

**OHIO RIVER ISLANDS  
NATIONAL WILDLIFE REFUGE**

**ANNUAL NARRATIVE  
Calendar Year 1995**

REVIEW AND APPROVALS

OHIO RIVER ISLANDS NATIONAL WILDLIFE REFUGE

Parkersburg, West Virginia

ANNUAL NARRATIVE REPORT

Calendar Year 1995

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Regional Office Approval      Date

OHIO RIVER ISLANDS NATIONAL WILDLIFE REFUGE  
Parkersburg, West Virginia

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Calendar Year 1995

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

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## INTRODUCTION

Established in 1990, the Ohio River Islands NWR became the first national wildlife refuge in West Virginia. There are now refuges in all 50 states. The refuge currently consists of all or parts of 19 islands in the Ohio River. As acquisition progresses, the refuge may include up to 35 Ohio River islands. The acquisition boundary stretches nearly 400 river miles from Shippingport, Pennsylvania to Manchester, Ohio and includes four states (PA, OH, WV, KY).

The geologic origin of this unique chain of islands has given them a relatively stable gravel base that has resisted natural erosion forces since the Wisconsin glacier receded 12,000 years ago. The natural character of some islands has been exploited by recent human activity but many are still relatively undisturbed.

The Ohio River islands and their back channels have long been recognized for high quality fish and wildlife, recreation, scientific, and natural heritage values. These areas provide some of the region's highest quality riverine, wetland, and bottomland habitats, and are used by waterfowl, shorebirds, songbirds, warmwater fish, and freshwater mussels. The refuge has potential to protect 2,000 acres of bottomland and wetland habitats and 1,500 acres of riverine habitat associated with the islands.

Refuge management concentrates on increasing the diversity and productivity of the fish and wildlife populations characteristic of the Ohio River Valley. Although some early successional vegetation stages are present, natural succession is being encouraged to benefit wildlife species adapted to the mature forest floodplain and associated wetland and riverine habitats.

Many types of public uses occur on and around the Ohio River islands. The relatively undisturbed nature of many of the islands make them popular spots for nature study, fishing, hunting, picnicking, and pleasure boating.

As land acquisition and planning has progressed, the refuge has developed a public use program which includes such activities as educational workshops, interpretive programs, wildlife exhibits, hunting and fishing programs, and day-use recreational opportunities. These and other wildlife-oriented recreational and educational opportunities benefit school groups of all ages as well as local residents and visitors.

## INTRODUCTION

### A. HIGHLIGHTS

- Manager Wilson served as Team Leader for the Ohio River Valley Ecosystem.
- Refuge Dive Team travels to Lake Champlain, New York to provide technical assistance and diving support to the Lake Champlain Fish and Wildlife Resources Office. (See Page 17)
- Habitat restoration efforts began on Middle Island this year including five acres of bottomland hardwoods planted by staff and volunteers. (See Page 25)
- Haying program implemented on Middle Island to control exotic plant encroachment. (See Page 28)
- Rule published in Federal Register proposing to open the refuge to sport fishing. (See Page 60)
- On February 23, a public meeting was held in St. Marys, West Virginia to discuss future management plans for Middle Island. (See Page 6)
- In cooperation with West Virginia Non-Game Wildlife Program and DuPont Habitat Enhancement Committee a prothonotary warbler nest box program was implemented. (See Page 37)
- Andrew Arkin donated 89 acres of Muskingum Island. (See Page 4)
- Refuge staff working through Ohio River Valley Ecosystem and Ohio Department of Natural Resources develop a cooperative agreement for placement of display at local museum. (See Page 53)
- Refuge staff helps collect over 2,500 mussels for captive rearing study. (See Page 48)
- Refuge staff, working with a variety of partners, establishes zebra mussel monitoring stations. (See Page 41)

- Commonwealth of Kentucky establishes a mussel sanctuary in the Ohio River. (See Page 39)
- Preliminary Project Proposal approved by Washington Office for the Embayment/Wetland Acquisition Package. (See Page 5)

#### B. CLIMATIC CONDITIONS

There is no such thing as a "typical weather year" in the mid-Ohio Valley. Calendar year 1995 was characterized by little snow (4.4" total), warm temperatures early (mean of 56 degrees in March), a very wet spring (9" of rain in May), June river flooding, and water temperatures reaching 88 degrees at the bottom of the river in August. There were 37 days which reached 90 degrees or above in 1995, which explains the warm water temperatures.

The unusual June flooding transported one of the refuge kiosks on Manchester Island (it was recovered and placed at a higher elevation). It was later determined by refuge divers that the June flood had a marked impact on zebra mussels--the scouring of the bottom and deposition of sand and gravel by floodwaters may actually have stripped zebra mussels off the bottom (leaving the byssal threads attached) and interfered with a reproductive class. This is potentially an important control mechanism for zebra mussels in an open system.



Figure 1. June floodwaters moved our new kiosk over 200 feet, but we found it. (ME)

**Table 1 - 1995 Weather Data for the Ohio River Valley, Taken at Parkersburg, WV.**

	Precipitation (inches)		Temp (°F)		
			Min.	Max.	Mean
January	Rain 4.38	Snow 2.5	5	74	32.5
February	2.29	0.2	3	62	30.0
March	1.57		14	78	56.0
April	2.21		21	84	52.0
May	8.99		41	86	56.0
June	4.84		49	91	73.0
July	1.06		54	98	77.0
August	4.71		58	97	79.0
September	2.42		35	94	65.0
October	4.60		30	83	57.0
November	2.70		21	73	39.7
December	2.50	1.7	8	64	31.6
<b>TOTAL</b>	<b>42.27</b>	<b>4.4</b>	<b>3</b>	<b>98</b>	<b>Annual Extremes</b>

### C. LAND ACQUISITION

#### 1. Fee Title

Fee Title land acquisition for 1995 are as follows:

- On January 24 the Service purchased Middle Island (235 acres) located in Pleasants County, West Virginia from Paul and Carroll Ingram of St. Marys, West Virginia. Jack Bailey, local attorney on contract by the Service for title work, administered the closing. Others in attendance were John Butler, attorney representing Paul and Carroll Ingram, Michael Ingram, Katharine Bentley, Realty Specialist, and Manager Wilson.

- On June 8, Manager Wilson traveled to the Regional Office whereas Andrew Arkin donated 89 acres of Muskingum Island to the Service as an addition to the refuge. The presentation was conducted in the Regional Office with the Regional Director accepting the donation during the monthly regional staff meeting. The land was valued at \$180,000. Mr. Arkin has been in contact with the refuge discussing the possibilities of monetary contribution to further enhance educational programs concerning Ohio River Islands NWR.

The addition of the above islands brings the total refuge acreage to 1,109 acres, which includes complete ownership of 16 islands and partial ownership of two others. One acquisition effort initiated in calendar year 1995 to be completed in calendar year 1996 is the donation of 17.82 acres of Wheeling Island by the City of Wheeling, West Virginia.

## 2. Easements

Currently, the refuge administers just one Farmers Home Administration Easement. This property consists of 8.37 acres located in Belleville, Wood County, West Virginia.

## 3. Other

On January 26, Manager Wilson discussed with Rusty Roten, District Bridge Engineer for West Virginia Department of Highways, the state owned bridge over to Middle Island. Manager Wilson expressed concern over the condition of the bridge and refuge's future plans for Middle Island. The Highway Department began some repair on the bridge in December 1995 which should assure its use for refuge purposes for many years to come. The repairs are scheduled to be completed by March 1996.

Manager Wilson visited with Kevin Ramsey concerning his future plans for Captina Island. Mr. Ramsey is selling the island which was previously donated to the Ohio Valley State College. Sadly, the Service could have purchased this island if Realty would have followed up on the initial contact with the landowner prior to his death. In time the property was donated to the college who has obtained the services of Mr. Ramsey to sell the property.

Several efforts have been made to try and get the Realty Division to pursue utilization of court approved funds obtained by The Nature Conservancy under the auspices of purchasing islands in the Ohio River.

On April 13, refuge staff and Joe Shamblin, former owner of Buffington Island, traveled to the island for clean-up and

removal of his personal property. Mr. Shamblin contracted with Joe S. Neale for the barge to haul several farm implements, junk, etc., from the island.

Numerous requests were sent to Realty during the year to pursue a variety of opportunities for protecting/purchasing additional islands. However, not much effort went into these possibilities.

During December 1994, refuge staff completed their work necessary to bring the embayments and mainland wetlands study to the Preliminary Project Proposal stage. During March, refuge Biologist Morrison presented a slide program to the LARC Committee in the Regional Office, and discussed the biological significance of the embayments and mainland wetlands along the Ohio River corridor. The presentation was well received, and the LARC voted to approve the package for potential acquisition. Refuge staff worked with Earl Possardt in Realty on the final touches to the Preliminary Project Proposal, and the PPP was forwarded to Washington for review.

September 1995, Acting Director John Rogers approved the Preliminary Project Proposal for an addition to the Ohio River Islands National Wildlife Refuge. The project proposal includes 100 separate areas along 400 river miles comprising 5,400 acres of wetland and bottomland habitat. The refuge plans to initiate some action to fulfill the necessary planning efforts in 1996.

#### D. PLANNING

##### 2. Management Planning

Management planning for a sport fishing program on the refuge began in 1995. Although the refuge islands have traditionally had sport fishing on and around them, time constraints have delayed the process to formally open these areas to fishing--until now (see page 59).

The acquisition of Middle Island in 1995 prompted the refuge to initiate habitat management planning specifically for this island because of its' size, accessibility, and condition of the habitat (see page 25). A written plan guiding our habitat management activities on Middle Island should be in place by mid-1996.

Several minor edits were made to the Hunting Management Plan in May of 1995. Information was removed from the plan that should be more appropriately placed in the annual hunt program document. All other management plans currently in place were reviewed and felt to be current.

### **3. Public Participation**

Public participation was solicited for our planning processes during development of the Sport Fishing Management Plan (see page 59).

Public participation was also sought during our planning efforts related to Middle Island. There were many management decisions that were required upon acquisition of Middle Island and public input was sought with regard to public uses, habitat management, disposition of surplus property, access issues, and commercial uses of the island

Manager Wilson and Outdoor Recreation Planner Janet Butler met in January with the Mayor of St. Marys to discuss the acquisition of Middle Island and its future management. Others in attendance included County Commissioners, West Virginia Extension Service, Sheriff, and the local newspaper reporter. The meeting went very well and set the groundwork for a public meeting.

On February 23, a public meeting was held in St. Marys to discuss the management plans for Middle Island. Approximately 70 people attended this meeting including several local community leaders. Television and newspaper reporters covered the event. Overall the meeting was a success and set the groundwork for positive relations in the community. Several concerns were raised by the community including the FWS's plans for the access bridge, the FWS's intentions regarding the commercial water wells which service a local refinery, the operation of the oil wells on the island, habitat management activities planned for the island, and what sorts of public uses will be permitted. Following the meeting, several individuals expressed an interest in volunteering for the refuge. The meeting served as an excellent forum to address public concerns. Our thanks go out to the Mayor of St. Marys who was, and continues to be, very helpful in building community support for the refuge.

### **6. Other**

On April 27, 1995, a meeting between the USFWS and West Virginia Division of Natural Resources (WVDNR) was held at the WVDNR Office in Parkersburg. The meeting was held to discuss common programs, particularly related to the Ohio River, National Wildlife Refuge issues, and land acquisition. WVDNR personnel in attendance included Bernie Dowler, Chief of Wildlife Resources; Jim Rawson, Supervisor of Federal Planning/Coordination; Walt Kordek, Asst. Chief of Planning

and Biometrics; Scott Morrison, District VI Fishery Biologist; J. R. Hill, District VI Game Biologist; and Jeff McCrady, District VI Asst. Game Biologist. USFWS personnel in attendance were: Jerry Wilson, Manager of Ohio River Islands NWR (ORI); Mitch Ellis, Refuge Operations Specialist ORI; Janet Butler, Outdoor Recreation Planner ORI; Patty Morrison, Biologist ORI; and Gail Baker, Manager of Canaan Valley NWR.

The meeting was productive and progress was made in outlining cooperative efforts that might result in benefits for both agencies and the resource. Bernie Dowler suggested using state funds for acquisition of embayment/wetland areas and having these areas administered by the refuge. Funding would come from the Ohio River Endowment Fund and, when available, funds received from the hydroelectric operations. Both parties agreed to explore the feasibility of such an arrangement. Jim Rawson agreed to contact the Ohio Department of Natural Resources and discuss the possibility of partnering with their agency as well. Of course, the FWS involvement in this endeavor is subject to approval of the Embayment/Wetland Expansion Package.

Other topics covered during the meeting included a new WVDNR initiative related to collecting physical and biological data along the Ohio River floodplain using aerial videography, the state's desire to develop partnerships (particularly relating to non-game programs), potential hunting programs on the Middle Island unit of ORI NWR, and the need for more outreach. Gail Baker also gave an update on activities related to Canaan Valley NWR.

The Ohio River Valley Ecosystem adopted and implemented a Strategic Action Plan which identifies seven Resource Priorities - the first of which is to "in cooperation with partners, reverse the decline of native aquatic mollusks within the ORVE with emphasis on endangered, threatened and candidate species and species of concern." The Ohio River basin historically harbored 127 species of the 297 worldwide. With 11 species already extinct, and 46 endangered or candidates, the globally significant freshwater mussel diversity of the Ohio River basin is currently imperiled further by the invasion of the exotic zebra mussel. Rather than "wait and watch" the potential demise of this resource, as occurred in the Great Lakes, participants in the ORVE established a freshwater sub-group to develop a pro-active plan to meet the immediate threat posed by the zebra mussel.

In April 1995, 19 federal, state, and private participants from throughout the ORVE met in Columbus, Ohio and drafted an "Ohio River Unionid Conservation Plan" and identified

activities to begin immediately, and which partners could contribute to the various action strategies. The Conservation Plan is organized under five major headings: Monitoring; Rescue, Recovery and Propagation; Tributaries; Meeting Research Needs; and Public Outreach. Beginning in 1995, refuge staff undertook new activities in three of the five major thrusts of the sub-group: Monitoring; Rescue, Recovery and Propagation; and Meeting Research Needs [see Section G-10 - Freshwater Mussels]. The sub-group met again in October to review progress made during the 1995 field season, and plan activities for 1996.

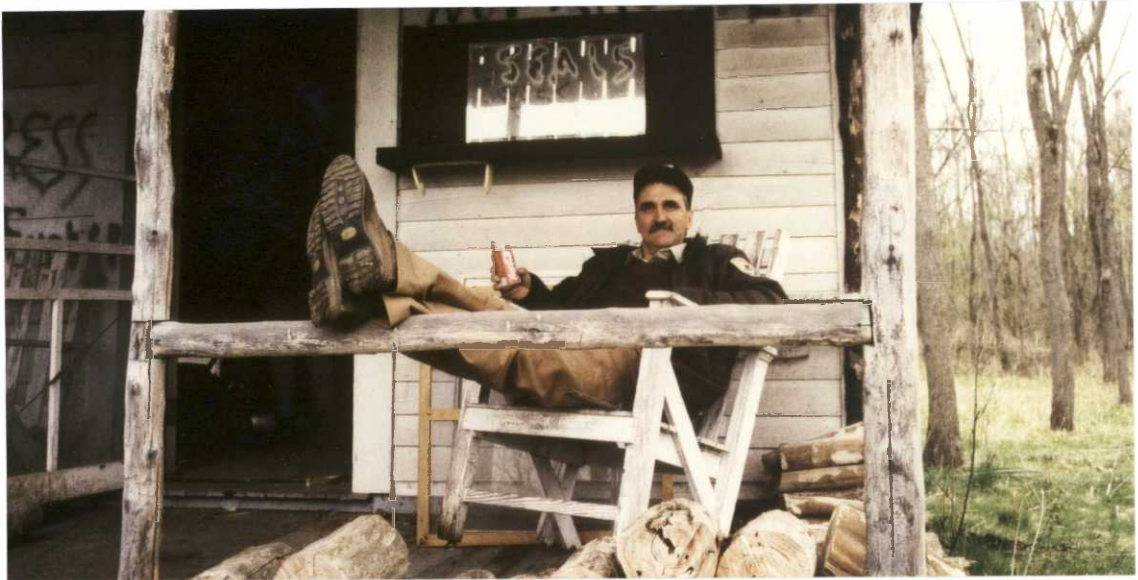
### E. ADMINISTRATION

#### 1. Personnel

The refuge experienced no changes in personnel during 1995. The refuge remained at five FTEs occupied by the same individuals. The refuge did enjoy the assistance of Camille Collins, a Student Conservation Association volunteer, who worked for the refuge during the summer months in 1995. This volunteer program has helped tremendously, providing assistance to refuge staff during the busiest time of year. We hope to continue with some sort of summer internship program in the years to come.

Table 2 - Ohio River Islands NWR Staff Information.

1995 Staff Information						
Jerry Wilson	GS-12	Refuge Manager (PFT) (EOD 3/91)				
Mitchell Ellis	GS-11	Ref. Oper. Spec. (PFT) (EOD 1/92)				
Patricia Morrison	GS-11	F & W Biologist (PFT) (EOD 1/92)				
Janet Butler	GS-11	Outd. Recr. Plan. (PFT) (EOD 6/93)				
Cynthia Bloomer	GS-5	Office Assistant (PFT) (EOD 7/91)				
Staffing History						
Year	Perm Full Time	Perm Part Time	Temporary	FTEs		
1991	2	0	0	2.0		
1992	4	0	0.5	4.5		
1993	4.5	0	0.8	5.3		
1994	5	0	0	5.0		
1995	5	0	0	5.0		



*Figure 2. Jerry Wilson, Refuge Manager (PM)*



*Figure 3. Mitchell Ellis, Assistant Refuge Manager (PM)*



*Figure 4. Patty Morrison, Refuge Biologist (ME)*



*Figure 5. Janet Butler, Outdoor Recreation Planner (SB)*



*Figure 6. Cindy Bloomer, Office Assistant (ME)*



*Figure 7. Camille Collins, SCA Volunteer (PM)*

#### 4. Volunteer Program

The refuge volunteer program saw a substantial increase in the number of volunteers involved in refuge activities in 1995. One-hundred-sixty-eight volunteers contributed 2095 hours to the refuge compared to 40 volunteers contributing 1177 hours the previous year. The increase in number of volunteers was in part due to the acquisition of Middle Island whose bridge provide automobile access to the refuge. The reforestation project on Middle Island contributed to the large increase in volunteer numbers with many groups and schools involved in the project.



*Figure 8. Volunteers from three states helped with the refuge's first reforestation efforts in 1995. Students from Kentucky harvested over 1000 trees on refuge property in that state. (JB)*



*Figure 9. Scout groups and 4-H Clubs from West Virginia planted the Kentucky trees as well as trees collected in West Virginia on Middle Island. (JB)*



*Figure 10. Ohio Students hand-weeded one of the tree plots on a scorching July day. (JB)*

The refuge received a major contribution of volunteer hours with a comprehensive bird and flora survey of the Manchester Islands by a professor and graduate student from Berea College in Kentucky. Work began in early spring and extended through late fall to complete the project.

The Student Conservation Association program once again provided us with a 12 week Resource Assistant appointment. Camille Collins returned for a second year in this position after attempts to find a new local recruit failed. We were delighted to have her return with her enthusiasm to take on any task and her familiarity with the river and the refuge. Outside of her SCA appointment, she volunteered frequently throughout the year.

The refuge held its first Volunteer Appreciation picnic this year, using the picnic facilities at the St. Marys public marina adjacent to Middle Island. Refuge staff prepared the food, attended by approximately 50 volunteers. Volunteers were introduced and presented with certificates of appreciation.



*Figure 11. Our refuge volunteer picnic took place at the end of August, a good way to end a summer of excellent volunteer support. (BB)*

Table 3 - Summary of 1995 Volunteer Programs.

ACTIVITY CATEGORY	# VOLUNTEERS	#VOL. HOURS
<b>MAINTENANCE:</b>		
Ohio River Sweep	30	90
Sign maintenance	3	22
Vehicle and boat cleaning	5	18
SCA contribution	1	94
Other		92
<b>HABITAT MANAGEMENT:</b>		
Middle Island reforestation	135	345
<b>RESOURCE SUPPORT:</b>		
Wood Duck Banding	2	160
Freshwater Mussels	6	85
Surveys: bird and flora	4	676
SCA contribution	1	330
Habitat mapping	1	20
Other		9
<b>PUBLIC USE:</b>		
Kiosk installation	4	46
SCA contribution	1	48
Photography	1	9
Other		35
<b>ADMINISTRATIVE:</b>		
SCA contribution	1	16
<b>TOTAL HOURS</b>		<b>2095</b>

### 5. Funding

The FY 1995 budget was \$298,672. However, \$20,800 of this was "Ohio River Ecosystem" funds which were merely administered by our office. Those monies were appropriated by the ecosystem team to various projects throughout the ecosystem. In reality, the refuge budget was \$277,872. This included \$227,000 for salaries, \$27,000 in other fixed expenses, \$6000 for maintenance, and \$15,000 for public use/recreation projects.

On May 8th of 1995, Chris Murphy and Dale Aubin of our regional office's CGS conducted an audit of our purchasing, procurement, and property functions. No major problems or discrepancies were found.

**Table 4 - Refuge Funding Summary.**

Year	FTEs	1261	1262	8400	1907	TOTAL
1991	2.0	69,800	-0-	-0-	-0	69,800
1992	4.5	143,571	8,000	40,000	-0-	191,571
1993	5.3	247,405	17,000	52,335	1,983	318,723
1994	5.0	246,511	6,000	-0-	-0-	252,511
1995	5.0	292,672	6,000	-0-	-0-	298,672

## 6. Safety

The refuge engaged in a variety of safety-related activities in 1995. Several inspections, training sessions, equipment acquisitions, and safety program implementations were accomplished in addition to staff safety meetings. The refuge dive program has a serious safety component and a large quantity of training and effort was put forth in this regard.

ORP Butler completed training requirements for DAN Oxygen Provider Certification at SCUBA, WV on January 21. All three members of the refuge SCUBA team are now certified to administer oxygen following diving or other accidents where its use could be beneficial to victims.

In preparation for SCUBA activities in the 1995 field season, several items were accomplished: annual swimming evaluations were passed by all three refuge divers on May 30, needed SCUBA supplies and equipment were procured; medical examination was received for one diver.

Practice SCUBA dives were conducted near Mill Creek Island on June 22. The outing was intended to re-acquaint our divers with the Ohio River and to work out any bugs prior to the beginning of our dive season.

The refuge's underwater diving support agreement with NBS was edited and forwarded for review and signature. Assistant Manager Ellis and Regional Safety Officer Ed Bajakian coordinated on the matter. The original support agreement expired September 30, 1995. It is necessary to keep the agreement current so that our divers are covered by NBS' Diving Control Board. The new memoranda was signed in October of 1995 and allows the Ohio River Islands NWR Dive Team to continue diving activities through FY 96.

Annual diving records were submitted to the NBS Diving Control Board for our SCUBA activities during FY 95. Dive log sheets, dive plans, dive master records, equipment maintenance

records, and training certificates were all forwarded to the NBS Diving Safety Officer as required.

All refuge staff received their bloodborn pathogen training on January 27th of 1995 at the Business Healthcare Center in Parkersburg, West Virginia. Staff who had previously taken the Hepatitis B vaccination series were tested to identify antibody titer levels and all were found to be immune to Hepatitis B.

On March 1st of 1995, refuge staff participated in a Defensive Driving Course. The course was completed through a video provided by Regional Office Safety Staff.

All refuge fire extinguishers were inspected on July 7, with one additional unit being purchased for the storage shed.

On October 4th of 1995, Ohio River Islands NWR's annual safety inspection was conducted. Mike Picirilli of Erie NWR conducted the inspection and completed the Station Safety and Health Checklist which was forwarded to the Regional Office. Only minor discrepancies were found and abatement plans were implemented.

#### **7. Technical Assistance**

Assistant Manager Ellis provided EPA Region 5's Oil Pollution Act Coordinator Karen Vendl with information she requested relating to "environmentally sensitive areas" along the Ohio River associated with the refuge.

##### **a. FWS ES Offices**

The refuge was contacted by the Lake Champlain Fish and Wildlife Resources Office with a request to assist them with freshwater mussel surveys. They are involved in a sea lamprey control program and are studying the effects of their control methods on the native mussels in Lake Champlain. Refuge divers Ellis, Morrison, and Butler traveled to Lake Champlain, New York from July 8 - July 15 to assist the Lake Champlain Fish and Wildlife Resources Office with freshwater mussel surveys. The refuge provided SCUBA capability for mussel surveys in the Ausable and Little Ausable River Deltas to evaluate the effect of Bayer 73 (lampriocide) on the native freshwater mussel community.



*Figure 12. Refuge Divers Ellis and Morrison conducting mussel surveys for the Lake Champlain Fish and Wildlife Resources Office in Lake Champlain, NY. (JB)*

Biologist Morrison provided technical assistance to FWS Region 3 Regional Office, ARD for Ecological Services on how resource agencies working in the Ohio River have effected change in sand and gravel dredging operations.

Biologist Morrison provided technical assistance to the Pennsylvania Field Office on freshwater mussel survey design for proposed bridge replacement studies.

Biologist Morrison provided comments to FWS-ES offices in State College, PA; Elkins, WV; and Reynoldsburg, OH on a proposed regional permit for recreational docks and piers.

On February 9, refuge staff attended the first scheduled public meeting on the alternatives under consideration for construction of Corridor D. Later in the month, the refuge provided its comments to the Elkins ES Office on the draft EIS concerning the proposed project.

On June 6 and 7, Assistant Manager Ellis, Biologist Morrison and ORP Butler assisted the Elkins Field Office in conducting freshwater mussel surveys in the Ohio River

near Point Pleasant, Mason County, West Virginia--a proposed site for a riverfront park development.

Biologist Morrison provided comments through the Elkins ES Office on a major sand and gravel dredging proposal which would impact almost 90 miles of the Ohio River Corridor. As a minimum, permit conditions for this proposed dredging operator should conform with those permit conditions already negotiated with and accepted by the Huntington District Corps of Engineers for dredging in downstream sections of the river.

Biologist Morrison assisted the Pennsylvania Field Office on review and comment on a public notice concerning a major sand and gravel dredging proposal in the upper Ohio River. The proposed dredging area would include the Ohio River in the vicinity of Phillis and Georgetown Islands. Refuge comments included the recommendations for a substantial buffer zone around the islands and the requirement for the applicant to conduct preliminary mussel surveys before any sand and gravel dredging is approved. These conditions are consistent with those in effect for sand and gravel dredgers in the lower Ohio River.

Refuge staff assisted the Elkins ES office in preparing documentation for an expected elevation of a Section 10 permit regarding a commercial barge loading facility in the backchannel of Muskingum Island. Refuge staff took photographs and video taped ongoing illegal activity by the applicant, which has occurred on and off for the past two years. The Huntington District Corps of Engineers is reluctant to take any enforcement action against the permit applicant. Mussel surveys in the vicinity of the proposed loading and mooring facility have revealed the presence of at least 27 different species of freshwater mussels, including the endangered fanshell mussel (*Cyprogenia stegaria*).



*Figure 13. Illegal barge loading activity in the backchannel of Muskingum Island. (PM)*

b. State of West Virginia

On July 5, Biologist Morrison met with contractors for the State Natural Heritage Program and provided technical assistance on their inventory of Ohio River riparian corridors. Biologist Morrison shared with them copies of recent aerial photographs, river charts, and data sheets reflecting recent visits to these areas by refuge staff. In addition, she escorted them on an orientation trip to visit one mainland wetland and one embayment close to Parkersburg.



*Figure 14. Wetland habitat diversity in the Sandy Creek Embayment. (PM)*

The botanists and ecologists spent the rest of the summer and fall visiting major embayments and wetlands along the Ohio River Corridor, and can provide valuable information documenting the significance of these wetland habitats.

On February 8, Biologist Morrison attended a planning meeting at the West Virginia DNR Office in Fairmont, West Virginia regarding baseline habitat mapping of the Monongahela River using side-scan sonar. As a result of the side-scan sonar pilot study conducted on the refuge in 1993 and the underwater habitat maps generated, the Corps of Engineers and West Virginia DNR decided to go forward with side-scan sonar of the West Virginia portion of the Monongahela River.

From August 29 through August 31, refuge staff assisted the West Virginia DNR in conducting fishery surveys in island back channels of the Willow Island and Belleville Pools of the Ohio River. Sampling techniques included quarter sweep seine hauls, backpack shocking, and boat electrofishing surveys. The DNR is trying to quantify the differences in fishery habitat and fishery resources between the backchannel portions of the river versus the open water segments of the river.



*Figure 15. WVDNR fisheries biologists conducted boat electrofishing surveys in selected island backchannels in 1995. (PM)*



*Figure 16. Refuge SCA volunteer Camille Collins assisted in backpack shocking fish surveys along island backchannel habitats. (PM)*

c. State of Kentucky

Biologist Morrison provided a current list of mussel species collected in the Kentucky portion of the refuge to the Kentucky Nature Preserves Commission.

d. Private

On April 3, Biologist Morrison gave a presentation to the True Outdoorsmen Conservation Club from the Roane/Jackson County Technical Center on erecting and monitoring bird nesting boxes.

**8. Other**

The following table summarizes the training received by our staff during 1995. Continued training of Service employees is essential to our mission and many hours of quality training were received in a variety of areas.

**Table 5 - Summary of training received in 1995 by staff.**

Training	Employee	Hours
VISA Card Program	3 Staff	12 (4ea)
Bloodborn Pathogen/Aids Education & Outreach	All Staff	20 (4ea)
FFS Electronic Payment	Butler	32
Freshwater Mussel Symposium	Bloomer	24
Law Enforcement Refresher	Morrison	23
DAN/PADI Oxygen 1st Aid	Ellis	40
Ecosystem Training	Butler	4
ORP Workshop	Wilson	32
Defensive Driving Course	Butler	36
RCRA Waste Management	All Staff	20 (4ea)
Boating Safety/Power Squadron	Ellis	16
Pre-Retirement Seminar	Collins(SCA)	30
	Wilson	16
<b>Total Hours of Training</b>		<b>305</b>

**F. HABITAT MANAGEMENT**

**1. General**

A major habitat problem which continues to plague the islands is shoreline erosion. Most islands have lost significant amounts of soil to the Ohio River for various reasons. Under normal (natural?) conditions, the head of an island would be expected to erode somewhat during spring run-off and accretion of soil would be expected at the toe of the island. However,

although some accretion of land is occurring at the toe of some islands, most islands now show evidence of erosion from both ends.

Erosion of the islands can be attributed to several causative factors. The construction of dams for navigation purposes, commercial sand and gravel dredging, dredging of the channel for navigation, wave action caused by passing barges and other watercraft, spring flooding, and removal of riparian vegetation have all contributed to the erosion of shoreline along the Ohio River to some degree.

An informal case study was initiated at Georgetown Island in 1993 to quantify erosion there. Measurements have been taken annually to track the linear feet of shoreline erosion from the tip of the island head. Also, aerial photography and historic charts were used to track the island's size over time. The following chronology of Georgetown Island, located at rivermile 37.5, is an excellent example of how events over the last century have affected the size of islands in the Ohio River.

The islands are getting smaller - here's why!  
(Chronology of Georgetown Island as an Example)

- 1914 - 44.0 acres** in size (Island would have been 23.9 acres in size at today's normal pool stage of 664.5').
- 1959 -** New Cumberland Lock and Dam facility completed, raising normal pool stage 10' in elevation and **submerging about ~20 acres or 45% of island** (based on 1914 chart).
- 1981 - Island is 14.4 acres** in size, based on 1981 aerial photography. About 10 acres lost to dredging and spring floods between 1959 and 1981.
- 1984 - Island is 10.0 acres** in size based on 1984 aerial photography. Additional 4.4 acres lost to dredging and spring run-off.
- 1993 - Island is 8.9 acres** in size based on 1993 aerial photography. Another 1.1 acres gone!
- 1994 -** Shoreline at island head **receded/eroded 34'** in one year, due mainly to spring 1994 flood.
- 1995 - Lost an additional 12'** of shoreline at tip of island head.

Current size of Georgetown Island estimated to be 7-8 acres - 18% of its' original size!



*Figure 17. Georgetown Island in Pennsylvania, showing effects of serious erosion near the head of the island. (ME)*

### **3. Forests**

Middle Island was acquired by the refuge in January of 1995. The island was a working farm when purchased and the vast majority was in use for agriculture. This is also the first refuge property with bridge access, which allows for more active habitat management. Approximately 5 acres of this island was reforested in the spring of 1995. Bottomland hardwood species endemic to the Ohio River Valley were planted in several areas. The primary habitat objective for Middle Island is to restore it entirely to mature bottomland hardwood forest.

Trees for reforestation were obtained from recently flooded areas along the Ohio River. Silver maple, cottonwood, sycamore, and willow regeneration in these areas was extremely dense due to heavy spring flooding. The cottonwood and sycamore seedlings were harvested by hand with the help of volunteers in March of 1995 from Manchester Islands. Most of the silver maples were hand picked from the backchannel of Crab Island by staff in the winter of 1995. The willows were cut from the main shore across from Williamson Island with the landowners permission. Although it was labor intensive, we

felt it was important to use trees from the local area to improve survival and maintain genetic integrity.



*Figure 18. Assistant Manager Ellis surveying trees collected by staff and volunteers for transplant to Middle Island. (JB)*

More than 2700 trees were planted on Middle Island in 1995, all local stock planted by hand with the help of volunteers (see section E.4). Specific survival data is being collected in three of these plots in order to evaluate various reforestation techniques being used. Some of the variables being studied include the use of fertilizer tablets, tree guards, planting methods, planting over fields with different crop histories, etc. Although not available yet, the results of this informal management study will guide future reforestation efforts on the island. Table 6 summarizes the initial survival or leaf-out response of the various species planted in the three plots.

**Table 6 Summary results of spring 1995 reforestation plots (RF-1, RF-3, RF-4) on Middle Island (1st year survival).**

Species of Tree	Alive	Dead	Total	Survival%
Silver Maple	870	221	1091	80%
Cottonwoods	374	423	797	47%
Sycamores	119	5	124	96%
Elms	6	0	6	100%
Willows	7	0	7	100%
Box Elders	1	0	1	100%
Unknown	3	19	22	14%
<b>TOTAL</b>	<b>1380</b>	<b>668</b>	<b>2048</b>	<b>67%</b>



*Figure 19. Cottonwood seedling planted by volunteer on Middle Island. (JB)*



*Figure 20. These tree plots are part of the refuge's efforts to restore bottomland hardwoods to Middle Island. (BP)*

#### **8. Haying**

A meeting was held in St. Marys, WV on March 7th of 1995 to solicit interest from local farmers regarding a potential haying program on Middle Island. Several farmers attended, as well as local extension agents and SCS employees. Refuge staff explained the objectives of the haying program to the attendees, emphasizing it was to be short term and primarily to "occupy" habitat so that certain weedy species would not take over the island. The acreage of hay fields on Middle Island would be reduced over time as bottomland hardwood reforestation activities progressed. The hay fields would also be restricted as to what species could be planted, and native grasses were encouraged. After much debate and additional on-site meetings with some of the farmers, only one individual remained interested in pursuing a cooperative agreement with the refuge to hay on Middle Island.

Approximately 100 acres of Middle Island were put into hay field in 1995. These fields were primarily timothy, switchgrass, and bromegrass overplanted with oats to provide cover and a cash crop incentive for the farmer. In addition to harvesting the oat crop, the cooperative farmer was able to take two cuttings of hay off the fields. Most of 1995's hay

crop was of marginal value as the perennial grasses the farmer planted did not reach full potential in the first year. A significant amount of the hay harvested was foxtail grass which came on very strong in the abandoned corn and soybean fields.

The farmer was also able to harvest alfalfa from two small fields this year. However, these areas are not being maintained for alfalfa and eventually will be overplanted with native grasses.



*Figure 21. Hayfields on Middle Island were established to control exotic weeds until reforestation efforts could be implemented at those sites. (BP)*

## G. WILDLIFE

### 1. Wildlife Diversity

On May 13, refuge staff and members of the Mountwood Bird Club participated in the Fourth Annual International Migratory Bird Day Count. Three separate groups of birders descended upon Blennerhassett Island, Neal Island, Muskingum Island and Middle Island. A total of 130 species of birds were documented in Wood County, up from 122 last year. This was the first year Middle Island in Pleasants County was added to the statewide count. Refuge birders documented 40 species on Middle Island.



*Figure 22. Local birders en-route to Muskingum Island for the International Migratory Bird Day Survey. (PM)*

Due to the three-week furlough in December, refuge staff were unable to conduct the Ohio River portion of the Christmas Bird Count.

During 1995, Professor Ralph Thompson from Berea College in Kentucky and three of his graduate students volunteered 810 hours conducting bird surveys and a floristic inventory of the Manchester Islands and Brush Creek Island. publication of the data is expected by the Kentucky Academy of Sciences. The annotated list of flora consists of 324 species. Bird surveys documented 83 species of birds between March and September, including nine listed by the Kentucky Nature Preserves Commission as species of concern. Nesting was confirmed for 23 species.



*Figure 23. A rare sighting, newly hatched black vulture chicks were raised to fledging in an old shed on Manchester Island #2. (PM)*

## **2. Endangered or Threatened Species**

On January 13, refuge staff conducted its first mid-winter bald eagle survey, consistent with the protocol established by the BLM Raptor Research Center. Biologist Morrison, Office Assistant Bloomer and volunteer Camille Collins ran a 30 mile boat survey through the Willow Island pool, and recorded one adult eagle. The week of the survey, a wing-tagged immature eagle was seen in the same area.



*Figure 24. Undaunted by January weather on the river, Volunteer Camille Collins and Office Assistant Cindy Bloomer prepare for the 30 mile mid-winter Bald Eagle Survey. (PM)*

On September 7, refuge staff collected two fresh dead specimens of *Cyprogenia stegaria*, the fanshell mussel, from a muskrat midden located on the backchannel side of Muskingum Island. One specimen was approximately nine years old, and the other 11 years old. One was given to the West Virginia Division of Natural Resources Endangered Species Program, and the other is housed in the Refuge Museum Collection. This discovery brings the total species diversity at Muskingum Island to 27 species, which represents the most diverse mussel bed in the upper Ohio River and certainly the most diverse around any refuge island. Refuge divers will attempt to locate live specimens in the vicinity of the upper backchannel of Muskingum Island.



*Figure 25. Two specimens of the endangered Cyprogenia stegaria, collected from a muskrat midden on Middle Island. (PM)*

#### 4. Marsh and Water Birds - Heron Rookeries

During 1995, refuge staff continued to monitor the two known great blue heron rookeries on the Ohio River Islands, one on Fish Creek Island and the other on Grape Island. This year's data indicates that there are substantial changes ongoing in the rookeries. On both islands, total nest structures and active nests were down substantially from previous years. Fish Creek Island (not a refuge island) has lost 29 structures and 63 active nests in the past year. Grape Island has lost 6 structures, but 55 active nests since 1994. One rookery tree has been destroyed completely by lightning and 19 other trees have no nests or heron nesting activity at all.

Although lightening and wind damage are undoubtedly responsible for some loss of structures, the 45% decrease in active nests at Grape Island and 37% decrease in active nests at Fish Creek Island are not explained by weather (see Table 7). Rookery activity could be finding some equilibrium after six years of rapid growth and expansion, and/or birds raised on these Ohio River Island rookeries may be expanding to new rookery sites off river.



Figure 26 . The Grape Island rookery in winter. Some herons stake out their territory early. (PM)

Table 7 - Results of Annual Monitoring of Great Blue Heron Rookeries.

LOCATION	YEAR	ACTIVE NESTS	TOTAL STRUCTURES
Grape Island	1995	68	118
	1994	123	124
	1993	126	128
	1992	105	106
Fish Creek Island	1995	106	144
	1994	169	173
	1993	150	161
	1992	140	158

## 6. Raptors

Although there are no confirmed osprey nests located on refuge islands, refuge staff members followed the progress of three confirmed osprey nest attempts in the Ohio River Valley during 1995: (1) the toe of Neal Island at rivermile 182.3; (2)

above Racine Dam at rivermile 237; and (3) above Rayland, Ohio at rivermile 81.

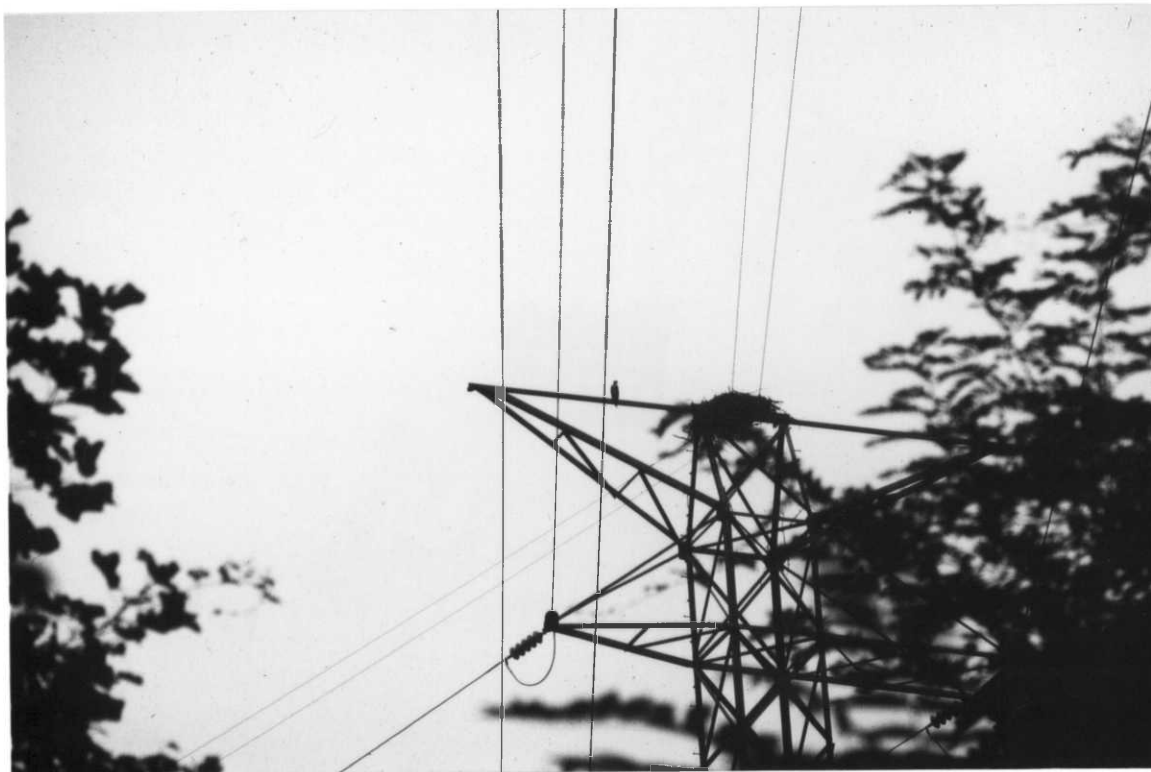
At the toe of Neal Island, on top of a powerline tower owned by the City of Parkersburg, a pair of osprey were observed successfully constructing a nest and mating on many occasions, but an overflight by a private pilot in July revealed that there were no young in the nest. It is unclear whether the osprey indeed laid eggs or hatched any young, but they appeared to have been incubating continuously for weeks. It is possible that a great horned owl or other predator may have disrupted the nest.



*Figure 27. Osprey nest on Neal Island, WV, was later abandoned and no young were produced. (PM)*

The nest above Rayland, Ohio apparently was successful. According to Ohio DNR Biologists, the pair fledged two young osprey. Ohio and Pennsylvania wildlife officials both are of the opinion that the nesting birds, or at least one of them, came out of the West Virginia Hacking Program on Blennerhassett Island.

The nest above Racine Dam was also apparently successful, as West Virginia DNR officials received information from a Huntington area birder that there were at least two young in the nests. All of these birds appeared to have a penchant for tall man-made structures adjacent to the river.



*Figure 28. Osprey nest on the WV hillside above Racine Dam apparently successful; two young birds were observed in 1995. (PM)*

On February 3, refuge staff erected a second barn owl nesting box, this one on Buffington Island adjacent to an old mowed air strip. The box was donated to the refuge by a local Parkersburg resident. The other barn owl nesting box is on the refuge Farmer's Home Easement in Belleville, West Virginia.



*Figure 29. Assistant Manager Ellis standing next to the barn owl box erected on Buffington Island. (CB)*

#### **7. Other Migratory Birds**

During 1995, the refuge cooperated with the West Virginia Division of Natural Resources, Non-Game Program and DuPont DeNemours Company, Wildlife Habitat Enhancement Committee on a prothonotary warbler nest box program along the Ohio River floodplain. DuPont employees constructed 100 nesting boxes for prothonotary warblers, and refuge and DNR staff erected 74 of the boxes on ten refuge islands and two mainland wetland sites along the Ohio River. Of the 51 boxes already checked, two had been used by prothonotary warblers, and the majority of the rest were used by house wrens. The West Virginia DNR also provided interpretive signs which describe and explain the cooperative project which we intend to place on Middle Island and Wheeling Island.



*Figure 30. One of the 100 prothonotary warbler nest boxes built by DuPont and donated to the Cooperative FWS/DNR/DuPont program. (JB)*



*Figure 31. Refuge Biologist Morrison, DNR non-game biologist Scott Butterworth, and DuPont employee Dick Esker erected prothonotary warbler nesting boxes on Middle Island. (JB)*

During the month of June, Biologist Morrison and SCA Volunteer Camille Collins established neotropical land bird point count sampling stations in the Willow Island Pool, and conducted pilot year point counts at 30 stations during the breeding season. The data will be entered in the new census database developed by Hal Laskowski. Although the data has not yet been analyzed, notable observations included two bald eagle sightings, and an unexpected nesting record for rose-breasted grosbeaks. Some of the more common nesting birds on the islands include grey catbird, white-eyed vireo, wood thrush, yellow warbler, yellow breasted chat, common yellow throat, indigo bunting, acadian flycatcher, northern cardinal, song sparrow, American goldfinch, warbling vireo, and rufous-sided towhee.

#### **10. Other Resident Wildlife - Freshwater Mussels**

As a result of a proposal submitted by the refuge in October of 1994, the Commonwealth of Kentucky promulgated a final regulation on October 11, 1995 establishing formal Mussel Sanctuaries in the Ohio River near Brush Creek Island, Manchester Island #1 and Manchester Island #2. The 4.2 mile long sanctuary includes state owned lands as well as underwater refuge acreage. Our intent for establishing the sanctuary was to help preserve the mussel communities for research and scientific study, environmental education, perpetuation of genetic diversity, and possible transplantation and reintroduction of extirpated species. Commercial harvest is prohibited within the sanctuary.

##### **a. Monitoring**

During 1995, refuge staff completed systematic baseline surveys of Middle Island, Grandview Island, Letart Island, and Muskingum Island. Grandview yielded no mussels by handpicking or brailing. Handpicking and brailing along Middle Island revealed scattered individuals along the upper one half of the channel side of the island. Muskingum Island to date harbors the highest diversity of freshwater mussels on the refuge: 27 species, including the federally endangered fanshell (*Cyprogenia stegaria*). With respect to Letart Island, if there is indeed a substantial concentration of mussels around Letart, they continue to elude us. Although we found significant evidence in a muskrat midden of over 1,000 individuals in the fall of 1994, brailing at Letart in the summer of 1995 resulted in the collection of fewer than 10 individuals. See Table 8 for summary information.

**Table 8 - Summary results of freshwater mussel surveys conducted on refuge properties, 1995.**

MIDDLE ISLAND Survey Type: Qualitative Survey

Species	Number	Percent
AMBLEMA PPLICATA	18	25.71
FUSCONAIA FLAVA	6	8.57
LASMIGONA COMPLANATA	3	4.29
LASMIGONA COSTATA	1	1.43
LAMPSILIS SILIQUOIDEA	3	4.29
LEPTODEA FRAGILIS	2	2.86
OBLIQUARIA REFLEXA	7	10.00
POTAMILUS ALATUS	1	1.43
POTAMILUS OHIENSIS	1	1.43
PYGANODON GRANDIS	2	2.86
QUADRULA PUSTULOSA	1	1.43
QUADRULA QUADRULA	22	31.43
TOXOLASMA PARVUS	2	2.86
UTTERBACKIA IMBECILLIS	1	1.43
Total	70	100.00

Number Species	Measures of Diversity		
	Margalef's Index d	Shannon-Weaver H'	Berger-Parker 1/d
14	3.0599	2.0320	3.1818

LETART ISLAND Survey Type: Qualitative Survey

Species	Number	Percent
AMBLEMA PPLICATA	1	14.29
OBLIQUARIA REFLEXA	6	85.71
Total	7	100.00

Number Species	Measures of Diversity		
	Margalef's Index d	Shannon-Weaver H'	Berger-Parker 1/d
2	0.5139	0.4101	1.1667

PHILLIS ISLAND Survey Type: Qualitative Survey

Species	Number	Percent
LEPTODEA FRAGILIS	9	52.94
PYGANODON GRANDIS	3	17.65
QUADRULA QUADRULA	4	23.53
UTTERBACKIA IMBECILLIS	1	5.88
Total	17	100.00

Number Species	Measures of Diversity		
	Margalef's Index d	Shannon-Weaver H'	Berger-Parker 1/d
4	1.0589	1.1499	1.8889

Relative Abundance of Freshwater Mussels

Data Collected: 1995

Report Date: 02/16/96

Island: MUSKINGUM ISLAND

Survey Type: Qualitative Survey

Species	Number	Percent
ACTINONAIAS LIGAMENTINA	9	0.34
AMBLEMA PPLICATA	1999	74.78
CYPROGENIA STEGARIA	2	0.07
ELLIPTIO CRASSIDENS	2	0.07
ELLIPSARIA LINEOLATA	10	0.37
FUSCONAIA FLAVA	2	0.07
LAMPSILIS CARDIUM	6	0.22
LASMIGONA COMPLANATA	5	0.19
LASMIGONA COSTATA	2	0.07
LAMPSILIS SILIQUOIDEA	1	0.04
LEPTODEA FRAGILIS	5	0.19
LIGUMIA RECTA	2	0.07
MEGALONAIAS NERVOSA	10	0.37
OBLIQUARIA REFLEXA	66	2.47
OBOVARIA SUBROTUNDA	4	0.15
PLEUROBEMA CORDATUM	92	3.44
PLETHOBASUS CYPHYUS	14	0.52
POTAMILUS ALATUS	13	0.49
POTAMILUS OHIENSIS	1	0.04
QUADRULA METANEVRA	156	5.84
QUADRULA PUSTULOSA	125	4.68
QUADRULA QUADRULA	139	5.20
STROPHITUS UNULATUS	1	0.04
TRUNCILLA DONACIFORMIS	2	0.07
TRUNCILLA TRUNCATA	4	0.15
UTTERBACKIA IMBECILLIS	1	0.04
Total	2673	100.00

Number Species	Measures of Diversity		
	Margalef's Index d	Shannon-Weaver H'	Berger-Parker 1/d
26	3.1682	1.1026	1.3372

Density and Frequency of Freshwater Mussels

Year: 1995  
Island: MUSKINGUM ISLAND  
Position: All Locations Combin

Rpt. Date: 02/16/96  
Sample Plots = 34

Species	Number Mussel	Ave. Sq. M	Min. Plot	Max. Plot	Std. Dev.	Freq.
AMBLEMA PPLICATA	56	6.588	0.	6.	1.686	70.00
ELLIPSARIA LINEOLATA	2	0.235	0.	1.	0.239	5.00
LASMIGONA COMPLANATA	1	0.118	0.	1.	0.171	2.00
LAMPSILIS SILIQUOIDEA	1	0.118	0.	1.	0.171	2.00
Empty Plot						14.71
OBLIQUARIA REFLEXA	8	0.941	0.	2.	0.606	14.00
PLEUROBEMA CORDATUM	3	0.353	0.	1.	0.288	8.00
PLETHOBASUS CYPHYUS	1	0.118	0.	1.	0.171	2.00
POTAMILUS ALATUS	2	0.235	0.	1.	0.239	5.00
QUADRULA METANEVRA	4	0.471	0.	1.	0.327	11.00
QUADRULA PUSTULOSA	10	1.176	0.	2.	0.579	23.00
QUADRULA QUADRULA	4	0.471	0.	2.	0.409	8.00
TRUNCILLA DONACIFORMIS	1	0.118	0.	1.	0.171	2.00
Total Mussels	93	10.941				

Relative Abundance of Freshwater Mussels

Data Collected: 1995

Report Date: 02/16/96

Island: MANCHESTER ISLAND #2

Survey Type: Qualitative Survey

Species	Number	Percent
AMBLEMA PPLICATA	12	32.43
FUSCONAIA FLAVA	2	5.41
OBLIQUARIA REFLEXA	2	5.41
PLEUROBEMA CORDATUM	1	2.70
POTAMILUS ALATUS	3	8.11
QUADRULA METANEVRA	1	2.70
QUADRULA NODULATA	6	16.22
QUADRULA PUSTULOSA	4	10.81
QUADRULA QUADRULA	6	16.22
Total	37	100.00

Number Species	Measures of Diversity		
	Margalef's Index d	Shannon-Weaver H'	Berger-Parker 1/d
9	2.2155	1.9100	3.0833

Density and Frequency of Freshwater Mussels

Year: 1995  
Island: MANCHESTER ISLAND #2  
Position: All Locations Combin

Rpt. Date: 02/16/96  
Sample Plots = 39

Species	Number Mussel	Ave. Sq. M	Min. Plot	Max. Plot	Std. Dev.	Freq.
AMBLEMA PPLICATA	31	1.179	0.	7.	1.454	38.00
ELLIPTIO CRASSIDENS	1	0.103	0.	1.	0.160	2.00
FUSCONAIA EBENA	1	0.103	0.	1.	0.160	2.00
Empty Plot						28.21
OBLIQUARIA REFLEXA	5	0.513	0.	1.	0.339	12.00
QUADRULA METANEVRA	2	0.205	0.	1.	0.223	5.00
QUADRULA NODULATA	3	0.308	0.	1.	0.270	7.00
QUADRULA PUSTULOSA	5	0.513	0.	1.	0.339	12.00
QUADRULA QUADRULA	5	0.513	0.	1.	0.339	12.00
TRUNCILLA TRUNCATA	3	0.308	0.	1.	0.270	7.00
Total Mussels	56	5.744				



*Figure 32. Biologist Morrison and Assistant Manager Ellis complete a diving survey for freshwater mussels. (JB)*

Biologist Morrison prepared a monitoring plan to track the status of zebra mussel infestation in the mainstem Ohio River. This quantitative sampling protocol was subsequently adopted by the Ohio River Valley Ecosystem Freshwater Mussel Subgroup, and applied to all researchers and resource managers conducting freshwater mussel surveys in the Ohio River. The refuge dive team subsequently conducted monitoring at six mainstem Ohio River sites from mile 175 to 815, revealing zebra mussel densities ranging from 4 per square meter at the upstream most station to nearly 4000 per square meter at the worst downstream site. Native mussel mortality was as high as 73% at the downstream most site. See Table 9 for summary information. A number of ecosystem partners contributed their time and manpower to help in the zebra mussel monitoring - White Sulphur Springs National Fish Hatchery, Ottawa National Wildlife Refuge, Elkins ES Office, Ecological Specialists, Inc., Kentucky Department of Fish and Wildlife Resources, Indiana Division of Fish and Wildlife, and the U. S. Army Corps of Engineers, Louisville District.

Table 9 - PRELIMINARY RESULTS - OHIO RIVER ZEBRA MUSSEL MONITORING 1995  
Ohio River Islands National Wildlife Refuge

Location	NATIVE MUSSEL DATA					ZEBRA MUSSEL DATA					
	# quads	# native species	% live	density per m <sup>2</sup>	% ≤ 3 years	density per m <sup>2</sup>	g. per m <sup>2</sup>	avg per unionid	max per unionid	% natives infested	% live
RM 175 Muskingum	34	12	96.0	11.4	8.0	4.1	--	0.11	2	11.8	100
RM 397 Manchester	36	9	87.8	6.7	32.0	12.0	--	1.0	25	24.3	96.4
RM 496 Aurora	33	12	78.6	6.5	11.4	942.0	588	34.1	136	81.4	87.0
RM 625 Rosewood	36	19	83.9	18.0	23.0	1211.0	712	7.0	51	84.5	89.0
RM 726 Hawesville	30	16	77.9	31.0	2.0	3540.0	325	22.4	121	92.0	98.0
RM 814 Cypress Bend	30	18	27.2	10.3	3.5	1056.0	264	22.5	464	54.0	91.0

- 1/ 8% had byssals but no live zebras  
 2/ Zebras were <6 mm or 10 to 20 mm. Nothing in between, or larger.  
 3/ 34% had byssals but no live zebras; infestation rate has dropped dramatically

Mortality monitoring plots established at Rosewood Bed.

Recommendations for next year - live biomass of zebras per m and per unionid; look at ratio of biomass of zebras to biomass of native. Probably more relevant to stress than numbers alone.



*Figure 33. Freshwater mussel diversity at Aurora, IN, one of the four zebra mussel monitoring sites sampled by refuge staff in 1995. (PM)*



*Figure 34. Our first good look at severe infestation by zebra mussels, at Aurora, IN. (PM)*



*Figure 35. Eight biologists from 3 FWS Offices and 2 state fisheries offices process mussel samples onboard during zebra mussel monitoring. (PM)*



*Figure 36. Onshore processing of mussel samples at Hawesville, KY zebra mussel monitoring site. (PM)*

In addition to monitoring the density of natives and zebra mussels at the various sites, the refuge staff established a mortality monitoring plot at the Rosewood Bed (rivermile 625) to evaluate the survival rates of infested native mussels and test the effectiveness of on-site cleaning of zebra mussels off the natives toward promoting survival. Six one square meter plots were established in the riverbed using spiral stakes to establish the corners. Three replicates were established with native mussels at 20 per square meter using "cleaned" mussels who had been stripped of their zebra mussel load. Another three replicates were established at the same density using native mussels which still had their zebra mussels attached. The monitoring plots will be checked annually to determine survival rates.



*Figure 37. Kari Duncan (White Sulphur Springs NFH) and Assistant Refuge Manager Mitch Ellis prepared marked native mussels for planting in mortality monitoring plots at Rosewood, IN. (PM).*

b. Rescue, Recovery and Propagation

Endangered species and law enforcement personnel from Regions 3, 4 and 5 prepared a formal salvage permit to allow the removal of nine species of federally endangered mussels from those portions of the Ohio River where they

are at risk from zebra mussels. State cooperators, including refuge staff, helped draft a protocol for the handling, transport, and quarantine of salvaged endangered mussels, and identified facilities basinwide which are now approved as quarantine and long-term holding sites. During the 1995 field season, one male *Lampsilis abrupta* was collected.



**Figure 38.** Refuge museum specimens of male and female *Lampsilis abrupta*, one of nine species of endangered mollusks which occur in the mainstem Ohio River. (JB)

The Middle Island tract of the refuge became one of four basinwide quarantine facilities approved to hold freshwater mussels taken out of the Ohio River for a 30 day period to ensure that they are free of zebra mussels before transporting them to their permanent longer-term holding facilities. Fourteen fiberglass tanks were set up in the old barn on Middle Island and plumbed with necessary hardware to carry water and air to the individual tanks. Refuge volunteers helped construct walls to close off the quarantine facility from the rest of the barn, and staff from White Sulphur Springs National Fish Hatchery and Leetown Aquatic Ecology Lab set up the tanks and the blowers to circulate the water in the tanks. The 14 tanks collectively can hold a total of 2,800 native mussels at one time. During 1995, over 3,200 mussels went through the Middle Island quarantine facility on route to their long-term holding sites at Leetown and White Sulphur Springs. Refuge staff assisted in maintaining the mussels in quarantine, and scrubbing

and inspecting the mussels after their mandatory quarantine period to ensure that they were zebra free.



*Figure 39. Experimental mussel quarantine facility constructed in an enclosed barn on Middle Island. (JB)*



*Figure 40. Native mussels are examined after a 30-day quarantine period to insure they are free of zebra mussels. (PM)*

From July through October, refuge divers cooperated with NBS/Virginia Polytechnic Institute Cooperative Fisheries Unit Researchers, State of West Virginia DNR, West Virginia DEP, White Sulphur Springs National Fish Hatchery, Elkins ES, and other volunteers in a major effort to collect eight species of big river freshwater mussels for captive rearing studies at the Leetown Aquatic Ecology Laboratory and White Sulphur Springs National Fish Hatchery. Over 20 people were involved in the collection and processing of specimens. Each one of the animals had to be scrubbed, tagged, measured, aged, and segregated by sex and gravity prior to transport to the quarantine facility on Middle Island. In addition to the eight species collected for the captive rearing studies, divers collected approximately 20 individuals of *Plethobasus cyphus*, the sheepsnose mussel, a species under consideration for candidate status. These individuals were collected under the newly approved salvage permit for threatened and endangered mussels and other species of special concern in the Ohio River mainstem and tributaries. Some of these animals will be housed at Leetown, and others at White Sulphur Springs National Fish Hatchery.



*Figure 41. Cooperative effort is launched to collect specimens of big river mussel species for captive rearing studies. (JB)*



*Figure 42. Assembly line of mussel processors. Mussels are measured, weighed, and tagged for longterm captive rearing studies. (JB)*

### c. Meeting Research Needs

On November 2, Biologist Morrison and volunteer Jim Noe collected 120 specimens of freshwater mussels from the Ohio River for a bacterial study being conducted by the Leetown Aquatic Ecology Laboratory. Researchers at Leetown are investigating whether there are any pathogens which could be transmitted from freshwater mussels to fish, or from fish to freshwater mussels. This information is vital for managers at fish hatcheries who are going to be also holding freshwater mussels. Refuge staff agreed to collect 120 animals at four different times during the year for this important and immediate research need.

### **16. Marking and Banding**

The refuge contributed to the Office of Migratory Bird Management's regional wood duck population initiative by continuing its wood duck banding program strictly through the use of trained volunteers in 1995. John and Sue Bell of Pine Grove, West Virginia banded 27 wood ducks on Fishing Creek. This is the third year that John and Sue participated in the

wood duck banding program, and the first year that they executed it completely on their own.



*Figure 43. Refuge volunteers band wood ducks to contribute to the Office of Migratory Bird Management Wood Duck Population Initiative. (BT)*

## H. PUBLIC USE

### 1. General

Acquisition of Middle Island in 1995 greatly expanded the refuge's public use opportunities primarily because of the island's bridge access. No longer would boats be the only means of transport to the refuge. Although the bridge's posted weight restriction of four tons precluded access by buses, student and teacher groups either walked, drove cars, or were shuttled in refuge vehicles to activity sites on the island.



*Figure 44. It doesn't look like much, but the bridge to Middle Island allowed for an expansion in our public use and volunteer programs. Public access to the refuge is no longer limited to boats. (ME)*

In addition to the bridge to the island, another novel feature of Middle Island is its road--the only one on the refuge. Following the main channel edge of the island, the dirt and gravel road traverses the two-mile length of the island. The road introduced recreational activities not previously seen on the refuge, including bicycling, jogging, fitness walking, and automobile touring. Some potential user conflicts emerged with the complaint of dust annoyance caused by motorized vehicles. Options including partial road closure and trail development will be considered in future planning for recreational use on the island.



*Figure 45. The refuge reported its first sighting of joggers on the refuge this year. Middle Island came with a road in addition to its bridge. (ME)*

Another "first" came to the refuge in 1995 with the installation of five information kiosks. Six 3'x 5' fiberglass embedment panels were fabricated by Wilderness Graphics at cost of approximately \$1030 each, including frame, scratch resistant plexiglass, hardware and mounting posts. Reserving one complete kiosk for a spare, the others were placed on islands receiving the majority of public use: Phillis Island in PA, Williamson, Grape, and Middle Islands in WV, and Manchester 2 Island in KY. Except for Middle Island, all kiosks were placed on beach areas and removed for the off-season months.



*Figure 46. One of five identical kiosks installed on refuge islands this year. (JB)*

By the end of the recreational use season, the kiosks varied in physical condition. The Williamson Island kiosk disappeared completely early in the summer, presumably due to vandals. The frame was recovered at a downstream riverbank after the refuge issued a news release requesting information about the kiosk. Vandals destroyed the plexiglass on the Middle Island kiosk, though did not bother its replacement. Nature proved to be the vandal of the Manchester 2 kiosk; a late spring high water event completely lifted the kiosk from the beach and redeposited it, muddied but undamaged, 200' inland. Kiosks on Phillis and Grape Islands received no damage throughout the season.

FY 95 funds amounting to \$7625 were obligated to Wilderness Graphics for the design and fabrication of custom fiberglass embedment panels to be produced in 1996. \$2000 of Ohio River Ecosystem was also obligated in 1995 to be used for the production of a freshwater mussel exhibit at the Ohio River Museum in Marietta, Ohio.

## **2. Outdoor Classrooms - Students**

The refuge held its first outdoor classroom for students this year on Middle Island. Although staff-led student classrooms

are not an emphasized refuge activity, the reforestation project on Middle Island provided a meaningful classroom tool and should remain so during the next several years. Students participating in the reforestation/habitat management classrooms were enrolled as volunteers and provided significant work contributions while learning about the refuge's mission. Classrooms are not limited to this project, but requests for staff-led student field trips are encouraged to consider this approach. Of four outdoor classrooms conducted in 1995, two were centered on the reforestation project.

### 3. Outdoor Classrooms - Teachers

The refuge hosted one on-site teachers' workshop in 1995. Twenty-four teachers from Wood County attended the workshop on Middle Island, a repeat group from the previous year. Activities were developed to compliment the reforestation project on the island. Because Middle Island will be the site of most future workshops, plans are to eventually create a curriculum covering a range of concepts that will allow teachers to choose those most relevant to their teaching needs. See section 7. "Other Interpretive Programs" for additional information about teacher workshops.



*Figure 47. ORP Butler gives instructions to teachers participating in a workshop on Middle Island. (CC)*

## 6. Interpretive Exhibits/Demonstrations

The refuge presented a higher public profile this year with first-time participation in several events. Earth Day at the Parkersburg mall brought about 1000 people to our staffed exhibit. The refuge also participated in Non-Game Wildlife Day at the capitol building in Charleston; Get Hooked on Fishing Day at the mall in Clarksburg, WV; and Children's Science Day at Washington Community College in Marietta, OH. As in past years, the refuge staffed an exhibit at the St. Marys Bass Festival, an event that will probably be dropped in future years in favor of more efficient outreach opportunities.



*Figure 48. Refuge Manager Wilson staffed the refuge's Earth Day Exhibit at the Parkersburg, West Virginia Mall. Can this man save the earth? (JB)*

## 7. Other Interpretive Programs

Refuge staff were involved in a wide variety of interpretive programs in 1995. Off-site programs at schools, to civic groups, environmental organizations, and scouts numbered 51 with 1353 participants. One outreach program included a trip well beyond the refuge to the Falls of the Ohio Visitor Center in Clarksville, IN for a combination teachers' workshop and public presentation on freshwater mussels. Mussels were also the refuge's topic at the Youth in Science and Engineering event at Marietta College and at a Project WET workshop in Ohio.



*Figure 49. Hilary Vinson from the Asheville, NC Field Office assisted ORP Butler and Biologist Morrison with a teacher workshop on freshwater mussels at the Falls of the Ohio Visitor Center in Clarksville, IN. (PM)*



*Figure 50. Wood County, West Virginia offered an Environmental Day Camp in 1995 in which the refuge participated. (CC)*

Special on-site tours were given, including a trip to Muskingum Island with the Marietta Natural History Association and a birding trip to Paden Island with the Brooks Bird Club.

The refuge commemorated National Wildlife Refuge Week in October with an open house on Middle Island and the planting of a tree in memory of John Hollingsworth, a nationally known photographer who had visited the refuge the previous year and whose interest and dedication to refuges made a lasting impression.



*Figure 51. The refuge honored John Hollingsworth, a nationally renowned photographer, by planting a sycamore tree in his memory during National Wildlife Week. (CB)*

The refuge received regular media attention in 1995, most of it resulting from news releases and invitations to reporters to cover specific events. Newspaper articles appeared on the donation of Muskingum Island, refuge participation in the Non-Game Wildlife Day at the West Virginia state capitol in Charleston, refuge acquisition of Middle Island, Middle Island public meeting announcement, Middle Island haying program, National Wildlife Refuge Week, Junior Duck Stamp contest, Middle Island dove hunt, prothonotary next box project, zebra mussel problems and freshwater mussel quarantine, vandalism of a refuge sign, and historic use of freshwater mussels. Some of these topics were carried in several newspapers. The Wonderful West Virginia magazine featured a refuge-authored

article about hunting opportunities on the refuge. Television coverage featured an Earth Day interview and National Wildlife Refuge Week.

#### 8. Hunting

The refuge hunt program consists of archery deer hunting, migratory bird hunting, rabbit hunting and squirrel hunting. The Annual Hunt Program along with minor revisions to the Hunt Management Plan was submitted to, and subsequently approved by, the zone biologist and Regional Office on May 22, 1995.

On September 1 and 2, dove hunting was allowed on Middle Island. Recent management activities increased the use of the island by dove and special hunt days were called by the manager to provide sportsmen opportunity. A total of 28 sportsmen harvested 103 doves over the 2-day period. Several hunters expressed gratitude for the FWS providing quality uncrowded dove hunting on public land.

In October of 1995, the "Wonderful West Virginia" magazine published their annual hunting issue which included an article written by ORP Butler about hunting opportunities on the refuge.

In reality, the refuge draws only a small number of sportsmen due to access difficulties. Watercraft are the only means available to get to most of the islands and few hunters are willing to invest the time or risk traversing the Ohio River at that time of year. An estimated 230 visits were made to the refuge by hunters in 1995. This included about 70 visits for deer, 120 for waterfowl, 30 for dove, and 10 visits for rabbit/squirrel hunting. Paden, Williamson, Buffington and Manchester Islands get the most attention from deer hunters while Phillis, Grape, Broadback and Letart are popular for waterfowl enthusiasts. Middle and Muskingum Islands receive limited attention for dove hunting as well.

Not all refuge islands are open to hunting and some have special restrictions. Because of this and State "written permission" laws, possession of the Refuge Hunt Brochure while hunting on the Refuge is mandatory. Table 10 summarizes the status of the various refuge islands with regard to the hunt program.

Table 10 - Refuge islands and their status in the hunt program.

ISLAND	RIVER MILE	ACRES	STATUS
<i>Pennsylvania</i>			
Phillis	35	27	Open
Georgetown	38	17	Open
<i>West Virginia</i>			
Wheeling	89	20	Closed
Paden	132	81	*Open
Williamson	134	140	Open
Witten Towhead	135	8	Open
Crab	138	1	Closed
Wells	139	47	Open
Mill Creek	141	23	*Open
Grandview	143	8	Open
Grape/Bat	152	37	Open
Middle	153	240	**Open
Broadback	159	40	Open
Muskingum	175	117	Open
Neal	181	17	Closed
Buffington	216	162	Open
Letart	235	25	Open
<i>Kentucky</i>			
Manchester #1	395	20	Open
Manchester #2	395	94	Open
* These islands open to white-tailed deer hunting only.			
** Middle Island is currently open to dove hunting only.			

Harvest information for hunts other than Middle Island dove hunting are not available. Lack of refuge hunter response to questionnaires attached to the 1994 hunt brochures prompted the refuge to forego the expense of continuing the process. The over-harvest of game species or displacement of non-target species is not a problem at this time. Current wildlife inventory surveys are adequate to evaluate the effects of refuge public uses, including the hunt program, on refuge resources.

### 9. Fishing

The process to formally open the refuge to sport fishing was undertaken in 1995. The decision was made to limit refuge-specific regulations related to sport fishing, due to adequate state fishing regulations already in effect. The difficulty of defining refuge boundaries off-shore of the islands also

weighed into this decision. Current fishing activities on refuge properties are compatible and do not pose a threat to refuge resources. We are monitoring some fishing techniques allowed under state regulation, such trot-lines, to see if these activities are occurring on refuge properties and what effect they may have on non-target species.

The first draft of the Sport Fishing Plan and Environmental Assessment was completed in January, 1995. The affected states were contacted for their initial feedback on the Service's proposal to open the refuge to fishing. All feedback from the states was positive. The package was then sent to the Regional Office for comment, and subsequently returned to the states for their official concurrence and comments. The proposed rule was published in the Federal Register on November 29, 1995, adding the Ohio River Islands National Wildlife Refuge to the list of refuges open for sport fishing.

### **13. Camping**

Camping is not a permitted use on the refuge, and very little occurs. Muskingum Island received the majority of camping activity during 1995, following the pattern of recently acquired islands receiving the most prohibited use. Although Middle Island was also acquired in 1995 and formerly had an RV campground, there was no evidence of camping during the past year. Overall, only several camping incidents occurred on the refuge in 1995, indicating high public compliance with refuge regulations based on noted camping use prior to refuge acquisition.

Overnight boat mooring, another prohibited activity, is more difficult to detect than camping unless observed first-hand. Refuge patrols found little evidence of this activity, although the staff received indignant remarks from Coast Guard auxiliary volunteers who disagreed with the refuge's position.

### **14. Picnicking**

Facilities for picnicking are not provided on any of the refuge islands. This activity occurs in conjunction with other public use and is included in "beach-use" figure in Table 11.

### **16. Other Non-Wildlife Oriented Recreation**

Most refuge visitors engage in non-wildlife oriented activities. Recreational boating and beach use (including picnicking) contribute the majority of such use, although with the refuge's addition of Middle Island and its bridge and

road; some bicycling, auto touring, walking and jogging also occurred. While the addition of Muskingum Island added

another popular recreation site to the refuge, other recent acquisitions didn't appear to be magnets for public use. Wells, Mill Creek, Grandview and Letart islands lack the extensive beach areas found on the more popular islands, and were largely ignored except for boating scenery and fishing opportunities.

Refuge public use data collection in 1995 was insufficient to construct island-by-island use summaries. Some islands were visited fairly often because of other refuge work, while others were documented only once during the recreation season. Table 11 lists estimates of use based on extrapolations of public use inventories, undocumented observations and reports, and comparisons to past use levels.



*Figure 52. The Ohio River isn't just for barges and jet skis. Island backchannels occasionally attract canoeists. (JB)*

Table 11 - Recreational Use on Ohio River Islands - 1995

NON-WILDLIFE ORIENTED			WILDLIFE ORIENTED		
MONTH	BEACH USE	BOAT USE	FISHING	*ROAD DEPEND.	TOTALS
March	-0-	-0-	1000	-0-	1000
April	-0-	-0-	3000	-0-	3000
May	3500	5500	5500	450	14950
June	10000	11000	5500	1200	27700
July	15000	18000	3000	1250	37250
August	16000	19000	3000	1250	39250
Sept.	7000	8000	4000	700	19700
Oct.	-0-	-0-	2400	300	2700
<b>TOTALS</b>	<b>51500</b>	<b>61500</b>	<b>27400</b>	<b>5150</b>	<b>145150</b>

#### 17. Law Enforcement

Refuge Officer Mitch Ellis attended the annual law enforcement in-service training from April 3-7 at Patuxent Research Center in Laurel, Maryland.

On April 14, Manager Wilson met with Dave Kelley, Sheriff of Pleasants County, to discuss our recent acquisition of Middle Island and deliver the county revenue sharing check. Mr. Kelley agreed to periodically send a patrol car over to Middle Island to provide a law enforcement presence in an effort to eliminate night use and other undesirable activities.

Patrols on Middle Island in early June revealed its popularity as a swimming hole for local youths. This use, along with several negative side-effects like illegal wood cutting, rope swings, litter, and an annoying increase in traffic, was proving incompatible with our other less intrusive public uses. The refuge manager made the decision to close Middle Island to swimming and contacted several of the area youths personally to give them the "good" news. They haven't been back.

The informational kiosk on Williamson Island was vandalized in June. The frame was recovered down river near Friendly, West Virginia but the sign itself was not recovered. An estimated \$800 worth of damage was sustained.

Visitor contact patrols were conducted over the 4th of July Holiday Weekend. Refuge staff Wilson, Ellis, Butler and Morrison worked Sunday and Monday over all 18 refuge islands

in an effort to reach our boating community with our mission. Several hundred people were contacted and given information.

In July of 1995, Manager Wilson and Refuge Operations Specialist Mitch Ellis met with Melissa Brown, Superintendent of Blennerhassett State Park. Ms. Brown was seeking advise and information on how we implemented law enforcement activities on refuge islands. She is faced with a new state law requiring no alcoholic beverages in state parks, which has occurred on Blennerhassett Island for many years.

The refuge was contacted by Lt. Randy Walters of the Manchester, Ohio Police Department on July 24. He requested, and received, a supply of refuge brochures to give to interested individuals upon request. The public boat ramp in Manchester, Ohio is the primary launching point for our visitors of Manchester Islands and Lt. Walters has been asked several times by locals for information about the refuge.

Refuge Officer Ellis assisted FWS Special Agent Gorham in an on-site investigation of a local chemical plant, that allegedly was taking migratory birds illegally to deal with a "fouling" problem they had. A December 14 visit revealed that starlings were being taken and few if any protected birds were being trapped. The permitting procedure was explained to the company, whose officials were very cooperative.

## I. EQUIPMENT AND FACILITIES

### 3. Major Maintenance

Boundary sign maintenance continues to be a "major" task. Factors including high water, vandalism, and lush Japanese knotweed growth required periodic inspection, replacement, and weed clearing. Each sign has to be inspected/weeded 2-3 times per year, however, keeping the signs visible to the public is critical in order to enforce refuge regulations and distinguish which islands are in the refuge system. Two additional islands were signed in 1995 -- Middle Island and Muskingum Island. The refuge now has 18 islands with approximately 165 sign locations that need to be maintained.

The refuge's maintenance workload increased significantly with the acquisition of Middle Island in 1995. Maintenance activities there centered around the 2-mile access road, the house trailer and the large pole barn. Modification of the pole barn for use as a zebra mussel quarantine facility required both time and money in 1995 (see section G-10.b). Other "major" maintenance projects on Middle Island included those described in the following paragraphs.

On November 7, Don Stover of Erie NWR traveled to Middle Island to assist the refuge with several projects. Don brought Erie's front end loader and conducted road maintenance, debris cleanup, erosion control projects, constructed a loading ramp, and improved our visitor parking lot -- all in a short two days. Our thanks to him and Tom Mountain, Project Leader at Erie NWR, for their assistance.

On November 7, seventy ton of "crush-run" gravel was put on the Middle Island road. This was only enough to put on the worst places. The refuge plans to put at least fifty ton of gravel annually on this road, as we have an agreement with a lessee for that amount. A local refinery that is operating water wells on the island is obligated to assist with maintenance of the road.

In early December, volunteers Jim Dotson and Lee Ridge assisted Mitch Ellis, assistant refuge manager, in the placement of a large sliding door on the barn at Middle Island. Over 30 hours of volunteer time were given to the project which will allow secure storage of refuge equipment at that facility.

The annual Ohio River Sweep, a clean-up campaign sponsored each year by the Ohio River Sanitation Commission (ORSANCO) brought 30 volunteers to Middle Island on June 17. Working with refuge staff, volunteers "swept" the island and accomplished a huge amount of garbage/debris removal.



*Figure 53. Refuge volunteer Malorie Morrison after a hard day picking up trash along Middle Island during the 1995 Ohio River Clean Sweep. (BB)*

On April 13, refuge staff and Joe Shamblin, former owner of Buffington Island, traveled to the island for clean-up and removal of his personal property. Mr. Shamblin contracted with Joe S. Neale for the barge to haul several farm implements, junk, etc., from the island.



*Figure 54. Buildings on Buffington Island which were focus of cleanup efforts on April 13, 1995. Contents of these buildings were removed by the prior landowner as part of the cleanup. (ME)*

#### **4. Equipment Utilization and Replacement**

The following funds were expended to purchase fuel for, maintain, and replace equipment in the following categories: \$4000 related to our three trucks, \$3400 to keep the two boats in service, \$6000 to maintain SCUBA capability for aquatic surveys, \$1200 for building improvements on Middle Island, and \$1500 for office equipment repairs. The refuge's total expenses related to equipment utilization and replacement were more than \$16,000 in 1995. Although we were allocated only \$13,000 for maintenance and fuel in 1995, we were able to make the difference up with a small amount of discretionary funds in our "supply" account. Obviously, some priority adjustments were made and certain activities didn't get done. An increase in our maintenance funding (1262) is badly needed.

Problems associated with the 16' Alumicraft boat continued this year (again). We are using this boat to accomplish tasks better suited for a larger, sturdier boat. Certain activities such as debris removal, freshwater mussel surveys, trash cleanup, boundary posting, reforestation efforts, etc. are taking its toll. The original trailer, which was light duty

aluminum, was replaced this year with a heavy duty steel trailer at a cost of \$1400. The outboard motor also required serious repair at a cost of \$1200. The refuge should eventually acquire a larger, more appropriate boat for our field activities.



*Figure 55. Ron Lambertson and Cathy Short on a recent visit to the refuge. Both agreed our current boats are too small, but expressed concern over our proposal to acquire the "American Queen." (PM)*

A farm tractor and three mowers were obtained from White Sulphur Springs NFH via surplus property. Staff from Erie NWR transported the tractor and equipment to Middle Island. They also assisted with set-up and service of the tractor to meet our needs on Middle Island. Controlling exotic plants, reducing competition in tree plots, and road/facility maintenance will be our main use of the tractor. The worn tractor implements were traded in for new implements at a local Masey Ferguson dealer on December 6, 1995. An estimated \$700 savings to the government was documented in the transaction.

##### **5. Communications System**

The refuge communications system changed little in 1995. It consists of marine radio/telephones in both boats, cellular phones in the trucks which are portable, and two hand-held

radios for misc. purposes. The office phone system is a "Norstar Meridian" system featuring 3 lines (one dedicated for fax/computer), an intercom system, paging, memory dialing, and other functions.

#### 6. Computer Systems

The refuge computer inventory is as follows: a Gateway 2000 486 PC, an AST 386 PC, an Epson Equity IIe 286 PC, a Dell 386 notebook computer, a Compaq 386 notebook computer, and an HP LaserJet III Printer. Software used at the station include MSdos, Windows, WordPerfect, RBase, and electronic mail.

During 1995, Southern Zone Biologist Hal Laskowski spent hundreds of hours customizing and re-designing the refuge Freshwater Mussel Database. His hard work has greatly improved and simplified data entry and reporting features of the database. Thank you, Hal!

#### 7. Energy Conservation

Because the refuge office is a "GSA rental" we have no energy information available with regard to our office specifically. Table 12 outlines our vehicle energy data for 1995.

Table 12 - Energy Data for the Refuge Vehicles for 1995.

Vehicle	Miles (1995)	Fuel (Gal.)	M.P.G.	Cost (Gas & Maint.)
Chev. Blazer (4WD)	8,250	601	13.7	\$1,075.79
Chev. Truck (4WD)	11,795	840	14.0	\$1,119.51
Chev. Suburban	16,659	1,077	15.5	\$1,379.70
Boston Whaler	----	207	--	\$466.50
Alumicraft Boat	----	105	--	\$1,461.23
<b>TOTALS</b>	<b>36,704</b>	<b>2,830</b>	<b>--</b>	<b>\$5,502.73</b>

#### J. OTHER ITEMS

##### 1. Cooperative Programs

In 1995, the State of West Virginia formally established its state-wide Partners In Flight Team. Biologist Morrison and ORP Butler attended two meetings in Elkins, West Virginia, and the group made substantial progress toward identifying objectives for the state program and establishing three major

subgroups. Biologist Morrison sits on the Inventory and Research Sub-Group, and ORP Butler is a member of the Outreach Sub-Group.

### 3. Items of Interest

The refuge coordinated the Federal Junior Duck Stamp Contest in West Virginia for a second year. Nearly 150 entries were received from throughout the state, an increase of almost 70% over the previous year. The Best of Show recipient was 13 year-old Amanda Smith of Ravenswood who entered a water color drawing of a mallard duck. Competition would have been greater if participants had better understood the concept of "native" ducks geese and swans.



*Figure 56. Amanda Smith, a 6th grade student from Ravenswood, West Virginia won the State Best of Show in the Junior Duck Stamp Contest coordinated by the refuge. (JB)*

In May of 1995, the following revenue sharing checks were delivered in person to the counties and boroughs listed below:

County/Borough	Acres	Payment
Shippingport Borough, PA	39	\$312
Ohioville Borough, PA	16	165
Wetzel County, WV	81	851
Tyler County, WV	204	2,263
Pleasants County, WV	96	998
Wood County, WV	45	411
Jackson County, WV	162	2,061
Mason County, WV	29	271
Lewis County, KY	114	1,670
<b>Totals &gt;</b>	<b>786</b>	<b>\$9,002</b>

On February 2 Manager Wilson met with Glenn Robinson and other members of the West Virginia Division of Environmental Protection to inspect the six active and four inactive oil wells located on Middle Island for state compliance in relation to oil/gas production. All wells were found in non-compliance lacking API numbers, retainer rings to capture spills and a variety of other violations. Division of Environmental Personnel notified Halwell Oil Company (lease holder) of the discrepancies. Therefore, on February 7 a meeting was held with Halwell Oil Company personnel including their attorney to discuss the matter. In short, Halwell agreed to develop a plan to address the problems. Once the plan was developed (within 30 days), Halwell, DEP representatives and refuge personnel met on-site to discuss. The plan will result in removal of several old storage tanks and other oil/gas debris. The results will be a more environmentally acceptable resolution and provide a more aesthetically pleasing impression to visitors of the island. John Wilson, Regional Archaeologist, was briefed on the proposal and inspected the area prior to any surface disturbance. A letter of concurrence was also received from the West Virginia State Historical Preservation Office. At the close of this report, Halwell Oil Company's work on the wells still failed to meet compliance with state oil and gas standards and were "shut down."

On March 22, Manager Wilson met with Bob Winland, Manager St. Marys Refinery, to discuss resolution of several safety matters relating to operation of their five water wells on the island. We also discussed the need for the yearly submission of \$4,000 due for the sale of water to the refinery. The island was purchased with the lease agreement in effect, eleven years are remaining on the lease. The refinery is also

obligated to provide 50 tons of gravel each year for the refuge entrance road.

Manager Wilson set up a meeting of the Regional Directors of Regions 3, 4 and 5 to discuss cross regional/problems in relation to effective ecosystem management. The meeting was held on July 20 and 21 in Columbus, Ohio and did provide some basic guidelines how regions would interact with cross-regional teams with problem resolution or project implementation.

On October 12, Biologist Morrison gave a presentation to the Marietta Natural History Society at Marietta College titled "Riparian Habitats-Their Values, Problems and Solutions." Approximately 60 people attended the talk. Residents of Marietta are wrestling with competing ideas for the future of the Marietta waterfront and floodplain, and the talk was aimed at providing technical information on the natural values of and services provided by riparian habitats.

On November 9, Biologist Morrison attended a meeting in Columbus, Ohio sponsored by the Ohio DNR regarding the possibility of conducting side-scan sonar mapping of the entire Ohio River. Conspicuously absent from the meeting were representatives from the Corps of Engineers and the State of Kentucky (major players on any cooperative Ohio River Project). Of the attendees at the meeting, there was a consensus that a demonstration project should be undertaken in 1996 or 1997, involving mapping of the entirety of one navigation pool. The refuge would like to draft a proposal to the Challenge Grant Program for cost sharing in order to participate monetarily in this important habitat management project.

Manager Wilson worked with Gary Dupuis, CGS, to make arrangements for disposal of two silos, three granaries and three excess buildings located on Middle Island. Exact bid closing and removal will occur in early 1996.

#### 4. Credits

The entire refuge staff participated in the preparation of the annual narrative. Refuge Manager Jerry Wilson wrote Sections A, C, and J. Assistant Manager Mitch Ellis wrote Sections D(1-4), E, H(8&17), and I. Biologist Morrison wrote Sections 5, D(5&6), F, G and J. Outdoor Recreation Planner Janet Butler wrote Sections E(4), H and J. The narrative was edited collectively by the staff. Office Assistant Cindy Bloomer typed and compiled the narrative. Photo credits are given in parenthesis under each photograph: ME=Mitch Ellis, PM=Patty Morrison, JB=Janet Butler, CB=Cindy Bloomer, CC=Camille Collins, BT=Bill Tolin, BB=Bill Butler, BP=Bob Phipps, and SB=Scott Butterworth.