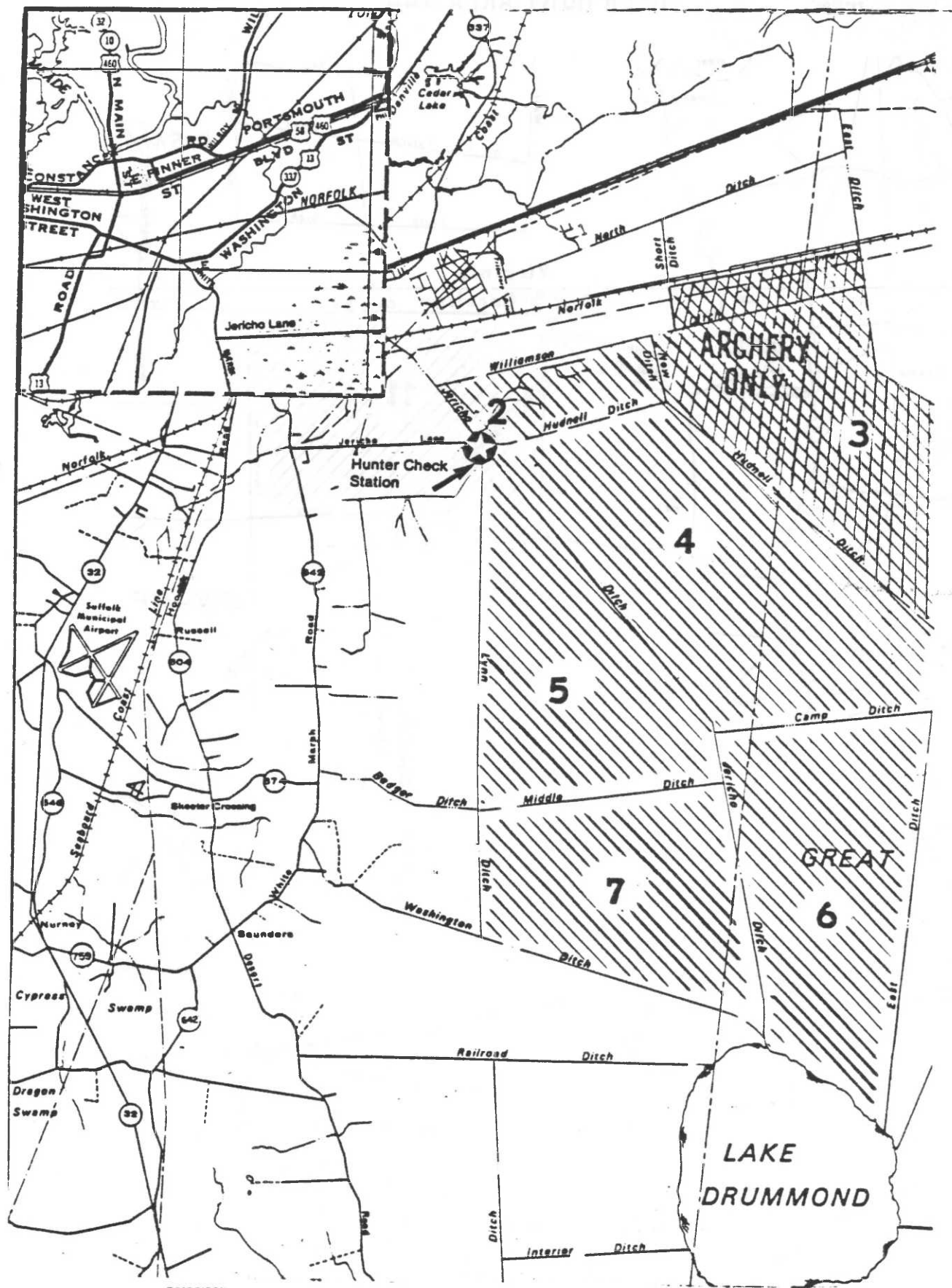
VIRGINIA AND NORTH CAROLINA

UNITED STATES
FISH AND WILDLIFE SERVICE

DEER HUNT AREA

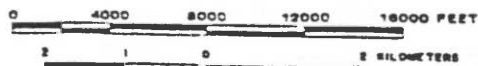
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76°30'00"



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

BOSTON, MASSACHUSETTS MARCH 1977
POSTED 2



MAGNETIC
7° 0' 53" MEAN
DECLINATION
1973

GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE

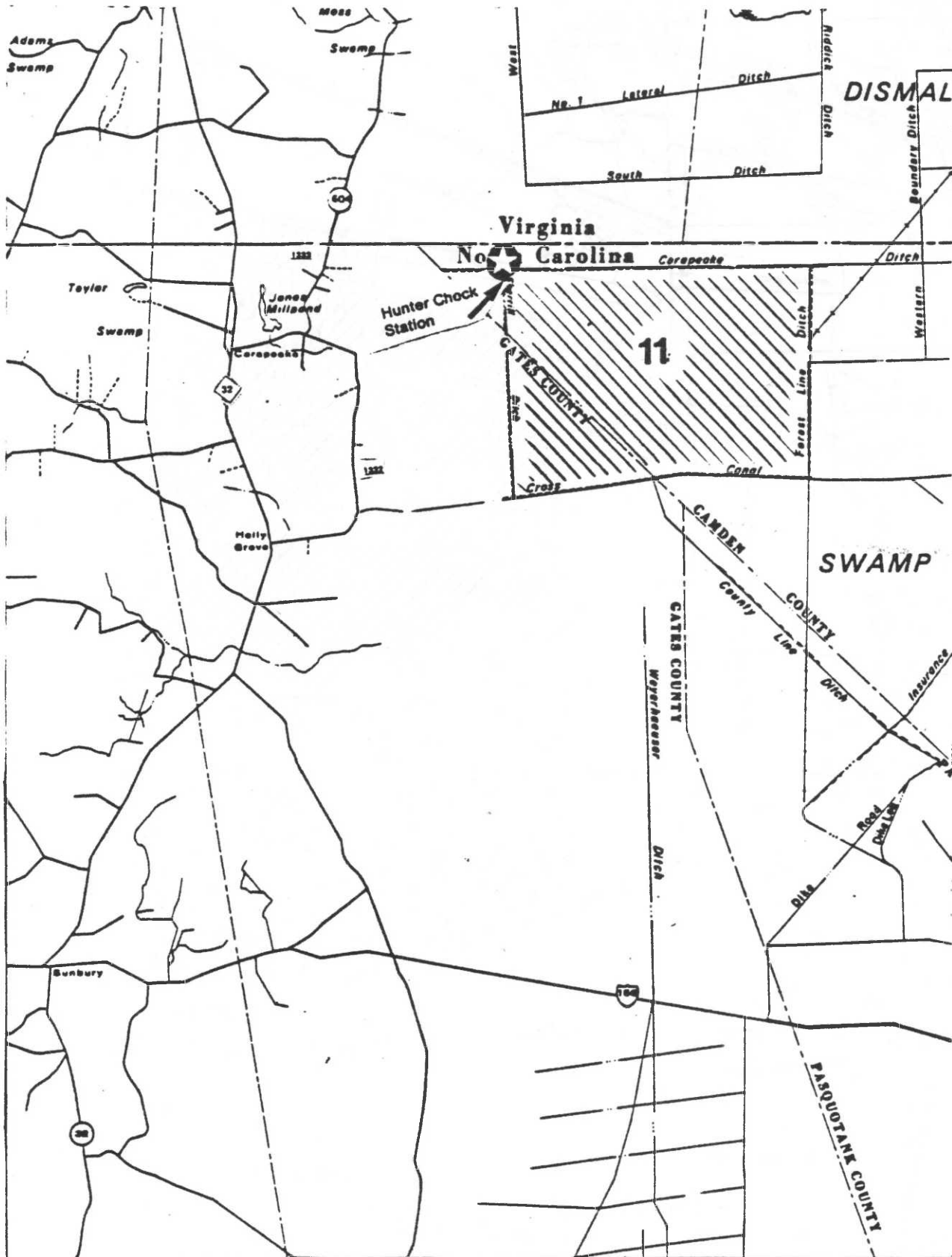
UNITED STATES
DEPARTMENT OF THE INTERIOR

VIRGINIA AND NORTH CAROLINA

UNITED STATES
FISH AND WILDLIFE SERVICE

76°35'00"

DEER HUNT AREA 76°30'00"



COMPILED IN THE DIVISION OF REALTY
FROM SURVEYS BY U.S.G.S. AND U.S.F.A.W.S.

BOSTON, MASSACHUSETTS MARCH 1977
POSTED: 12/77



MN 7° 0' 53" MEAN
DECLINATION
1973

NANSEMOND NATIONAL WILDLIFE REFUGE
Suffolk, Virginia

ANNUAL NARRATIVE REPORT
Calendar Year 1981

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

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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° - 95°. The average summer temperature is 80°, and average winter temperature is 50°. Average annual rainfall is 48 inches with 3 inches in one 24-hour period the average maximum rate. Average annual snowfall is 8 inches, with 210 frost-free days. The last frost averages April 1 and first frost October 15.

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 vegetation is dominant 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. Croplands

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.

No eagles were found at Nansemond Refuge during the January 1981 eagle count. It is quite likely that eagles will be spotted here in the future, since the species is making a comeback in the Chesapeake Bay region.

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 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

Whitetail deer, cottontail rabbit, and eastern gray squirrel use the timbered field edge.

10. Other Resident Wildlife

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