

REVIEW AND APPROVALS

MUSCATATUCK NATIONAL WILDLIFE REFUGE

Seymour, Indiana

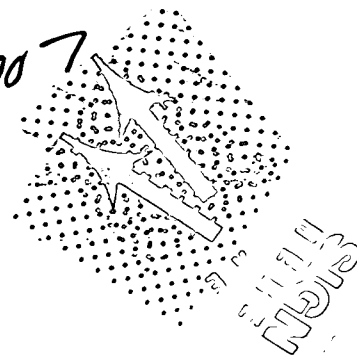
ANNUAL NARRATIVE REPORT

Fiscal Year 2005

M. A. Lehn 6/22/07
Refuge Manager Date

Don Kauffeld 9/27/07
Refuge Supervisor Date

Walter M. Felt 9.24.2007
Regional Office Approval Date





U.S. Fish & Wildlife Service

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Department of the Interior
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National Wildlife Refuge System


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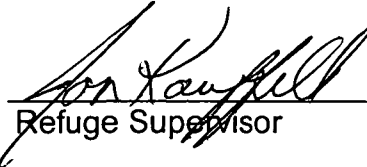
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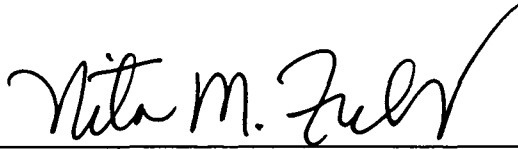
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APPENDIX

Refuge Annual Performance Plan (RAPP) FY '05

Muscatatuck National Wildlife Refuge

Annual Narrative

Seymour, Indiana

Fiscal Year 2005 (October 1, 2004 to September 30, 2005)
(*Calendar year data are used for climate and waterfowl UD)

***2005 Climatic Data**

| Month | Temperatures AVG | | Precipitation | |
|-----------|------------------|---------------|---------------|--------|
| | Maximum | Minimum | NWR | Normal |
| January | 41.2 | 29.7 | 8.61 | 3.30 |
| February | 37.1 | 26.6 | 1.80 | 2.94 |
| March | 47.1 | 31.7 | 2.39 | 4.22 |
| April | 67.7 | 47.0 | 4.09 | 3.83 |
| May | 75.5 | 55.0 | 3.63 | 4.31 |
| June | 83.2 | 64.0 | 4.66 | 4.14 |
| July | 88.6 | 68.5 | 0.55 | 4.77 |
| August | 85.5 | 67.3 | 7.61 | 2.91 |
| September | 79.7 | 59.3 | 3.33 | 3.03 |
| October | 65.2 | 47.4 | 1.07 | 2.47 |
| November | 54.4 | 38.8 | 4.49 | 3.09 |
| December | 33.8 | 24.5 | 2.37 | 3.16 |
| Totals | 63.3 (AVG) | 46.7 (AVG) | 44.6 | 42.17 |

1. Precipitation and temperature data from the office gauge.
2. Normal precipitation is from the 1951 to 1977 period (recorded at Seymour, IN).

INTRODUCTION

The Muscatatuck National Wildlife Refuge (MNWR) established October 6, 1966, is located in south central Indiana midway between Indianapolis, Indiana, and Louisville, Kentucky. The refuge is just south and east of the junction of I-65 and US 50 and is divided by the county line of Jackson and Jennings Counties. The Restle Unit, a 78 acre parcel northwest of Bloomington in Monroe County, Indiana, was donated in 1990 as part of the Muscatatuck National Wildlife Refuge and includes bottomland hardwoods and a restored wetland. The 50,000 acre Big Oaks National Wildlife Refuge (former Jefferson Proving Ground) was established June 30, 2000 and formally dedicated July 8, 2000 and was managed as part of Muscatatuck / Big Oaks NWR complex until August 2002 when it became a "stand alone" refuge.

The refuge name, Muscatatuck, means "Land of the Winding Waters" which historically reflects the topography of the area. Approximately 36% of the refuge lies within the annual flood plain of the Muscatatuck River-Vernon Fork which forms the southern boundary of the refuge. The topographic relief from the refuge bottomlands to gently sloping uplands ranges from 540 to 620 MSL in the otherwise flat region known as the Scottsburg lowlands. Given the physiographic diversity of the area, the refuge is rich in history of early cultures.

The refuge was authorized by the Migratory Bird Conservation Commission in 1966 and purchased with "Duck Stamp" money. A total of 7,724 acres were purchased. The primary objectives for the refuge are to provide migratory waterfowl with a resting/feeding area during the migration and to produce wood ducks.

To start achieving these objectives at significant levels, 1,200 acres of managed waters, i.e., lakes, moist soil impoundments and green tree impoundments were constructed with Bicentennial Land Heritage Program (BLHP) funding by the fall of 1983. Hardwood forest dominates 4,160 acres of the flood plain and on the upland slopes. An additional 2,015 acres of land are reverting to forest lands and brush lands and an ongoing cooperative farming program of 307 acres provides corn, wheat, soybeans and hay to a broad spectrum of wildlife to compliment the habitat diversity within the Muscatatuck National Wildlife Refuge.

The Muscatatuck NWR Fish and Wildlife Easement Management District includes 30 Indiana counties.

HIGHLIGHTS:

- National Wildlife Refuge Week celebration (section 7a)
- Conservation Field Days attended by 600 third graders in October
- Log Cabin Day
- FFA National Convention in Louisville, KY highlights careers and centennial to 48,000 (section 7b)
- Fourteen whooping cranes from "Class of 2004" visit Muscatatuck in route to Florida, spectators watched the lift-off as the journey south continued (section 4c)
- Junior Duck Stamp Contest attracts 281 entries from throughout the state (section 7a)
- Wings over Muscatatuck migratory bird festival attended by 700 people (section 7a)
- Annual "Take a Kid Fishing" event held on June 4, 2005 attracts over 400 (section 7a)
- Student volunteer/interns assist at Muscatatuck (section 7b)
- Copperbelly pit tag monitoring project begins with snake week May 2005 (section 1a)
- Invasive species control begins for stilt grass (section 3h)

MONITORING AND STUDIES

1a. Surveys and Censuses

The annual FWS Greater Sandhill Crane (*Grus canadensis*) Survey was conducted from November 1-5, 2004. No cranes were found on the refuge at this time, but migration did start later in November. Flocks of cranes stopped at the refuge throughout autumn and winter, with sightings occurring through March 2005.

We conducted our annual Christmas bird count on January 1, 2005 with the help of 20 volunteer birders. All areas of the refuge were surveyed using the protocol established by the National Audubon Society. Sixty bird species and 7,532 individuals were counted. Melting snow combined with 50 degree temperatures caused a dense fog that limited visibility to a few feet and made viewing birds extremely difficult.

The annual FWS Midwinter Waterfowl survey was conducted on January 5, 2005 by refuge staff. Seven species and 1,492 individuals counted. Interestingly, four wood ducks (*Aix sponsa*) were spotted on the survey.

The Indiana Mid-Winter Bald Eagle (*Haliaeetus leucocephalus*) Survey, conducted January 12, 2005, saw two mature and one immature eagles on the refuge. The eagle nest located on MNWR was destroyed in a strong storm on January 6, 2005. However, the nesting pair rebuilt in a different location in Moss Lake and was seen incubating three eggs on March 7, 2005 during an Indiana Department of Natural Resources (IDNR) helicopter check of eagle nests. On June 6, the nest was confirmed empty as a failed nest attempt. The pair of adult bald eagles remained on the property all year and we anticipate another nesting attempt next year.

The annual May Day bird count was conducted May 14, 2005. This survey also covered all areas of the refuge and used protocol established by the National Audubon Society. A total of 112 species and 1,212 individuals were counted in spite of rain that persisted most of the day. Highlights from the day included an abundance of warblers and a notable sighting of a Sora rail.

The great blue heron (*Ardea herodias*) rookery located in the eastern portion of Moss Lake was checked in June of 2005 by interns. Of the 48 nests seen by interns, 35 were active.

MNWR volunteers held a butterfly count on July 23, 2005 using a protocol established by the North American Butterfly Association. Surveyors documented 29 different species on the refuge during the counting period, which was an unusually low count. This count is an annual effort and over time the information should provide insight on trends in the butterfly populations on the refuge.

As in previous years, the refuge population of the state endangered southern tubercled orchid (*Platanthera flava* var. *flava*) was monitored by refuge volunteer Brian Lowry with the assistance of interns. This year's survey took place on July 26, 2005. Seven plants were confirmed at the original Seep Spring Location and 29 plants were confirmed at the Endicott Marsh location.

Muscatatuck NWR again participated in the North American Amphibian Monitoring Program. This program is part of a larger international effort and is designed to determine the abundance and distribution of amphibians to better understand their conservation needs. Our survey route was completed in March, May, and July as prescribed by the national protocol. Seven species were recorded; spring peeper (*Hyla crucifer*), chorus frog (*Pseudacris triseriata*), southern leopard frog (*Rana utricularia*), bullfrog (*Rana catesbeiana*), cricket frog (*Acris crepitans*), Copes gray tree frog (*Hyla chrysoscelis*), and green frog (*Rana clamitans*).

Water Quality monitoring was done quarterly in 2005 on 5 refuge creeks (see 6c for details).

Waterfowl counts were conducted throughout the year and waterfowl brood surveys were conducted throughout the breeding season. These counts allowed us to estimate total waterfowl use days (557,522) and total waterfowl production (700 wood ducks and 60 Canada geese).

These totals are relatively low and reflect the trend we have observed on the refuge over the past few years. Discussion as to why this is occurring includes various thoughts, but no exact reason for this trend. Our trend does not seem to reflect national waterfowl trends. Lower total use days could be a reflection of reduced local production combined with weather influences and increased habitat availability in the area. In recent years, there has been an increase of permanently protected wetlands on private lands (4,980 acres of WRP in the Muscatatuck River basin), which offer off-refuge habitat. Another factor could be the reduction of farmed acreage from 750 acres in 2002 to 307 acres in 2005, which may have resulted in less food available for waterfowl.

Interesting wildlife sightings through the year include cattle egrets, American pipits, a white winged scoter, osprey, tundra swans, ring billed gulls, snow geese, trumpeter swans, red breasted merganser, common loon, black vultures, dickcissel, blue grosbeaks, and horned grebes. The red-spotted Newt was encountered this year and added to our herpetofauna list, bringing total herp species known to occur on the refuge to 41.



Red-Spotted Newt (*Notophtalmus viridescens viridescens*)

1b. Studies and Investigations

Along with Muscatatuck and Bloomington Field Office (BFO) staff, summer interns conducted a survey for deformed frogs at the Refuge. Field work was coordinated by Robin McWilliams Munson (BFO), and is part of the FWS Nationwide Abnormal Amphibian Monitoring Project. For the fifth year, the Boardwalk wetland site was used to collect samples of southern leopard frogs (*Rana utricularia*), and green frogs (*Rana clamitans*). Nine of the 58 sampled green frogs and none of the 56 sampled leopard frogs were considered abnormal. Abnormalities included swollen rumps (possible fungal infection), missing pupil, abnormal pigmentation in eye, and shortened digits. Five animals were submitted for radiograph (x-ray). MNWR may continue to be monitored in the future.

A long-term copperbelly watersnake (*Nerodia erythrogaster neglecta*) monitoring project was initiated this year. The project was led by Cameron Young, a graduate student, who was assisted by MNWR staff and volunteers. This study proposes to estimate population size, compare population statistics to prior studies, and analyze population viability of the species through an extensive mark-recapture/release study. Snakes were captured and permanently marked with Passive Integrated Transponder (PIT) tags so that they can be identified in the future. We captured 81 copperbelly watersnakes and implanted 75 PIT tags. Other data such as sex, age, body mass, lengths, and location were also recorded to provide life-history data on future recaptures. This first season of effort indicated that long-term population monitoring is feasible with copperbelly watersnakes and may yield valuable information on survivorship, growth and population dynamics. We plan to continue this work in 2006.

John Marshall, PhD student from Purdue University began using MNWR as a study site for his research investigating the genetic "connectedness" of various populations of copperbelly watersnake. Working in conjunction with Cameron Young, MNWR staff, and MNWR volunteers, John non-invasively collected tissue samples from 50 individuals. John will be performing genetic analyses of these samples during the winter and will return in 2006 to continue his field work.

HABITAT RESTORATION

2a. Wetland Restoration

Repairs were made to the outlet pipe of Persimmon Pond November 1999. Beaver continue to plug the inlet pipe throughout 2005.

Muscatatuck NWR staff, BFO Private Lands Coordinator, Jeff Kiefer and Dave Hudak (retired USFWS, BFO), continue to work within the Restle unit area. There is now along with the 78 acre Restle Unit tract over 700 contiguous acres protected in the Bean Blossom Bottoms area of Monroe County, IN. Protected acres include land owned by IDNR, Sycamore Land Trust, TNC, WRP acreage, and Partners for Fish and Wildlife Program projects.

Rehabilitation of the Restle unit dike with 36 acres of emergent wetland was needed due to muskrat, beaver and flood damage. It was rebuilt in FY05 beginning with dewatering in July, construction in August and September, 2005. This project was done as a Region 3 Maintenance Action Team project utilizing MMS funding and wonderful help from maintenance employees throughout the region. Maintenance Mechanic Rusty Pike and region 3 – Dale Pittman spearheaded the project.



The Restle Unit "Before"
De-Watering in Preparation for Construction (Note Pump Visible in Foreground)



The Restle Unit "During"
Construction Equipment Working on the Perimeter Dike



The Restle Unit "After"
Completed with Vegetation Returning (Picture Taken in Summer 2006)



The Restle Unit "A Happy Ending"
Barbara Restle Enjoying View of Completed Project from Overlook Structure

2b. Upland Restoration

Sandy Branch watershed work with Jackson Co. SWCD and NRCS continues.

2c. Riverine Restoration

We continue to work with Jackson, Jennings, Scott, and Washington SWCD and NRCS to promote conservation efforts in the Muscatatuck River watershed. This work includes efforts to reduce sedimentation, non point source pollution and promote awareness with the goal of improving water quality within the watershed.

2d. Deepwater/Coral Reef Restoration - N/A

HABITAT MANAGEMENT

3a. Water Level Management

1,130 acres of wetland areas in 11 units were managed by refuge staff guided by the 2005 water management plan to benefit fish, wildlife and water quality.

Water level gauges on managed water units were monitored biweekly. A late December 2004 record snowfall of 29 inches and early January rainfall and warm temperatures created major flooding that included a 14 day period with the Muscatatuck River out of its banks. Average temperature was above normal, and the precipitation was five inches above normal, which were 41.2 degrees and 8.61" respectively

Greentree unit drawdown began early March 2005. These units are supposed to be maintained empty until flooding begins in November but numerous flooding problems occurred during the summer due to beaver blocking the water control structures. Beaver continue to be a problem during the drawdown efforts. Beaver are cutting on and felling many trees in these units some of which are falling across the constructed dikes and need to be removed as part of maintenance activities.

3b. Moist Soil Management

270 acres in 8 units were managed by refuge staff guided by the 2005 water management plan to benefit fish, wildlife and water quality.

Vegetation checks of all MSU were conducted August 17, 2005 on all units. M4 needs to be rehabilitated by mowing/discing/dozing to promote moist soil plant production. It is scheduled to occur fall of FY06.

Management of moist soil units was done in accordance with the 2005 water management plan.

3c. Graze/Mow/Hay

Hay cutting was done on 90 acres according to the grassland/cropland management plans.

3d. Farming

Croplands are managed for migrant waterfowl, sandhill cranes and resident wildlife. Cropland production supports the moist soil management program in food production for migratory birds. In 2005, 307 acres were farmed using a rotation of corn, soybeans, wheat, and hay. The different crops are evenly distributed across the farming acreage and in accordance with the

cropland/grassland management plan and the farmers Refuge Cooperative Agreement.

3e. Forest Management

Approximately 350 acres of cropland was removed from the farm program after the 2003 season and allowed to revert back to forest through natural succession. Thirty acres of this retired cropland was planted to 14,000 oak seedlings in spring 2004.

Preliminary work was begun on a forest succession study. Since the establishment of MNWR nearly 40 years ago, many areas of the Refuge have been removed from the farming program. Some fields were left to natural succession, while others were planted with oak seedlings. We would like to compare planted versus not planted fields of similar ages in order to better evaluate the costs and benefits of supplemental planting. We will use this information to make future management decisions.

Beaver continue to block some of the creeks with dams causing damage to the forest, we feel beaver dams are affecting about 490 acres of forests and we continue to open them up, but this is a continuous maintenance problem.

During fieldwork in 2004, intern Laura Fribley identified invasive Japanese stilt grass (*Microstegium vimineum*) in the Hackman trail area. We strategically attacked this invasive in 2005 (see 3h).

3f. Prescribed Burning

With a change in Refuge objectives beginning in 2003, reforestation may negate the need for future prescribed burn plans at the refuge.

3g. Pest Plant Control

As required by Indiana noxious weed laws spraying and mowing was conducted for Johnsongrass (*Sorghum halepense*) and Canada thistle (*Cirsium arvense*) control.

3h. Invasive Plant Management

Japanese stilt grass (*Microstegium vimineum*) was first documented on the refuge late in the summer of 2004. This grass can quickly spread through forests, crowding out native vegetation and establishing thick carpet-like stands of grass. In 2005 the refuge was searched to determine the extent of this grass's spread. We were able to map the affected area, which is approximately 100 acres in size. We then made a plan to attack this problem plant using a combination of FWS-approved herbicides, mowing, and hand-cutting. Summer

interns spent many days working on this project and were instrumental in making great strides. Later in the summer, groups of cub scouts, girl scouts, and high school students helped to continue with hand-cutting. With the efforts of so many volunteers we were able to treat approximately 1/3 of the area affected by stilt grass.



Invasive Japanese Stilt Grass In Woodland Area

Kudzu (*Peuraria lobata*) is a vine that can quickly cover anything that doesn't move – including large sections of forest and it is common in the more southern states than Indiana. By covering trees with their vines, kudzu can deprive trees of essential sunshine and, eventually, kill them. We moved quickly to remove this plant when it was reported on the eastern edge of the refuge. Again we used a combination of techniques (hand cutting and herbicides) as a remedy. In this case, the affected area was less than an acre, so we were able to treat the entire infestation.

Oriental bittersweet (*Celastrus orbiculata*) is another invasive vine that was found on the refuge. Although this vine grows slower than kudzu, the result is quite similar: trees are eventually cut off from the necessary sunshine and then begin to die. With the help of many cub scouts and a handful of biology students from Seymour High School during National Public Lands Day we were able to cut and remove most of the Oriental bittersweet vines localized along Chestnut Ridge Trail.

Purple loosestrife (*Lythrum salicaria*) has been found on the refuge in the past. Although interns and staff searched areas that were known to have been infested in recent years, no plants were found this year. It appears that our many years of continued vigilance have resulted in control of this invader.

The small infestation of Japanese knotweed (*Polygonum cuspidatum*) identified several years ago on CR1225 E was again treated. The known infestation of this plant is quite small and localized along an agriculture field. The infested area is no longer increasing and we appear to have this invader contained.

Monitoring and control of the above invasive plants will continue in the future. Additionally, we plan on increasing our efforts next year and treating the entire Japanese stilt grass infestation, with eradication as our goal.

FISH AND WILDLIFE MANAGEMENT

4a. Bird Banding

No duck banding occurred in 2005.

4b. Disease monitoring and treatment

Refuge staff was vigilant for signs of West Nile disease and Chronic Wasting disease on the refuge in 2005. No cases were reported, but a few suspected cases of distemper were observed in refuge raccoons this year. No specimens were collected to verify this suspicion

4c. Reintroductions

Once again Muscatatuck NWR served as an excellent Bed & Breakfast for the Whooping Crane Eastern Partnership project. Fourteen young Cranes and crew flew and drove into the refuge for a stopover on November 8, 2004 and left November 13, 2004. The project used the same secluded field as last year for a landing strip and overnight penning of the cranes. With crowds arriving each morning for the "go- no go" flight potential due to weather conditions unfavorable for flight, the planes and cranes did not lift off until November 13, 2004 in quest of the next southerly point on their route to Florida. The project is part of an international partnership effort to establish a migrating flock of whoopers in the Eastern United States. All portions of the stop-over went well, with refuge staff accommodating needs of both the cranes, aircraft and ground crew. Muscatatuck NWR is the only national wildlife refuge on the stop-over schedule between Necedah and Chassahowitzka NWRs.

4d. Provide Nest Structures

Sixty five bluebird boxes attached to road sign posts were monitored, repaired, and replaced by volunteer Norma King in FY05. Successful box use included 4 with Bluebirds, 19 with Tree swallows, 5 with wrens, and 1 with Chickadees.

4e. Native Animal and Predator Control

Beaver continue to plug Water Control Structures especially during greentree unit and moist soil unit drawdowns. Affected structures requiring maintenance staff time to clean out include G1/ML, G1/M7, M3, M4, M5, Lake Linda, Display Pond, M2, M10, Wood duck pond, Persimmon pond, and G3. Beaver dams backing up drainage are beginning to affect the integrity of some of our forests and affect our water management goals in the moist soil units and greentree units.

Muskrats continue to damage dikes especially M8, M7, M9, Moss Lake, and M2. At this time the only control method being used is water elevation changes. This

has not been successful.

4f. Invasive Animal and Other Invasive Non-Plant Taxa Management

The Indiana Department of Natural Resources (IDNR) continued to place and monitor gypsy moth traps on the refuge. All summer 2005 refuge traps were negative. An infestation occurred in Scott County, IN summer 2005 which saw defoliation of several trees on the property. The proximity of Scott County will have us paying more attention to potential signs of infestation and the IDNR is currently working on a plan to control that infestation.

COORDINATION ACTIVITIES

5a. Interagency Coordination

This years annual conservation field days held in May for Jennings County and October in Jackson County at the refuge continues as a great collaborative effort for environmental education with students working their way through rotating stations consisting of wetlands, wildlife, forestry, soils, geology, and recycling. The sessions were taught by personnel from Purdue Extension, Jackson and Jennings County SWCD's, IDNR, Natural Resource Conservation Service, Jackson Co. Solid Waste Management District, and the refuge.

The IDNR again provided outstanding support to the refuge in many areas- research (otter tracking), law enforcement (by conservation officers), education (through help at field days), and recreation (by managing the refuge deer and turkey hunt drawing).

The refuge ORP spent considerable time working with the Jackson and Jennings County Visitor Bureaus on the Wings over Muscatatuck bird festival.

The Muscatatuck Wildlife Society, the refuge ORP, refuge volunteers, and the Scott County Chapter of Ducks Unlimited worked together on the Indiana Junior Duck Stamp program that is administered by Muscatatuck NWR

The Refuge Operation Specialist (ROS) continues to work with NRCS, SWCD, IDNR with WRP, CRP, EQIP, Partners for fish and wildlife and other joint projects concerning the Muscatatuck River Basin and watershed.

5b. Tribal Coordination - N/A

5c. Private Land Activities

Muscatatuck NWR staff and local NRCS staff have concentrated Wetland Reserve Program (WRP) efforts in the Muscatatuck River basin and a lot of interest has been generated. In the Muscatatuck River Watershed there are currently (FY05) 73 easements totaling 4,980 acres of land under WRP easement protection.

Technical assistance was provided to NRCS for 3 WRP applications.

RESOURCE PROTECTION

6a. Law Enforcement

IDNR Conservation Officers worked the refuge as much as their time permitted as did Jason Lewis and Brian Winters (Refuge Officers from Big Oaks NWR). Zone Officer Kevin Shinn also worked the refuge on several occasions.

The remnants of a small methamphetamine cooking operation were found on the refuge at a parking spot on County Road 900 West in March. Jennings County Sheriff's Dept. officers certified in cleanup had the materials gone from the area the next day.

Refuge Manager Marc Webber arrived for his first day at Muscatatuck on the morning of April 18 after a rare robbery break-in on the refuge had occurred. Refuge staff arriving for work at 7:00 AM noticed the Office door unlocked. Entry by the perpetrator was gained by forcing open a window on the side of the building. The perpetrator unsuccessfully tried to pry open locked file cabinets. Also, a closet containing a shotgun and key boards (with keys) was broken into, the combination dial on a safe in a closet was destroyed in an attempt to gain entry, and desks drawers were opened and searched. While nothing was initially thought to be missing from the office, a key may have been taken and used to open the Visitor Center bookstore. The bookstore door was found open and the cash drawers in the desk had been destroyed. The bookstore cash and apparently some duck stamp funds were taken. Surprisingly, small amounts of cash in envelopes were missed by the burglar. The State Police responded to our call, opened an investigation, and took fingerprints. The total loss in damage and missing funds was estimated at \$2,000. In May a subject who had broken into several area IDNR Offices was arrested by a Conservation Officer and admitted the offense.

The following citations and incidents were documented during the year:

| Offense | Federal and State Citations | Warnings | Incidents Documented |
|-------------------------------|-----------------------------|----------|----------------------|
| Illegal Collection of Snake | | 1 | |
| Speeding | | 3 | 48 |
| Trespass After Hours | 16 | | |
| Driving Deer | 1 | | |
| Hunting in a Non-hunting Area | 6 | | 5 |
| No Hunter Orange | | 1 | |
| Uncased Firearm | 2 | | |
| No Hunting License | 1 | | |
| Road Hunting | 1 | | |

| | | | |
|-----------------------------------|----|---|----|
| Illegal Take of Deer | 1 | | |
| Improper Vehicle Registration | 1 | | |
| Improper Vehicle Tag | 1 | | |
| Off-Road Trespass | 1 | | 4 |
| Biking on Trails | | | 3 |
| Illegal Use of Trot Line | | | 1 |
| Fishing in Area Closed to Fishing | | | 15 |
| No Fishing License | 2 | | |
| Dumping | | | 2 |
| Reckless Driving | | | 2 |
| Parking Violations | | | 1 |
| Illegal Shooting | | | 3 |
| TOTAL | 33 | 5 | 79 |

Refuge entrance gates malfunctioned May through August and had to remain open frequently. When the gates were repaired there were a large number of lock-ins (the State Police reported 27 in a few months). We greatly appreciated the State Police responding to the lock-ins, but they frequently did not pass the subject information along to us to get citations processed.

An attempted burglary occurred to a tool trailer parked at the Restle Unit in September while work was being done on the Restle Unit dike. Entry was not gained.

A stolen truck was recovered from inside the gate on County Road 500 North in September.

Odds and ends reported during the year included a license plate stolen from a parked car; individuals in November hunting illegally; in one case with a slingshot and another with an automatic weapon off of County Road 900; a car hitting a tree in the Visitor Center yard; an unmarked tree stand found in January; and two visitor tips on potential marijuana growing operations, however, nothing was ever found.

The remains of a deer that had been shot and butchered were found at the edge of the Persimmon Pond parking lot on Nov. 20.

6b. Permits & Economic Use Management

Eleven special use permits were issued during the year. Two were for snake research, two for groups to have regular meetings at the Visitor Center, four for special meetings at the Visitor Center, and three for groups to enter the closed area to observe birds.

6c. Contaminant Investigations

Water quality monitoring of several creeks was again accomplished quarterly. Sandy Branch, Mutton Creek, Storm Creek, a Richart Lake tributary, and a Stanfield Lake tributary were used as sampling sites as they entered Refuge property. As in the past, these monitoring efforts were accomplished by volunteers using the Hoosier Riverwatch protocol, which includes habitat assessment, chemical monitoring, and biological monitoring. No contamination problems were found through this monitoring – the sampled creeks were found to contain low levels of bacterial and chemical while providing good habitat for macroinvertebrates. All data were entered into the statewide Riverwatch Database which can be accessed at <http://www.hoosieriverwatch.com/>. Hard copies of the data can be found in Refuge files.

6d. Contaminant Cleanup - nothing to report

6e. Water Rights Management

The 2005 water management plan was written and approved February 1, 2005.

6f. Cultural Resource Management

Volunteers helped maintain the Myers Cabin and Barn during the year. Both structures are in very good condition due to the efforts of the Refuge Friends group in past years. Volunteers from our Friends Group also contributed effort to maintain the grounds around the cabin and barn with weekly mowing and litter pick-up efforts.

6g. Landownership support - nothing to report

PUBLIC EDUCATION & RECREATION

7a. Provide Visitor Services

Compatibility Determinations (CD) for MNWR were reviewed as a part of the required re-evaluation process. These uses were open for public comment October 20-November 19, 2004. The USFWS received and reviewed over 200 comments on revising 8 public uses on Muscatatuck National Wildlife Refuge during October and November 2004. These uses included hunting, fishing, interpretation, wildlife observation, wildlife photography, environmental education, wild food and antler collection, and cooperative farming and haying.

All comments were considered in revising these uses on the refuge. Six compatibility determinations were signed December 3, 2004 by acting Refuge Manager Suzanne Baird and sent to the RO for approval. The uses were 1) Recreational Fishing, 2) Hunting, 3) Farming and Haying, 4) Wild Food/Shed Antler Collecting, 5) Wildlife Observation and Photography, and 6) Interpretation and Environmental Education. Concurrence signature by Nita Fuller, Regional Chief was dated February 11, 2005 on the six CD's.

Code of Federal Regulations (CFR) changes were submitted and were then printed as final rule in the Federal Register September 13, 2005. They include allowing year round fishing in Richart Lake, Stanfield Lake, Lake Sheryl, Display Pond, Mallard Pond, Sandhill Ponds, Persimmon Ponds, Lake Linda and the north bank of the Muscatatuck River. Boats will be allowed on Stanfield Lake with no motors and no harvesting of frogs and turtles. A squirrel hunting season will be allowed on the refuge. These changes are planned to be implemented beginning January 1, 2006.

October started with a Hunter Education Course at the refuge taught by volunteer instructors on Oct. 2-3. Approximately 30 youngsters attended. Other Hunter Education Courses were held at the refuge Nov. 6-7 (with approximately 100 people attending) and April 23-24 (around 40 participants). A notable feature of the Hunter Education course in October was that an interpreter was present to sign for hearing impaired youth present at the program.



An Interpreter Signs for the Instructor At the October Hunter Education Course

The annual National Wildlife Refuge week celebration at Muscatatuck consisted of many events.

The refuge closed area was open to the public for walk-in visits and many people enjoyed seeing an area they normally couldn't visit. Some visitors were lucky enough to see bald eagles in the area. National Wildlife Refuge Week Photography contest entries featuring refuge photos were on display in the Conservation Learning Center.

Log Cabin Day, sponsored by the Muscatatuck Wildlife Society was well attended as usual on October 16 (the end of Refuge Week). The community festival (at the old Myers family log cabin restored by the Friends group) featured old time crafts, music, a free ham and bean lunch, a blacksmith, and horse-drawn wagon rides into the closed area. A volunteer interpreter rode the wagons into the closed area this year to give information about management activities and the bald eagles that nest in the area. There was also an interpreter with animal skins and bones at the festival talking about wildlife of Southern Indiana "then and now."

The Jackson County Conservation Field Days programs were also held during the week (Oct. 12-13) and more than 600 third grade students, parents, staff, and teachers participated. Students attended rotating stations on the subject of wildlife, soils, wetlands, forests, and recycling. Instructors for the sessions included educators from the Jackson and Jennings County SWCDs, IDNR, Purdue Extension, NRCS, Jackson County Solid Waste Management District, and the Refuge. The Conservation Field Days are both a hit with the local schools and the agency personnel who staff them. The Field Days provide a large number of students high quality, interactive, education about a variety of conservation topics in a reasonably short time frame.

A Boy Scout District Camporee was held in the Scout Camping Area on October 15-17. In addition to their Scout activities, the participants spread a dump truck sized load of gravel on Wood Duck Hiking Trail as one of their service projects.

The approximately 100 youngsters and leaders present also picked up trash in various locations on the Refuge.

Lauri Munroe Hultman from the RO visited Muscatatuck Nov. 4-5 along with Marvin Cook from Wilderness Graphics to meet with Refuge staff on implementation of our Visitor Center Exhibit Plan.

Two new comfort stations were built replacing the old outhouses at Persimmon Pond and Lake Stanfield parking areas.

A hunter education class was held at the conservation learning center November 6-7, 2004 with 100 people attending.

Muscatatuck's special permit deer hunt December 4-19, and the late archery season hunt through January 2, 2005, provided hunting opportunities for 3480 hunters. The hunts are held annually as a management tool to control the herd size at a level of less than 20 deer per square mile which should maintain a healthy deer population without negative impact on the vegetation in the ecosystem.

Bloomington Field office Biologist Jeff Kiefer gave tours of the Restle Unit to several school classes in the spring 2004.

The first Turkey hunt at Muscatatuck was held April 27-May 13, 2005 with a special permit hunt draw of 10 hunters per day, only on weekdays. The hunt was very popular with more applications received than slots available. A total of 18 birds were harvested.



The first turkey harvested from the refuge during the hunt

Muscatatuck staff and volunteers managed the tenth annual Indiana Junior Duck Stamp contest this year. A total of 281 entries were received, fewer than last year, but the quality was excellent. Judging took place at the refuge Visitor Center on March 19. The awards ceremony was held during the Wings Over Muscatatuck Event and approximately 100 people filled the auditorium in the new Refuge Conservation Learning Center auditorium to see the prizes handed out. The Refuge friends group is the major funding support of this program along with challenge cost-share grants received from the Regional Office. The winning Junior Duck Stamp art is displayed at the Visitor Center and a rotating display is sent to State Park visitor centers throughout the state for one year.



First place winners at the Indiana Junior Duck Stamp Awards Ceremony

Visitor Service Intern Amy Gentry started working on the Refuge in May and provided the Refuge with a great deal of assistance before she returned to school in August. We wish we could have kept her longer.

Jennings County Conservation Field Days for third graders were held May 11-12 and, like Jackson County, were instructed by personnel from many different agencies. Approximately 600 students participated.

Muscatatuck NWR held the sixth annual 'Wings Over Muscatatuck' migratory bird festival on Saturday, May 14, 2005, in celebration of International Migratory Bird Day. Rain dampened the event but approximately 700 people still came out to attend the 25 programs, hikes, demonstration, and tours that ran from before dawn to after dusk. Partners included the Muscatatuck Wildlife Society (MWS) and the Jackson and Jennings County Visitor Bureaus. The bird festival is the big Refuge event of the year and takes lots of planning time to arrange the programs, guided van tours, and walks (see brochure in the back of this report). The rain may have reduced the number of overall visitors, but we were still able to have a very successful event despite the weather, and due in large part to the enthusiasm of all of our participants.



Bill Zimmerman Leads A Wet Bird Walk At Wings.

Approximately 400 people come for "Take a Kid Fishing Day" on June 4. Kids could participate in activities that included fly fishing demonstrations, a "fish art" contest, casting contests, and fishing contests. Prizes were awarded in many categories, and door prizes were donated by Flambeau Corporation of Columbus. There were also prizes for catching specially tagged fish from Richart Lake. Hayden Boy Scout Troop 518 provided a food concession and the Indianapolis Fly Casters demonstrated fly tying and casting.

A consistent problem with our fishing event is the lack of places to effectively bank fish on the refuge. While there are lots of fishing areas open on the refuge aquatic weeds along the shoreline in the warm months of the year can make fishing extremely difficult and frustrating for first-time anglers. Through the years we have noted a reduction in youngsters coming on fishing day, possibly because of this problem. Fishing for the contests was allowed in all fishing areas on the refuge this year to try to provide more fishing opportunity.

Richart Lake was also open to everyone June 5-11 in celebration of National Fishing Week.

A "Wildlife Camp" bird program for youngsters was held July 13 but only a handful of youngsters participated.

National Public Lands Day was celebrated September 24, 2005 with a volunteer workday.

7b. Outreach

Muscatatuck NWR and BONWR staff operated an exhibit at the 75th National FFA (fka Future Farmers of America) Convention in Louisville, KY October 26-29, 2004. The convention focused on careers and was attended by approximately 51,000 students, advisors and guests, the largest annual student gathering in the country. The diverse group of 34% females, 77% white, and

73% urban, non rural members are very interested in the work of the Service and kept the staff busy with career questions.

Several of the student groups made Muscatatuck NWR a tour stop on their FFA trip. The FWS was recognized for the support and participation in the FFA National Agricultural Career Show with a 25 year plaque.

There were numerous newspaper articles and radio interviews during the year on the volunteer program, the Conservation Learning Center, the bird festival, other special events, and the refuge.

MWS volunteers and Refuge staff contacted approximately 2,000 educators at the Hoosier Association of Science Teachers Conference in Indianapolis in February with Refuge information, Educators Guides to Muscatatuck, bookstore items, and an exhibit about the Indiana Junior Duck Stamp program. Many teachers who were unfamiliar with the Refuge were contacted during this event.

The Refuge setup an exhibit at the Indiana Ducks Unlimited Convention in Columbus March 5.

Refuge volunteer Lori Kendrick formed a Refuge Club at Hayden School in April. Approximately 30 elementary students participated in activities that had them spending a lot of time at Muscatatuck.

The refuge ORP gave a program at the Jennings County High School Career Day Event on April 6.

Muscatatuck NWR helped coordinate an Arbor Day/Earth Day 2005 program held at Scottsburg Middle School for 300 sixth grade students and staff. This annual program conducted by teachers, features environmental education learning stations for students and then all participants go home with a tree seedling to plant. This is the 10th year for this program.

Muscatatuck NWR helped coordinate an Arbor Day/Earth Day 2005 program held at Vienna Finley Elementary School for all 400 students and staff in grades K-5. The teachers incorporated conservation education in special programs throughout the week. This annual program conducted by teachers, features environmental education learning stations for students and then all participants went home Arbor day with a tree seedling to plant. This is the 15th year for this program.

MNWR and Big Oaks staffs set up Refuge displays at the Jennings County Fair June 27-July 1. Interns and some Refuge staff from both refuges staffed the exhibits some evenings.

The refuge ORP gave an evening wildlife program at a Columbus area park in July.

Muscatatuck setup a refuge and Junior Duck Stamp exhibit at the Jackson County Fair July 24-30.

Muscatatuck staff and volunteers hosted an exhibit at the Indianapolis Zoo Conservation Day Sept. 17.

The refuge ORP gave programs on backyard conservation and bird conservation at Jennings County SWCD events in Jennings County in April and September.

Muscatatuck NWR contacted U.S. Senators Lugar and Bayh, Congressman Hill, State Senator Skillman, and State Representative Goodin, Seymour Mayor Burkhardt and North Vernon Mayor John Hall with information about the MNWR and the Service during the year.

Volunteers/Work Programs/Cooperating Associations/Friends Groups

In FY2005 over 150 volunteers donated over 9,600 hours to the refuge. Refuge volunteers this year included individuals, volunteer interns, scouts, church groups, and high school students. A

Volunteer appreciation dinner was held in July and a pitch-in dinner was held each time the Refuge had a new acting manager that stayed a month (6 times during the year). At the pitch-ins the Acting Manager would give a program about his or her work station.

A group of Sierra Club members placed rock on Turkey Trail in October. A group from Quinco also picked up trash all over the Refuge in October. Boy Scouts attending the district Camporee on the Refuge also placed rock on Wood Duck Trail and picked up trash.

Refuge Volunteers Harold and Elizabeth Otte worked at the Visitor Center and stayed in the double-wide trailer Bunkhouse or their RV frequently during the year. The Ottes were staying at the trailer when the big snow hit in December and "had the refuge to themselves" for the few days when it was difficult to drive onto the refuge due to snow on the roads.

Volunteer birders did the Christmas and May Day Bird Counts on the refuge again this year and a summer butterfly count. The Christmas Count on Jan. 1 was notable in that the fog from melting snow and warm temperatures was so thick that visibility was only a few feet (and a bat was seen).



Fog Made Seeing Very Difficult For Birders On The January 1 Count

Refuge Volunteer John Favinger died in May after about a year's illness. John sometimes worked at the Visitor Center, and frequently helped with special events, but was best known as being the "birder tour guide" to groups visiting the refuge. John, a retired railroad man, had also been a YCC Group Leader here. Memorials made in John's memory (many from those who went birding with him) were given to the refuge friends group to fund Junior Birder programs at the refuge. John will be missed by those who knew him.

Muscatatuck NWR intern recruitment efforts were conducted through various venues including universities, soil and water conservation districts, and the FFA. These recruiting efforts were quite successful and brought us 8 interns throughout the year: Theresa Dailey, Indiana State University; Josh Wallace, Avon High School; Amy Amones, Ball State University; Blake Schepman, Franklin College; Amanda Horning, Pennsylvania State University; Mike Steiner, Purdue University; Amy Gentry, University of Louisville; and Zach Bagley, Purdue University. These interns worked on biological, public use and maintenance projects. Some specific projects on which they worked included the copperbelly watersnake mark-recapture study, invasive species control efforts, amphibian monitoring, waterfowl surveys, Take-A-Kid-Fishing day, and staffing the Visitor Center. The internship program continues to be an asset for both the refuge and the participating students: the refuge benefits from the donated labor of the interns, without which many tasks would not be completed, and students gain experience they take with them into their future careers. Collectively, the 2005 interns contributed 2,700 hours of work to the refuge.

National Public Lands Day volunteers worked on invasive species plant removal, landscaping at the Visitor Center and trash pickup on September 24. Approximately 35 attended.



A Tired Public Lands Day Group after Their Harvest of Oriental Bittersweet.

Trinity Lutheran High School students did volunteer work on the Refuge four times during the year placing rock on trails and pulling invasive garlic mustard.

A young man working on an Eagle project, Ben Higgenbottom built an attractive fence around the heat pumps at the Learning Center to screen the equipment from view.



Eagle Scout Ben Higgenbottom With His Dad Standing By The New Fence

The Seymour High School Key Club worked on placing rock on Wood Duck Trail in November.

A group of community leaders enrolled in the "Leadership Jackson County" program built and installed four picnic tables on the back porch of the Conservation Learning Center in April.

Muscatatuck has teamed with Experience Works (formerly Green Thumb) since refuge establishment in 1966. Currently two enrollees Webb Jaynes, and John Gaffney, Sr., donate 20 hours/week year round to the refuge and they help with many refuge projects including trash pickup, mowing, sign maintenance and facility maintenance.

The Muscatatuck Wildlife Society assisted the refuge ORP staff a Refuge booth and worked their "traveling bookstore" at the Hoosier Association of Science Teachers conference in February. Over 2000 participants stopped by and saw information on the Indiana Junior Duck Stamp contest, Muscatatuck NWR, and Whooping cranes.

The Muscatatuck Wildlife Society, our friends group, helped the refuge with many projects this year. They paid for butterfly plants for the Visitor Center butterfly garden, ordered "tree trail" interpretive signs for Wood Duck Hiking Trail, purchased and installed computer equipment and software for the bookstore, purchased persimmon trees, sent two volunteers to a national Friends Conference in Washington, DC, agreed to act as the purchasing agent for the "Flying WILD" Indiana program and to disburse books, funded the copperbelly watersnake research for \$4,500, purchased cameras for an attempt to find bobcats on the refuge, and provided financial support to special events including Wings Over Muscatatuck, the Indiana Junior Duck Stamp program, and Take A Kid Fishing Day. They also hosted the annual Log Cabin Day celebration of National Wildlife Refuge Week.

The Board of Directors of the Muscatatuck Wildlife Society Foundation (MWSF) continued to oversee fund-raising efforts and improvements to the Conservation Learning Center. This year they funded moving of the Audio Visual program, carpet for acoustics, and benches for storage. They hope to dissolve the MWSF and merge with the MWS at the end of 2005 calendar year. Their goal of building the CLC has been met and it is a wonderful gift worth one half million dollars to Muscatatuck and the FWS.

PLANNING & ADMINISTRATION

8a. Comprehensive Conservation Planning

An estimated 75% of the Habitat Management Plan, a step-down plan portion of the CCP, was completed in 2004. Review, comments and writing will continue in 2005.

8b. Personnel

Refuge Manager Herzberger retired January 2, 2005. Scott Kahan served as Acting Refuge Manager late in FY 04, following Mary Stefanski, and followed by additional Acting Managers, detailed to MNWR (see table below).

Muscatatuck NWR Acting Refuge Managers, 1 October 2004 – 17 April 2005

| | | | |
|---|---------------|------------------------|----------|
| 1 | Scott Kahan | Detroit Lake WMD | Oct |
| 2 | Pam Dryer | Wittlesey Creek NWR | Nov |
| 3 | Suzanne Baird | RO | Dec |
| 4 | Joe Robb | Big Oaks NWR | Holidays |
| 5 | Tom Cox | Port Louisa NWR | Jan |
| 6 | John Magera | Middle Mississippi NWR | Jan |
| 7 | Mike Brown | Crab Orchard NWR | Feb |
| 8 | Todd Hauge | Windom WMD | Mar |
| 9 | Joe Robb | Big Oaks NWR | Apr |

- Marc Webber, Refuge Manager, GS-12, PFT, EOD 4/17/05
- Susan M. Knowles, Refuge Operations Specialist, GS-12, PFT
- Mike Oliver, Wildlife Biologist, GS-11, PFT; Retired 1/2/05; Position Vacant since retirement
- Donna Stanley, Outdoor Recreation Planner, GS-9, PFT
- Frederick (Rusty) Pike, Maintenance Mechanic, WG-9, PFT; promotion from Tractor Operator 2/6/05; Tractor Operator position Vacant
- Mark Rarey, Administrative Support Assistant, GS-7, PFT
- Theresa Dailey, Biological Science Technician (Wildlife), GS-5, TFT, EOD 5/31/05
- Joshua Wallace, Laborer – STEP student, WG-1, TPT, EOD 5/31/05

8c. Funding

Funds for operating the refuge the last six years are shown below. The figures reflect all funds appropriated and OFT'd as available to this station except quarters O&M.

| *FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005 |
|-------------|-----------|-------------|-----------|-----------|-----------|
| \$1,000,214 | \$620,425 | \$1,339,425 | \$805,000 | \$570,343 | \$682,920 |

*JPG/BONWR is in the figure because it operated under MNWR organizational code

Feedback - none

Goal 1I

[Muscatatuck NWR]

| | Previous Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---------------|--------------|--------------|----------|----------|----------|----------|
| I. Habitat Condition Classification | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Class 1A Lands where management is not needed | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.01 Uplands, no management needed | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.02 Wetlands, no management needed | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.03 Open water, no management needed | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Acres of Class 1A Lands | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Class 1B Lands receiving needed management | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.04 Uplands receiving needed management | 0 | 550 | 550 | 0 | 0 | 0 | 0 |
| 1.05 Wetlands receiving needed management | 0 | 1,200 | 1,200 | 0 | 0 | 0 | 0 |
| 1.06 Open water receiving needed management | 0 | 400 | 400 | 0 | 0 | 0 | 0 |
| Total Acres of Class 1B Lands | 0 | 2,150 | 2,150 | 0 | 0 | 0 | 0 |
| Class 2 Lands where management is deferred | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.07 Upland management deferred | 0 | 3,000 | 3,000 | 0 | 0 | 0 | 0 |
| 1.08 Wetlands management deferred | 0 | 1,800 | 1,800 | 0 | 0 | 0 | 0 |
| 1.09 Open water management deferred | 0 | 50 | 50 | 0 | 0 | 0 | 0 |
| Total Acres of Class 2 Lands | 0 | 4,850 | 4,850 | 0 | 0 | 0 | 0 |
| Class 3 Lands where restoration is deferred | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.10 Upland restoration deferred | 0 | 384 | 384 | 0 | 0 | 0 | 0 |
| 1.11 Wetland restoration deferred | 0 | 400 | 400 | 0 | 0 | 0 | 0 |
| 1.12 Open water restoration deferred | 0 | 18 | 18 | 0 | 0 | 0 | 0 |
| Total Acres of Class 3 Lands | 0 | 802 | 802 | 0 | 0 | 0 | 0 |
| Total Acres by Habitat | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total uplands | 0 | 3,934 | 3,934 | 0 | 0 | 0 | 0 |
| Total wetlands | 0 | 3,400 | 3,400 | 0 | 0 | 0 | 0 |
| Total open water | 0 | 468 | 468 | 0 | 0 | 0 | 0 |
| Total of classified acres | 0 | 7,802 | 7,802 | 0 | 0 | 0 | 0 |
| Total Refuge Acres (from Realty) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| II Riparian Mile Condition Classification | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.13 Riparian miles, no management needed | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.14 Riparian miles receiving management | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.15 Riparian miles management deferred | 0 | 16 | 16 | 0 | 0 | 0 | 0 |
| 1.16 Riparian miles restoration deferred | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Total Riparian Miles | 0 | 17 | 17 | 0 | 0 | 0 | 0 |

Goal 1II

[Muscatatuck NWR]

| | Previous Year |
|--|---------------|
| II. Habitat Management | 0 |
| 1.17 If HMP is approved, enter year completed | |
| 1.18 If no HMP, enter target year to complete | |
| Specific Management Prescriptions Acres | 0 |
| 1.19 Prescribed burns | 0 |
| 1.20 Forest stand harvest | 0 |
| 1.21 Forest or Shrubland Improvement | 0 |
| 1.22 Prescribed grazing | 0 |
| 1.23 Cropland management | 0 |
| 1.24 Hayed/mowed grassland | 0 |
| 1.25 Water level manipulation | 0 |
| 1.26 Moist soil managed | 0 |
| 1.27 Managed by other techniques | 0 |
| Acres/Miles of Habitat Restored | 0 |
| 1.28 Upland Acres Restored | 0 |
| 1.29 Wetland Acres Restored | 0 |
| 1.30 Open Water Acres Restored | 0 |
| 1.31 Riparian Miles Restored | 0 |
| Invasive Plants Infestation, Treatment, Control | 0 |
| 1.32 Total acres known to be infested by invasives | 0 |
| 1.33 Total acres treated for invasives | 0 |
| 1.34 Total acres of invasive plants controlled | 0 |
| Invasive Animal Infestation and Control | 0 |
| 1.35 Number of invasive animal populations | 0 |
| 1.36 Number invasive animal populations controlled | 0 |
| Invasive Species of Concern | 0 |
| 1.37 Identify 1st invasive species of concern | |
| 1.38 Identify 2nd invasive species of concern | |
| 1.39 Identify 3rd invasive species of concern | |
| 1.40 Identify 4th invasive species of concern | |
| 1.41 Identify 5th invasive species of concern | |

Goal 1II

[Muscatatuck NWR]

| | 2005 |
|--|---|
| II. Habitat Management | 0 |
| 1.17 If HMP is approved, enter year completed | |
| 1.18 If no HMP, enter target year to complete | 2006 |
| Specific Management Prescriptions Acres | 0 |
| 1.19 Prescribed burns | 0 |
| 1.20 Forest stand harvest | 0 |
| 1.21 Forest or Shrubland Improvement | 490 |
| 1.22 Prescribed grazing | 0 |
| 1.23 Cropland management | 344 |
| 1.24 Hayed/mowed grassland | 170 |
| 1.25 Water level manipulation | 900 |
| 1.26 Moist soil managed | 300 |
| 1.27 Managed by other techniques | 0 |
| Acres/Miles of Habitat Restored | 0 |
| 1.28 Upland Acres Restored | 0 |
| 1.29 Wetland Acres Restored | 36 |
| 1.30 Open Water Acres Restored | 0 |
| 1.31 Riparian Miles Restored | 0 |
| Invasive Plants Infestation, Treatment, Control | 0 |
| 1.32 Total acres known to be infested by invasives | 1,800 |
| 1.33 Total acres treated for invasives | 80 |
| 1.34 Total acres of invasive plants controlled | 1 |
| Invasive Animal Infestation and Control | 0 |
| 1.35 Number of invasive animal populations | 11 |
| 1.36 Number invasive animal populations controlled | 2 |
| Invasive Species of Concern | 0 |
| 1.37 Identify 1st invasive species of concern | Japanese stiltgrass <i>Microstegium vimineum</i> Plant |
| 1.38 Identify 2nd invasive species of concern | Oriental bittersweet <i>Celastrus orbiculatus</i> Plant |
| 1.39 Identify 3rd invasive species of concern | Garlic mustard <i>Alliaria petiolata</i> Plant |
| 1.40 Identify 4th invasive species of concern | Autumn olive <i>Elaeagnus umbellata</i> Plant |
| 1.41 Identify 5th invasive species of concern | Canada thistle <i>Cirsium arvense</i> Plant |

Goal 1II

[Muscatatuck NWR]

| | 2006 |
|--|---|
| II. Habitat Management | 0 |
| 1.17 If HMP is approved, enter year completed | |
| 1.18 If no HMP, enter target year to complete | 2006 |
| Specific Management Prescriptions Acres | 0 |
| 1.19 Prescribed burns | 0 |
| 1.20 Forest stand harvest | 0 |
| 1.21 Forest or Shrubland Improvement | 490 |
| 1.22 Prescribed grazing | 0 |
| 1.23 Cropland management | 344 |
| 1.24 Hayed/mowed grassland | 177 |
| 1.25 Water level manipulation | 900 |
| 1.26 Moist soil managed | 300 |
| 1.27 Managed by other techniques | 0 |
| Acres/Miles of Habitat Restored | 0 |
| 1.28 Upland Acres Restored | 0 |
| 1.29 Wetland Acres Restored | 0 |
| 1.30 Open Water Acres Restored | 0 |
| 1.31 Riparian Miles Restored | 0 |
| Invasive Plants Infestation, Treatment, Control | 0 |
| 1.32 Total acres known to be infested by invasives | 1,800 |
| 1.33 Total acres treated for invasives | 160 |
| 1.34 Total acres of invasive plants controlled | 1 |
| Invasive Animal Infestation and Control | 0 |
| 1.35 Number of invasive animal populations | 11 |
| 1.36 Number invasive animal populations controlled | 2 |
| Invasive Species of Concern | 0 |
| 1.37 Identify 1st invasive species of concern | Japanese stiltgrass <i>Microstegium vimineum</i> Plant |
| 1.38 Identify 2nd invasive species of concern | Oriental bittersweet <i>Celastrus orbiculatus</i> Plant |
| 1.39 Identify 3rd invasive species of concern | Garlic mustard <i>Alliaria petiolata</i> Plant |
| 1.40 Identify 4th invasive species of concern | Autumn olive <i>Elaeagnus umbellata</i> Plant |
| 1.41 Identify 5th invasive species of concern | Canada thistle <i>Cirsium arvense</i> Plant |

Goal 1II

[Muscatatuck NWR]

| | 2007 | 2008 | 2009 | 2010 |
|--|------|------|------|------|
| II. Habitat Management | 0 | 0 | 0 | 0 |
| 1.17 If HMP is approved, enter year completed | | | | |
| 1.18 If no HMP, enter target year to complete | | | | |
| Specific Management Prescriptions Acres | 0 | 0 | 0 | 0 |
| 1.19 Prescribed burns | 0 | 0 | 0 | 0 |
| 1.20 Forest stand harvest | 0 | 0 | 0 | 0 |
| 1.21 Forest or Shrubland Improvement | 0 | 0 | 0 | 0 |
| 1.22 Prescribed grazing | 0 | 0 | 0 | 0 |
| 1.23 Cropland management | 0 | 0 | 0 | 0 |
| 1.24 Hayed/mowed grassland | 0 | 0 | 0 | 0 |
| 1.25 Water level manipulation | 0 | 0 | 0 | 0 |
| 1.26 Moist soil managed | 0 | 0 | 0 | 0 |
| 1.27 Managed by other techniques | 0 | 0 | 0 | 0 |
| Acres/Miles of Habitat Restored | 0 | 0 | 0 | 0 |
| 1.28 Upland Acres Restored | 0 | 0 | 0 | 0 |
| 1.29 Wetland Acres Restored | 0 | 0 | 0 | 0 |
| 1.30 Open Water Acres Restored | 0 | 0 | 0 | 0 |
| 1.31 Riparian Miles Restored | 0 | 0 | 0 | 0 |
| Invasive Plants Infestation, Treatment, Control | 0 | 0 | 0 | 0 |
| 1.32 Total acres known to be infested by invasives | 0 | 0 | 0 | 0 |
| 1.33 Total acres treated for invasives | 0 | 0 | 0 | 0 |
| 1.34 Total acres of invasive plants controlled | 0 | 0 | 0 | 0 |
| Invasive Animal Infestation and Control | 0 | 0 | 0 | 0 |
| 1.35 Number of invasive animal populations | 0 | 0 | 0 | 0 |
| 1.36 Number invasive animal populations controlled | 0 | 0 | 0 | 0 |
| Invasive Species of Concern | 0 | 0 | 0 | 0 |
| 1.37 Identify 1st invasive species of concern | | | | |
| 1.38 Identify 2nd invasive species of concern | | | | |
| 1.39 Identify 3rd invasive species of concern | | | | |
| 1.40 Identify 4th invasive species of concern | | | | |
| 1.41 Identify 5th invasive species of concern | | | | |

Goal 1III

[Muscatatuck NWR]

| | Previous Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---------------|------|------|------|------|------|------|
| III. Wildlife Populations, Inventory & Monitoring | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.42 If I&M Plan approved, enter year completed | 1980 | | | | | | |
| 1.43 If no I&M plan, target year to complete | | | | | | | |
| 1.44 Number of I&M surveys | 0 | 23 | 21 | 0 | 0 | 0 | 0 |
| 1.45 Number of populations with target goals | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.46 Number of target populations increasing | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.47 Number of target populations decreasing | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.48 Number of target populations stable | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.49 Number of population management actions | 0 | 3 | 4 | 0 | 0 | 0 | 0 |
| 1.50 Number of research studies | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1.51 Number of T&E actions | 0 | 2 | 2 | 0 | 0 | 0 | 0 |
| 1.52 Number of written public communications | 0 | 6 | 1 | 0 | 0 | 0 | 0 |

Goal 2

[Muscatatuck NWR]

| | Previous Year | 2005 | 2006 | 2007 | 2008 |
|--|---------------|------------|------------|------|------|
| Water | 0 | 0 | 0 | 0 | 0 |
| 2.03 Presence of State 303d-listed water | | No | No | | |
| 2.04 Other documented water quality problems | | No | No | | |
| 2.05 Water resource assessment conducted? | | No | No | | |
| 2.06 Sufficient water resource legal protection? | | Not needed | Not needed | | |
| Contaminated Sites | 0 | 0 | 0 | 0 | 0 |
| 2.07 Contaminated sites not in existing systems | 0 | 0 | 0 | 0 | 0 |

Goal 2

[Muscatatuck NWR]

| | 2009 | 2010 |
|--|------|------|
| Water | 0 | 0 |
| 2.03 Presence of State 303d-listed water | | |
| 2.04 Other documented water quality problems | | |
| 2.05 Water resource assessment conducted? | | |
| 2.06 Sufficient water resource legal protection? | | |
| Contaminated Sites | 0 | 0 |
| 2.07 Contaminated sites not in existing systems | 0 | 0 |

Goal 3

[Muscatatuck NWR]

| | Previous Year | 2005 | 2006 |
|--|---------------|------------------|------------------|
| Wilderness | 0 | 0 | 0 |
| 3.01 Designated Wilderness | | | |
| 3.02 If Wild. Plan completed, enter year | | No approved plan | No approved plan |
| 3.03 If no Wild. Plan, target year to complete | | | |
| 3.04 Number of designated wilderness acres | 0 | 0 | 0 |
| 3.05 Acres achieving wilderness objectives | 0 | 0 | 0 |
| Wild & Scenic Rivers | 0 | 0 | 0 |
| 3.06 Wild and Scenic River miles | 0 | 0 | 0 |
| 3.07 River miles achieving values in WSR Act | 0 | 0 | 0 |
| Marine Protected Areas | 0 | 0 | 0 |
| 3.08 Is the refuge a Marine Protected Area? | | | |
| 3.09 Does MPA achieve unique values in EO 13089? | | No | No |

Goal 3

[Muscatatuck NWR]

| | 2007 | 2008 | 2009 | 2010 |
|--|------|------|------|------|
| Wilderness | 0 | 0 | 0 | 0 |
| 3.01 Designated Wilderness | | | | |
| 3.02 If Wild. Plan completed, enter year | | | | |
| 3.03 If no Wild. Plan, target year to complete | | | | |
| 3.04 Number of designated wilderness acres | 0 | 0 | 0 | 0 |
| 3.05 Acres achieving wilderness objectives | 0 | 0 | 0 | 0 |
| Wild & Scenic Rivers | 0 | 0 | 0 | 0 |
| 3.06 Wild and Scenic River miles | 0 | 0 | 0 | 0 |
| 3.07 River miles achieving values in WSR Act | 0 | 0 | 0 | 0 |
| Marine Protected Areas | 0 | 0 | 0 | 0 |
| 3.08 Is the refuge a Marine Protected Area? | | | | |
| 3.09 Does MPA achieve unique values in EO 13089? | | | | |

Goal 4

[Muscatatuck NWR]

| | Previous Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--|---------------|------|------|------|------|------|------|
| Signs and Orientation | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.01 Adequate directional signs to locate refuge? | | Yes | Yes | | | | |
| 4.02 Adequate signs to orient visitors? | | Yes | Yes | | | | |
| 4.03 Percent of existing signs in good condition? | | 90 | 100 | | | | |
| 4.04 Standard or approved entrance sign in place? | | No | Yes | | | | |
| 4.05 Visitor orientation points in place? | | No | Yes | | | | |
| Adequacy of Boundary Posting | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.06 Percent of boundary posted to standards? | | 75 | 100 | | | | |
| Brochures, Publications and Web Site | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.07 Adequate supply of current general brochures | | No | Yes | | | | |
| 4.08 Other publications that meet standards? | | Yes | Yes | | | | |
| 4.09 Is a current web site maintained to standards | | Yes | Yes | | | | |

Goal 5

[Muscatatuck NWR]

| | Previous Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--|---------------|----------------|----------------|----------|----------|----------|----------|
| General Visitation | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.01 Is the refuge/WMD open to public entry? | | Yes | Yes | | | | |
| 5.02 If VS plan completed, enter year | | Yes | Yes | | | | |
| 5.03 If no VS plan, target year to complete | | | | | | | |
| 5.04 Total number of visitors | 0 | 142,000 | 142,000 | 0 | 0 | 0 | 0 |
| 5.05 Special Events Hosted on site | 0 | 14 | 14 | 0 | 0 | 0 | 0 |
| 5.06 Number of participants in special events | 0 | 4,000 | 4,000 | 0 | 0 | 0 | 0 |
| 5.07 Visits to Visitor Center or Contact Station | 0 | 10,000 | 10,000 | 0 | 0 | 0 | 0 |
| Hunting | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.08 Is Hunting offered? | | Yes | Yes | | | | |
| 5.09 Indicate the quality of the hunt program | | Good | Good | | | | |
| 5.10 Total hunting visits | 0 | 4,130 | 4,400 | 0 | 0 | 0 | 0 |
| 5.11 Waterfowl hunt visits | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.12 Other migratory bird hunt visits | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.13 Upland game hunt visits | 0 | 650 | 920 | 0 | 0 | 0 | 0 |
| 5.14 Big game hunt visits | 0 | 3,480 | 3,480 | 0 | 0 | 0 | 0 |
| Fishing | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.15 Is fishing offered? | | Yes | Yes | | | | |
| 5.16 Indicate the quality of the fishing program | | Good | Good | | | | |
| 5.17 Total fishing visits | 0 | 18,000 | 25,000 | 0 | 0 | 0 | 0 |
| 5.18 Freshwater fishing visits | 0 | 18,000 | 25,000 | 0 | 0 | 0 | 0 |
| 5.19 Saltwater fishing visits | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.20 Estuarine fishing visits | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wildlife Observation | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.21 Is Wildlife Observation offered? | | Yes | Yes | | | | |
| 5.22 Indicate quality of wildlife observations | | Good | Good | | | | |
| 5.23 Total wildlife observation visits | 0 | 115,000 | 115,000 | 0 | 0 | 0 | 0 |
| 5.24 Foot trail visits | 0 | 44,700 | 44,700 | 0 | 0 | 0 | 0 |
| 5.25 Auto Tour Visits | 0 | 70,000 | 70,000 | 0 | 0 | 0 | 0 |
| 5.26 Boat Trail/Launch Visits | 0 | 300 | 300 | 0 | 0 | 0 | 0 |
| Wildlife Photography | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.27 Is Wildlife Photography offered? | | Yes | Yes | | | | |
| 5.28 Indicate quality of wildlife photography | | Good | Good | | | | |
| 5.29 Total photography visits | 0 | 2,000 | 2,000 | 0 | 0 | 0 | 0 |
| 5.30 Photo Blind Visits | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.31 Other Photography location visits | 0 | 2,000 | 2,000 | 0 | 0 | 0 | 0 |
| Environmental Education | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.32 Is Environmental Education offered? | | Yes | Yes | | | | |
| 5.33 Indicate the quality of the EE program | | Good | Good | | | | |
| 5.34 Total EE participants | 0 | 3,200 | 3,580 | 0 | 0 | 0 | 0 |
| 5.35 Number of teachers in on-site programs | 0 | 100 | 100 | 0 | 0 | 0 | 0 |
| 5.36 Number of teachers in off-site programs | 0 | 60 | 80 | 0 | 0 | 0 | 0 |
| 5.37 Number of students in on-site programs | 0 | 3,000 | 3,000 | 0 | 0 | 0 | 0 |
| 5.38 Number of students in off-site programs | 0 | 40 | 400 | 0 | 0 | 0 | 0 |
| Interpretation Program | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.39 Is interpretation offered? | | Yes | Yes | | | | |
| 5.40 Indicate the quality of the interp program | | Good | Good | | | | |

Goal 5

[Muscatatuck NWR]

| | Previous Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---------------|---------------|---------------|----------|----------|----------|----------|
| 5.41 Total interpretation participants | 0 | 11,000 | 11,000 | 0 | 0 | 0 | 0 |
| 5.42 Participants in on-site programs | 0 | 10,600 | 10,600 | 0 | 0 | 0 | 0 |
| 5.43 Participants in off-site talks/programs | 0 | 400 | 400 | 0 | 0 | 0 | 0 |
| Other On-site Recreational Uses Offered | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.44 Other recreational activities offered? | | Yes | Yes | | | | |
| 5.45 Total other rec participants | 0 | 600 | 600 | 0 | 0 | 0 | 0 |
| 5.46 Trapping visits | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.47 Bicycling visits | 0 | 100 | 100 | 0 | 0 | 0 | 0 |
| 5.48 Camping visits | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.49 Swimming visits | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.50 Motorized boat travel | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.51 Non-motorized travel by boat | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.52 Other recreational visits | 0 | 500 | 500 | 0 | 0 | 0 | 0 |

Goal 6

[Muscatatuck NWR]

| | Previous Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--|---------------|--------|--------|------|------|------|------|
| Volunteer Program | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6.01 Does the station have a volunteer program? | | Yes | Yes | | | | |
| 6.02 Number of volunteers | 0 | 150 | 175 | 0 | 0 | 0 | 0 |
| 6.03 Total Volunteer hours | 0 | 9,600 | 10,600 | 0 | 0 | 0 | 0 |
| 6.04 Volunteer Hours for wildlife and habitat | 0 | 2,250 | 2,750 | 0 | 0 | 0 | 0 |
| 6.05 Volunteer Hours for Refuge maintenance | 0 | 300 | 800 | 0 | 0 | 0 | 0 |
| 6.06 Volunteer Hours for environmental education | 0 | 6,400 | 6,400 | 0 | 0 | 0 | 0 |
| 6.07 Volunteer Hours for other recreation | 0 | 50 | 50 | 0 | 0 | 0 | 0 |
| 6.08 Volunteer Hours for cultural resources | 0 | 200 | 200 | 0 | 0 | 0 | 0 |
| 6.09 Volunteer Hours for other activities | 0 | 400 | 400 | 0 | 0 | 0 | 0 |
| 6.10 Cost to manage the volunteer program | 0 | 5,000 | 5,000 | 0 | 0 | 0 | 0 |
| Friends and Community Support Groups | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6.11 Does the station have a Friends Organization? | | Yes | Yes | | | | |
| 6.12 Other Community Support Groups? | | Yes | Yes | | | | |
| Conservation partnership projects | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6.13 Number of partnership projects | 0 | 10 | 10 | 0 | 0 | 0 | 0 |
| 6.14 Monetary partner contributions | 0 | 25,000 | 37,000 | 0 | 0 | 0 | 0 |
| 6.15 Cash value of in-kind partner contributions | 0 | 3,500 | 3,500 | 0 | 0 | 0 | 0 |
| 6.16 Monetary NWRS contributions | 0 | 2,000 | 2,000 | 0 | 0 | 0 | 0 |
| 6.17 Cash value of in-kind NWRS contributions | 0 | 1,000 | 1,000 | 0 | 0 | 0 | 0 |
| 6.18 Number of on-refuge acres improved | 0 | 2 | 10 | 0 | 0 | 0 | 0 |
| 6.19 Number of off-refuge acres improved | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Non appropriated funds | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6.20 Funds from fees and other contributions | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Goal 7

[Muscatatuck NWR]

| | Previous Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---------------|------|-------|------|------|------|------|
| Law Enforcement | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7.06 Actual LE field hours planned | 0 | 250 | 1,000 | 0 | 0 | 0 | 0 |
| 7.07 Violation Notices issued | 0 | 35 | 100 | 0 | 0 | 0 | 0 |
| 7.08 Criminal LE incidents documented | 0 | 4 | 8 | 0 | 0 | 0 | 0 |
| 7.09 Other LE incidents documented | 0 | 100 | 200 | 0 | 0 | 0 | 0 |
| 7.10 Community Policing Program in place | | No | No | | | | |
| Easements | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7.11 Total number of easements | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7.12 Number of easements inspected | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7.13 Easements found in compliance | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7.14 Easements violations detected | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7.15 Viol. brought in compliance by admin actions | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7.16 Viol. brought in compliance by legal actions | 0 | 0 | 0 | 0 | 0 | 0 | 0 |