

POTOMAC RIVER NATIONAL WILDLIFE  
REFUGE COMPLEX

MASON NECK NATIONAL WILDLIFE REFUGE  
Lorton, Virginia

OCCOQUAN BAY NATIONAL WILDLIFE REFUGE  
Woodbridge, Virginia

FEATHERSTONE NATIONAL WILDLIFE REFUGE  
Woodbridge, Virginia

ANNUAL NARRATIVE REPORT

Calendar Year 2000

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

REVIEW AND APPROVALS

POTOMAC RIVER NATIONAL WILDLIFE REFUGE COMPLEX

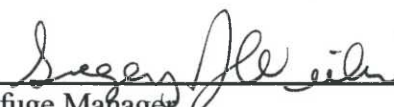
MASON NECK NATIONAL WILDLIFE REFUGE  
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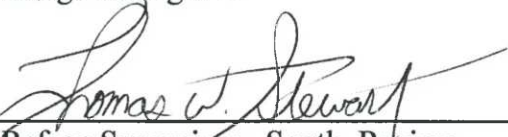
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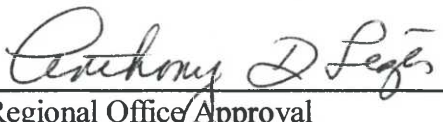
FEATHERSTONE NATIONAL WILDLIFE REFUGE  
Woodbridge, Virginia

ANNUAL NARRATIVE REPORT

Calendar Year 2000

  
Refuge Manager 4/7/01  
Date

  
Refuge Supervisor - South Review 6/27/01  
Date

  
Regional Office Approval 7/16/01  
Date

# POTOMAC RIVER NATIONAL WILDLIFE REFUGE COMPLEX

## Woodbridge, Virginia

### INTRODUCTION

In 1998, Mason Neck National Wildlife Refuge, Occoquan Bay National Wildlife Refuge, and Featherstone National Wildlife Refuge, were reorganized into the Potomac River National Wildlife Refuge. Reasons for the reorganization were the realization that Occoquan Bay NWR rivaled Mason Neck NWR in complexity and to better apportion staff and resources to the needs of the three refuges. All three refuges border Occoquan Bay at the junction of Fairfax County and Prince William County. Mason Neck NWR on the northeast side of the bay is the oldest, being established in 1969 and the largest at 2,277 acres. As the first national wildlife refuge specifically established under the Endangered Species Act for bald eagles, its focus is on forest, marsh and riverine habitat important to the bald eagle. On the southwest side of Occoquan Bay is Featherstone NWR, 325 acres of marsh and riverine habitat important to both waterfowl and eagles. Occoquan Bay NWR is on the west edge of the bay between the other two refuges and is the most recently established of the three. It was established in 1998 as a combination of land previously acquired as Marumsco NWR and recently acquired military surplus lands to form the new 640 acre refuge. Its primary values are the extensive grasslands interspersed with marshes and early successional shrub and forest areas with value to neotropical migrants and grassland dependent species.

The office for the complex is located in Woodbridge, Virginia, about 9 miles from Mason Neck and a mile from Occoquan Bay and Featherstone Refuges. The office is in GSA managed rental space in a store front in a small strip mall.

## MASON NECK NATIONAL WILDLIFE REFUGE

### Lorton, Virginia

#### INTRODUCTION

Mason Neck National Wildlife Refuge is located in Virginia, 18 miles south of Washington, D. C. Nestled on an 8,000 acre boot-shaped peninsula jutting out into the Potomac River, the refuge is dominated by mixed hardwood and pine forests, high bluffs, and about 300 acres of freshwater marshes. From the initial acquisition of 845 acres in 1969, Mason Neck has grown to 2,277 acres, including 789 acres leased in 1982 from the Northern Virginia Regional Park Authority. Until 1974, the Mason Neck National Wildlife Refuge was a subunit of Blackwater National Wildlife Refuge, based out of Cambridge, Maryland. Mason Neck then became an independent unit with a manager and two subunits of its own, Featherstone Refuge and Occoquan Bay Refuge (then known as Marumsco Refuge).

The refuge was established in 1969 as the Nation's first bald eagle refuge using funds provided under the Endangered Species Act. Eagles nested and wintered on the peninsula as far back as colonial times but in the 1950's and 1960's, succumbed to development and pesticides. With greater awareness, better protection nationally and regionally of the birds and their habitat, and reduction in pollution, the eagle population has been making a recovery. In 1999, there were 3 eagle nest sites on the refuge, one on the adjacent state park, one on the adjacent Gunston Hall Plantation, and two on private lands elsewhere on the peninsula. In an expanding ring, there are at least 3 more nests within a five mile radius on the Virginia side of the Potomac River and reports of several more nests on neighboring Maryland lands.

Though located within easy driving distance for approximately 10 million residents of Virginia, Maryland, and Washington, D. C., the refuge has an annual visitation of only around 20,000 people. This is due to limited public use facilities and competition from over 400 nearby Federal, state, regional, county, and community parks. On the Mason Neck peninsula alone, the refuge is bordered by Mason Neck State Park, Gunston Hall Plantation, and Pohick Bay Regional Park. Together they protect over 6,000 acres of the 8,000 acre peninsula. Working together in a loose association entitled the Mason Neck Management Area, the federal, state, and regional government agencies can share manpower and material resources and minimize duplication of effort by coordinating recreational activities. Each can focus on its strengths of general recreation, outdoor or wildlife oriented recreation, resource protection, and historical interpretation and depend on its neighbors to help provide a variety of opportunities without anyone stretched beyond their mission.

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## A. HIGHLIGHTS

Mason Neck and its environs continue to be a locally treasured haven for nature enthusiasts as reflected in both the number visitors who use the public trails for wildlife observation or outdoor recreation and even more in ample turn out of local volunteers who participate in the various regular wildlife surveys (i.e., Great Blue Heron winter nest count, bald eagle nest survey, Christmas Bird Count, deer spotlight count, and others) or restoration projects (Boy Scouts of America adoption of Woodmarsh Trail). The most significant management activity at the Refuge for this year was the annual hunt for white-tailed deer, described below.

## B. CLIMATIC CONDITIONS

In the Washington area, every summer month in 2000 was cooler than average, at least since 1972, even though it was the eleventh warmest summer for the United States in more than 100 years. There were only nine 90-degree days, the fewest ever at Reagan National Airport, and the fewest in the Washington area since 1906. The maximum temperature in July was 89 degree Fahrenheit. The winter months were also relatively mild. A heavy snow on January 25 resulted in Federal government closure; however the Refuge office remained open and three of the staff were able to make it in. In January, the minimum temperature was 27 degrees Fahrenheit. The annual precipitation was 39 inches; annual snowfall was 18 inches.

## C. LAND ACQUISITION

### 1. Fee Title

The Accokeek Creek NWR proposal encompasses 7,000 acres including a 4,500-acre peninsula located in the southeastern portion of Stafford County, Virginia, approximately 50 miles south of Washington, D. C. The peninsula, locally known as Crow's Nest, is the largest unfragmented mature hardwood forest in the Chesapeake Bay watershed. The peninsula is surrounded by the freshwater tidal wetlands of Accokeek and Potomac Creeks. The property provides important nesting and migration habitat for many species of birds, especially Neotropical species, raptors, and waterfowl. This 4 ½ mile long peninsula, the majority of which is one ownership, is threatened by intensive logging operations and residential development. Highlights of the property include:

- The 4,500-acre unfragmented, mature forest support numerous species of Neotropical migrants, including several regionally declining species identified by Partners for Flight: Wood Thrush, Prairie Warbler, Black-throated Blue Warbler, Worm-eating Warbler, Kentucky Warbler, and Swainson's Warbler.

- The peninsula is surrounded by 705 acres of freshwater tidal marshes that accounts for >50% of all marshes in Stafford County, and support many species of waterfowl and commercially and recreationally important fish species.
- The peninsula has three nesting pairs of the federally threatened American bald eagle, and the surrounding marsh potentially support the federally listed sensitive joint vetch (*Aeschynomene virginica*) and small whorled pogonia (*Isotria medeoloides*).
- Crow's Nest is rich in Native American, colonial and Civil War history.
- A 3800-acre core portion of the proposal is owned by a single landowner.
- The preservation of Crow's Nest enjoys enormous local and regional and Congressional support. Partners campaigning for preservation of the property include the Chesapeake Bay Foundation, The Trust for Public Land, Stafford County, and Virginia Department of Conservation & Recreation. Stafford County has passed a resolution unanimously supporting the creation of a NWR.
- There are very few management issues or conflicts at Crow's Nest. The property is largely owned by a single entity, has no buildings or improvements on the property except a historical cemetery, and has no contaminant problems.

The PPP was signed in December 1999 and public meetings were held in February 2000. Two nights of public meetings were held in Stafford related to the proposed Service acquisition of the property known as Crows Nest. The initial land bloc targeted for acquisition is approximately 3800 acres with a total acquisition boundary of about 7000 acres. Between 170 and 200 people attended the meetings and all expressed strong support for the project. Few issues were expressed and those were mostly related to hunting - either wanting more or not in favor of it at all. Questions from neighboring landowners mostly related to how being included in the acquisition boundary would affect them. All expressed support for the project.

The draft EA was distributed in August 2000. Based on public comment, the acquisition boundary was expanded to include the hills north of RT 608 up to the top of the drainage divide. The FONSI was signed by the Regional Director in December 2000 and the Final Environmental Assessment for the proposed Accokeek Creek NWR was sent to the Washington Office for review and approval by the Director.

Congressman Herbert Bateman (R-VA 1st) died in his sleep on September 11, 2000. Mr. Bateman had been ill and was not going to run for re-election. While none of the current refuges in the complex were in Mr. Bateman's district, the proposed Accokeek Creek NWR was and he had supported the refuge. In December, Refuge Manager Weiler met with Congresswoman-elect JoAnn Davis. Ms. Davis was elected to fill the vacancy of

Congressman Bateman. Ms. Davis, two of her staff, several Stafford County Supervisors, and a number of local residents toured Crows Nest and discussed the proposed acquisition of the property by FWS and the creation of Accokeek Creek NWR. Ms Davis is fully supportive of the refuge. Staff present were John Goolrick - District staff, Fredericksburg and Joe Shumaker, Hill staff.

Another area that was considered in 2000 for acquisition was Meadowood Farms near the Mason Neck NWR. Locals wanted to see it protected from development by its owner and proposed acquisition by the Service. There were few benefits to be gained by the Service in acquiring the property except for potential exchange with the Northern Virginia Regional Park Authority to gain fee title to lands leased by the Service from the Park Authority. A three-way exchange of the Service giving surplus lands from the Lorton Prison to the developer who would give the farm to the Park Authority who would then give the Service the leased land fell through due to conflicting valuation of the farm and leased lands. BLM (Bureau of Land Management) then stepped in expressing interest in the farm as a demonstration site for their wild horse and burro program and dropping the Service and Park Authority out of the picture. BLM is continuing. BLM is ready to issue several contracts for HazMat survey and appraisals and expects to complete the exchange before the end of the year. However, the recent GAO report requesting that all land purchases and exchanges being conducted by BLM and Forest Service may delay this. If the exchange involving BLM falls through we could expect renewed pressure to bring the Service back into this issue.

2. Easements - Nothing to Report

3. Other - Nothing to Report

#### D. PLANNING

1. Master Plan - Nothing to Report

2. Management Plan - Nothing to Report

3. Public Participation

On August 11, 2000, Mason Neck NWR was visited by Linda "Toddy" Puller, Virginia State Senator for this district. Mrs. Puller was recently elected to this position following the retirement of Senator Joseph Gartlan. The visit was part of a general tour of the Mason Neck hosted by local residents Gary Knipling, Julie Kutruff, and Diana Rock. Refuge manager Weiler and ORP Schultz took them for a tour of the refuge highlighting the heronry and shoreline activity.

#### 4. Compliance with Environmental Mandates

Maintenance Worker Boska began the "closed loop" method of procuring motor oil through DOD. The closed loop system required the procurement and use of re-refined motor oil for all refuge vehicles and equipment. After use, the oil is picked up by a used oil distributor.

In February, the refuge worked with the VA field office to review a permit application to construct a sewage treatment plant on Mason Neck with discharge into Belmont Bay near the refuge. While considered a small plant discharge rates on the permit are for a daily average of 250,000 gals with a max of 375,000 gals. While the permit has not been issued it appears that VDEQ (Virginia Department of Environmental Quality) is going to approve it. Refuge manager Weiler attended a public hearing on a proposed wastewater treatment plant. The bottom line is that VDEQ does not evaluate any criteria except the water quality discharge. Therefore, it is almost a certainty that this permit will be issued which could result in a development of over 500 homes near the refuge. The landowner would still need to get approvals from the county which (at the moment) is opposed to the project. The State Water Control Board gave final approval in April. The permit was opposed by both Fairfax and Prince William counties as well as by local citizens and the refuge.

On January 4, a representative from the Regional Office conducted an environmental audit of the maintenance shop and compound. A shortage of flammable storage cabinets, approved gas cans, and the need for adequate eyewashing facilities highlighted the discrepancies noted during the visit. The Regional Office provided \$4,000 in additional funding to correct discrepancies, and purchase additional equipment. The Regional Office also provided a pollution prevention plan. As a result of the audit, an asbestos survey was required. On April 25, the survey of the maintenance shop found the first layer of shingles on the cinderblock portion of the shop contained asbestos. This will be addressed when the roof is replaced.

In September, one of the communities on the north side of the Mason Neck peninsula applied for a permit to construct a private marina. The refuge will be working with the Virginia Field office to evaluate and comment on the application.

In January, Refuge manager Weiler worked on a Pollution Control Plan with maintenance worker Boska.

#### 5. Research and Investigations

Staff coordinated studies and surveys-

Deer spot-lighting

Great Blue Heron nest survey

Great Blue Heron reproductive survey  
 Bald Eagle reproductive surveys  
 Bald Eagle roost use at refuge and park  
 Bald Eagle Winter Count  
 Forest interior/upland bird point count surveys  
 Bald Eagle surveys along the Potomac River

Collateral surveys by permit on refuge-

Christmas Bird Count - Audubon Society  
 Raccoon/Rabies survey - Virginia Polytechnical Institute State University  
 MAPS station (2) - Institute for Bird Populations (IBP)  
 Duck banding - Virginia Department of Game & Inland Fisheries  
 Snake community survey - Terry Creque, George Mason University  
 Deformed frogs surveys at Mason Neck - Ecological Services, CBFO  
 Mid-winter raptor survey - The Raptor Society  
 Bluebird Nest Box - VA Bluebird Society  
 Amphibian egg mass survey

Wildlife biologist Witt continued with a pilot field study on the bald eagles along the Potomac River during the spring. He found that completing surveys during the weekend were inappropriate as the general/recreational boat activity along on the river was clearly influencing the number of Bald Eagle observed from the boat compared with those counted during the weekday (Monday through Friday). The river was divided up into three segments and each segment will be surveyed two to three times during the breeding and non-breeding season in the spring and fall. Their abundance and distribution along the Potomac River will be evaluated based upon the quality and quantity of available perching and foraging habitat along the river.

6. Other - Nothing to Report

E. ADMINISTRATION

1. Personnel

- Gregory Weiler, Refuge Manager, GS-13, EOD 11/23/97 from WASO, Arlington VA, PFT
- Joseph Witt, Wildlife Biologist, GS-11, EOD 6/20/98 from BLM, PFT
- Yvonne M. Schultz, Outdoor Recreation Planner, GS-9, EOD 10/30/83, PFT
- Martin McClevey, Outdoor Recreation Planner, GS-5, EOD 1/17/99 from NPS, PFT, GS-7 effective 1/2000 PFT

- Barbara Mitchell, Secretary, GS-5, EOD 12-14-80, GS-6 effective 5/1/94, PFT
- Stephen P. Boska, Maintenance Worker, WG-8, EOD 8/26/90, PFT
- Sandy C. Spencer, SCEP Wildlife Biologist, GS-7, EOD 5/22/2000, PPT.

Meetings and Travel Sessions for refuge personnel not listed elsewhere:

March 13-17 Barbara Mitchell attended the Administrative Officer workshop at NCTC

April 19 - 20 Resource Conservation and Recovery Act Waste Management Regulation Course, NCTC, Boska

August 1-3 Volunteer Recruitment and Management, Atlantic City, NJ, McClevey

August 7-9 Sandy Spencer attended a SCEP workshop in Annapolis, MD

August 14-17 Outdoor Recreation Planner Workshop, NCTC, Schultz, McClevey.. Schultz served on the planning committee for the workshop which was in conjunction with the Project Leaders Meeting

August 14-17 Project Leader Meeting at NCTC - Weiler

September 6-8 MCI Acquisition Refresher Training - Schultz

October 17-21 NAAEE Conference in South Padre Island, TX - Schultz

December 4-8 Introduction to Visitor Services, NCTC, McClevey

## 2. Youth Programs

In February of 2000 an Adopt a Trail agreement was signed between Boy Scout Troop 964 of Dale City, Virginia and the Potomac River NWR Complex. This agreement has enabled members of this troop to perform maintenance on the Woodmarsh Trail. Several work parties supervised by adult coordinator Rose Thomas routinely patrolled to look for vandalism and to identify hazards. They also performed maintenance such as clearing storm damage, removing encroaching limbs, installing water control structures and maintaining the closed area during the nesting of bald eagles. In 2001, two scouts are scheduled to complete special projects on this trail to fulfill requirements for the rank of Eagle.

In July of 2000, Boy Scout District Eagle Coordinator Bill Ludwig was given a tour of the Mason Neck Refuge to assess potential Eagle Scout projects. He then placed a list of these projects on the local Scout web page.

In October of 2000, Scout Andy McLean completed an Eagle project on the Mason Neck Refuge by replacing a foot/ATV bridge on the refuge boundary. The 18 foot long bridge spans an intermittent stream drainage and is capable of supporting 1000 pounds, specifically our Honda 4 wheel all terrain vehicle.

### 3. Other Manpower Programs

In May the Complex acquired a SCEP (Student Career Experience Program) wildlife biologist trainee from George Mason University, Sandy C. Spencer. The SCEP program was established by the Service to facilitate the recruitment of high quality employees into Federal service, to support equal employment opportunity objectives, to provide exposure to public service, and to promote education. The Potomac River NWR Complex sought acquisition of a SCEP student to assist with the increased workload in the biology section resulting from the acquisition of an additional refuge (Occoquan Bay). During the summer and fall of 2000, SCEP Biologist Spencer worked for the Potomac River NWR Complex on such projects as the Deer Management Environmental Assessment for Occoquan Bay, the annual public hunt at Mason Neck, and various wildlife surveys at both refuges. Upon completion of her degree requirements in 2000 (Masters in Biology, Concentration in Environmental Science), Ms. Spencer will be converted a career-conditional wildlife biologist 486, GS9 in January 2001. Biologist Spencer will continue at the Complex until her transfer to Eastern Virginia Rivers National Wildlife Refuge Complex in Warsaw, Virginia, in June, 2001.

### 4. Volunteer Program

In June of 2000 Marty McClevey, Outdoor Recreation Planner for the Complex and Volunteer Coordinator, attended Volunteer Management and Recruitment Training in New Jersey. It has taken a great amount of time and effort in coordinating the Scouting aspects of the volunteer program. An interim data base has been set up to more efficiently track volunteers, their hours and accomplishments.

Volunteers have been used for various biological research projects including small mammal studies, great blue heron nest counts, eagle surveys, deer spotlight counts, vegetation studies and the Junior Duck Stamp program.

### Special Recognition:

Bill Mitchell, husband of Administrative Secretary Barbara Mitchell, and hunter Dan Sheppard, returned this fall to assist our Biologists at the deer check station during the four days of the managed hunt. Their assistance with taking weights and measurements enormously facilitated the timely processing of deer as they were brought in, particularly during busy periods.

Rose Thomas, Adopt a Trail coordinator for Boy Scout Troop 964, has worked very hard at involving scouts in the maintenance of the Woodmarsh Trail.

Volunteer Services Report FY 99-00										
# volunteers by age	Under 18		18-35		36-61		over 61		Total	
	FY99	FY00	FY99	FY00	FY99	FY00	FY99	FY00	FY99	FY00
Mason Neck	22	34	5	12	40	52	15	7	82	105
Occoquan	218	412	20	90	20	118	5	7	263	627
#hours by Activity Category					Mason Neck		Occoquan Bay			
					FY99	FY00	FY99	FY00	FY99	FY00
Monitoring & Studies	Survey & Censuses				472	1384	378	724		
	Studies & Investigations				30			270		
Habitat Restoration	Wetland Restoration									
	Upland Restoration						110	100		
	Riverine Restoration						450			
Habitat Management	Water Level Management					86				
	Moist Soil management									
	Graze/Mow/Hay									
	Forest Management									
	Fire management					16				
	Pest Plant control								40	
Fish & Wildlife Management	Bird Banding								16	
	Disease Monitor/Treatment									
	Reintroductions									
	Nest Structures								25	
	Pest/Predator/Exotic Control									
Coordination Activities	Interagency Coordination									
	Private Lands Activities									
Resource Protection	Law enforcement									
	Permits/Economic Use Mgmt									
	Contaminant Investigation									
	Contaminant Cleanup									

	Cultural Resource Management				
	Land Acquisition Support				
Public Education & Recreation	Provide Visitor Services	299	155	559	1400
	Outreach				3
Planning & Administration	Comprehensive Conservation Plan				
	General Administration				
TOTAL HOURS		801	1641	864	2587

## 5. Funding

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Source</u>
1995	\$299,000	1260
1996	\$319,000	1260
1997	\$278,900	1260
1998	\$441,000	1260
1999	\$411,000	1260

On June 13, ORP Schultz delivered revenue sharing checks in the amounts of \$73,901.00 for Fairfax County and \$28,379.00 for Prince William County. Fairfax County never hesitates to accept their check and usually calls to see when it is coming. On the other hand, Prince William County has been very reticent the last two years to accept their check without a customer account number at hand.

## 6. Safety

On July 21 a workman, contracted to drill the new well at the maintenance shop, lacerated his finger on sheet metal. Maintenance Worker Boska cleaned and bandaged the wound. The workman denied transportation to a nearby hospital, and stated he would see a physician near the company's home office. Boska made a follow-up call to the workman's company. The injured workman did receive further medical treatment.

Four staff members (McClevey, Witt, Boska, and Schultz) took their third Lymes shots and one staff member (Spencer) started the series on June 28 through Prince William County Public Health.

On August 2, when attaching equipment to the Deere 1250 tractor, Maintenance Worker Boska dislocated his left thumb. Boska applied first-aid and did not require further medical attention.

The Complex now has expanded search and rescue capabilities after entering into a partnership with Trail Search, a volunteer organization of police officers and emergency

medical personnel. Trail Search have the ability to rapidly respond to the need for search and rescue and to provide initial medical care via trail bikes. They also will provide logistic support for larger operations, emergency services for special events, and will put on demonstration programs.

Biologist Spencer took the standard motor boat operators course during the third week of September.

All staff members who were planning on participating in prescribed fire or law enforcement took the standard law enforcement physical through Pratt Medical in March.

#### 7. Technical Assistance

Refuge manager Weiler met with Mason Neck Management Area managers in January to maintain lines of communications.

In March, an Army research team requested and received permission to test some new antenna designs from the refuge maintenance area. This gave them elevation and a clear shot over Occoquan Bay.

In June, ORP Schultz who is on the regional special events strike force, served a detail in White Sulphur Springs. It was the 100<sup>th</sup> anniversary of the fish hatchery and drew dignitaries and Service representatives from across the nation.

On March 18 staff volunteered to help judge the Prince William Regional Science Fair.

RM Weiler served on the Fairfax County Deer Management Committee.

#### 8. Other Items

Manager Weiler participated in the Chesapeake Bay/Susquahannah Ecoteam with ORP Schultz participating on the outreach committee.

In June, Refuge manager Weiler was invited to and attended the annual meeting of the U.S. National Ramsar Committee (Ramsar is the Convention on Wetlands, first signed in Ramsar, Iran, 1971). Refuges from the Chesapeake Bay area as well as Forsythe, Okefenokee, and Ash Meadows were represented.

## F. HABITAT MANAGEMENT

### 1. General

Located along the Potomac River and Occoquan Bay, the Refuge consists of 2,277 acres of the over 8,000 acre Mason Neck peninsula and consists of the following habitat types:

<u>Habitat</u>	<u>Acres</u>
Woodland	1,883
Wetland	364
Grassland	15
Brush	10
Administrative areas (i.e. buildings, parking lots)	5

Habitat management has primarily been directed at providing relatively undisturbed habitat for the bald eagles and maintaining and creating habitat for wintering and migrating waterfowl and other resident wildlife populations. Only support activities were accomplished at Mason Neck this year as focus was put on getting Occoquan Bay NWR up and running. As programs settle at Occoquan Bay, staff will be able to take a more balanced approach to all the complex units.

### 2. Wetlands

The wetlands are split between the broad Great Marsh fronting onto the Potomac in the arch of the boot shaped peninsula and High Point Creek, an impounded drainage system near the toe of the peninsula. The Great Marsh has several meandering creek mouths and is dominated by wild rice, spatterdock, and other open marsh species favored by a constant tidal exchange. High Point Creek is narrow, protected by forested promontories except at the narrow diked mouth with little exchange of water beyond storm surges and runoff.

High Point Creek Marsh was drawn down during the summer to provide better foraging for young eagles and great blue herons. The drawdown provides an additional benefit for river otters, which can be seen feeding upon the crayfish in the upper reaches of the High Point Creek Marsh in the spring.

On February 2, 2000, Boska bulldozed a small basin area on High Point Road near the gate for Little Marsh Road as an experimental vernal pool for amphibians. The following spring turtles were observed basking on its banks. This area will be compared to the study areas Thomas Jefferson High School for Science and Technology has at vernal pools along High Point Road and near the trail heads.

The Region V Anuran Call Count Survey was conducted at 10 points distributed along river shore, wetland edge, and temporal wetlands on the Refuge (and at Occoquan Bay) this year to evaluate habitat use by anurans and by which species. Refer "Other Resident Wildlife" Section G below.

### 3. Forests

Upland hardwood forest (1,883 acres) is the predominant cover type on the Refuge and the peninsula. Dominant deciduous species include white oak (*Quercus alba*), chestnut oak (*Quercus prinus*), red maple (*Acer rubrum*), American beech (*Fagus grandifolia*), and yellow poplar (*Liriodendron tulipifera*). Virginia pine (*Pinus virginiana*) and loblolly pine (*Pinus taeda*) constitute the principle conifer species. Thirty-six species of trees have been recorded on the refuge.

No direct management of the forested areas of the Refuge was conducted. Of increasing concern is the wide distribution of numerous stands of Japanese stiltgrass (*Microstigeum vimineum*) throughout the forest. This invasive exotic is highly competitive and inhibits the regeneration of tree seedlings where it occurs. To date, the distribution, coverage, and rate of spread has not been measured. The Refuge is currently negotiating with a George Mason University graduate student to obtain this data in preparation for making the appropriate management decisions for its control or eradication.

### 4. Croplands - Nothing to report

### 5. Grasslands

Only about 15 acres of grasslands remain on the refuge. During colonial times and up to the early 1900's, numerous acres was used for agriculture (crops and dairy) and logging. Natural succession has converted the grasslands into hardwood forests leaving basically a monotypic habitat of mixed hardwoods with small patches of conifers. Most of the refuge has not been logged in 40 to 50 years and some areas have stands of 100+ year old trees.

Grassland management activities are directed at rotational and cyclical mowing of designated fields. One-third (approximately two acres) of the environmental education field is mowed annually as part of a three year rotational strip mowing program designed for educational interpretation and habitat diversity. Maintenance worker Boska mowed the Environmental Education field and the old dairy area at the end of Sycamore Road to maintain these grasslands. Other areas mowed included the weather station field near the maintenance shop and the old home site at the end of Anchorage Road.

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. WILDLIFE

##### 1. Wildlife Diversity

Mason Neck is located just 18 miles south of our Nation's capital and is adjacent to a rapidly growing metropolitan area where habitat is constantly being altered and degraded. The Refuge is located at the end of a boot-shaped peninsula which extends out into the Potomac River and provides a relatively remote area of upland forests and freshwater marshes which are frequented by a diverse group of wildlife species. The mature upland hardwoods, freshwater marshes, and small grassland areas which comprise the Refuge habitat hosts over 211 species of birds, 31 species of mammals, and 44 species of reptiles and amphibians.

##### 2. Endangered and/or Threatened Species

The primary objective for which the refuge was established was to protect essential nesting, feeding, and roosting habitat for bald eagles (*Haliaeetus leucocephalus*). There are three primary areas of nesting activity on the refuge: the Great Marsh, the heronry and Potomac River shoreline near High Point, and the middle and upper reaches of High Point Creek. The new occupied breeding territory in 1999 is located in the Great Marsh (called Great Marsh II site) and is approximately 250m west from the Great Marsh I site (refer to the table on the next page). Other significant areas in the vicinity are the roost and a nest site on Kanes Creek in the neighboring state park, a nest and roost on the north border of the refuge and Gunston Hall, a nest site between Gunston Manor and Hallowing Point communities, and a nest site on undeveloped land on the north portion of the peninsula.

In 1999, the eagles abandoned the nest in the heronry and moved out along the shore between Anchorage and High Point. Though active for three years, the nest in the heronry seemed in conflict with the herons (one eagle nest to 1,500 Great Blue Heron nests) and the High Point Creek Nest so the move was not surprising.

Since the Great Marsh eagle nest's discovery in 1994, management annually closes portions of Woodmarsh Trail beyond Eagle Point that come close to the nest site from December to July so that public use would be less of a disturbance.

<b>Bald Eagle Nesting Territories and Productivity</b>											
<b>Territory</b>	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Great Marsh I					Occu	Unk	2	2	1	Unsuc	2
Rookery + River								2	Unsuc	1	2
High Point Creek	3	1	2	1	1	2	Unsuc	2	Unsuc	1	Unsuc
Great Marsh II											Occu

Occu = Occupied Breeding Territory but not Active, Unsuc = Active Site but no fledglings observed, Unk = Unknown. Definitions used in text and table are based on Postupalsky 1974.

On August 11, 2000 the refuge office received a call from one of the local car dealers indicating that they had an injured eagle in their maintenance area. Responding refuge personnel (Biologist Witt and ORP Schultz) arrived to find that the eagle was a Jacobin (sp) pigeon. Even accounting for the fact that the bird was dark with a white head and tail, you have to wonder sometimes.

### 3. Waterfowl

The Virginia Department of Game and Inland Fisheries (Non-Game Division) has not banded waterfowl at Mason Neck since 1998. In the past they were banding American black ducks and ruddy ducks.

Currently, the Christmas Bird Count yields the best data on winter use of the Refuge and its environs (including State Park property and the Hallowing Point community) by waterfowl. For the CBC on January 2, 2000, the most abundant species of waterfowl (in descending order) were: Scaup spp, 12,999; lesser scaup, 3,124; Canada goose, 2,787;

American black duck, 671; ruddy duck, 497; mallard, 461; common merganser, 295; bufflehead, 285; and ring-necked duck, 211. Also observed were great blue heron, greater scaup, common goldeneye, canvas back, redhead, oldsquaw, gadwall, American wigeon, red-breasted merganser, hooded merganser, northern shoveler, northern pintail, horned grebe, pied-billed grebe, blue-winged teal, green-winged teal, double-crested cormorant, tundra swan, and common loon. Tundra swans in flocks of 300 or more also use the Great Marsh wetlands in the winter.

#### 4. Marsh and Water Birds

The Regional Marshbird Callback Survey was not repeated this year for any of the refuges in the Complex.

The great blue heron is a large colonial nesting marsh bird that requires undisturbed habitat to produce and rear their young. The Refuge hosts one of the largest Great Blue Heron rookeries in the mid-Atlantic states. This rookery has grown from 26 nests discovered in 1979 to over 1400 nests in 2000. The colony continues to be active and productive. The tables below show the results of the production survey conducted by Biologist Spencer on June 6 and 7, 2000, the results of the winter nest count, percent of active nests, average clutch size, production estimate, and breeding population. To date, no nests were found in Section E (furthest removed from the central, most inhabited areas of the rookery—A, B, and C— and Section D had only a few nests (43), comparatively speaking. The center of area B continues to suffer tree loss from winds and root failure. This opening of the canopy is changing the forest floor as succulents such as pokeweed invade.

<b>Mason Neck Great Blue Heron Production Survey, June 6-7, 2000</b>				
Area	# Active Nests	# Inactive Nests	Total Nests	% Active
A	157	24	181	86
B	143	48	191	75
C & D	88	334	122	72
Total	388	106	494	79

<b>Mason Neck Great Blue Heron Post-Season Winter Nest Count, January 28, 2001</b>		
Area	# Trees	# Nests
A	169	449

B	188	589
C & D	151	373
Total	508	1411
Total Previous Winter Count	516	1457

<b>Mason Neck Great Blue Heron Average Clutch Size for 2000</b>			
Area	# Nests	# Young	Ave. Young/Nest
A	157	242	2.40
B	143	265	1.85
C & D	88	136	1.55
Total	388	643	1.66 young/nest

<b>Total Active Nests:</b>	Total # Nests Post Season Winter Count * % Active Nests Determined from Production Survey (1411 * .79)	1114.69
<b>Production Estimate</b>	# Active Nests * Average Young per Nest (1114.69 * 1.66)	1850.40
<b>Breeding Population</b>	# Active Nests * 2 (1114.69 * 2)	2229.38

During the Christmas Bird Count of January 2, 2000, ring-billed gull was the most abundant species in the count, totaling 552. Herring gulls and greater black-backed gulls were also observed, about 27 each.

5. Shorebirds, Gulls, Terns, and Allied Species - Nothing to Report

6. Raptors - Nothing to Report

7. Other Migratory Birds

In 1999 and 2000, Spring bird point counts were conducted at Mason Neck for upland forest interior breeding birds. Twenty four points were distributed along Wood Marsh

Trail, Sycamore Road, High Point Creek Road, Little Marsh Road, and Anchorage Road. Four more points were added in 2000: two on Sycamore and two on Great Marsh Trail. All are forested habitats, although some of the points border marsh areas, hence marsh species will be heard within the radii of those points, such as red-winged blackbirds and common yellowthroat. The protocol involves recording all species seen or heard within 0-3 minutes and 3-5 minutes at multiple radii, <50 meters and 50-100 meters. Each point was visited 5 times from late May through June. The results for the 1999 survey was 54 species and for the 2000 survey, 44 species. Red-eyed vireos and acadian flycatchers were the most frequently observed species in both years. Two deep forest species were detected in both years, ovenbird and woodthrush.

Interestingly, a far greater number of species was detected in the CBC on January 2, 2000 led by Paul Dumont, but then there were many more eyes covering non-Refuge environs as well. A total of 83 species was detected, not including ducks and geese. The most abundant passerine species on this count were American goldfinch (303), Carolina chickadee (280), American crow (232), white-throated sparrow (230), dark-eyed junco (209), eastern tufted titmouse (183), European starling (155), red-winged blackbird (150), cedar waxwing (117), Carolina wren (112), and song sparrow (109). 73 individual eagles were counted, 38 of which were immature.

The second season of bird banding by volunteers working under the auspices of the MAPS (Monitoring Avian Productivity and Survival) also took place at Mason Neck in two forested locations, one off of Sycamore Road and the other off of Little Marsh Road. At the Sycamore station, 17 species were banded and a total of 112 birds, 79 of which were new captures, 19 recaptures, and 14 released unbanded. At the Little Marsh station, 22 species were banded and again, 112 birds captured, 85 were new captures, 16 were recaptures, and 11 released unbanded. The dominant species captures for the Sycamore Road site are (in descending order of dominance) northern cardinal, carolina wren, common grackle, acadian flycatcher, and red-eyed vireo. The dominant species captured at the Little Marsh Road site are (in descending order of dominance) common grackle, northern cardinal, eastern tufted titmouse, red-eyed vireo, and acadian flycatcher.

Volunteer Larry Brindza operated the Refuge's blue bird trail in 1999, but not in 2000. There are nest boxes on Sycamore Road, Anchorage Road, the field and shop yard near the end of High Point Road, and on the High Point Creek Dike. Blue birds use most of the boxes but Brindza had reported that chickadees, prothonotary warblers, and tree swallows were also using the boxes.

## 8. Game Mammals

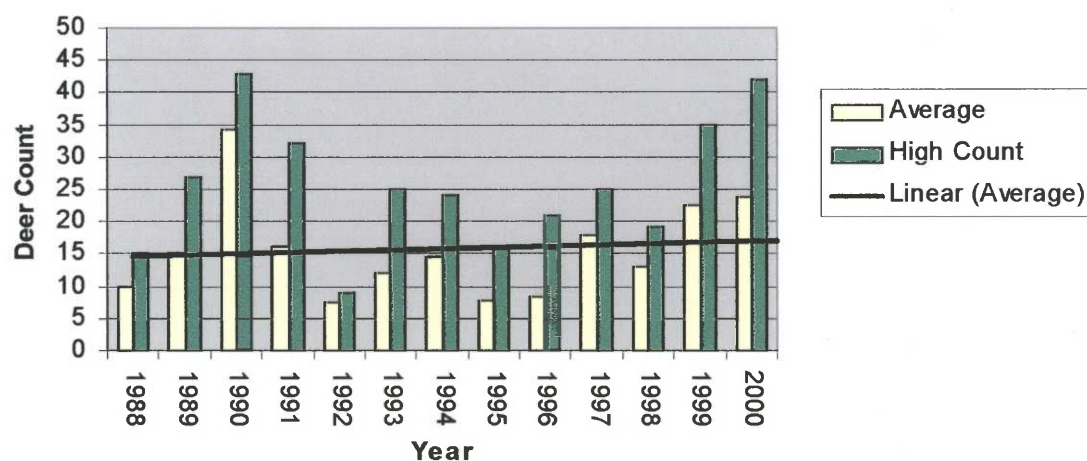
White-tailed deer have been harvested at the Refuge by public hunt since 1990 in order to maintain the population at levels compatible for bald eagle habitat. To estimate the effectiveness of the harvest effort, it is useful to periodically examine the harvest data over

time, three years at the minimum, to look for trends in weights, antler measurements, fawn to doe ratio, and other parameters indicative of deer health and population density. Biologist Spencer conducted the first three-year (1998-2000) comparative analysis of the Mason Neck deer harvest data, hence the inclusion of these years in the 2000 annual narrative.

### Spotlight Count Results

The average deer counted during the spotlight counts on the Refuge during the fall of 2000 was 22.8. By comparison, the average was 22.5 in 1999 and 17.8 in 1998. T-test analyses however indicate that only the increase from 1998 to 1999 was large enough to be significant ( $P = 0.044$ ) and therefore likely to be indicative a genuine population increase. Biologists use spotlight count averages to estimate the size of the herd of the management unit. Due to the mobility of deer and vegetative impediments to visibility, however, these counts can be highly variable or questionable, and some biologists prefer not to rely on this method. To estimate the population size or density, the area covered during the spotlight survey (called acres of visibility) is divided by the average from the spotlight count; the result is the population density for those acres covered. The *proportional population density* for the entire management unit is then obtained by dividing the acres of deer habitat by the population density obtained in the first step. For Mason Neck National Wildlife Refuge and State Park combined, the total habitable deer acres are 3388 (1928 + 1475). The proportional population density of the Refuge and State Park combined based on combined spotlight count results for Fall, 2000 is 547. Should this estimate be correct, that is, if the spotlight count average is a reliable representation of the true population size, it would yield a density figure of 1 deer per 6.19 acres, considerably higher than the current Virginia Department of Game and Inland Fisheries (VDGIF) preference of 1 deer per 25 acres. Figure 1 below shows the spotlight count results since 1988.

**Figure 1. Summary of Fall Deer Spotlight Surveys for Mason Neck National Wildlife Refuge, 1988-2000**



### Shotgun Hunt Results

In the 2000 combined hunt, 92 hunters took 109 deer in 4 days, of which 28 were antlered (3+ points) buck, 10 were spikes, 18 were button buck, and 53 were does. Sixty-five deer were harvested from Refuge property, 44 from the State Park. Table 1a below shows the combined harvest results per each day of the 2000 hunt. Table 1b shows the combined harvest results for 1998 and 1999.

**Table 1a. Daily Take Percentages for Combined Shotgun Harvest, 2000**

Date	Does	Bucks (antlered/button)	Totals
11/27/00	34	31 (20/11)	65
11/28/00	13	16 (10/6)	29
12/11/00	3	7 (5/2)	10
12/12/00	3	2 (2/0)	5
<b>TOTALS</b>	<b>53</b>	<b>56 (37/19)</b>	<b>109</b>
<b>% OF TAKE</b>	<b>48.6</b>	<b>51.3 (33.9/17.4)</b>	

**Table 1b. Combined Shotgun Harvest, 1999 and 1998**

<u>Year</u>	<u>Does</u>	<u>Bucks (antlered/button)</u>	<u>Totals</u>
1999	33	60 (34/26)	93
1998	42	53 (38/15)	95

Yarrow and Yarrow (1999) recommend that the harvest rate for antlerless deer in the southeast United States should be 1 deer/60 acres and higher rates apply for overpopulated areas. The harvest rate of antlerless deer for the combined hunt in 2000 was 1 deer per 47.7 acres, for 1999, 1 deer per 57.4 acres; and for 1998, 59.4. The overall harvest rate in 2000 for all sexes and age classes is 1 deer per 31 acres, or 19.6 deer per square mile. For 1999, the overall harvest rate was 1 deer per 35 acres, or 18.1 deer per square mile. For 1998, the overall harvest rate was 1 deer per 35.6 acres, or 17.9 deer per square mile. Should the above population estimate based on spotlight surveys of both the Refuge and the State Park be fairly accurate, the percent population harvested in 2000 would be about 1/5 or about 20% of the herd (109/547).

#### Mean Dressed Weight

Yearling male condition differs between physiographic regions, which dictate soil associations and thus nutritional quality of vegetative cover. Piedmont soils are relatively fertile, while coastal plain soils rank low in fertility and consequently negatively affect average weights (Strickland and Demarais 2000). Mason Neck NWR soils are composed of coastal plain sediment which is sandy, silty, loamy and has some clay. The soil association is matapeake-mattapex-woodstone (Fairfax County General Soil Map), which is not highly fertile. Because soil fertility plays such an important role in deer nutrition, the Virginia Department of Game and Inland Fisheries utilizes a four-tiered ranking scheme to qualitatively evaluate deer weight data for specific physiographic regions. For Tidewater (TW) and Piedmont (PM), they are as follows:

#### VDGIF Ranking Scheme for White-Tailed Deer Average Weights

	TW	PM
Excellent	> 90 lbs	> 100 lbs.
Good	86-90 lbs	96-100 lbs.
Fair	80-85 lbs.	90-95 lbs.
Poor	<79 lbs.	<89 lbs.

By Tidewater standards, the Mason Neck yearlings rank fair; by Piedmont standards, poor. The Tidewater and Piedmont averages provide a useful bracket for general placement of the Mason Neck averages, but because Mason Neck lies on a transition zone between the

two physiographic regions, a closer comparison could be obtained by using a larger data set from a population that is more local and from a region similar to Mason Neck in soil, vegetation, rainfall, and climate, such as Virginia's Northern Neck region. Because this population has also been subjected to hunting, it is likely to be in the best possible health that that habitat affords. In the 2000 Mason Neck combined hunt, average dressed deer weight in the age class 1.5 was 85.5 pounds for bucks and 73.3 for does. The average for the past three years (1998-2000) was 84.8 for bucks and 72.8 for does. There was no significant change over the last three years in average weights for this age class for bucks or does (See Table 2 below). The average dressed weight for yearlings harvested from 17 hunt clubs on Virginia's Northern Neck region from 1989-1999 is 86.7 pounds for bucks (range 83-92) and 70 for does (range 69-75). For latest three years of data, 1997-1999, the average was 87.6 bucks, 72 for does. Compared to Northern Neck, the Mason Neck herd does not differ significantly in terms of weights (see Table 2 below). Table 3 below shows the combined hunt weight averages for all age and sex classes at Mason Neck.

**Table 2: Mean Dressed Weights for Deer Age Class 1.5 at Mason Neck  
NWR/State Park  
1998, 1999, 2000**

	1998	1999	2000
Bucks	81.6	87.3	85.5
Does	71.25	73.75	73.3
T-Test 1998-2000*:	0.73	T-Test 1999-2000*:	0.68

\* Significance Level  $P < 0.05$ .

**Table 3: Combined Hunt Average Dressed Weights by Sex  
and Age Class, 2000**

AGE	DOES	AVG. WT.	BUCKS	AVG. WT.
0	17	44.4	18	45.7
1.5	11	73.3	14	85.5
2.5	11	77.5	11	105.3
3.5	4	75.5	10	116.7
4.5+	7	79.2	2	108

Deer for which only live weights were available are omitted from table ( $n = 4$ )

## Antler Measurements

As with weight averages, yearling antler condition also varies with physiographic region. Even with superior genes, full potential for antler growth will not be reached without proper dietary protein (about 13-16%), hence the use of antler mass as a health indicator. Shape and number of points may depend chiefly on heredity, while size may be more due to diet (Rue 1978) and soil fertility (Strickland and Demarais 2000). For example, the antler beams of all 1.5 age class bucks harvested in New Jersey in 1975 varied according to soil fertility: bucks from poorest soils averaged 11.5 mm, while those taken from rich farmlands averaged 22.4 mm. In another study of 260 white-tail skulls from Michigan, 1.5-year bucks averaged 21 mm (Rue 1978). Compared with the New Jersey deer harvested from poor soils in 1975, Mason Neck deer fare better, by 26%, but by Michigan standards, the Mason Neck herd does not favorably compare. (See Table 4 below.)

The State of Virginia has established standards for interpreting antler measurements in terms of deer health for Tidewater (TW) and Piedmont (PM) physiographic regions:

### VDGIF Ranking Scheme for White-Tailed Deer Antler Measurements

	TW	PM
Excellent	>19 mm	>20 mm
Good	17.0-18.9 mm	18-19.9 mm
Fair	14.5-16.9 mm	15.5-17.9 mm
Poor	<14.5	<15.5

By the standard for Tidewater deer, the three-year average of 14.8 mm for Mason Neck yearlings ranks only fair, and by the Piedmont standard, poor. As with the weight data above, it would be more precise to compare with the Northern Neck herd. The average beam diameter for yearlings from Virginia's Northern Neck region over the past 11 years (1989-1999) is 16.5 mm, and the average for the latest three years (1997-1999) is also 16.5 mm..

Bucks reach their greatest antler potential between years 4-6 (Yarrow and Yarrow 1999, Rue 1978). The Mason Neck harvest data yields an insufficient sample size for evaluation of these age classes as the herd age structure tends now toward younger deer, however, the best age class for evaluating overall deer health using antler measurements is the yearling, 1.5, age class (Strickland et al. 1996). Table 4 below provides the antler beam and point averages for age classes 1.5, 2.5 and 3.5 from 1998-2000 of the Mason Neck herd. No significant ( $P > 0.05$ ) change between years for antler measurements was detected in the Mason Neck herd.

**Table 4: Combined Hunt Antler Measurements for Deer Age Classes 1.5, 2.5, and 3.5 for 1998, 1999, and 2000 (beams in mm)**

Age	1998		1999		2000		T-Tests (Significance Level $P < .05$ )			
	Mean Beam	Mean # Points	Mean Beam	Mean # Points	Mean Beam	Mean# Points	Beam		Points	
							1998-2000	1999-2000	1998-2000	1999-2000
1.5	14.5	2.9	14.6	2.6	15.4	2.6	.47	.42	.56	1.0
2.5	22.7	5.3	21.8	5.3	24.4	7.0	.39	.17	.22	.06
3.5	29.3	7.3	29.0	6.0	28.48	7.2	.74	.88	.83	.08
MN yearling beam 3-year avg.: 14.8mm					MN yearling # Points 3-year avg: 2.7					
NN yearling beam 3-yr avg.: 16.5 mm					NN yearling # points 3-year avg.: 3.7					

The two populations are quite similar to each other in terms of weight, but differ by as much as 1.7 mm for average beam diameter and 1.0 for average number of points. Since the two regions are so similar in terms of vegetation, soil, climate and rainfall, perhaps we can conclude that the Mason Neck herd might be slightly compromised by density, which would affect availability of dietary protein. In the 1999 Mason Neck hunt the overall harvest rate was 1 deer per 35 acres, or 18.1 deer per square mile. For the Northern Neck region, 1999 (latest year data available), the number of acres per deer harvested is 60, or 10.5 deer per square mile. Based on harvest data, the Mason Neck herd *appears* to be almost twice as dense as the Northern Neck herd, however it is uncertain as to whether hunter effort was comparable for the two populations. (Northern Neck issued 620 hunting permits and claimed a total hunting area of 45.3 square miles, or 1 hunter per .07 mi<sup>2</sup>. Mason Neck had 470 "visits" over 4 hunting days and a total hunted area of 5.3 square miles, or 1 hunter per .01 mi<sup>2</sup>.)

#### Herd Sex Structure

The herd sex structure for the 2000 harvest was 56 bucks and 53 does. In 1999 however, the herd sex structure differed significantly ( $P < 0.005$ ) from 1998 or 2000 toward a greater proportion of bucks. Thirty-four of the 60 bucks taken in 1999 were antlered, compared to 38 antlered bucks in 2000 and 38 antlered bucks in 1998. The increase in bucks taken in 1999 is due to a jump in the number of button bucks harvested, (26) compared to 18 in 2000 and 15 in 1998. The increase in bucks cannot be explained by hunter selectivity since the antlered buck harvests are so similar between years and it is impossible for hunters to distinguish between button bucks and fawn does at a distance. Nor can an increase in hunting pressure explain the increase in buck harvest, since hunting pressure was somewhat lowered in 1999 compared to 1998 and 2000 (3612 hours in

1998, 3580 hours in 1999, and 3695 in 2000). The 1999 increase in buck harvest may indeed reflect a genuine change in sex structure of the entire herd toward a larger number of males. This state is ideal from a management perspective, as a reduced number of does compared to bucks results in slowed population growth. Unfortunately, the pattern does not hold for the following year. Table 5 below shows the harvest age and sex structure of the herd from the last three hunts, 1998, 1999, and 2000.

### Herd Age Distribution

For each year, 1998, 1999, and 2000, the differences between expected and observed age classes were significant ( $P < 0.05$ ), with a greater proportion of deer in the lower (0.5-2.5 age classes). This is not an unexpected result in populations subjected to hunting pressure due to natural attrition of older deer and the higher reproductive rates of the remaining deer which are younger and healthier. Interestingly, the age structure of the herd based on harvest data from 1990 (the first hunt) also exhibited a greater proportion ( $>80\%$ ) in the lower (0.5, 1.5, 2.5) age classes, but plummeted in 1991-1993. This plummet could have resulted from harvest removal, population crash in response to overshooting the carrying capacity of the habitat, low mast production, or some combination of all of these factors.

**Table 5: Harvest Herd Age and Sex Structure**

AGE/SEX STRUCTURE 2000					AGE/SEX STRUCTURE 1999				AGE/SEX STRUCTURE 1998			
Age	Bucks	Does	Total	% (109)	Bucks	Does	Total	% (93)	Bucks	Does	Total	% 95
0.5	18	17	35	0.32	26	14	40	0.43	15	11	26	0.27
1.5	14	8	22	0.20	12	5	17	0.18	12	5	17	0.18
1.6	1	1	2	0.02	2	2	4	0.04	4	7	11	0.12
1.7	0	2	2	0.02	3	1	4	0.04	5	0	5	0.05
2.5	11	12	23	0.21	11	7	18	0.19	3	12	15	0.16
3.5	10	5	15	0.14	4	2	6	0.06	11	4	15	0.16
4.5	2	8	10	0.09	2	2	4	0.04	3	3	6	0.06
<b>Tot'l</b>	<b>56</b>	<b>53</b>	<b>109</b>	<b>1.00</b>	<b>60</b>	<b>33</b>	<b>93</b>	<b>1.00</b>	<b>53</b>	<b>42</b>	<b>95</b>	<b>1.00</b>
Sex Structure Chi Square & P Value:			0.083	0.77			7.839	0.005			1.274	0.259
Age Structure Chi Square & P Value:			17.38	0.002			46.84	0.000			23.47	0.000

\* The higher the Chi Square value, the greater the discrepancy between observed and expected results, and the lower the probability that each age class or sex class will be equally represented within a given harvest. Suggest a genuine discrepancy between age classes.

### Percent Fawns and Fawn to Doe Ratio (based on combined harvest data)

In most habitats in Virginia and elsewhere, deer condition and productivity rates are inversely related to density, hence the fawn to doe ratio and percent fawns in the antlerless harvest are useful indicators for deer density (VDGIF, Swihart 1998). The fawn to doe ratio for the 2000 hunt was 97.2 fawns to 100 does, for 1999, 210 fawns to 100 does; and for 1998, 83.9 fawns to 100 does (see Table 6 below). In good habitats, healthy productive deer herd FDR's will typically approach or exceed 1.0 and percent fawns in the

antlerless harvest will equal or exceed 50% (Virginia Department of Game and Inland Fisheries, DMAP). As can be seen from the table, the productivity of the Mason Neck herd appears to be in the healthy range for 2000 and 1999, but slightly down in 1998.

**Table 6 : Percent Fawns and Fawn to Doe Ratio (FDR), Combined Hunt, 1998-2000**

AGE	2000			1999			1998		
	Bucks	Does	Fawns	Bucks	Does	Fawns	Buck	Does	Fawns
0.5	18	17	35	26	14	40	15	11	26
1.5	14	8		12	5		12	5	
1.6	1	1		2	2		4	7	
1.7	0	2		3	1		5	0	
2.5	11	12		11	7		3	12	
3.5	10	5		4	2		11	4	
4.5	2	8		2	2		3	3	
<b>Totals</b>	<b>56</b>	<b>53</b>	<b>109</b>	<b>60</b>	<b>33</b>	<b>93</b>	<b>53</b>	<b>42</b>	<b>95</b>
% Fawns (total fawns/total antlerless deer)			49.2			67.8			45.6
FDR (total fawns/females) $\geq 1.5$ )			0.97			2.11			0.84

The fawn to doe ratio for 1999 is notably higher than for 2000 or 1998. Since it is based on harvest data, and since hunters took more bucks in 1999, this has the side effect of lowering the doe take which affects the FDR ratio calculations. Results based on hunt data should be viewed therefore with caution. The fawn to doe ratio for the past three years (average 1.30) does appear to indicate a reasonably productive herd. The three-year average for percent fawns in the antlerless harvest also appears to be within a comparatively healthy range, 54.2. By comparison, the average FDR ratio for the past three years (1997-1999) for the Northern Neck herd was 1.06, and the percent fawns in the antlerless harvest for the same time period was 51%.

#### Percent Lactation

Lactation rates are indicative of productivity or recruitment. In healthy herds, lactation rates in adult age classes ( $\geq 2.5$  and 3.5) should be high, about 60-70%. Good condition of the females in a herd will be reflected in high lactation (VDGIF). Lactation in yearling females is evidence of fawn breeding and typically only occurs in very health herds. In most herds, the rate is at or below 20%. Table 7 below shows the lactation rates for the Mason Neck herd for the past three years, 1998-2000. No fawn lactation was detected for the fall 2000 hunt. Fawn breeding is rare where herds exceed 60% of a habitat's biological carrying capacity, although precise measurements of BCC is rarely if ever available (Strickland et al. 1996).

**Table 7: Percent Lactation**

Age Class	2000		1999		1998	
1.5	5/11	45%	1/14	7%	1/12	8%
2.5	7/12	58%	2/7	29%	2/12	17%
3.5	4/13	31%	4/4	100%	5/7	71%

Although the lactation rates for age class 3.5 appear to be excellent for 1998 and 1999, this should be viewed with skepticism due to the very small sample size and may not therefore, be reliable or truly representative. Nonetheless, the percent lactation from this harvest data would suggest that the Mason Neck is only moderately impacted by density. By comparison, the three-year (1997-1999) average percent lactation rate for the Northern Neck 2.5 age class of does was 56%. The lactation rates are not high for both herds for this age class.

#### Disease and Parasites

Only cursory scans for external parasites and examination of hooves for hemorrhagic disease. No incidence of hoof-splitting was recorded in 2000, 5 incidences were recorded in 1999 (5 out of 95), and no incidences were recorded for 1998. Limited staff availability precludes monitoring other health data such as examination for abomasal parasites, measuring body or organ fat content, or counting corpora leutea of pregnancy and embryos.

#### Hunt Data Summary and Conclusion

The parameters used above to determine deer health (and thus estimate density) do not lead to a strong conclusion in either direction. Because the averages for weight, antler measurements (especially beam diameter), FDR, percent fawns in antlerless harvest, and percent lactation of the Mason Neck herd, while not alarmingly low as one would expect in a starving population, they hover slightly above or below the averages from the Northern Neck herd, it may be safe to conclude that the Mason Neck herd is flirting with high density and that efforts need to be maintained to curb population growth. This may be best achieved by continuing to encourage hunters to take does during the public hunt and/or increasing the number of hunt days. Increasing hunter density is not an option since hunter density is already at maximum safe level.

#### 9. Marine Mammals - Nothing to Report

## 10. Other Resident Wildlife

Data collection for the snake community research conducted by Terry Creque (George Mason University) continued from the previous three years into 2000. The three research sites continued to be the primary focus areas for snake collection with a total of 80 snakes of twelve different species collected during the year using visual search and hand capture. (Coverboards placed throughout the three areas were not productive, as experienced in 1998 and 1997.) See table next page.

Genus/Species	Snake Community Survey at Mason Neck by Terry Creque								
	Old Farm Site 1999                  2000		Field Site 1999                  2000		Pond Site 1999                  2000		Capture plus Sightings* 1999 / 2000	Recaptures 1999 / 2000	Recapture Rate % 1999 / 2000
<i>C. amoenus</i> (SAY) (Eastern worm snake)	27	27	2	3	3		32 / 30	15 / 9	47 / 30
<i>C. constrictor</i> (Northern black racer)	10	6	5	6	6	1	21 / 13	0 / 1	0 / 8
<i>N. sipedon</i> (Northern water snake)					10	12	10 / 12	0 / 1	0 / 8
<i>D. punctatus</i> (Ringneck snake)	3	4	7				10 / 4	2 / 1	20 / 25
<i>E. obsoleta</i> (Black rat snake)	6	2	1		1		8 / 2	1 / 0	13 / 0
<i>T. sirtalis</i> (Eastern garter snake)	4	2	1	2	1		6 / 4	1 / 0	17 / 0
<i>T. sauritus</i> (Eastern ribbon snake)					3	5	3 / 5	0 / 0	0 / 0
<i>A. contortrix</i> (Northern copperhead)	1	2					1 / 2	1 / 1	100 / 50
<i>L. triangulum</i> (Eastern milk snake)	1				2		- / 3	0	0
<i>V. valeriae</i> (Eastern earth snake)		4					- / 4	- / 1	- / 25
<i>S. delayi</i> (Northern brown snake)		3					- / 3	0	0
<i>H. pletirrhinos</i> (Eastern hognose snake)				1			- / 1	0	0
Totals for 1999	52		16		26		94	20	22
Totals for 2000		50		12		18	80	14	20

\*Sightings are those snakes that are identifiable a to species but could not be captured.

## Anuran Call Count Survey

Anuran Call Count Surveys were initiated on the Refuge as a simple way of determining what species of frogs occur on the refuge and which sites are important to breeding populations. Surveys were conducted by standing at one point for a standard period of time and recording all the amphibians that are heard within one specified area. The survey is conducted from a central point located on the edge of a semi-circular sample area. If done consistently, call surveys can provide information on the status of different species in the areas sampled.

Anuran Call Survey - Number of nights: 4 - Species heard (11):

Pickerel frog ( <i>Rana palustris</i> )	American toad ( <i>Bufo americanus</i> )
Southern leopard frog ( <i>Rana utricularia</i> )	Gray treefrog ( <i>Hyla versicolor</i> )
Green frog ( <i>Rana clamitans</i> )	Cope's gray treefrog ( <i>H. chrysocelis</i> )
Bull frog ( <i>Rana catesbiana</i> )	Green treefrog ( <i>H. cineria</i> )
Northern cricket frog ( <i>Acris crepitans</i> )	Spring peeper ( <i>Pseudacris crucifer</i> )
Striped chorus frog ( <i>Pseudocris triseriata feriarium</i> )	

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

In July, there were alleged sightings of a cougar on the Mason Neck peninsula with several sightings near the refuge. According to a park authority employee, a Fairfax county wildlife biologist checking out the reports saw the cat. Managers from each of the agencies on the peninsula met and discussed potential responses. After initial contingency plans were made by the agencies, it came to light that all the sightings were traceable back to one event interpreted by a zealous volunteer. The bottom line was that there was no cougar.

16. Marking and Banding

The second season of bird banding by volunteers working under the auspices of the MAPS (Monitoring Avian Productivity and Survival) also took place at Mason Neck in two forested locations, one off of Sycamore Road and the other off of Little Marsh Road. At the Sycamore station, 17 species were banded and a total of 112 birds, 79 of which were new captures, 19 recaptures, and 14 released unbanded.. At the Little Marsh station, 22 species were banded and again, 112 birds captured, 85 were new captures, 16 were

recaptures, and 11 released unbanded. The dominant species captures for the Sycamore Road site are (in descending order of dominance) northern cardinal, carolina wren, common grackle, acadian flycatcher, and red-eyed vireo. The dominant species captured at the Little Marsh Road site are (in descending order of dominance) common grackle, northern cardinal, eastern tufted titmouse, red-eyed vireo, and acadian flycatcher.

## 17. Disease Prevention and Control

Mason Neck NWR initiated plans in May to participate in a rabies control project with Fairfax County, Virginia Polytechnic Institute, and the Virginia-Maryland Regional College of Veterinary Medicine. Oral vaccine baits were distributed on areas in Fairfax county (including the refuge) to control rabies in raccoons. The baits will be distributed twice a year over the next several years with ongoing evaluation of the effectiveness of the project.

## H. PUBLIC USE

### 1. General

Time and manpower spent on Mason Neck was limited due to a heavy focus on the development of new facilities, programs, and management plans at the recently established Occoquan Bay NWR.

### Public Use Statistics

Mason Neck NWR 51610 (*incl Woodbridge unit 97-94)	FY00	FY99	FY98	FY97	FY96	FY95
I. Total number of visitors	20448	20332	21301	20393	19149	20193
II Interpretation & Nature Observation (on-site)	12984	12114	12639	13337	19564	21213
A. Staff/Volunteer Conducted Activities		0	21	144	89	40
1. Talks		0	0	0	0	0
2. Tours		0	21	104	89	40
3. Demonstrations		0	0	40	0	0
B. Visitor Centers		0	0	0	0	0
C. Administrative Office	90	65	120	110	60	60
D. Kiosks	9330	9305	9311	9337	8440	9176
E. Nature Trails	12129	12104	12104	11900	10975	11937
1. Foot	12129	12104	12104	11900	10975	11937
2. Boat	0	0	0	0	0	0
3. Auto	0	0	0	0	0	0
F. Observation Towers/Platforms/Photo Blinds	0	0	0	0	0	0
G Other Wildlife	0	0	0	0	0	0
III. Environmental Education	683	637	1459	1237	1665	1493
A. Staff/Volunteer Conducted	0	135	86	152	179	529
1. Teachers participating in workshops	0	135	41	128	89	154
2. Students taught on-site	0	0	45	24	0	300

3. Students taught off-site	0	0	0	0	90	75
B. Non-staff Conducted	683	502	1373	1085	1486	964
IV. Recreation	6789	1520	6852	6031	5795	6222
A. Hunting	1005	1030	1083	246	564	453
1. Migratory Birds	0	0	0	0	0	0
2. Upland Game	0	0	0	0	0	0
3. Big Game	1005	1030	1083	246	564	453
B. Fishing	0	0	0	0	0	0
C. Trapping	0	0	0	0	0	0
D. Beach & Water Uses	0	0	0	0	0	0
E. Other recreation	5784	5880	5769	5785	5231	5769
V. Education Outreach (off-site)	120	0	2	2100	1062	768
A. Group presentations	20	0	0	300	67	430
B. Exhibits	100	0	0	1800	915	226
C. Other education outreach	0	0	2	0	80	112
VI. Special Events	1	1	0	4	4	4
A. Number of news releases	1	1	0	3	0	2
B. Number of radio/TV spots	0	0	0	0	2	0
C. Number of other special events	200	0	0	1	2	2

\*Ocoquan Bay was listed as a subunit of Mason Neck NWR (Woodbridge unit) through 1997 NWR.

## 2. Outdoor Classrooms - Students

Only Thomas Jefferson High School for Science and Technology (TJHSST) continued to use Mason Neck regularly. Their Integrated Biology, English, and Technology (IBET) program monitored vernal pools on High Point Road and near the trail heads. Three teachers with additional adult chaperones (usually other teachers or biology professionals) brought 75 students per trip to map and inventory the pools. Biologist Witt worked with the teachers on topics and agency outreach.

Chesapeake Bay Foundation (CBF) and teachers from Kings Park Elementary School brought their classes but interest is waning in the sites without workshops and personalized contacts to keep the refuge in mind as a study site. CBF plans to use the adjacent James property for accommodations for its education events.

## 3. Outdoor Classrooms - Teachers

Only one set of workshops were presented this year. Fairfax County's School Age Child Care (SACC) program requested and received a series of workshops based on Project WILD, Aquatic Project WILD, and Wonders of Wetlands.

#### 4. Interpretive Foot Trails

Closure of half the Woodmarsh Trail from December to June so as not to disturb nesting eagles limits the trail's attraction to visitors, leaving only the fall since bugs discourage use during the summer. This is complicated by the failure of a foot bridge that lets visitors complete at least one loop of the trail. With the bridge down, visitors are going across country to get to the other portion of the trail rather than backtracking. Replacement of the bridge has been in engineering for several years.

#### 5. Interpretive Tour Routes - Nothing to Report

#### 6. Interpretative Exhibits and Demonstrations - Nothing to Report

Mason Neck NWR loaned an eagle mount to Ft Belvoir for National Public Lands Day event on September 20. They were hosting the Assistant Secretary of Defense. In return they shared sets of DOD/DOI posters on endangered species on military bases.

On September 1, ORP Schultz attended the annual meeting of the Prince William Natural Resource Council. A presentation was made which included showing the new refuge video tape. Ms. Schultz also discussed opportunities for qualified members to lead tours of the refuge.

On December 14, Schultz gave a presentation to the Springfield Rotary Club.

#### 7. Other Interpretive Programs

On April 28, Mason Neck NWR hosted the Virginia competition for the Junior Federal Duck Stamp. The panel members which judged the 170 entries included staff from the Virginia State Department of Game and Inland Fisheries, Prince William County Supervisor Hilda Barge, and representatives from several local conservation groups. This year members of the Prince William Art Society and the Manassas Art Guild volunteered to assist with the event and helped get prizes donated to the category winners. A northern Virginia student won with a watercolor and alcohol painting of cinnamon teal.

#### 8. Hunting

Refuge Manager Weiler and Park Manager Foster decided to switch to a lower maintenance boundary marker from the plastic sheeting used in the past. Each agency bought and marked their boundary with orange Carsonite posts. Primary boundaries were marked with reflective orange tape on the hunt area side of the post and reflective green on special boundaries like the tree stand area. The previously used eighteen inch wide pink flagging allowed for more flexibility and had a higher visibility level but required up to 6

man-days of annual maintenance versus after initial installation, the Carsonite posts require less than two man-days of annual maintenance.

Mason Neck went to a system of delegating range qualification to local ranges, reducing the time (and expense) required to qualify hunters. Five local ranges were identified as being willing to certify hunters. The Refuge supplied targets, a log and instructions as well as advertisement in the hunters' notification letters while the ranges kept any shooting fee. Two evening orientations at the state park visitor center were also added to the normal weekend of combination range certification and orientation, this year at Bull Run Regional Park. Both changes were welcomed by hunter applicants as allowing more flexibility and will probably be expanded next year.

Another change was in the fees. After last year being hit with elevated shooting range rates at the last moment, this year, application fees were doubled from \$5.00 to \$10.00 and permit fees raised from \$10.00 to \$20.00. Surprisingly there was no resistance from the hunters who accepted that after ten years, the price change was long due.

The last major change was to open the area west of Anchorage Road during the first two days of the hunt. This was to put pressure on a reservoir where deer had gathered out of reach of the hunters. Hunters liked it and did well but had trouble resisting "trophy" deer who hadn't been hunted since the first two years of the hunt and only then by archery.

For the third year, hunters were allowed to buy extra permits after standbys had their chance. These permits are known by staff and veteran hunters as "buck insurance". It negated some of the pressure of the original permit to take does but the hunters had been taking their spikes or trophy and leaving. This option kept more hunters in the field and produced money for the leftover permits that were just wasted before. Since the regular price of permits had been doubled this year, the extra permits were discounted (\$15.00 rather than \$20.00) and still were popular. Only a few last day permits were not purchased.

In September, Refuge manager Weiler attended the Fairfax County Deer Management Committee meeting. The county proposed to expand the number of parks that would be hunted this year using a combination of managed hunts and sharpshooting. As can be expected the anti-hunting groups were not pleased and the hunting groups wanted more opportunities for archery hunts. Overall, the county presented a well balanced plan for addressing the deer population problem. The refuge also had discussions with the county on the feasibility of hunting Gunston Hall Plantation and Pohick Bay Regional Park. This program would be run in conjunction with the current hunt on Mason Neck Refuge and State Park. It was also indicated, by the consultant working with the county, that the county's hunt program had been targeted by four of the national animal rights groups. This raised concern about a potential increase in the amount of publicity and protests associated with the hunts. There was some concern when refuge officers Schultz and Boska found abnormal amounts of flagging in a portion of the refuge hit in the early years by demonstrators but nothing came of it.

## Mason Neck Hunt Summary 1989 - 2000

Year	Typ	Appli- cants	Orient Assign	Permits Stby	#Hunt Sold Avail	Activity Days	/Day	Bag Visits	Hrs	Hours M F	Hunter Tot	Pattern of Hunt /Deer	Success	or Comments
1989	Arch	1700	-	12	107 120	6	20	134	1370	4 4	8	171	7%	
	Gun	combined			235 315	9	35							No gun - law suit
1990	Arch	440	134	8/30	139 180	6	30	180	1852	3 6	9	206	5%	
	Gun/MI	1100+	-	151	180 6		209	2038	32	44 76	27	34%		
1991	Gun/MI		-	-	- -	12	-	509	4135	- -	137	30	-	
1992	Gun	742	248/304	31/76	279 304	10	38	394	3457	- -	52	60.7	19	
	MI	18	8	-	- -	10	3	19	185	- -	8			
1993	Gun	-	-	-	- -	6	78	578	4253	- -	144	30	-	
	MI	-	-	-	- -	6	3	7	64	- -	-	-	-	1 <sup>st</sup> yr for park
1994	Gun	443	304	-	295 344	4	86	402	3202	41 32	73	44	29	
	MI	2	2	-	2 -	4	3	6	66	0 0	0	0	0	
	Gen	47	27/34	3/5	30 34	1	30	27	515	1 0	1	515	2	
1995	Gun	514	126	30/70	156 172	2	86	169	1509	23 17	40	38	30	
	MI	4	3	-	3 -	2	3	5	50	- -	-	-	0	
	Gen	52	37/47	2/5	37/2 39/47	1	39	39	787	11 8	19	41	49	
1996	Gun	535	162/53	-	153 172	2	86	168	430	12 30	42	34	25	
	MI				3 6	2	3			- -	-			
	Gen	77	40/9	49/47	39 39	1	39	39	567	6 2	8	71		
1997	Gun	473	317	-	316 344	4	86	-	-	51 62	113			MT/skip 2wk/MT
	MI					4	3	-	-	0 0	-			1st yr sell left perm
1998	Gun	416	317	-	334 344	4	86	425	3612	50 43	93	39	23	MT/skip 2wk/MT
	MI	5	5		5	4	3							
1999	Gun	531	344/344	82/197	344 344	4	86	469	3580	59 34	93	38	22	MT/skip 1wk/MT
	MI	5	5/5		5 5	4	5							
2000	Gun	511	256/358	62/153	351 358	4	93/86	470	3695	56 53	109	34	26	MT/skip 1wk/MT

A/Arch = Archery G/Gun = Shotgun (buckshot) MI = Mobility Impaired Gen = Generation (youth + adult) data by permit  
 Hunter Success = #hunters who got a deer divided by # permits or # hunters

## Summary for YR2000

## HUNTERS

Lottery - all applicants either drawn for lot or as standby  
 MI treated same as everyone - same prices (discount golden access) and same lots

Orientation- Sessions on 2 Friday nights at state park visitor center and Sat/Sun at Bull Run Reg. Park  
 MNBP Oct 20 - 45 assigned/no standby Oct 27 - 56 assigned/2 standby  
 BRRP Oct 28 - 49 assigned/2 standby Oct 28 - 102 assigned/53 standby  
 TOTAL 256 of 358 assigned & 62 of 153 standbys attended (recording errors 4 assigned/4 standby)

Range Certification - booked BRRP for 2 days, arrangement with Clarke Bros., Gilberts, Shooter's  
 Paradise, Izzac Waltons, & BRRP to use our targets, cards, & records (NVa piggybacked)

# hunters who bought permits	318	
# hunters who bought 2 permits	33 (all extra permits sold were from Day 4)	
#unsold permits	7 (all leftover permits were from Day 4)	
Hunters who took 1 deer	77	x1=77
Hunters who took 2 deer	13	x2=26 (4 hunters took 1 each on 2 permits)
Hunters who took 3 deer	2	x3= 6
TOTAL #hunters to take any deer	92	
Success rates	By # permit (351) = 26%	By # individuals hunting( 318) = 29%

	<u>Day 1</u>	<u>Day2</u>	<u>Day3</u>	<u>Day 4</u>	<u>Total</u>
HOURS PER DAY	1142.4	1073.6	1013.1	465.7	3694.8
AVG # HRS PER DEER (#deer / #permits sold)	17.58	37.02	46.57	93.14	33.90
AVG# HRS IN FIELD Per hunter (# hrs / #permits sold)	7.52	8.32	7.98	7.51	7.86

## DAILY ACTIVITY BREAKDOWN

By Day	Number Avail	Number Bought	As 2nd Permits	Not Used	By day used/taken				Equivalent #permits
					Day 1	Day2	Day3	Day4	
<b>PERMITS</b>									
1st	93	93		5	88	21	26	5	140
2nd	93	93		7	26	83	20	5	134
3rd	86	86		10	19	9	69	8	105
4th	86	79	(33)	16	19	16	12	44	91
Total	358	351		38	152	129	127	62	470
(-33 second permits = 318 actual hunters)									
<b>DEER</b>									
Doe					34	13	3	3	53
Button Buck					11	6	2	0	19
Antlered Buck					20	10	5	2	37
TOTAL					65	29	10	5	109

9. Fishing - Nothing to Report
10. Trapping - Nothing to Report
11. Wildlife Observation - Nothing to Report
12. Other Wildlife Oriented Recreation - Nothing to Report
13. Camping - Nothing to Report
14. Picnicking - Nothing to Report
15. Off-Road Vehicling - Nothing to Report
16. Other Non-Wildlife Oriented Recreation - Nothing to Report
17. Law Enforcement

Collateral duty officers Schultz and Boska attended law enforcement refresher at NCTC in late March, participating in all sessions and qualifying on the range with both service pistols and shotguns. Both officers then requalified with their weapons in the fall during the six month requalification session at Patuxent.

Upon recommendation from the regional office, Boska initiated a request for authorization for refuge officers to be able to access NCTC for background checks on suspects. A January letter provided a code for officers to use when working through local police dispatchers.

Near the end of April, the kiosk at Great Marsh Trail was vandalized. Signs were torn down, display doors were pried open and the plexiglass panels broken. The refuge has had an increasing number of incidents after hours at the trail heads.

Over several weeks in late spring, refuge staff found evidence of increased after hours use of Mason Neck NWR parking lots. Crack cans were found several times each week. Fairfax county police were notified and asked to conduct regular patrols during the night.

This year's deer hunt yielded two violations for which termination of permit resulted. The first was when a hunter tried to scout on the refuge outside the designated days and then gave false information. The second was for a hunter reported to have taken a shot down a roadway at deer crossing the road. Evidence was limited but warranted some action and the hunters didn't argue the actions.

September 19 started a flurry of reports by refuge neighbors about a suspicious vehicle parked on a street next to the refuge. An older couple reported a person possibly entering the refuge through their yard but were afraid to get involved. Refuge officers Schultz and Boska responded several times, searched the area, and even tried watching the vehicle but saw no one. They finally decided to notify the owner that the vehicle was suspect by putting a warning on the windshield. The owner then contacted the office and it was

discovered it was actually a boyfriend of one the neighbors who was visiting but not parking near where he was visiting for some reason. The officers reported this to the neighbors and were thanked for responding and showing concern.

On August 10, Schultz represented the staff at a Law Enforcement "Town Meeting" at Patuxent NWR. One of a series of comment sessions throughout the country, this was sparked by a study requested by the Service Director through the Inspector General's Office and being carried out by the International Association of Police Chiefs. They will be evaluating law enforcement on refugees and making recommendations as an independent source.

Trespassing continued to be a problem along the shoreline between the maintenance shop and High Point, primarily by boaters coming ashore to sun themselves or use a tree. No damage was found but there was frequent evidence of small campfires on the High Point Creek Dike and some littering.

#### 18. Cooperating Associations - Nothing to Report

### I. EQUIPMENT AND FACILITIES

#### 1. New Construction

On October 18 and 19, the Leonard Company constructed a 32' x 21' aluminum carport type storage facility in the maintenance compound. The building housed boats, ATV's, and mowing equipment.

#### 2. Rehabilitation

In anticipation of repairs to the High Point Creek Dike, Maintenance Worker Boska completed extensive repairs to Little Marsh Road. Three pull-offs were graveled, culverts were cleared, and several portions of the road received stone, gravel, or grading. These improvements made easier access to this area recently included into the deer management hunt area.

In July, a new water well was drilled at the Mason Neck NWR shop. The refuge waited about five weeks for confirmation that the water was acceptable for drinking (had to be retested because the first samples were not tested for use as a drinking supply!!!). Two days after receiving the approval for use of the well, staff received a call from the Fairfax County Health Department. They indicated that there were problems with the well which included a contractor not licensed to work in the county, use of unapproved grout to seal the casing of the new well, and issues with the closure of the old well. It was indicated that they would pursue these "violations" and the end result would be closure of the new well and re-drilling. Regional Office engineering and contracting are working on this

issue. They confirmed that the contractor is licensed in the county and are currently waiting for a letter which details the other problems.

On September 18, an inspector from the Federal Highways Administration visited and examined High Point Road to see if Federal highway funds could be used for repairs. He found it a much smaller job than he anticipated (3/4 of a mile of dirt road) and has not called back.

### 3. Major Maintenance

In July, a contractor closed and abandoned the old shop well and drilled a new well. Conflicts between the drilling contractor and Fairfax County officials existed and the new well could not receive final approval. Differences of opinions existed on the materials used to seal the old well and the type of casing used on the new well. The water remained non-potable and drinking water continued to be brought into the maintenance shop.

### 4. Equipment Utilization and Replacement

In January, the Deere 301 tractor, originally obtained as surplus from the National Park Service, broke down and required extensive repairs to the motor. Because the tractor's age was over 26 years old and number of hours on the machine, repair was not an economical solution. It would cost almost half of a new tractor to replace the motor so the refuge will excess it and look for a replacement. A replacement tractor was requested in the MMS program. During the year, the Kubota 7100 tractor required repairs to the loader and bucket. All hydraulic lines, one hydraulic cylinder, and the alternator of the Deere 1250 tractor required repair or replacement. The right front steering cylinder and four wheel drive control of the Deere 7200 tractor also required repair or replacement.

Refuge staff gave the 1985 Dodge crew cab pick-up truck limited use. In January, Maintenance Worker Boska removed all law enforcement, fire, and radio equipment from the vehicle. Later in the month, staff from the Ohio River NWR picked up the vehicle for use at that refuge. In February, the 1987 Ford Aerostar van was placed on excess property. Later in the year, GSA sold the van by public auction.

A new 15-passenger Ford van was purchased in 1999. In 2000, after getting erratic grabbing of the brakes and a sensor light coming on in the Ford fifteen passenger van, staff contacted the dealership. They said not to worry, the light only meant that the ABS system wasn't working but the hydraulic part of the brakes would still function. The van was taken in to the dealer in June to fix the problem under warranty.

The refuge's boats required repairs. The Boston Whaler required repairs to the bow and replacement of the entire wiring harness and tachometer cable. The 16' Jon boat required welding to repair stress cracks and the trailer required repairs tongue, frame, and springs. Maintenance Worker Boska has scheduled to boat for painting.

The Ford pickup was taken to American Truck in August to have a snow plow mounted. The unit can either drop just the blade or almost the whole frame if necessary when not needed.

## 5. Communications Systems

The refuge had radios switched from the Ford Aerostar as it was decommissioned to the Ford fifteen passenger van in January and an old radio installed in the new Ford pickup truck in April. The contractor is very accommodating but does take his time completing the work tying up any vehicle being serviced.

To lessen the shortage of portable radios among the staff, an old GE portable radio was repaired.

## 6. Computer Systems

No on-line computer capability existed at the maintenance shop. Maintenance worker Boska received e-mail at the Refuge headquarters. The maintenance shop finally got a combination fax/printer/scanner for its computer in October being it into the age of electronic communications.

On February 18, Refuge manager Weiler spent a day in the Arlington office to review the new real property inventory database which has been developed by realty. The new database is in a layout similar to the FileMaker Pro version used last year. The new database (designed in Oracle) will be accessed via the web and will not reside on your PC. There were a variety of suggestions presented by the reviewers. Three main drawbacks to this system are: 1) Oracle is a high end database which is not user friendly. It requires a programmer to make changes so it is not very adaptable for future needs. 2) There is no security controls in the program. Anyone can make changes to any record. While it will be able to track who made a change that will be of little consolation to anyone whose data has been modified. 3) There is no import/export feature. Once data is entered there is no simple way for a field station to access it and use it or modify it for their own needs as is now available in FileMaker. The contractor indicated that they would work on some of these issues but it is a question of dollars and time.

The new version of Word Perfect 98 was installed on all refuge computers in February.

## 7. Energy Conservation

The refuge continued with an aggressive recycling program. Most scrap metals, glass, paper, etc. were transferred to recycling facilities. Discarded tires washing up along the refuge's water boundary continued to be a problem with paperwork associated with disposal as well as increased disposal fees at Fairfax County's Energy Recovery Facility.

## 8. Other - Nothing to report.

### J. OTHER ITEMS

#### 1. Cooperative Programs

The Science Museum of Virginia is planning to build a Life Science Center on property adjacent to the Occoquan Bay NWR. They approached the Refuge and the Region regarding a possible partnership with the Service and a Service exhibit area within their building. The Region initially agreed that this was a good idea and created a committee (consisting of RO staff and RM Weiler) to review the proposal and make recommendations to the Regional Directorate as to the level of involvement the Service should have in this project. The committee recommended that the Service should be involved in the maximum extent possible, including an area interpreted jointly by the Service and SMV and a stand alone Service exhibit which would highlight all Service programs. The recommended theme for the Service area was watersheds with emphasis on the Chesapeake Bay area.

Progress on the planning and extent of our involvement in this project rapidly came to a halt as the committee was not empowered to make any decisions regarding level of involvement or even to proceed to the next step. The SMV has continued to move ahead and has now issued a request for proposals for architect and engineering firms. They still want the Service to be involved. Hopefully this will be resolved this coming year or the Service will miss out on an incredible opportunity to promote Service programs to a large number of people (estimates of visitation start at 500,000) which includes a large school age segment which we typically find difficult to reach.

#### 2. Other Economic Uses - Nothing to Report

#### 3. Items of Interest

Sadly, Elizabeth Hartwell, primary campaigner for establishing the refuge, the state park, and the regional park on Mason Neck and a statewide known environmentalist, passed away from cardiopulmonary disease on December 17.

Through Washington Office promotions, an ESPN Outdoors film crew spent a day (June 8) filming in Great Marsh on Mason Neck NWR. Several segments featured Dan Ashe discussing eagles and endangered species, pressures on refuges such as development, and public use opportunities including fishing. Most of the day was spent filming short segments that will be used as leaders for upcoming shows. During each segment the host (Tom Sanders) would plug NWR's and fishing opportunities. Dan Ashe and Phil Milion (WO) were present. Thanks to Janet Tennyson (Division of Refuges) for arranging and coordinating this activity and to Al Hundley (LE) for use of his boat. Weather was great and wildlife cooperative.

#### 4. Credits

Everyone on the staff contributed to the writing of this report. Manager Weiler reviewed it.

K. FEEDBACK - Nothing to Report

# OCCOQUAN BAY NATIONAL WILDLIFE REFUGE

## Woodbridge, Virginia

### INTRODUCTION

Located about 20 miles south of Washington, D. C., Occoquan Bay National Wildlife Refuge is a 644 acre parcel on a peninsula bordered by the sandy river shoreline of Belmont Bay and Occoquan Bay and the tidal flats of Marumsco Creek. It lies approximately 4 miles east of the fall line separating the Coastal Plain from the Piedmont Uplands Province, resulting in alluvial terrace deposits underlain by sand, silt, clay, and gravel in a massive eastward-thickening wedge of sediments. "Occoquan" is derived from a Dogue Indian word meaning "at the end of the water". Adjacent to the confluence of the Occoquan and Potomac Rivers, tributaries to the Chesapeake Bay, the location made this area a stopover site for migrant birds as well as a natural site for Native American and colonial settlement.

Occoquan Bay NWR is made up of two parcels formerly known as the Woodbridge Research Facility and the Marumsco National Wildlife Refuge. The research facility, which served as an Army communications in the 1950's and 1960's and a top secret research center in the 1970's and 1980's, closed its operations in September 1994 under the Base Realignment and Closure Act (BRAC). Local citizen initiatives and political support led to the signing of legislation by President Clinton in September 1994, authorizing transfer of the entire facility to the U. S. Fish and Wildlife Service. The site was formally transferred in June, 1998. Marumsco NWR had been established in 1973 when the Army exsessed the creek portion of the property. Recombining the two parcels with the new name of Occoquan Bay gave the site more community recognition and management capability.

As a classified Army site, the Woodbridge Research Facility was closed to the public. Mowed and cleared for electronics testing, the site contains a diversity of grassland and wetland plant species unusual in the heavily developed Potomac region. Its diverse habitats support a correspondingly high number of wildlife species, particularly migrant land and waterbirds and grassland nesting species. Wetland habitats cover about 50 percent of the site, and include wet meadows, bottomland hardwoods, open freshwater marsh, and tidally influenced marshes and streams. About 20 percent of the unit is upland meadows, with the remaining vegetated areas consisting of shrub and mature or second growth forest. The refuge is managed to provide early successional habitats and appropriate wildlife-dependent recreational opportunities, to educate visitors on the results and benefits of habitat management for wildlife, and for the enjoyment and benefit of people.

The Refuge is located in Prince William County, one of the fastest growing counties in the Commonwealth of Virginia, with more than 241,000 residents. The county consists of 222,305 acres of land and 5,1200 acres of water. It comprises singe-family residential, multi-family residential, agriculture, parks and open space, and government, commercial, and industrial facilities. Employment is high, predominately in government and government-associated services or activities.

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K. FEEDBACK - Nothing to Report

### A. HIGHLIGHTS

The most significant accomplishment this year at Occoquan Bay National Wildlife Refuge was the completion of the remediation and clean-up of contaminated sites by the Army Corps of Engineers and the removal of buildings and other structures associated with the former Woodbridge Research Center compound. The removal of nearly 71,000 square feet of buildings was an enormous contribution to the aesthetic and natural resource value for visitors and for wildlife and resulted in 10-12 additional acres of grassland for the Refuge.

### B. CLIMATIC CONDITIONS

Occoquan Bay NWR with its open vistas across the grasslands and marshy perimeter was subject to high winds and perimeter flooding during major storms.

In the Washington area, every summer month in 2000 was cooler than average, at least since 1972, even though it was the eleventh warmest summer for the United States in more the 100 years. There were only nine 90-degree days, the fewest ever at Reagan National Airport, and the fewest in the Washington area since 1906. The maximum temperature in July was 89 degree Farenheit. The winter months were also relatively mild. In January, the minimum temperature was 27 degrees Farenheit. The annual precipitation was 39 inches; annual snowfall was 18 inches.

### C. LAND ACQUISITION

1. Fee Title - Nothing to report
2. Easements - Nothing to Report
3. Other - Nothing to Report

### D. PLANNING

1. Master Plan - Nothing to Report
2. Management Plan - Nothing to Report
3. Public Participation

On March 24, Congressman Tom Davis toured Occoquan Bay Refuge. His support was critical in the establishment of the Refuge and he provided funding for the CCP process. The tour highlighted the progress the refuge has made since the transfer of the property from the Army. Mr. Davis was presented with a plaque in honor of his support.

On May 4, Sean Connaughton, the newly elected Chairman of the Prince William County Board of Supervisors, spent over two hours on the refuge. Topics of discussion included refuge activities and plans, working relations with the county and other agencies, and ways to improve refuge/county interaction on future projects.

Next to visit was Prince William County executive Graig Gerhart on June 15. Discussions focused on refuge plans, the National Heritage Trail, and refuge/county interaction and ways to increase opportunities for joint participation on projects. The refuge has very good working relations with the county.

State Delegate Jack Rollison toured Occoquan Bay NWR in September. Mr. Rollison was impressed with the work that had been done since he attended the refuge dedication. When the topic of fishing was brought up, Mr. Rollison commented on the difference in views between the refuge and the Leesylvania State Park. The Park has one of the largest and best boat launch facilities in the area. This opened a discussion on the differences between the park and the refuge. Mr. Rollison had no doubt when he left that the Service had no plans for facilities similar to the State Park's on the refuge.

#### 4. Compliance with Environmental Mandates

On April 26, Refuge manager Weiler attended a public meeting regarding a proposed water taxi that would operate from Prince William County up to Washington DC. Potomac River Jet proposed loading points near Quantico, Neabsco, and Occoquan and potentially would impact Occoquan Bay NWR at the least and potentially Mason Neck and Featherstone refuges. The river has been considered several times as an alternative to increasing traffic gridlock. What surprised everyone was the announcement by two private companies that they are expecting to offer commuter ferry service from Occoquan Bay to DC starting as soon as Labor Day. Again, most questions were left unanswered. The company had a lot of local support but eventually fell by the wayside and current status is unknown.

#### 5. Research and Investigations

##### Staff coordinated:

- Winter grassland bird point count surveys
- Spring (diurnal) grassland bird point count surveys
- Spring (evening) grassland bird point count surveys
- Territorial mapping surveys of grassland birds
- Insect surveys
- Grassland vegetation surveys
- Fall deer spot-lighting
- Bald eagle surveys along the Potomac River
- Anuran Call Count Survey

Collateral surveys by permit:

Small mammal study - Dr. L. Underwood, N. Virginia Community College/Woodbridge  
 Mid-winter raptor survey - The Raptor Society  
 Banding/breeding birds and MAPS Training - Institute for Bird Populations (IBP)  
 On-going (monthly) bird surveys - Prince William Natural Resources Council  
 Christmas Bird Count Occoquan Bay NWR - Prince William Natural Resources Council  
 Deformed frogs surveys - Ecological Services, USFWS Chesapeake Bay Field Office  
 Bluebird Nest Box - VA Bluebird Society  
 Submerged Aquatic Vegetation (SAV) - Virginia Native Plant Society (Elaine Haug)  
 Plant Monitoring - Virginia Native Plant Society (Elaine Haug & Nicki Stanton)  
 Woodcock survey - Fairfax Audubon Society  
 Dragonfly/Butterfly Survey - Kim Hosen

6. Other - Nothing to Report

E. ADMINISTRATION

1. Personnel

See Mason Neck NWR - staff shared as part of Potomac River NWR Complex.

2. Youth Programs

The Girl Scout Council of the Nation's Capital continued its cooperative outreach program with Fairfax Audubon Society and the Fish and Wildlife Service. This Adopt a Refuge program has involved over 600 scouts and adults in litter pickup, tree planting, trail clearing, vista clearing, seed collection, shoreline stabilization, erosion control, fence maintenance, phragmites control and painting projects.

Adopt a Refuge Accomplishments:

Sixty 2-two foot tall cedars were transplanted in a wedge to create a wildlife shelter. Three hundred feet of shoreline was stabilized with geogrid and recycled concrete. Five pounds of Eastern gamma grass seed was collected for reuse on the refuge. Three hundred feet of fence line was cleared of vines. Seventy feet of chain link fence was cleared of vines, cleaned of rust and prepared for painting. A twelve by twenty foot storage building was painted. Two hundred feet of a badly eroded and gullied road was stabilized by the installation of perforated drain pipe, gravel and silt fencing. Litter was removed from thousands of feet of shoreline. One of the girls created a four panel display interpreting the Adopt a Refuge outreach. This display has been used at several Girl Scout and conservation oriented events.

Though this program has been labor intensive for the staff and there are numerous "bugs" to work out, the outreach has been a success in involving local troops in the refuge and

providing the Girl Scouts with “meaningful” work. We have received many comments from the girls and troop leaders about the opportunities to work and learn derived from their experiences at Occoquan Bay.

Boy Scouts have also been involved at Occoquan Bay. Scout Matt Kudla removed old deer hunting stands from the refuge as an Eagle project. These tree stands are old and dilapidated and have posed a great safety risk since the transfer of the property to the Fish and Wildlife Service.

Scout Dan Miller, an Eagle Scout candidate is in the process of installing eight cable gates at road intersections within the refuge.

### Special Recognition:

Rose Thomas, Adopt a Trail coordinator for Boy Scout Troop 964, has worked very hard at involving scouts in the maintenance of the Woodmarsh Trail.

Karen Brown, Program Specialist with the Girl Scout Council of the Nation’s Capital, has been enthusiastic and dogged in her efforts to keep the Adopt a Refuge program going for another year.

Rachelle Price, Girl Scout troop leader, involved her girls in the creation and construction of a table top interpretive display on the Adopt a Refuge program. This display has been used by refuge staff as well as Girl Scouts at several public functions. Rachelle has also taken a lead in coordinating the involvement of Girl Scouts on the Occoquan Bay NWR.

### 3. Other Manpower Programs - Nothing to Report

### 4. Volunteer Program

Volunteer Services Report FY 99-00										
# volunteers by age	Under 18		18-35		36-61		over 61		Total	
	FY99	FY00	FY99	FY00	FY99	FY00	FY99	FY00	FY99	FY00
Mason Neck	22	34	5	12	40	52	15	7	82	105
Occoquan	218	412	20	90	20	118	5	7	263	627
#hours by Activity Category					Mason Neck		Occoquan Bay			
					FY99	FY00	FY99	FY00	FY99	FY00
Monitoring & Studies	Survey & Censuses				472	1384	378	724		
	Studies & Investigations				30			270		
Habitat Restoration	Wetland Restoration									
	Upland Restoration						110	100		
	Riverine Restoration						450			

Habitat Management	Water Level Management		86		
	Moist Soil management				
	Graze/Mow/Hay				
	Forest Management				
	Fire management		16		
	Pest Plant control				40
Fish & Wildlife Management	Bird Banding				16
	Disease Monitor/Treatment				
	Reintroductions				
	Nest Structures				25
	Pest/Predator/Exotic Control				
Coordination Activities	Interagency Coordination				
	Private Lands Activities				
Resource Protection	Law enforcement				
	Permits/Economic Use Mgmt				
	Contaminant Investigation				
	Contaminant Cleanup				
	Cultural Resource Management				
	Land Acquisition Support				
Public Education & Recreation	Provide Visitor Services	299	155	559	1400
	Outreach				3
Planning & Administration	Comprehensive Conservation Plan				
	General Administration				
TOTAL HOURS		801	1641	864	2587

### Special Recognition:

Elain Haug, a plant specialist at the Smithsonian Institute has continued to provide hours of volunteer time in conducting plant surveys, updating the refuge master plant list and providing assistance in a variety of wildlife management and habitat management projects.

Marty McClevey supervised the volunteer program on Occoquan Bay Refuge.

### 5. Funding

See Mason Neck NWR - combined funding for complex.

### 6. Safety - Nothing to Report

## 7. Technical Assistance

Biologist Witt served on the Prince William County Water Roundtable during 2000.

ORP Schultz served on Prince William County Schools' Vocational Advisory Board.

## 8. Other Items - Nothing to Report

# F. HABITAT MANAGEMENT

## 1. General

Due to ongoing site rehabilitation by the Army, activity was limited to mowing and removal of tree lines. Site rehabilitation focused on capping a disposal site at the mouth of Marumsco Creek, shoreline stabilization with rip-rap, and removal of the buildings in the center compound.

Located along the Potomac River and Occoquan Bay, the Refuge consists of 677 acres and consists of the following habitat types:

<u>Habitat</u>	<u>Acres</u>
Woodland/Forest	58
Grassland	327
Pond	4
Wetland	284
Administrative areas (i.e. buildings, parking lots)	4

## 2. Wetlands

A delineation by the Army Corps of Engineers in November and December of 1991 determined that approximately 284 acres of the Refuge are jurisdictional wetlands. 264 of these acres are freshwater tidal dominated by emergent low and high marsh vegetation and fed by the tidal influx of the Occoquan Bay. 15 acres of tidal wetland are associated with Marumsco Creek on the Refuge's southwest border, and about five acres of non-tidal wetlands are distributed throughout the Refuge in the form of wet meadow, swamp (forested wetland), and drainages.

Beaver activity is apparent and may have affected the acreage of the wetland portion of the Refuge, although this has not been measured. A stand of common reed (*Phragmites australis*) of about 150 square feet (11.6 square meters) borders one of the inlets from the Occoquan Bay and portions of nearby Deephole Point Road. This was cut back by Biologist Spencer in July when much plant energy is directed toward reproductive growth as this timing will have greater impact regrowth. A volunteer group of girlscouts under the guidance of ORP McClevey also did some cutting and bagging of the seed heads. This

effort will have to be continuously and aggressively pursued if we are to prevent its spreading throughout the wetlands by seed dispersal or vegetative growth.

### 3. Forests

The existing forest stands on the Refuge have not been directly managed since acquisition. Thirty to 35 large and isolated eastern cedar trees (*Juniperus virginiana*) were removed this year to improve the grassland habitat and reduce the edge effect created by woodland patches. These were growing in a row (perhaps deliberately planted along a fence line).

### 4. Croplands - Nothing to Report

### 5. Grasslands

On February 11, 2000, NPS conducted a one day chain saw training class on Occoquan Bay NWR. With the help of the saw class we were able to cut down 30-35 large trees in the grasslands and trim, chip, and cut up approximately half of those. Chips will be used on trails and the wood was given to the Regional Park for use at their camp ground. Thirty students and instructors assisted refuge staff in the limbing and removal of downed cedar trees. The wood was later transported to Pohick Bay Regional Park for use in their campsite area.

Grassland birds and insects at Occoquan Bay National Wildlife Refuge were surveyed during May and June of 2000, as part of a field study to examine the effects of mowing and burning. The estimated relative abundance of the birds during the surveys was based upon a point count methodology, using six 5-minute surveys at each of the 18 point count stations in the grasslands with all birds being counted within a 50 m and 100 m radius of the point count location. See Wildlife Section, Other Migratory Birds for results. The insects were collected at each of the bird point counts using 3"by 5" yellow sticky boards during the months of June and July and stored in the freezer for later identification and analysis.

The table below provides the results of the Grassland Vegetation Survey. The vegetative composition and the relative abundance of the grassland species at Occoquan Bay NWR during June 2000 was based upon the plants found within 108 m<sup>2</sup> quads randomly located around 18 bird point count survey locations in the grasslands. The visual percent for each plant species were estimated in each quad using two observers and based on the five most dominant species within each individual quad.

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**Vegetative composition at Occoquan Bay NWR, June 2000**


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Common Name	Species Name	Frequency of Encounter in the quads	Overall Avg Dominance in quads, %
Raspberry	Rubus sp.	75	23.0
Eastern Gama Grass	Tripsacum dactyloides	41	18.2
Dogbane	Apocymum cannabinum	43	10.2
Beauty Berry	Symphoricarpos orbiculatus	23	7.9
Japanese Honeysuckle	Lonicera japonica	36	7.1
Silky Lespedeza	Lespedeza cuneata	35	6.6
Virginia Creeper	Parthenocissus quinquefolia	22	5.0
Goldenrod	Solidago sp.	28	8.2
Grape	Vitis sp.	25	4.6
Poison Ivy	Rhus radicans	17	3.7
Quack Grass	Agropyron repens	8	3.3
Sweet Vernal grass	Anthoxanthum odoratum	17	3.1
Deer Tongue Grass	Dichanthelium clandestium	14	2.8
Tall Fescue	Fescue elatior	8	2.7
Panic Grass	Paspalum laeve	6	2.4
Tall Goldenrod	Solidago canadensis	14	2.3
American Germander	Teucrium canadense	5	2.0
Bushy Panic Grass	Dichanthelium dichotomum	4	1.7
Blue Stem Goldenrod	Solidago caesia	8	1.6
Path Rush	Juncus tenuis	9	1.1
Velvet Grass	Holcus lanatus	6	0.8
Thistle sp.	Cirsium sp.	8	0.7
Wingstem	Verbesina alternifolia	4	0.7
Smartweed	Polygonium sp.	3	0.7
Lespedeza sp.	Lespedeza sp.	3	0.7
Yellow Leaf Cup	Polymnia uvedalia	1	0.6
Green Ash	Fraxinus pennsylvanica	1	0.6
Brome Grass	Bromus commutatus	4	0.6
Carolina Pasture Rose	Rosa carolina	3	0.6
Common Milkweed	Asclepias syriaca	3	0.6
Common Persimmon	Diospyros virginiana	3	0.6
Sweetgum	Liquidambar styraciflua	4	0.5
Trumpet Vine	Campsis radicans	4	0.5
Juncus effusus	Juncus effusus	5	0.5
Rough Goldenrod	Solidago rugosa	3	0.4
Goldenrod sp.	Solidago sp.	1	0.4
Narrow Leaf Mtn Mint	Pycnanthemum tenuifolium	3	0.4
Sheep Sorrel	Rumex acetosella	3	0.4
Dogwood sp.	Cornus sp.	2	0.3
Horse Nettle	Equisetum sp.	5	0.3
Canada Bluegrass	Poa compressa	4	0.3
Intermediate Dogbane	Apocynum medium	1	0.3

Little Dogbane	Apocynum sp	1	0.2
Broom Sedge	Andropogon virginicus	1	0.2
Lycopus	Lycopus sp.	1	0.2
False Nettle	Boehmeria cylindrica	1	0.2
Multiflora Rose	Rosa multiflora	1	0.2
Tall Oat Grass	Arrhenatherum elatius	3	0.2
Whorled Goldenrod	Solidago sp.	3	0.2
Oxeyed Daisy	Heliopsis helianthoides	2	0.1
Galium	Galium sp.	1	0.1
Narrowleaf Goldenrod	Solidago sp.	1	0.1
Black Locust	Robinia pseudo-acacia	1	0.1
Solidago sp.	Solidago sp.	2	0.1
Swamp Dogwood	Cornus foemina	1	0.1
Narrowleaf Fleabane	Erigeron sp.	1	0.1
<hr/> Total		56	

#### 6. Other Habitats - Nothing to Report

#### 7. Grazing - Nothing to Report

#### 8. Haying - Nothing to Report

#### 9. Fire Management

The Wajax slip on the pumper required minor repair. While stored at the Occoquan Bay NWR, the pressure gauge received damage and required replacement.

Repairs were made to gauges on the complex's fire pumper trailer. The refuge purchased a large construction site tool box for a storage area of refuge fire tools. A gravel pad and tool box were placed at the refuge entrance to allow easy access to refuge personnel.

The Fire Management Plan (FMP) and Environmental Assessment for the FMP at Occoquan Bay NWR were both completed during the year; and the EAS and FONSI documentation for the EA is presently in the regional office for consideration and approval. The EA on the plan was distributed to the public - comment period closes on Dec. 15, 2000. From November 11 to 15, a public notice was run in the local papers regarding the Fire Plan.

Fields adjacent to Dawson Beach Road, south of the pond, west of Fox Road, and in the north central meadow were mowed starting in February and ending in March 2000.

In preparation for conducting prescribed burns and maintaining safe conditions on all three units of the complex, staff went through several training courses and testing as listed below:

January 4 - 8, 1999	Witt - S290 training, NCTC
February, 2000	Weiler - Basic Fire Fighting 130/190 Course
June 22- 24, 1999	Witt - S390, Wildland Fire Behavior Calculations Training
October 19 - 21, 1999	Witt - Prescribed Fire Planning & Implementation, NCTC

March 13, 2001

Weiler, Witt, Boska, and McClevey - Backpack Fitness Test

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. WILDLIFE

### 1. Wildlife Diversity

Over 215 species of birds, 60 species of butterflies, and numerous mammals, amphibians, reptiles, and other species inhabit the site making it one of the most varied in northern Virginia. Important contributions to the diversity are the over 600 species of plants that have been documented, the site's location at the junction of two rivers, and the many uses of the land in the past.

### 2. Endangered and/or Threatened Species

The large trees in inner portions of the refuge are occasionally used during the winter for perching by eagles, while the perimeter and the shoreline are frequently used for perching and foraging during all seasons. Peregrine falcons have not been seen on the refuge during the past year, but previous year they were observed apparently passing through on migration.

### 3. Waterfowl

No formal surveys of waterfowl were conducted by Refuge staff this year but wood ducks, mallards, Canada geese are regularly observed at the mouth of Marumscro Creek and off the Refuge's shores. Currently, the monthly surveys conducted by volunteer Jim Waggener and the Christmas Bird Count yields the best data on use of the Refuge and its immediate environs by ducks and geese. For the CBC on January 2, 2000 the most abundant species (in descending order) were: Canada goose, 1,659; ruddy duck, 602; mallard, 397; American green-winged teal, 139; American black duck, 104; and hooded merganser, 65.

### 4. Marsh and Water Birds

The Regional Marshbird Callback Survey was not repeated this year for either Refuge.

No formal surveys of marshbirds and water birds were conducted by biology staff this year, although red-winged blackbirds and common yellowthroats are commonly encountered

throughout the wetter portions of the Refuge in the warm seasons, and great blue and black-crowned night herons frequent pond and the creeks. Volunteer Jim Waggener's monthly bird surveys and the Christmas Bird Count yields the best current data on marshbird and water bird use of the Refuge. The most abundant species from the January 2, 2000 count were ring-billed gulls, 1,650 and herring gulls, 353. More secretive birds were also observed in the winter: American woodcock, 12; common snipe, 4; and king rail, 2.

#### 5. Shorebirds, Gulls, Terns, and Allied Species - Nothing to Report

#### 6. Raptors

See Endangered and Threatened Species section of Mason Neck NWR narrative for bald eagle report.

#### 7. Other Migratory Birds

Breeding Bird Point Counts for Spring daytime and evening, and winter daytime were conducted for breeding and residential birds at each of the eighteen points in the grassland study plan.

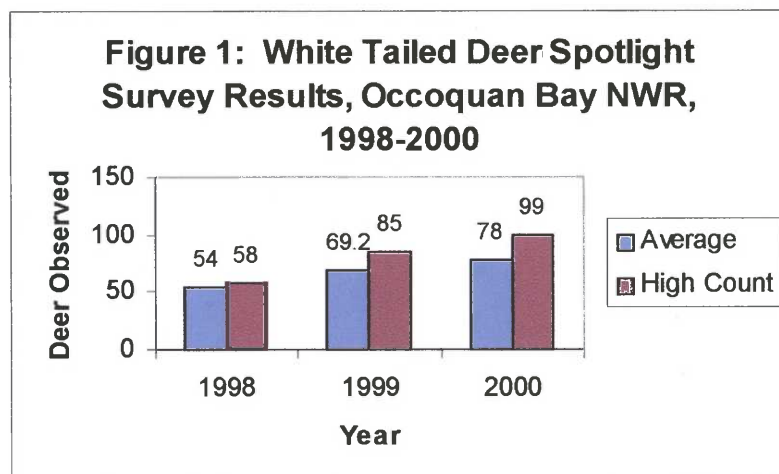
**Grassland birds at Occoquan Bay National Wildlife Refuge during May and June of 2000** The relative abundance of the birds observed during the surveys is based upon a point count methodology, using six 5-minute surveys at each of the 18 point count stations in the grasslands with all birds being counted within a 50 m and 100 m radius of the point count location.

Common Name	Species	Species Code	Total Observed within 50m	Total Observed w/in 100m
Acadian Flycatcher	Empidonax virescens	ACFL		1
American Crow	Corvus brachyrhynchos	AMCR	10	25
American Goldfinch	Carduelis tristis	AMGO	35	71
American Robin	Turdus migratorius	AMRO	1	3
American Woodcock	Philohela minor	AMWO		2
Barn Swallow	Hirundo rustica	BARS	1	3
Bank Swallow	Riparia riparia	BASW	3	3
Blue-gray Gnatcatcher	Poliophtila caerulea	BGGN		18
Brown-headed Cowbird	Molothrus ater	BHCO	2	5
Blue Grosbeak	Guiraca caerulea	BLGR	1	1
Bobolink	Dolichonyx oryzivorus	BOBO		4
Blackpoll Warbler	Dendroica striata	BLPW	2	8
Brown Thrasher	Toxostoma rufum	BRTH	1	2
Carolina Chickadee	Parus carolinensis	CACH		2
Carolina Wren	Thryothorus ludovicianus	CARW	5	23
Cedar Waxwing	Bombycilla cedrorum	CEDW	4	11
Chipping Sparrow	Spizella passeriana	CHSP	2	3
Chimney Swift	Chaetura pelagica	CHSW		11
Common Grackle	Quiscalus quiscula	COGR	11	22
Common Yellowthroated	Geothlypis trichas	COYE	161	294
Downy Woodpecker	Picoides pubescens	DOWO	2	2
Eastern Bluebird	Sialia sialis	EABL	13	21

Eastern Kingbird	Tyrannus tyrannus	EAKI	11	22
Eastern Meadowlark	Sturnella magna	EAME	9	24
Eastern Phoebe	Sayornis phoebe	EAPH		5
Eastern Towhee	Pipilo erythrophthalmus	EATO	4	11
Eastern Tufted Titmouse	Parus bicolor	ETTI	4	25
Eastern Wood-pewee	Contopus virens	EAWP		2
European Starling	Sturnus vulgaris	EUST	9	51
Fish Crow	Corvus ossifragus	FICR		3
Field Sparrow	Spizella pusilla	FISP	27	72
Great Blue Heron	Ardea herodias	GBHE	1	3
Grasshopper Sparrow	Ammodramus savannarum	GRSP	3	3
Gray Catbird	Dumetella carolinensis	GRCA	1	1
House Finch	Carpodacus mexicanus	HOFI		1
Indigo Bunting	Passerina cyanea	INBU	40	84
Mourning Dove	Zenaidura macroura	MODO	5	15
Northern Bobwhite	Colinus virginianus	NOBO	10	52
Northern Cardinal	Cardinalis cardinalis	NOCA	5	26
Northern Mockingbird	Mimus polyglottos	NOMO	6	18
Northern Parula	Parula americana	NOPA		3
Orchard Oriole	Icterus spurius	OROR	7	15
Osprey	Pandion haliaetus	OSPR	15	18
Prairie Warbler	Dendroica discolor	PRAW	2	9
Prothonotary Warbler	Protonotaria citrea	PROW	1	4
Purple Martin	Progne subis	PUMA	9	10
Red-bellied Woodpecker	Melanerpes carolinus	RBWO	2	7
Red-eyed Vireo	Vireo olivaceus	REVI	4	11
Red-head Woodpecker	Melanerpes erythrocephalus	RHWP	1	1
Red-tailed Hawk	Buteo jamaicensis	RTHA		2
Red-winged Blackbird	Agelaius phoeniceus	RWBL	58	145
Song Sparrow	Melospiza melodia	SOSP	2	10
Swainson Thrush	Catharus ustulatus	SWTH		1
Tree Swallow	Iridoprocne bicolor	TRES	26	40
Turkey Vulture	Cathartes aura	TUVU		5
White-eyed Vireo	Vireo griseus	WEVI	2	12
Willow Flycatcher	Empidonax traillii	WIFL	1	4
Yellow-breasted Chat	Icteria virens	YBCH	27	70
Yellow Warbler	Dendroica petechia	YEWA	33	109
Yellow-shafted Flicker	Colaptes auratus	YSFL	2	5
Total:			581	1434

## 8. Game Mammals

Fall white-tailed deer spotlight counts were conducted at Occoquan Bay NWR for the past three years. Figure 1 below shows the results of these surveys. Preparation of a draft Environmental Assessment for Deer Management for Occoquan Bay was begun in the fall of 2000 for submission to Regional Headquarters in early 2001. The Refuge seeks to begin management of the deer population on the Refuge via a controlled hunt in the fall of 2001.



#### 9. Marine Mammals - Nothing to Report

#### 10. Other Resident Wildlife

Small Mammals (Rodentia) Northern Virginia Community College professor Larry Underwood worked with the biologist and volunteer Marcy Heacker-Skeans to initiate small mammal trapping for baseline data. Primary survey areas were west of Fox Road and north of Painted Turtle Pond. The table below shows the results of this survey.

Small mammals observed at Occoquan Bay National Wildlife Refuge during 2000					
Common Name	Species Name	Spring: Total Captured	Mortality Observed	Fall Total Captured	Mortality Observed
House Mouse	Mus musculus			2	0
Rice Rat	Oryzomys palustus			1	0
White-footed Mouse	Peromyscus leucopus	16	0	11	0
Shorttail Shrew	Blarina brevicauda	3	3	6	0

Meadow Vole	Microtus pennsylvanicus	5	1	1	0
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**Butterflies (Insecta)** Several volunteers, headed by Kim Hosen of the Prince William County Natural Resources Council conducted four butterfly surveys at the Refuge over a period of three months. Estimates of the relative abundance of the butterflies at Occoquan Bay NWR during July was completed by a minimum of 3 people per survey, with Kim Hosen and Jim Waggener as the coordinators. The table below shows the results of those surveys.

<b>Butterflies at Occoquan Bay National Wildlife Refuge, 2000</b>				
<b>Species</b>	<b>Abundant</b>	<b>Common</b>	<b>Uncommon</b>	<b>Rare</b>
Appalachian Brown		X		
Blue, Eastern-tailed	X			
Blue, Spring Azure	X			
Checkerspot, Silvery			X	
Comma		X		
Common Buckeye		X		
Common Wood Nymph	X			
Duskywing, Juvenals		X		
Duskywing, Horace's		X		
Emperor, Hackberry			X	
Fritillary, Great Spangled	X			
Fritillary, Meadow			X	
Fritillary, Variegated		X		
Hairstreak, Banded				X
Hairstreak, Grey		X		
Hairstreak, Red Banded	X			
Lady, American		X		
Lady, Painted				X
Monarch		X		
Mourning Cloak			X	
Northern Pearly Eye			X	

Pearl Crescent	X			
Question Mark		X		
Red Admiral		X		
Red Spotted Purple		X		
Satyr, Carolina			X	
Satyr, Little Wood	X			
Skipper, Common Checkered			X	
Skipper, Delaware			X	
Skipper, Dunn		X		
Skipper, Least		X		
Skipper, Fiery		X		
Skipper, Little Glassywing		X		
Skipper, Long Tailed			X	
Skipper, No. Broken Dash		X		
Skipper, Peck's		X		
Skipper, Sachem		X		
Skipper, Silver Spotted	X			
Skipper, Zabulion		X		
Sulphur, Clouded		X		
Sulphur, Cloudless			X	
Sulphur, Little Yellow		X		
Sulphur, Orange	X			
Sulphur, Sleepy Orange		X		
Swallowtail, Black		X		
Swallowtail, Pipevine		X		
Swallowtail, Spicebush		X		
Swallowtail, Tiger Dark Form		X		
Swallowtail, Tiger Yellow Form	X			
Swallowtail, Zebra		X		

Viceroy		X		
White, Cabbage	X			
White, Checkered			X	
White, Falcate Orange Tip			X	

Anuran Call Count Survey These surveys were initiated on the refuge as a simple way of determining what species of frogs occur on the refuge and which sites are important to breeding populations. Surveys were conducted by standing at one point for a standard period of time and recording all the amphibians that are heard within one specified area. The survey is conducted from a central point located on the edge of a semi-circular sample area. If done consistently, call surveys can provide information on the status of different species in the areas sampled.

Anuran Call Survey      Number of nights: (4)      # Species heard: (8)

Green frog ( <i>Rana clamitans</i> )	Northern cricket frog ( <i>Acris crepitans</i> )
Bullfrog ( <i>Rana catesbiana</i> )	Spring peeper ( <i>Pseudocris crucifer</i> )
Green treefrog ( <i>Hyla cinerea</i> )	Gray treefrog ( <i>Hyla versicolor</i> )
Cope's gray treefrog ( <i>Hyla chrysoscelis</i> )	American toad ( <i>Bufo americanus</i> )

#### 11. Fisheries Resources

There were fish kills documented on March 13 and the weekend of May 3 and 4. The cause was unknown for March but the May incident was the result of a commercial fisherman dumping his nets when his boat broke.

In August, the Fisheries division based their boat and shad spawning operations on the refuge.

#### 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

Kerry Wilcox from the Institute for Bird Populations/MAPS conducted a bird banding training session for future MAPS volunteers in the wetlands on the Occoquan Bay NWR. During the 3-day session in April numerous species were banded, indicating that the refuge would make an excellent migration banding site.

## 17. Disease Prevention and Control - Nothing to Report

H. PUBLIC USE

## 1. General

Occoquan Bay NWR	FY00	FY99	FY98	FY96	FY95
I. Total number of visitors	4,975	3,658	1,303	98	340
II Interpretation & Nature Observation (on-site)	3,774	2,611	868	5	0
A. Staff/Volunteer Conducted Activities	0	24	179	5	0
1. Talks	0	0	0	0	0
2. Tours	0	24	179	5	0
3. Demonstrations	0	0	0	0	0
B. Visitor Centers	0	0	0	0	0
C. Administrative Office	0	60	0	0	0
D. Kiosks	0	0	0	0	0
E. Nature Trails	3213	2,611	689	0	0
1. Foot	3213	2,611	689	0	0
2. Boat	0	0	0	0	0
3. Auto	0	0	0	0	0
F. Observation Towers/Platforms/Photo Blinds	0	0	0	0	0
G Other Wildlife	561	0	0	0	0
III. Environmental Education	1,225	499	230	93	340
A. Staff/Volunteer Conducted	20	0	0	93	0
1. Teachers participating in workshops	20	0	0	1	0
2. Students taught on-site	0	0	0	92	0
3. Students taught off-site	0	0	0	0	0
B. Non-staff Conducted	1,205	499	230	0	340
IV. Recreation	0	20	205	0	0
A. Hunting	0	0	0	0	0
1. Migratory Birds	0	0	0	0	0
2. Upland Game	0	0	0	0	0
3. Big Game	0	0	0	0	0
B. Fishing	0	0	0	0	0
E. Other recreation	0	20	205	0	0
V. Education Outreach (off-site)	73	1,066	0	90	0
A. Group presentations	73	56	0	90	0
B. Exhibits	0	1,00	0	0	0
C. Other education outreach	0	20	0	0	0
VI. Special Events	0	7	0	0	0
A. Number of news releases	0	3	0	0	0
B. Number of radio/TV spots	0	0	0	0	0
C. Number of other special events	0	4	0	0	0

1998 Marumscow NWR combined w/ Army property to form Occoquan NWR  
1997 was in flux with Army property recorded as Mason Neck - Woodbridge Division

## 2. Outdoor Classrooms - Students

Kim Hosen from Nature's Wonderworld, a non profit organization conducted most of the environmental education programs this year. Teachers learned of her through word of mouth and contracted with her to provide field trip programs since the teachers didn't want to tackle it on their own. After having almost 1,200 students in the spring of 2000, Kim negotiated with Prince William County public schools for a contract to conduct much of their field trip program in the vicinity of the refuge and to use the County's Environmental Education trailers based at Belmont Elementary. This will be fully implemented in 2001. Teachers do not have to use her program but it simplifies field trips and gives the students a well structured experience. The refuge sees it as a service that staff currently can't provide being offered by a person supportive of the refuge and receptive to its suggestions and needs.

Osborne Park High School in Prince William County has established a special environmental sciences curriculum for students as a magnet program similar to Fairfax County's Thomas Jefferson High School for Science and Technology. There have been several attempts to interface the school program with the Refuge but logistics have been a problem. As part of the program, students are supposed to get involved in community service or research associated with their chosen field of study. A template of opportunities were drafted for a parent discussion group and then distributed by the instructor to the students in February, however, no coordinated effort by the school to use the Refuge resulted.

## 3. Outdoor Classrooms - Teachers

In April, folks from the Bird Populations from Port Reyes Station, California conducted training at Occoquan Bay for volunteers and surveyors. They learned techniques for operating Monitoring Avian Productivity and Survivorship (MAPS) banding stations that may be used next year for biological surveys and play a role in environmental education.

## 4. Interpretive Foot Trails

The refuge still operated the two mile loop from the parking lot down Fox Road to the perimeter, along Occoquan Bay, and then back by Easy Road. Interpretive materials are still in the planning stage. Deer, eagles, foxes, and beaver were regularly sighted and the more intense visitor could find plenty of butterflies and birds to flesh out a hike. Several times when remediation by the military, maintenance by refuge staff, or high tides interfered with use of the trail, visitors were rerouted into the northeast corner of the refuge on an alternate two mile loop. This gave visitors both a new and safe place to explore and provided feedback for planning opening other parts of the refuge.

5. Interpretive Tour Routes - Nothing to Report

6. Interpretative Exhibits and Demonstrations - Nothing to Report

7. Other Interpretive Programs

ORP McCleavy staffed a display about the refuge and ARK (Audubon Refuge Keepers) at the Girl Scout Council's ECO Expo in Maryland on October 7. Some of the scouts who have been working with McCleavy (see youth programs) put the display together under McCleavy's guidance and then helped him set up and staff it.

ORP McCleavy put together a meeting between Washington Office Migratory Bird staff and a bird biologist from Virginia Department of Game and Inland Fisheries in September. They plan to expand on his idea from two years ago to have an International Migratory Bird Day Display at the local commuter rail station. We hope to work with the Washington office to provide staff displays at several rail stations and provide shade grown coffee to the commuters for the 2001 Migratory Bird Day.

Each year starting several years before the Refuge was established, representatives from Mobil's national headquarters in northern Virginia and the Prince William Natural Resource Council have sponsored a cleanup at Occoquan Bay. This year, with Exxon and Mobil merging and drawing more employees to their national headquarters, they wanted to intensify the experience by semi-adopting the refuge for a staff bonding opportunity. On April 6, refuge and council representatives presented a program at Exxon Mobil headquarters to invite personnel to come to the cleanup. Despite lousy weather, over 40 persons with their families showed up and cleaned about a mile of beach. Enough refuse was gathered to fill to the brim an entire construction-site bin. As a reward they received T-shirts, a catered lunch, and watched wildlife including a fully displaying killdeer next to the parking area. Exxon Mobil footed all expenses including hauling the trash and even made a donation of \$5,000 through the Council for refuge facilities (see wildlife observation).

On August 30, ORP Schultz was the guest speaker at the Prince William Natural Resource Council annual meeting. During the meeting, Jim Waggener turned the reins as president over to Nicky Staunton.

8. Hunting - Nothing to Report

9. Fishing - Nothing to Report

10. Trapping - Nothing to Report

11. Wildlife Observation

Exxon Mobil, following their annual spring cleanup, donated \$5,000 through the Prince William Natural Resource Council for development of facilities. With this donation, the Refuge purchased a prefab cedar gazebo for use by the public as a look-out station and

delivered to the overlook sight along the walking trail at the Refuge. The gazebo faces south and looks out across the Potomac River.

Starting the year out right, 18 birders counted 66 species of birds during the Christmas Bird Count held on January 1.

12. Other Wildlife Oriented Recreation - Nothing to Report

13. Camping - Nothing to Report

14. Picnicking - Nothing to Report

15. Off-Road Vehicling - Nothing to Report

16. Other Non-Wildlife Oriented Recreation - Nothing to Report

17. Law Enforcement

On January 2, two Prince William County Police Officers who patrol on bicycles visited the refuge. They were encouraged to explore and numbers were exchanged for coordinating enforcement activities in the area.

On January 23, ORP McClevey called in refuge officer Schultz to handle an incident involving sign vandalism and driving without a license. Due to the participants being juveniles, they were turned over to their parents. One parent made his son come back for two weekends of community service.

It continues to be a problem with local car dealership sending customers down Dawson Beach Road, a straight road which approaches the Refuge entrance, to check out the cars' performance. Most are very courteous but some use the road for excessive acceleration tests. The dealership has not been receptive to redirecting the traffic.

18. Cooperating Associations - Nothing to Report

## I. EQUIPMENT AND FACILITIES

1. New Construction - Nothing to Report

2. Rehabilitation

Culvert replacement and erosion control of the shoreline portion of the perimeter road required a large portion of refuge staff and volunteer time. Maintenance worker Boska recruited help from SCEP Biologist Spencer, Manager Weiler, Outdoor Recreation Planner McClevey, and volunteers Justin Weiler, Stephanie Boska, and Billy Higgs. Plastic DOT

approved culverts replaced rusted corrugated metal pipe culverts. The staff repaired the shoreline perimeter road with riprap, recycled concrete, geogrid, and geocloth.

Maintenance worker Boska was able to replace road culverts near the pond, ball field, on Bravo, on Charlie, and around the compound perimeter. Taylor Point Road along the north perimeter of the refuge was graded and paved in the fall.

Work began on January 14 on demolition of the buildings on Occoquan Bay NWR. The contractor removed over 2200 fluorescent light tubes, 1500 PCB light ballasts, 140 smoke detectors, and 20 lead acid batteries which were sent to recycle facilities. Building roofs and fire doors were sampled for asbestos. Only two fire doors and the roof flashing were found to contain asbestos. By February 11, three truck loads have been removed from the site and two of the buildings were cleared and the contractor, Radian, had started taking down the three story building (211) and the barracks/office (203) followed by the lab building (201) and the maintenance building (202). All major buildings were down by March 24 and remaining was funding used to remove 3 small buildings and the electrical substation.

On May 25, the Army did the final inspection on the shoreline protection near the capped dump site on Occoquan Bay NWR. The only remaining work was related to monitoring wells which was done by the CoE (Corps of Engineers).

### 3. Major Maintenance

The Army Corp of Engineers continued to monitor water quality wells at the refuge. Cleanup continued with the demolition and removal of buildings in the inner compound, outlying buildings, and clean-up and stabilization of the Marumsco Creek side of the Refuge. Communication and electrical junction boxes were also removed.

In November, 1999, renovation of the Visitor Contact Station ground to a halt. By the end of April, 2000, the contractor defaulted on the project and was terminated. Contracting and engineering started working with the contractor's bonding company to finish the project. In August, work again started on the visitor contact station at Occoquan Bay NWR. The construction firm hired by the bonding company met with existing subcontractors to determine who had done what, who had been paid, and who wanted to continue. It appears that most of the subcontractors had only verbal contracts with the contractor who defaulted on the project. The new contractor had to replace walls which were as much as 4" out of plumb and re-roof the building after it was found the roofing nails had been shot through the sheathing as well as the shingles, leading to sagging and leaking. Work on the contact station is continuing.

### 4. Equipment Utilization and Replacement

In January the Dodge crewcab was loaned out to Ohio River NWR.

### 5. Communications Systems - Nothing to Report

## 6. Computer Systems

On September 29, end of year funds were used to purchase computers, a scanner, and a printer for the new contact station.

## 7. Energy Conservation

The Refuge set up an account with Prince William County landfill. The account allowed the Refuge to drop off larger quantities of recyclable materials as a commercial hauler. The refuge took recyclable materials, including glass, metal, paper, cardboard, batteries, antifreeze, etc., to the landfill for disposal.

## 8. Other - Nothing to Report

# J. OTHER ITEMS

## 1. Cooperative Program

The State continues to maintain a deep well on the refuge along Easy Road for long term monitoring of the water table. Monitoring is done by the U.S. Geological Survey in a consolidation of survey territories and is performed on a quarterly basis.

## 2. Other Economic Uses - Nothing to Report

## 3. Items of Interest - Nothing to Report

## 4. Credits

Everyone on the staff contributed to the writing of this report. Refuge manager Weiler reviewed it.

# K. FEEDBACK - Nothing to Report

## FEATHERSTONE NATIONAL WILDLIFE REFUGE Woodbridge, Virginia

### INTRODUCTION

Featherstone National Wildlife Refuge is an unmanned station and is located 4 miles southwest of Mason Neck at the mouth of Neabsco Creek where it joins the Potomac River. The refuge is approximately 22 miles from Washington, D. C., in Prince William County, Virginia.

Acquired in 1979 from the District of Columbia, Featherstone Refuge was originally proposed to be one of a 17 unit Potomac Estuary National Wildlife Refuge Complex. No additional Federal acquisitions were made after this plan was proposed in 1970 except Marumsco NWR and Featherstone NWR until 1998. With the addition of land to Marumsco NWR forming Occoquan Bay NWR, changing Mason Neck NWR and its satellites status to a complex (name suggested by this plan, and discussion of additional acquisitions in Stafford County, elements of this plan are coming to fruition.

Featherstone NWR contains 325 acres of woodland and freshwater tidal marsh along the northern shore and mouth of Neabsco Creek and north around Featherstone Point along Occoquan Bay. Topography is almost entirely flat on the east side with patches of bottom land hardwoods and tidal marsh. A Richmond, Fredericksburg and Potomac Railroad (RF&P) right-of-way bisects the Refuge from north to south with built up elevations of 80 feet separating the east from the west with its series of sharply incised peninsulas. An abandoned railroad grade also traverses the Refuge, impacting the refuge through it's compacted roadbed, castoff slag and coal from early train use, and channeling some of the drainage into vernal pools and swamps. Farm Creek passes through the northeastern portion of the Refuge before draining into Occoquan Bay and the Potomac River.

Official access is by two meandering right-of-ways, neither of which are accessible to vehicles. Staff have taken advantage of a commuter rail station built next to the refuge as a way to cross the tracks and gain quicker access to the refuge as an improvement of when they used to walk the tracks to get to the refuge without having to cross creeks and vernal pools. No public use is permitted on Featherstone, although a considerable amount of unauthorized activity does occur. Refuge staff have received various reports of illegal hunting, trapping, and camping. Staff visits have been able to confirm the presence of such activity but not the level due to poor accessibility and limited staff time.

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11. Wildlife Observation - Nothing to Report .....	5
12. Other Wildlife Oriented Recreation - Nothing to Report .....	5
13. Camping - Nothing to Report .....	5
14. Picnicking - Nothing to Report .....	5
15. Off-Road Vehicling - Nothing to Report .....	5
16. Other Non-Wildlife Oriented Recreation - Nothing to Report .....	5
17. Law Enforcement .....	5
18. Cooperating Associations - Nothing to Report .....	5

#### I. EQUIPMENT AND FACILITIES

1. New Construction - Nothing to Report .....	5
2. Rehabilitation - Nothing to Report .....	5
3. Major Maintenance - Nothing to Report .....	5
4. Equipment Utilization and Replacement - Nothing to Report .....	5
5. Communications Systems - Nothing to Report .....	5
6. Computer Systems - Nothing to Report .....	6
7. Energy Conservation - Nothing to Report .....	6
8. Other - Nothing to Report .....	6

#### J. OTHER ITEMS

1. Cooperative Programs - Nothing to Report .....	6
2. Other Economic Uses - Nothing to Report .....	6
3. Items of Interest .....	6
4. Credits .....	6

K. FEEDBACK - Nothing to Report

A. HIGHLIGHTS - Nothing to Report

B. CLIMATIC CONDITIONS

See Mason Neck NWR for details.

C. LAND ACQUISITION

1. Fee Title - Nothing to report
2. Easements - Nothing to Report
3. Other - Nothing to Report

D. PLANNING

1. Master Plan - Nothing to Report
2. Management Plan - Nothing to Report
3. Public Participation - Nothing to Report
4. Compliance with Environmental Mandates - Nothing to Report
5. Research and Investigations - Nothing to Report
6. Other - Nothing to Report

E. ADMINISTRATION

1. Personnel

See Mason Neck NWR

2. Youth Programs - Nothing to Report
3. Other Manpower Programs - Nothing to Report
4. Volunteer Program - Nothing to report.

5. Funding

Featherstone Bay NWR did not receive direct funding. Funding has been either through Mason Neck when it was the lead refuge or through Potomac River NWR Complex.

## 6. Safety

Safety is a large concern when volunteers or staff are visiting Featherstone, especially alone. This is due to lack of access (except by boat), unreliable radio communications with the main office, and the railroad tracks which allows uncontrolled access by unauthorized users.

## 7. Technical Assistance - Nothing to Report

## 8. Other Items - Nothing to Report

# F. HABITAT MANAGEMENT

## 1. General

Featherstone Refuge presently consists of 325 acres of which 80 acres are forested upland, 220 acres are palustrine wetland, and 25 acres are open water. This area is a tidal freshwater wetland. Portions of "Hidden Lake", the main portion of Farm Creek running through the refuge was at one time diked, presumably for fisheries management in the late 1800's or early 1900's. This dike has deteriorated to a few pilings in the water and short earthen section that is no barrier to water, wildlife, or boaters.

## 2. Wetlands

The forested wetland sections of the Refuge are comprised of red maple, sweetgum, yellow poplar and water willow. Emergent marsh is located mainly on the southern section of the property.

## 3. Forests

The pockets of upland forest scattered throughout the Refuge are at or near climax stage and are comprised mostly of mixed oak species with Virginia and loblolly pine. In most areas there is little ground cover. Areas bordering Neabsco Creek consist of steep slopes with an understory of mountain laurel.

## 4. Croplands - Nothing to Report

## 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. WILDLIFE

### 1. Wildlife Diversity

The Refuge provides important wintering and nesting habitat for waterfowl, wading birds and shorebirds. Wintering and migrating waterfowl include black duck, mallard, blue-winged teal, wood duck, hooded merganser, green-winged teal, gadwall, and lesser scaup. The dense and diverse marsh vegetation attracts many wading birds including great blue heron, great egret and double-crested cormorants. Osprey, red-tailed and red shouldered hawks, northern harrier, kestrel, and Cooper's hawks have all used the Refuge.

### 2. Endangered and/or Threatened Species

Bald eagles are frequently observed using the Refuge. The shoreline provides important feeding and perching habitat. The pair that nested on Featherstone initially nested in the swamp area between the railroad tracks and the river just above the mouth of Neabsco Creek. They moved the next year to a chestnut oak on the third peninsula in from the railroad bridge, and after three years moved west, possibly onto the neighboring developer's land and then back out to near the first site. Their last several locations were not productive and their current status is unknown.

### 3. Waterfowl - Nothing to Report

### 4. Marsh and Water Birds

Great blue herons are commonly seen on Featherstone Refuge. Other birds in this group which utilize the refuge include egrets and double-crested cormorants.

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

Due to the dense vegetation, mostly forest, the most likely places to observe species in this group is just off the Refuge in the waters of the Occoquan Bay and Potomac River. Mudflats exposed at low tide are high in fine sediments and anerobic, producing little vegetation or fauna to attract birds for feeding and unattractive for loafing.

### 6. Raptors

Osprey, red-tailed and red-shouldered hawks, northern harrier, kestrel, and Coopers hawks have been recorded on the refuge.

7. Other Migratory Birds - Nothing to Report

8. Game Mammals

White-tailed deer, red fox, raccoon, gray squirrel, and beaver all use the refuge.

9. Marine Mammals - Nothing to Report

10. Other Resident Wildlife - Nothing to Report

11. Fisheries Resources - Nothing to Report

12. Wildlife Propagation and Stocking - Nothing to Report

13. Surplus Animal Disposal - Nothing to Report

14. Scientific Collections - Nothing to Report

15. Animal Control - Nothing to Report

16. Marking and Banding - Nothing to Report

17. Disease Prevention and Control - Nothing to Report

#### H. PUBLIC USE

1. General

The refuge is closed to all public use. The Virginia commuter rail service has constructed a rail station along the edge of this property. This may be an option to get the Refuge in the public eye without being overrun by non-wildlife oriented uses. Refuge staff will be cooperating with the rail station to construct some information panels as funding and staffing permits.

2. Outdoor Classrooms - Students - Nothing to Report

3. Outdoor Classrooms - Teachers - Nothing to Report

4. Interpretive Foot Trails - Nothing to Report

5. Interpretive Tour Routes - Nothing to Report

6. Interpretative Exhibits and Demonstrations - Nothing to Report

7. Other Interpretive Programs - Nothing to Report

8. Hunting - Nothing to Report
9. Fishing - Nothing to Report
10. Trapping - Nothing to Report
11. Wildlife Observation - Nothing to Report
12. Other Wildlife Oriented Recreation - Nothing to Report
13. Camping - Nothing to Report
14. Picnicking - Nothing to Report
15. Off-Road Vehicling - Nothing to Report
16. Other Non-Wildlife Oriented Recreation - Nothing to Report
17. Law Enforcement

On January 1, bird surveyor Waggener reported an illegal tent on Featherstone, where he had visited as part of the annual Christmas Bird Count. Refuge officers have made only a few visits due to staffing limitations but never fail to find evidence of fires, fishing, shooting, ATV trespass, and litter.

The primary contact with the Refuge this year was through visits by boat during vicinity eagle surveys. Several times the biologist observed trespassers fishing from the remains of the dike but without law enforcement authority he was limited to advising them of the regulations. This level of contact is of limited effectiveness.

18. Cooperating Associations - Nothing to Report

#### I. EQUIPMENT AND FACILITIES

1. New Construction - Nothing to Report
2. Rehabilitation - Nothing to Report
3. Major Maintenance - Nothing to Report
4. Equipment Utilization and Replacement - Nothing to Report
5. Communications Systems - Nothing to Report
6. Computer Systems - Nothing to Report

7. Energy Conservation - Nothing to Report

8. Other - Nothing to Report

J. OTHER ITEMS

1. Cooperative Programs - Nothing to Report

2. Other Economic Uses - Nothing to Report

3. Items of Interest

4. Credits

ORP Schultz wrote the report. Manager Weiler reviewed it.

K. FEEDBACK - Nothing to Report