

MUSCATATUCK NATIONAL

WILDLIFE REFUGE

1981 Annual Narrative

MAY 07 1982

MUSCATATUCK NATIONAL WILDLIFE REFUGE

Seymour, Indiana

ANNUAL NARRATIVE REPORT

Calendar Year 1981

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



7 4 5 1 2 6 3

Personnel

- * 1. Charles E. Scheffe, Refuge Manager, GS-11, PFT
- * 2. Leroy E. Hovell, Jr., Assistant Refuge Manager, GS-9, PFT
- * 3. Edward F. Wagner, Outdoor Recreation Planner, GS-7, PFT
- * 4. Lawrence A. Pagel, Maintenance Person, WG-8, PFT
- * 5. Immanuel J. Johnson, Assistant Refuge Manager, GS-7, PFT
- * 6. Rita Fletcher, YACC Enrollee
- * 7. Anita Synder, YACC Enrollee
- 8. A. John Boles, YACC Group Leader, GS-9, Terminated 9/18/81
- 9. Carol J. Teipen, Secretary (Typing), GS-4, Resigned 7/24/81
- 10. Wanda Lakins, ODC Employee, EOD-6/81, Terminated 11/9/81

* PICTURED

Review and Approvals

Charles E. Scheffe 2/19/82
Submitted By Date

John P. Powowski 3/1/82
Area Office Date

Muscotuck NWR
Refuge

Calvin R. Dole 5-4-82
Regional Office Date

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NA

A. HIGHLIGHTS

The wet spring made this the poorest crop year in the history of the refuge. (Section F. 4)

Sora, King, and Virginia rail all used Moss Lake in the Spring during high water. This is the first time all three species have been on the refuge at the same time. (Section G. 5)

The first beaver was sighted in May of this year at Moss Lake. (Section G. 10)

An EE workshop was held in October. This was attended by 70 educators from throughout Indiana. John Gottschalk was the featured speaker. (Section H. 3)

The Corps of Engineers permit for the water control structures. Central Waterfowl area has been held up. However, the bridge work and the dike work has been started.

Construction continued to highlight refuge activities. The Moss Lake, Endicott Marsh, and the southern dikes were completed. The contracts were let for the bridges, (Haley Brothers, Terre Haute, Indiana) and the Central Waterfowl Area (Rust Construction Co., Seymour, Indiana). (Section I. 3)

B. CLIMATIC CONDITIONS

The following table summarizes weather conditions for 1961.

WEATHER SUMMARY 1981

	<u>TEMPERATURE</u>					<u>PRECIPITATION</u>		
	<u>High Max</u>	<u>High Avg</u>	<u>Low Max</u>	<u>Low Avg</u>	<u>Depart.</u>	<u>Total</u>	<u>Depart.</u>	<u>Snow Fall</u>
January	61	35.5	-4	14.7	-5.3	.32	-3.2	2.5
February	63	44.1	-5	20.5	-.8	3.03	.01	T
March	71	51.7	19	27.0	-2.2	2.2	-1.71	2.1
April	86	69.8	29	46.6	2.4	6.63	2.88	.0
May	85	69.16	35	46.93	14.21	6.35	2.08	.0
June	91	83.1	51	61.3	-.1	2.52	-1.69	.0
July	94	84.5	48	63.0	-2.0	3.76	-.56	.0
August	89	82.1	49	58.7	-3.7	4.01	1.17	.0
Setpember	88	75.9	35	49.0	-4.8	1.36	-1.45	.0
October	82	67.77	15	36.02	-3.57	1.82	-2.30	.0
November	78	55.53	18	28.23	.88	3.32	.12	.0
December	<u>60</u>	<u>38.19</u>	<u>1</u>	<u>17.16</u>	<u>15.73</u>	<u>2.04</u>	<u>-.89</u>	<u>8.0</u>
YEAR	94	63.11	-5	38.95	-.77	37.63	3.76	10.5

January, February, and March was cold and dry. A total of 4.6" of snow fell these three months. Precipitation to the end of March was 4.92" below normal.

Rain started April 3rd. We had fourteen days of measurable rain during the remaining part of the month. Rain continued through May and for eight of the first twelve days in June.

July, August, September, and October was cool averaging 3.52" below normal. Early frost killed the corn. Then the weather warmed and the ears molded. Even though the grains had dented heavy losses resulted.

A dry summer and fall resulted in an overall dry year with rainfall 3.76" below normal.

D. PLANNING

1. Master Plan

Miller, Wihry and Lee were contracted in 1978 to make a master plan summary for Muscatatuck Refuge. Thus far, very little has been done on this. We hear that they are still working on the plan, but there is nothing to show at this time. We expect this contract will be finished next year.

E. ADMINISTRATION

1. Personnel

Carol Teipen resigned from the secretary's position on July 24, 1981. Since that time we have been using Y.A.C.C. ers and ODC personnel in the position.

Immanuel J. Johnson transferred from Shiawassee Refuge to Muscatatuck on January 19, 1981 as an Assistant Refuge Manager Trainee.

2. Funding

a. Operations and Maintenance

The following is a comparative break down of Operations and Maintenance monies for the last five years.

Migratory Birds	1210	181,000	150,000	172,000	166,000	113,900
Migratory and Nonmigratory Birds	1220	13,000	10,000	3,000	7,000	1,100
Interpretation and Recreation	1240	<u>9,000</u>	<u>12,000</u>	<u>12,000</u>	<u>12,000</u>	<u>12,000</u>
TOTAL		203,000**	172,000*	187,000	185,000	127,000

* In 1981, we had an additional \$3,000 allotted for cyclical maintenance.

**This represents monies promised before the axe falls. We expect this to be cut..



Contractor placing riprap on dam. E.W.

B. BLHP

Appropriations under BLHP total \$4,033,000. The annual breakdown is shown below:

<u>1978</u>	<u>1979</u>	<u>1980</u>
\$1,050,000	\$1,591,000	\$1,392,000

Projects completed or under way include the following:

Moss Lake	Under Construction
Richart and Stanfield Lakes	Complete
Southern Dikes	Complete
Central Area Dikes and Bridges	Under Construction
Equipment Purchases	Complete
Master Plan Update	Ongoing
Hydrologic Engineering Studies	Complete
Archeological Studies	Complete

Although the total development planned for Muscatatuck is not complete and additional funding is necessary, we have come a long way. One dike, a water control structure, a bridge, and a new road to the maintenance area are the primary remaining needs.

3. Safety

No lost time accidents or vehicle accidents occurred on the refuge in 1981.

Safety meeting were held regularly.

The work being done on the bridges under BLHP will erradicate two hazards on the refuge by widening the two bridges and one mile of narrow road.

4. Technical Assistance

Mr. Scheffe and Mr. Wagner assisted in assessing the Falls of the Ohio as a possibility for a new refuge. This is a small area near Louisville, Kentucky that is rich in fossils. It appears at this time that the Fish and Wildlife Service will be given the job of caring for this area. why?

F. HABITAT MANAGEMENT

1. General

Habitat management for the refuge is being concentrated in the wetland portion of the three different sectors, wetland, upland, and forests. The primary objective is to provide the waterfowl more natural foods. Moist soil units are being utilized for that purpose. Now that the construction has been finished most at the MS units, water management can commence.

Old fields that were once farmed are now reverting back to the beginning stages of the forest. The edge of most of the fields have from two to ten years growth of woody vegetation such as willows, cottonwood, and sycamore. The edge effect is purposely managed to produce additional cover for the few wild turkeys that inhabit the refuge. The edge effect will also benefit all other wildlife that are on the refuge.

Along with forests, croplands, and wetlands, the old fields could be considered grasslands. In 1981, nothing was done to the grasslands on the refuge. The only type of management for grasses is to protect them from fire and allow them to revert.

The state of Indiana has a weed law similar to the state of Minnesota where the state dictates a list of noxious weeds for the farmers to control. There are two noxious weeds on the refuge, Johnson grass and Canada Thistle. These are the primary weeds that the state

wants controlled. The enforcement of the law is not strict. There are no appointed weed control officers for the state.

Most of the time invested to fight the weeds is done by the cooperative farmers during planting and harvest season. The primary pesticides that are used during the fight are Dalapon, Atrazine, and Roundup.



Moss Lake dike. E.W.

2. Wetland

The Moss Lake Complex was finally finished last year. All water control structures were completed during the summer months. However, water management did not start because of bidding and construction work on the central waterfowl area. Also, rainfall was low and Moss Lake was not filled until late in the year. Now that the Moss Lake Complex is finished and ready for the coming year the water management program for the area can go into effect.

The water management system for the refuge is based on the use of water from Moss Lake, Stanfield Lake, and Richart Lake. Stored water in these lakes will be moved by gravity to moist soil and green timber units.

Work is still continuing on the dike system that will one day give us approximately 300 additional acres of moist soil

and premanent marsh. If the weather will permit, the project should be done by the coming fall of 1982. Along with added marshes and moist soil units the refuge will improve more roads and replace two bridges.



Richart Lake. E.W.

3. Forests

There has been no timber management other than fire protection on the refuge during the last year. This coming year there will be some wildlife food plots put in the isolated part of the refuge.

Moss Lake was used as a green tree reservoir last spring. Construction work on the central waterfowl area required lake drainage. Rainfall in the fall was not sufficient to flood the units.

4. Cropland

The refuge is continuing to cut farming. About 50% of the west A-26 unit was dropped this year. This was 40 acres in size.

Extremely wet soil conditions in the spring delayed planting.

The first corn was planted on the refuge June 19th.

This late planting resulted in cooperators rushing and thus work was not up to standards. Weed control was poor. Yields ranged from slightly over 100 bushels per acre down to 0.00 bushels. Frost hit in late September followed by warm days with high humidity. This caused the corn to mold.

Consequently, the cooperators were docked 60¢ to 90¢ per bushel because of moisture and mold. This took the rest of the profit.

This early frost also caused the small amount of buckwheat to seed early or, in a few plots, die without seeding.

The refuge has been fighting 50 years of tradition in trying to change farming operations on the refuge. This year forced the cooperators to try no-till farming on the refuge. Weather, fixed cost, and time entered into this decision.

On June 10th, the refuge staff held a meeting with all the cooperative farmers, the agriculture extension agent for Jackson County, (Charles Yeager), and the Soil Conservation Service Representative, (Henry Horstman). The program was on no-till farming. The program was well recieved but the farmers were still skeptical. no till

However, one farmer did rent a no-till planter and tried 10 acres on the fescue sod field. His conventional heavy tractor was used (100+ H.P.).

The field was fertilized, sprayed with 1 quart paraquat and 2 1/2 pounds of atrazine per acre, and planted on June 19th. The rows ran east and west across a hilltop. The field was relatively flat except on the extreme southeast corner and the west end. The slope at the west end was roughly estimated at 10%. The rows ran up and down this hill. Yields on this field ran 70+ bushels per acre. This was low but still higher than the majority of the corn on the refuge. There was no visible evidence of erosion on the hill on the west side.

Although the farmer used overpowered equipment, (60 H.P. is recommended instead of 100+ H.P.), he used 3 gallons of fuel per acre compared to 6.2 gallons per acre on conventional tillage. This is a 52% fuel savings.

Another advantage of this method is that some of the fescue survived. After the corn was picked this fall, the field was still covered with a good fescue sod, thus there is no chance for significant erosion and there is still good cover for rabbits and other field type wildlife. One covey of quail used the field throughout the late summer.

This farming method is recommended by the Eastern and Southern states extension services over organic farming as a fuel-saving method because of the acid soil quality in forested soils. Therefore, the refuge will continue to investigate results of this method.



Turkey and Deer. E.W.

G. WILDLIFE

1. Wildlife Diversity

The Moss Lake Complex has been closed to vehicle travel since the construction began. The limited use has manifested itself by an increase in the population of wild turkeys. One year ago an estimated five turkeys used the area and now the population has increased to about twenty.

The wild turkeys seem to move north and south from the Moss Lake area, staying near Mutton Creek and the river.



Beaver Dam at Moss Lake. E.W.

The first beaver was sighted on the refuge this spring. Later the beaver built a dam to prevent drainage of Moss Lake for the construction season. Then, this fall a dead beaver was found on the Muscatatuck River. It is not believed to be the same animal.

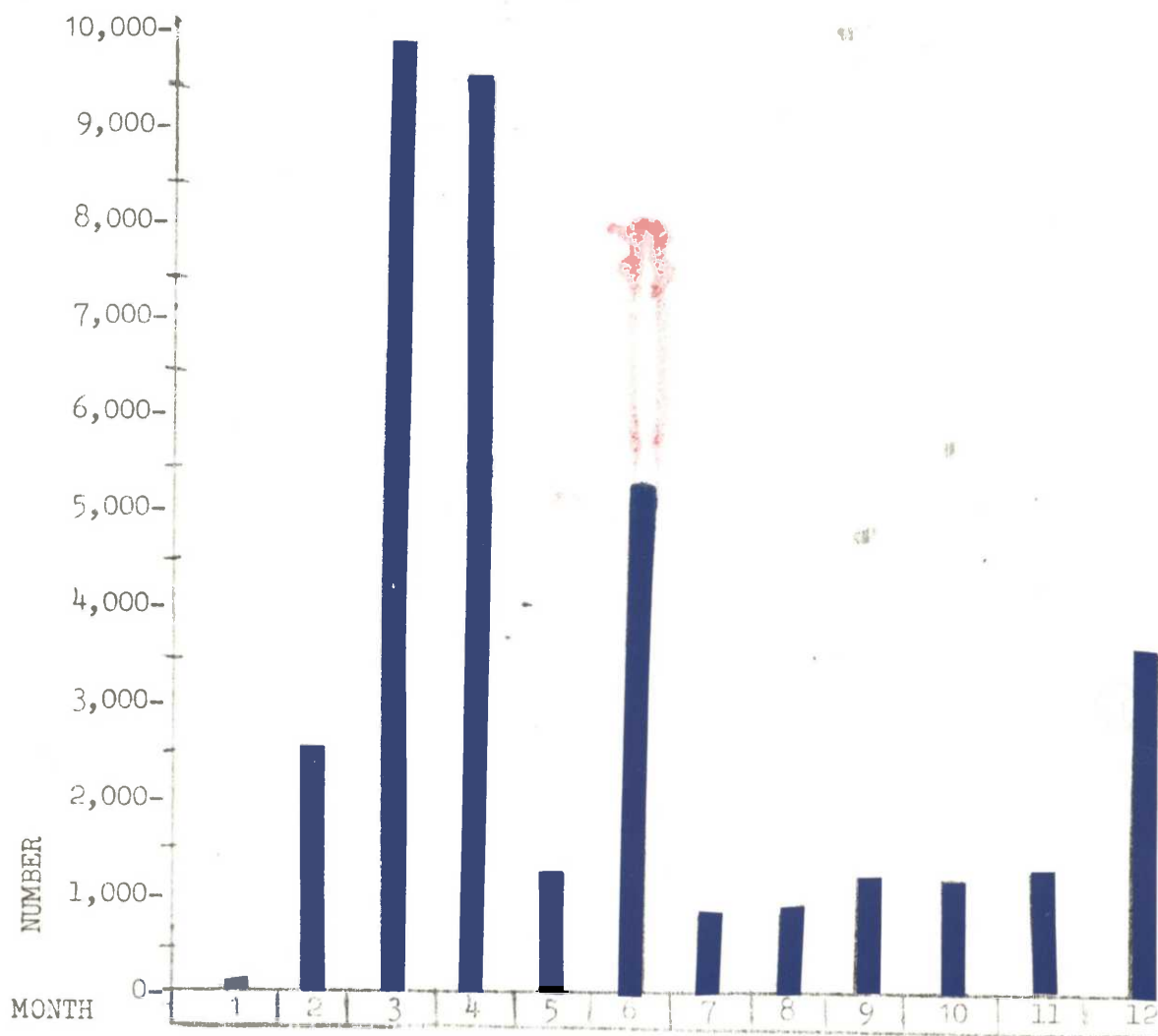
Two double-crested cormorants used the refuge this spring. They were sighted on Stanfield Lake several times but disappeared when fishing opened June 15th.

2. Endangered and/or Threatened Species

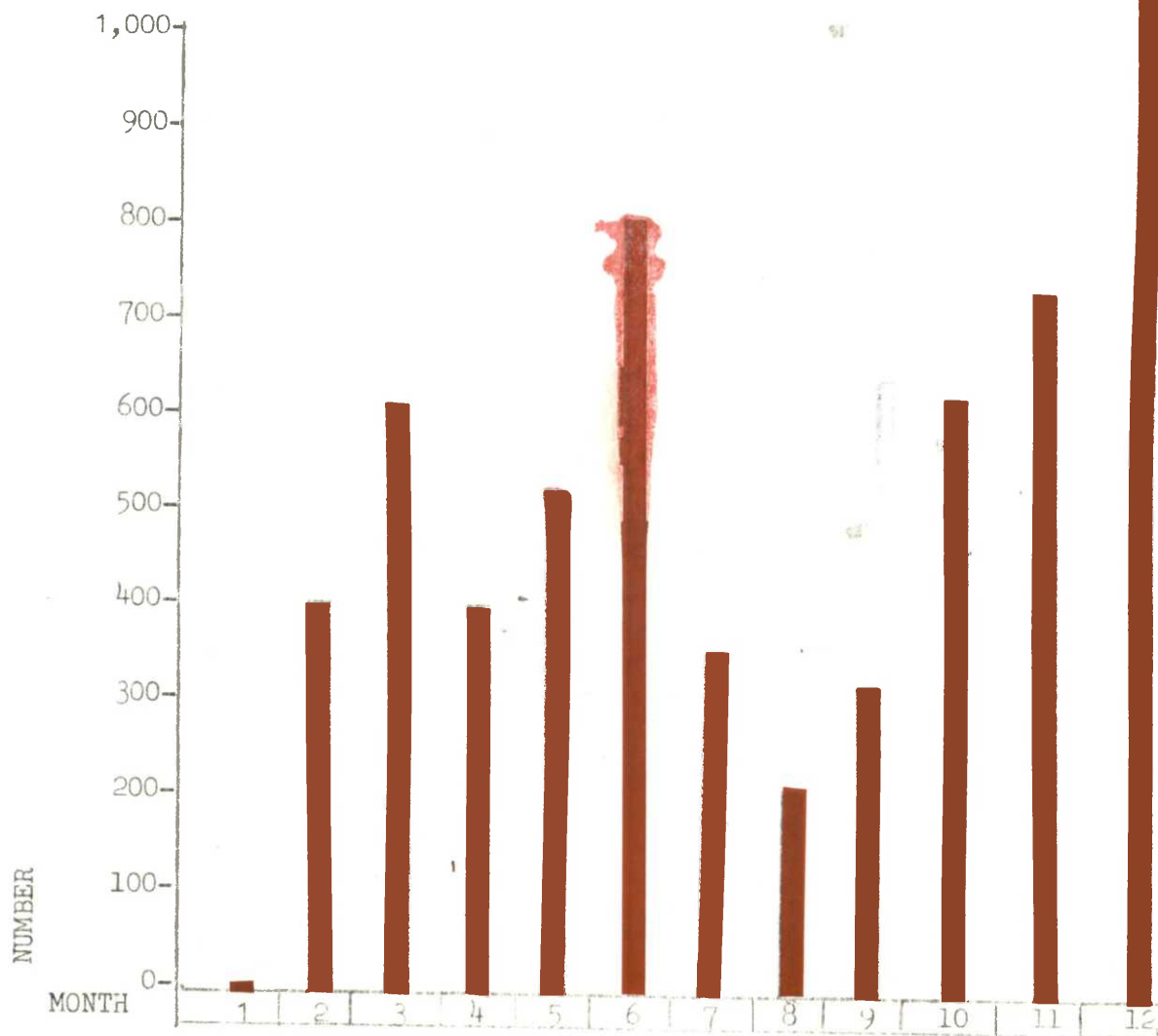
The only species that appeared on the refuge was the osprey. There were several sightings of the bird last year. Sightings indicated that the birds only stayed within the refuge boundaries for a week. Apparently, it disappeared when fishing opened on Stanfield Lake.

3. Waterfowl

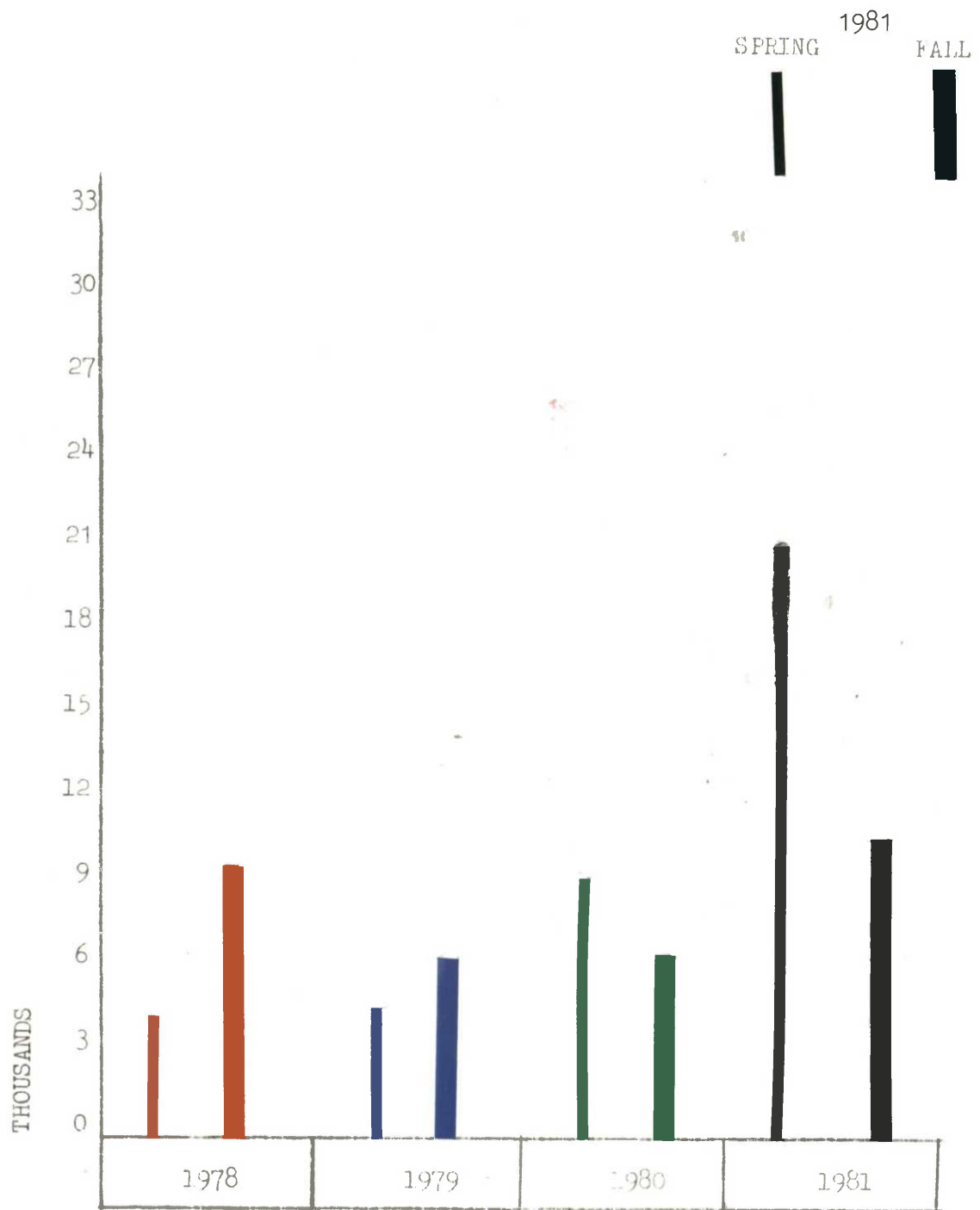
Most of the waterfowl that come to the refuge for the spring and fall migration have gathered in the Moss Lake Complex the



PEAK WATERFOWL POPULATIONS
DUCKS
BY MONTHS 1981



PEAK WATERFOWL POPULATIONS
GESE
BY MONTHS 1981



A COMPARISON OF PEAK WATERFOWL POPULATION
by Year

larger bodies of water, such as Stanfield and Richart lakes. Last year there were no swans on the refuge. One year in the past swans did stop at the refuge for a rest.

The ducks and geese were scattered over the refuge quite evenly. When March 15 arrives most the migrating waterfowl have gone farther north and the residents remain for the summer. Canada Geese seem to prefer the smaller ponds during nesting. Approximately 100 geese hatched and after the hatch, most geese are found on the larger bodies of water. Once the weather warms up and fishing is opened for Stanfield Lake the geese will move and find refuge in the Moss Lake Complex, or Richart Lake area.

Wood ducks are the most numerous waterfowl during the summer and early fall. A lot of nesting takes place on the refuge throughout the Mutton Creek and Muscatatuck River bottomland. The intensive management for the wood duck is now going to be the Moss Lake Complex. Last year the Lake was managed similar to the green-tree reservior scheme so the trees have not really been affected as yet - the lake will be managed for a true reservior when the maintenance road contract is finished this fall. The density of cover made brood census extremely difficult. An estimate of 500 wood ducks were hatched. Once the trees start to die there should be more cavities for the ducks to nest. Therefore, Moss Lake should have heavier use in the future.

The majority of coot used Richart and Stanfield Lakes when they came to the refuge. One place that comes to minds, is the heavy use of the west end of Stanfield Lake where there is a good growth of waterweed (*Elodea canadensis*). In the same area there is a large number of woody plants that are still standing and provide good cover for coot. Again the area is filled with the same waterweed found in the Stanfield area.

4. Marsh and Water Birds

Two double-crested cormorants, were sighted during the spring migration period. Each sighting was on Stanfield Lake.

Another birds that frequents the refuge in migration is the Sandhill crane, but this past spring there was 700 use-days at the refuge. The number of 700 is a conglomerate of the several different sightings logged by refuge personnel during the spring migration.



Great Blue Heron. E.W.

5. Shorebirds, gull, terns, and allied species

The woodcock have maintained their numbers for the past year, which is an estimated 450 or more. Once all the compounds have been finished and we can establish some mud flats in the moist soil area it should attract the shorebirds.

Even though the water control structures were not finished during the spring; rains deposited enough water to attract the birds as they migrated through the refuge. The greatest numbers were the greater and lesser yellowlegs. Others included solitary, spotted, and semipalmated sandpipers, snipe and killdeer.

6. Raptors

The number of raptors have remained about the same from previous years, so there is nothing new to report. No eagles were sighted.

8. Game Mammals

The Deer is the biggest attraction in the mammal category on this Refuge. The large numbers attracted visitors in the early mornings and the late evening to watch them. The refuge habitat is good and these animals were easily seen along the roads and in the fields.

Squirrels are also abundant. Mast was not good but field crops made up for the lack of acorns.

Raccoons are increasing and appreciate the new water areas.

Coyotes were sighted occasionally. Although this animal is uncommon on the refuge, word is getting around and we have had several inquiries about this species.

Rabbits are slowly coming back. One factor that may contribute to the slow recovery is the heavy soils on the refuge. These soils hold water on the surface and, thus, increases mortality of the young after rains in the nesting season.

Mink have been sighted numerous times during the season. Two families of young was observed this year.

Muskrat population is stable at this time but we expect an increase with the increase in water after construction completion.

10. Other Resident Wildlife

The Indiana Heritage Program awarded Muscatatuck National Wildlife Refuge the recognition that we have been preserving habitat for the northern copper bellied water snake, *Natrix erythrogaster erythrogaster*, by presenting the refuge with a wooden plaque. According to the Heritage Program Muscatatuck Refuge was one of the last strongholds for the snake.

The Indiana Heritage Program represents a comprehensive attempt to determine the state's most significant natural areas through an intensive statewide inventory. The Heritage program is being administered through the division of Outdoor Recreation of the Indiana Department of Natural Resources, and is initially being funded by a grant from the Indiana Electric Association and an appropriation from the Indiana Legislature.



Sandhill Cranes. E.W.



Snake. E.W.

11. Fishery Resources

The refuge has 53 small ponds and six of the larger ones are open to public fishing, also Stanfield Lake is open for fishing during the Summer. Other ponds are employed as demonstration sites in testing management techniques, holding and rearing small numbers of fish for redistribution to other federal management areas.

The Winter of '81 was mild, but there was a lack of precipitation and some of the smaller ponds dried up completely. The ponds that did dry up were restocked from other nearby ponds.

Just as the Summer fishing season on the refuge came to a close, Hebron NFH delivered some two thousand channel cats for Stanfield Lake. Earlier in the Summer they made a delivery of 1500 bass and some bluegills for the same Lake. The next season should be even better than the last fishing season.

16. Marking and Banding

Muscatatuck National Wildlife Refuge did have a banding program this past year. The banding site that was used was the same one used for the past and for some reason the birds weren't attracted to it as they once were. Our old banding site lost all its attractiveness for the target species when it came time to get a little piece of aluminum around their ankle. The banding program began in the middle part of August and continued thru October. The banded birds are in the following list:

WOOD DUCKS

AHYF	52
HYF	41
AHYM	43
HYM	53

H. PUBLIC USE

1. General

Public use total this year was approximately 78,080 people.

Visitation increased 75% over last year. The reason for this increase was due to the reopening of roads that were blocked during the construction activities in 1980 and the opening of



Dog fish and Students. E.W.



Teachers and Don Brown. E.W.

a new lake to fishing. The 1981 surge in visitation will again be slowed in 1982 due to bridge and road construction on the main auto tour route. It is anticipated that public use will increase significantly upon the reopening of the auto route in the fall of 1982.



Teacher in red. E.W.

2. Outdoor Classrooms - Students

397 students participated in formal environmental education sessions. Their activities included bird study, plant identification and seining marshes to learn of aquatic life.

3. Outdoor Classrooms - Teachers

The refuge was host for the Environmental Education Association of Indiana Annual conference, (EEAI). The highlight of the meeting was the keynote speaker Dr. John Gottschalk, former director of the U.S. Fish and Wildlife Service.

Seventy educators representing many of Indiana's elementary, middle schools, high schools, and universities participated in the twenty one sessions that were presented at this two day symposium. There were also several participants from the Indiana Department of Natural Resources, the U.S. Forest Service and the Indianapolis Childrens Museum. A copy of the program is included in this report.



Dr. John Gottschalk talks to group. E. W.



Outdoor classroo - teachers at Visitor Center. E.W.

4. Interpretive Foot Trails

Approximately 1550 people were given an interpretive walk on the Visitor Information Center Trail. The majority of them were school children. This interpretive experience continues to be in demand by the local schools systems.

Refuge personnel use this interpretive session to instill an appreciation of nature in visitors and to explain refuge objectives.

6. Interpretive Exhibit/Demonstrations

15,000 visitors were presented an introductory tape slide-tape program at the Visitor Information Center. First time visitors are encouraged to view this program. The center continues to be opened seven days a week, staffed with employees of the Young Adult Conservation Corps.

7. Other Interpretive Programs

Eleven off refuge interpretive programs were presented to 816 people. These programs were conducted for service clubs, state parks, bird clubs, schools. One program was for the regional association of engineers. This program explained how BLHP Funds were directed into wildlife enhancement projects through construction of impoundments.

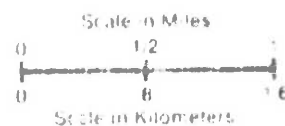
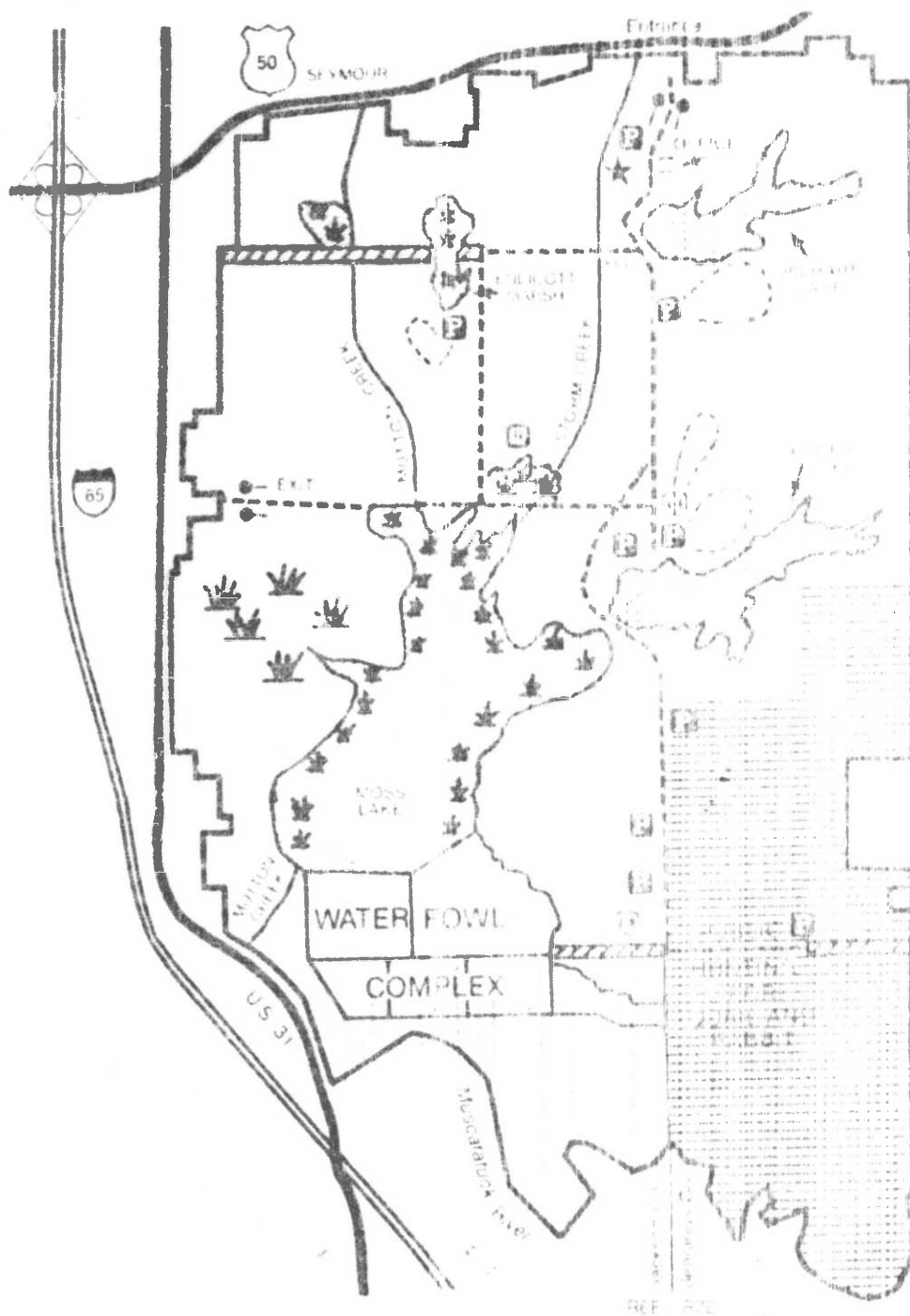
8. Hunting

The hunting area was changed this year, see attached map, and includes better habitat for rabbit and quail. This change will also move the hunting area from the new waterfowl area. Rabbit populations remain low, very few were harvested, probably less than twenty. Quail populations improved slightly, approximately 30 were taken. Approximately 240 hunters utilized the 1300 acre hunting area.

9. Fishing

The most significant event regarding fishing was the first time opening of Stanfield, a 90 acre lake, to shore and boat fishing June 15th.

During the first week 2700 anglers were counted by refuge personnel and a university student who helped conduct a creel census.



- Refuge Boundary
- - - Refuge Roads
- ... Walking Trails
- ▨ Patrol Roads
- ▨ Hunting Area (Green Signs)
- ☙ Marsh Areas
- ⬇ Gate Closed at Sunset
- P Parking
- 🚻 Restrooms
- 🔍 Environmental Study Area
- ★ Visitor Information Center

Anglers were satisfied with large quantities of fish. Few large fish were caught, however due to the short time the lake has existed. One more growing season will permit the young fish to attain excellent size.

A total of 10,500 anglers had used Stanfield Lake by the October 15 closing date.



Child observes a fawn. E.W.

11. Wildlife Observation

Observation of wildlife is the main public recreation activity and accounted for 37,000 visits. Most observers are particularly interested in seeing and photographing birds and deer.

12. Other Wildlife Oriented Recreation

Wildfood harvesting constitutes an important facet of this activity.

In the spring approximately 3,000 people search the woods for mushroom. Success rate is usually good and many people find a quart size container full of the favored morels.

Berries are sought by about 500 visitors in the summer months. Nuts and persimmons are harvested in the fall. Approximately 400 visitors come to

the refuge mostly to pick up persimmons which they use to make a rich and delicious breads and puddings. In addition some of the more unusual things that are gathered are turtles, deer antlers, dried plant parts, and catalpa worms (for fish bait).



Turtle Harvest. E. W.

17. Law Enforcement

Emphasis are placed primarily on preventing enforcement problems through public information programs. This program is carried out through news releases, off refuge staff talks and at the Visitor Information Center via the introductory slide-tape show.

There are, of course, violations that occur no matter how much effort is expended through public relation activity. These violations include staying in the refuge after closing time, digging up plants such as gensing, and more common refuge violations.

18. Youth Programs

The Muscatatuck Young Adult Conservation Corps (YACC) accomplished many tasks during 1981, including grounds maintenance and wildlife habitat improvement.

The ground maintenance entailed mowing, weed pulling, and painting building exteriors. The YACC Crew did the dry walling, apinting, base boarding, and floor tiling of the YACC office buidling. Wildlife habitat improvement consisted of tree planting, stocking new lakes with various kinds of fish, and fence pulling. The crew also staffed the Visitor Information Center seven days a week and the refuge office five days a week. During much of the year YACC'ers were relied upon to serve as secretary/receptionist in the refuge office. At the Visitor Center, the YACC'ers h lp conduct guided tours on the trails and give slide presentations. The YACC crew had an excellent safety record in 1981. As a result of a combination of effort and skill, on the part of the YACC crew, Muscatatuck National Wildlife Refuge had a very rewarding year.

21. Volunteers Program

The Boy Scouts of America volunteered to do repair work on the bridge over Mallard Pond. The repair job consisted of replacing boards that were dry rotting. The task took about twenty hours to complete. Once the job was finished, one scout recieved his Eagle rank . . . and we had a useable bridge again.

I. EQUIPMENT AND FACILITIES

1. New Construction

Work on the Moss Lake complex resumed on July 20, 1981. Good weather helped the work go smoothly and work finished September 18, 1981. This construction will create a shallow, wooded, 428-acre lake when it is filled. Also, immediately bleow the lake, there is an 60-acre moist soil unit and a 100-acre green timber unit. Water control structures permit use of gravity to fill the drain the two latter impoundments.

The total dikes on the units are $2\frac{1}{2}$ miles in length and graveled on top for easy access to the seven water control structures.

Work on the Southern Dikes resumed on May 18, 1981. The Earth work went fast in the weather. Concrete work was slow. An extension on the contract was requested. However, work was completed on time September 18, 1981.

This work completed five impoundments. The four southern impoundments was 40-60 acre in size and the work consisted of four water control structures and over three miles of grassed dikes. Two of the impoundments will be managed as a moist soil unit and two will be green timber units.

The water supply will be furnished for these units from Moss Lake by gravity. Gates can be opened to drain them into Mutton Creek.

If additional water is needed we can open gates on Richart Lake and Stanfield Lake and run the water to these units.

Endicott Marsh was also rebuilt on this contract. This will enlarge the "marsh" to a 15-acre pond. The concrete pour on the control structure honey combed and the contractor was told to chisel out the bad portion and repour it.

This was the most serious trouble with all the construction work done thus far. We were extremely lucky with the weather throughout the period. Close inspection and good dialogue with the contractors permitted the work to run smoothly. We are pleased with the contractors and their performance.

The contract was also let for replacing Mutton Creek and Storm Creek bridges this year. Haley Brothers from Terre Haute, got the Bid.

The crane arrived on December 14, 1981. By the end of the month storm creek bridge was removed and six piling has been driven for the new bridge.

Rust construction Co., got the contract for the Central Waterfowl area. Rust has proven in the past to be a very good contractor and we were pleased.

There will be 6,500 linear feet of improved gravel road on this contract. The road will be elevated approximately 6 feet and will serve as a dike. It will be 22 feet wide.

An additional 2.15 miles of dike will create 5 new moist soil units. Water from Richart Lake can be utilized with gravity flow to manage three of these. Water can be pumped from Moss Lake for the other two.

Work started on November 12, 1981 on these dikes. By the end of the year, all right-of-ways were cleared, ditches were cut for drainage of borrow areas and fill sites, and approximately one mile of dike had fill placed on site for use next spring. Work was halted at the time and will continue in the spring.

3. Major Maintenance

The assistant manager's house and the house at the Maintenance area was reroofed and the guttering was replaced this year.

A well was drilled at the Maintenance area and plumbing was finished in the YACC building. The walls were finished and the floors were tiled. It is now completed.

A new underground 1000-gallon tank and pump was installed at the Maintenance area for deisel fuel in December, 1981.

Work started on widening one mile of the Endicott Marsh road. Some ditching was done but before the project was completed, fall rains set in and we could not finish.

Also terraces were laid out in A-24. Prices were figured and the terraces were staked. We hope to have sufficient money and man power to finish this project in 1982.

4. Equipment Utilization and Maintenance

The following equipment was received in 1981:

- 1-07-81 20-ton capacity trailer
- 1-16-81 GMC Stake side diesel dump truck
- 6-01-81 John Deere model 2440 deisel farm tractor and 3-bottom plow
- 7-08-81 AMC Concord Station Wagon
- 10-01-81 Plymouth Reliant K-Car
- 11-25-81 John Deere model 302 industrial tractor with side-mount mower

We now have most of the major equipment the refuge needs. With the exception of one truck and two tractors, all equipment is 1978 or newer. We are now surveying or have surveyed the old equipment.

The refuge has attempted to up-days all major equipment while funds were available through O and M or BIHP. We now have the more economical vehicles and heavy equipment and a communications system that will be satisfactory for some time.

5. Communications System

Three walkie-talkies and chargers were transferred to us from the outgoing YACC program.

6. Energy Conservation

Energy Conservation is effected by added work load and facilities. We are now heating the YACC building and we have lights in the new equipment shed. We have taken L.P. gas supply for the old shop and have removed the electric supply to the scout cabin and the YCC building. Visitor Center heat is kept at 50 F.

We have had a heavy work load with Construction. This past year we have had the YACC and the Green Thumb program using the refuge gasoline supply.

Briefly, we cannot seem to cut energy usage with the expanded program here. If any usage is decreasing it is gasoline and L.P. gas. Diesel usage will rise because, in the last two years, we have acquired six pieces of Diesel powered equipment and surveyed one. This gave us five additional pieces. The YACC building will require additional electricity. Fuel oil will be a constant factor.

However, we will keep trying.

J. OTHER ITEMS

Refuge Manager Scheffe and Outdoor Recreation Planner Wagner, attended hearings regarding the preservation of the Falls of the Ohio area.

As a result of the concerns of Congressman Lee Hamilton (IN), Congressman Gene Snyder (KY), and others, the Falls of the Ohio has been designated a National Wildlife Conservation Area. 77

This section of the Ohio river bed contains 375 million year old fossils and is considered one of the most significant fossil beds in the world. This area is also unique in the diversity of birds that frequent it. Many birds that stop at the Falls are seldom observed elsewhere in the Midwest.

The Falls of the Ohio National Wildlife Conservation Area will be managed by the Army Corps of Engineers, the Corps is presently responsible for managing the Ohio River flow through the Falls area. The U.S. Fish and Wildlife Service may be called upon for advise in wildlife matters, possibly assisted by personnel from this refuge. Good.

Manager Scheffe was honored with a plaque entitled "Conservation Service Citation for Outstanding and Distinguished Service in the Field of Natural Resource Management."

Scheffe served for nine years as the National Wildlife Federation

Representative for the State of Indiana.



Presentation to Scheffe by Dave Herbst, Midwest Field Representative, NWF, and Herb Crouch, present NWF Representative, for Indiana.

Refuge personnel again spent several evenings helping the local Ducks Unlimited Chapter in thier annual fund raising event. This was the fourth year for this new chapter. Each year the funds collected has increased significantly the total was \$14,000 this year.

The refuge participated in two cooperative programs Wood duck banding and the Mid-Winter Waterfowl Inventory.

On the 20th of November, Nancy Hamilton, Congressman Lee Hamilton's wife, toured the refuge with a staff assistant and refuge personnel. She was very pleased with what she saw.

3. Credits

Leroy E. Hvell, Jr., Edward F. Wagner, and Immanuel J. Johnson are responsible fore putting together the major part of the text.

Rita Fletcher and Anita Snyder was responsible for typing the report and graphs.

K. FEED BACK

One major problem exists on the expenditure of construction money. There is poor communication.

The effort to find out exactly where the money was going was fruitless. We could not account for much of it. The printouts we got were incomplete, unclear, and subject to error. We did not receive all printouts on overhead or engineering.

Because of this, our equipment purchases and suggestions for changes in work orders were hampered. We needed a complete running account of the funds from Refuge allotments to final payment.

We sincerely suggest this be done in future years.



Concrete had to be chiseled out and replaced, on Endicott Marsh Control Structure. E.W.



Bird watchers enjoy Standfield Lake. E.W.



National Hunting and Fishing day demonstration. E.W.



Wagner receives plaque for refuge. C.S.



Scheffe explains control structure at Moss Lake to State
Property Managers. E.W.

**Twelfth
Annual
Meeting
Of The
Environmental
Education
Association
Of
Indiana Inc.**



Theme:

People, Places and Curriculum Date:

October 2nd and 3rd, 1981

Location:

**Muscatatuck National Wildlife Refuge,
Seymour, Indiana.**

Objective: To strengthen and promote conservation and outdoor education in Indiana.

ENVIRONMENTAL EDUCATION ASSOCIATION OF INDIANA, INC. (formerly known as the
Conservation Outdoor Education Association, Inc.)
TWELFTH ANNUAL CONFERENCE
Muscatatuck N.W.R.

WELCOME TO YOUR TWELFTH ANNUAL CONFERENCE

OFFICERS

President: Sue Becker
President Elect: John McCory
Vice-President: Jerry Sweeten
Immediate Past President: Ed Wagner
Secretary: Bill Vernon
Treasurer: Don Winslow

MEMBERS AT LARGE

Priscilla Costello
Michael Cohen

THEME: PEOPLE, PLACES, & CURRICULUM

PEOPLE—Meet resource people who are available statewide to help you inspire your students. These professionals provide facilities and services which enable you to incorporate outdoor experiences with your indoor teaching strategy. This will enhance your ability to stimulate learning in any area of curriculum.

PLACES—Learn about outdoor classroom sites in your area of the state and how you can also utilize your school grounds as an outdoor learning area.

CURRICULUM—Examine the latest literature and share your ideas with publisher representatives. Bring several copies of your favorite lesson plans to exchange with other educators and enhance your sharing experience.

Whenever possible, this conference will be held out-of-doors; bring suitable clothing.

NATURE ABOUNDS AT MUSCATATUCK!!!

Plan to stay after the conference to observe and photograph wildlife and the splendor of fall colors. Fishing will be available. Bring your equipment! Hunting does not begin until Nov.
No need to be concerned about poisonous snakes. None have ever been observed on the refuge.
Do you like persimmon pudding? If so bring a container, the seedless persimmons in our 39 tree orchard should be ripe!
So plan to learn, share, and enjoy!

— PROGRAM —

Thursday, October 1, 1981

7:00 p.m. Meeting of the Board of Directors

Refuge Office

Presider: Sue Becker, President

Friday, October 2, 1981

8:30 a.m. REGISTRATION AND COFFEE

Evergreen Room

8:30 a.m. EXHIBITS

Evergreen Room

Wayne Ziegler, Sec.-Treas. of Indiana
Gamma Chapter, Pi Beta Alpha
A display of text materials

Tom Russell, Science Research Associates, Inc.
A display of their energy literacy series

Encyclopedia Britannica Education Corporation
and Silver Burdett literature displays

A representative of the Audubon Society (IN Chapt.)
Exhibit and materials

Gary Doxtater, Manager, Environmental Studies
and Planning, Amax Coal Co.
Exhibit

Curt Hahn, Director of Video Education Teaching
Instruction (VETI)
Video exhibit

9:15 a.m. OPENING SESSION

Evergreen Room

Presider: Ed Wagner, Program Chairperson
Welcome, Introductions, and
Announcements

CONCURRENT SESSIONS

Friday, October 2, 1981

9:30 a.m. Session I Evergreen Room

Speaker: Tom Russell
Program Administrator, Science
Research Associates, Inc.

Title: An in-depth explanation of their
energy literacy series.
Society, Environment, Energy and
Development Studies (SEEDS)

9:30 a.m. Session II Visitor Center

Speaker: Gary Doxtater, Manager,
Environmental Studies and Planning,
Amax Coal Co.

Title: Environmental Aspects of Coal
Surface Mining

9:30 a.m. Session III Evergreen Room

Speaker: Emily Kress, former teacher
active in environmental education

Title: Where to find free Environmental
Education Materials

An important part of preparing
for environmental classroom
activities

10:30 a.m. Session IV Campfire Site

Speaker: The Ecology Club of Columbia
Middle School, Logansport, IN

STUDENTS TEACH STUDENTS

Students through role-playing
create a stimulating learning
experience

Friday, October 2, 1981

10:30 a.m. Session V Visitor Center

Speaker: Don Hully, Chairman,
Science Department and
Frank Williams, Assistant
Principal, 7th Grade,
Northview Jr. High School

Title: Building an Outdoor Classroom

How to construct and use an
outdoor classroom in the vicinity
of your school

10:30 a.m. Session VI Endicott Marsh

Speaker: Don Brown
Assistant Director, Bradford Woods

Title: Tips and Tricks of Leading a
Nature Walk

11:30 a.m. Lunch: Catered — 3 pc. chicken dinner
with slaw, potato salad, roll
and drink (participation limited
to ticket holders) Visitor Center

12:30 p.m. Luncheon

Speaker: John Disinger, Professor,
Division of Environmental Education,
School of Natural Resources,
Ohio State University and
Assistant Director of ERIC/SMEAC

Title: Environmental Education. . . A State
Responsibility

Decreasing availability of federal
support increases state responsibility

How state agencies and other
organizations respond to fulfill environ-
mental education needs

Friday, October 2, 1981

1:00 p.m.

Session VII

Visitor Center

Speaker: Les Zimmer
Field Representative,
Indiana Chapter of the Nature
Conservancy

Title: Building an Arc

A short slide series will
explain the objectives of the
National Nature Conservancy
Organization

Mr. Zimmer will then focus on
Indiana Nature Areas and the objec-
tives of the Indiana Chapter

1:00 p.m.

Session: VIII

Endicott Marsh

Speaker: Priscilla Costello, Teacher
at Terre Haute South

Title: Using Nature's Supply House

Developing a self-sufficient life-
style

Priscilla and her husband, through
hunting, fishing, and gardening, plus
wild food harvesting spend only an
average of \$6.00 a week for food

Friday, October 2, 1981

2:00 p.m.	Session IX	Visitor Center
	Speaker: Lois Mittino Gray Spring Mill State Park Naturalist	
	Title: Techniques of Audio-Visual Presentations	
	Humorous and informative. . . do's and don'ts of slide presentations	
2:00 p.m.	Session X	Endicott Marsh
	Speaker: Alan Backler Social Studies Development Center Indiana University	
	Title: Environmental Decision Making	
	Cross-cultural examples will featured. Participants will receive copies of lessons for use in their classrooms	
2:00 p.m.	Session XI	Camp Fire Site
	Speaker: Ed Guljas, Biologist, Indiana Dept. Natural Resources	
	Title: Fur Bearers and Their Ecological Roles in the Environment	
3:00 p.m.	Session XII	Camp Fire Site
	Speaker: Neal Case Manager of Salamonie Reservoir	
	Title: Outdoor Classroom Opportunities at State Reservoirs	

Friday, October 2, 1981

3:00 p.m.	Session XIII	Visitor Center
	Speaker: John Hendrix, Director Human Genetics & Bioethics Education Laboratory Ball State University	
	Title: The Confluent Theory of Value Moral Development	
	An activity session demonstrating methodology of decision-making	
4:00 p.m.	Business Meeting	Evergreen Room
	Presider: Sue Becker	
5:00 p.m.	Social Hour	Evergreen Room
	Cash Bar	
6:00 p.m.	Dinner: Hot Buffet—Chicken, Ham, roast beef, one meat casserole, three or four vegetables, six or eight salads, plus the trimmings. Beef and ham carved to your preference (participation limited to ticket holders)	
7:00 p.m.	Key Note	
	Speaker: Dr. John Gottschalk	
	Title: Man and Nature in the 21st Century	
	He will focus on the continuing need to use our out-door areas as an educational medium to promote public understanding of the ruling role of nature	



ABOUT THE SPEAKER

Mr. Gottschalk is currently Counsel for the International Association of Fish and Wildlife Agencies, an organization of state and federal conservation agencies of Canada, the United States, and Mexico. He is a veteran conservationist, with a career of nearly 50 years in the field.

A native of Indiana, he began his career in the Indiana State Parks System as a ranger and life guard upon graduation from high school, subsequently serving as a naturalist, and chief of fisheries for the Indiana Department of Conservation. During World War II, he was a bacteriologist producing penicillin. He joined the U.S. Fish and Wildlife Service as a fisheries biologist in 1945, serving that agency in various capacities, including director during the period 1964 to 1970.

He established the Washington office of the International Association in 1973 upon retirement from the National Marine Fisheries Service where he had been responsible for recreational fisheries and environmental programs.

Mr. Gottschalk holds an A.B. degree and an honorary doctorate from Earlham College, and a Masters Degree from Indiana University. He is a former president of the American Fisheries Society and vice president of The Wildlife Society, and holder of its prestigious Leopold Award. He was given a special conservation award by the National Wildlife Federation, the Distinguished Service Award by the Department of the Interior, and holds his Association's Seth Gordon Award.

A man who enjoys the fruits of his labors, Mr. Gottschalk is an amateur naturalist, with a "life bird-list" of more than 550 North American Birds, and he is also a dedicated hunter and fisherman.

Friday, October 2, 1981

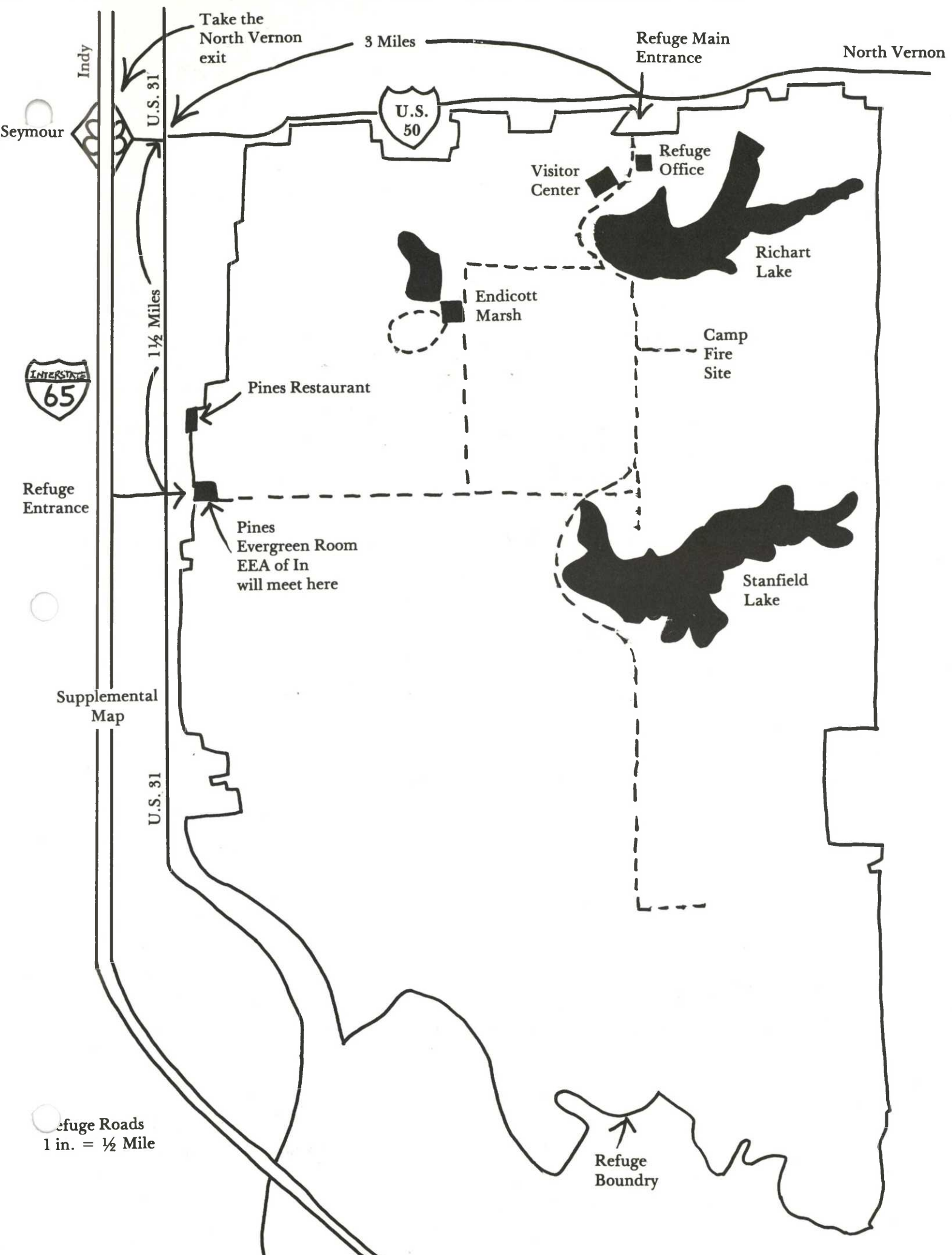
8:00 p.m.	Campfire:	Campfire Site
	Herbert Montgomery: "Stories in the Sky"	
	Music: Bring an instrument of just relax and sing or socialize around the campfire	

Saturday, October 3, 1981

6:40 a.m. Sunrise	Fishing or canoeing (on your own) in Stanfield Lake	
6:40 a.m. Sunrise	Visitor Center: Birding on the refuge by Ed Wagner	
8:30 a.m.	Visitor Center: Registration — for Saturday-only participants — \$3.00	
9:00 a.m.	Concurrent Sessions	
9:00 a.m.	Session XIV	Endicott Marsh
	Speaker: Larry Enochs IUPUI Columbus Campus	
	Title: Teaching Environmental Responsibility in the Jr. High School	
9:00 a.m.	Session XV	Visitor Center
	Speaker: Mary Latham, Assistant Naturalist Children's Museum Indianapolis, IN	
	Title: Environmental Education Program of the Children's Museum (On and Off Site)	

Saturday, October 3, 1981

10:00 a.m.	Session XVI	Visitor Center
	Speaker: Curt Hahn, Director of Video Education Teaching Instruction (VETI)	
	Title: Video Classroom Aids	
	Contemporary methods of classroom instruction with emphasis on nature	
10:00 a.m.	Session XVII	Endicott Marsh
	Speaker: Elvin E. East Indiana University	
	Title: Outdoor Workshops	
	A participation-type session demonstrating techniques for conducting outdoor workshops	
11:00 a.m.	Session XVIII	Endicott Marsh
	Speaker: John Garner Cloverdale High School	
	Title: Outdoor Understanding Topics (OUT)	
11:00 a.m.	Session XIX	Visitor Center
	Speaker: David Wright, Associate Director Camp Tecumseh, YMCA Outdoor Center	
	Title: Sunship Earth Concepts	
	An organized approach to environmental education. Mr. Wright's program is based on Steve Van Matre's seven basic concepts	
12:00	End of Conference	
12:00	Meeting of New Board of Directors at Refuge Office	



Indy

Seymour



U.S. 31

3 Miles



Refuge Main Entrance

North Vernon

Visitor Center

Refuge Office

Richart Lake

Endicott Marsh

Camp Fire Site

Pines Restaurant

Refuge Entrance

Pines Evergreen Room
EEA of In
will meet here

Stanfield Lake

Supplemental Map

U.S. 31

Refuge Roads
1 in. = 1/2 Mile

Refuge Boundry

Conference Planning Guide

Name _____

Institution _____

Mailing Address:

Phone Number: _____

Please suggest possible EEAI Award Recipients:

Individuals _____

Organizations _____

School District _____

Since a conference is only as good as the participation of members, what areas would you like to participate in next year?

Environmental Studies (Technical) _____

Environmental Studies (General) _____

K-12 _____

Community Education _____

Public Policy _____

Teacher Education _____

International _____

Values, Attitudes, Lifestyle _____

Continuing Education _____

Other (List) _____

Would you like to be a presider, committee chairperson, moderator, paper presenter, or other?

State preferences: _____

If you wish to present a paper or other program part, could you have an abstract available by September 1, 1982?

Yes _____ No _____