

A NARRATIVE REPORT
MINGO NATIONAL WILDLIFE REFUGE
January - December, 1969

PERSONNEL

John E. Toll.....Refuge Manager
Stephen S. Berlinger.....Ass't Refuge Manager
Howard G. Shelton.....Clerk-Typist
Audrey Walk.....Mechanic, HD
Howard D. Gaines.....Operator General
Richard L. Sebree..(EOD-5/19).....Maintenance man
Lonzo E. Hassel...(Deceased-5/30).....Maintenance man

Seasonal Permanent (May thru September)

Charles A. Walk.....Tractor Operator
Charley E. Hargrove.....Dragline Operator

U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
PUXICO, MISSOURI



Jack Toll



Steve Berlinger



Audrey Walk



Howard Shelton



Howard Gaines



Rich Sebree

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I. GENERAL

A. Weather Conditions

	<u>Month</u>	<u>Precipitation</u>		<u>Max.</u>	<u>Min.</u>
		<u>Normal</u>	<u>Snowfall</u>	<u>Temp.</u>	<u>Temp.</u>
January	<u>10.74</u>	<u>4.26</u>	<u> </u>	<u>61</u>	<u>7</u>
February	<u>1.76</u>	<u>2.76</u>	<u> </u>	<u>61</u>	<u>18</u>
March	<u>2.90</u>	<u>4.40</u>	<u> </u>	<u>79</u>	<u>19</u>
April	<u>6.10</u>	<u>4.33</u>	<u> </u>	<u>83</u>	<u>33</u>
May	<u>1.57</u>	<u>5.52</u>	<u> </u>	<u>92</u>	<u>40</u>
June	<u>.81</u>	<u>3.57</u>	<u> </u>	<u>100</u>	<u>44</u>
July	<u>3.28</u>	<u>4.03</u>	<u> </u>	<u>102</u>	<u>63</u>
August	<u>.91</u>	<u>2.28</u>	<u> </u>	<u>104</u>	<u>60</u>
September	<u>2.54</u>	<u>4.21</u>	<u> </u>	<u>94</u>	<u>48</u>
October	<u>4.29</u>	<u>3.69</u>	<u> </u>	<u>89</u>	<u>29</u>
November	<u>2.29</u>	<u>3.46</u>	<u> </u>	<u>73</u>	<u>20</u>
December	<u>4.36</u>	<u>3.45</u>	<u>14</u>	<u>63</u>	<u>16</u>
Annual Totals	<u>41.55</u>	<u>46.71</u>	<u>14</u> Extremes	<u>104</u>	<u>7</u>

The above data was obtained from the U. S. Corps of Engineers at Wappapello Dam located approximately 3/4 mile from the southwest corner of the refuge.

The annual precipitation was only slightly below normal but precipitation for the summer months was far below normal.

High and low temperatures were slightly above normal for this area.

B. Habitat Conditions

1. Water

Water conditions were not desirable this year. Heavy spring rains prevented an early draw-down of Monopoly Marsh. Because of dry weather this fall, Monopoly Marsh and several moist soil plant units were not reflooded early enough to allow substantial waterfowl utilization. (See Fig. 1.)



Figure 1. In November, only 300 acres of Monopoly Marsh (3,500 acres) were flooded.

Rockhouse Cypress Marsh (2,000 surface acres) was not drawn-down this year but evaporation had reduced the water level by 1.8 feet by November.

Fall water levels were too low to flood any lowland forested areas; therefore, no "green tree impoundments" were created for waterfowl use.

In late October two moist soil plant units (160 acres) were flooded via our 1,800 g.p.m. pump. Flooding made the seed crop of wild millet (Echinochloa sp.) and smartweed (Polygonum sp.) available to waterfowl.

2. Food and Cover

The draw-down of Monopoly Marsh was not completed until August or three months too late for optimum wild millet and smartweed production. Some dense stands of smartweed did develop on the higher knolls. (See Fig. 2.)



Figure 2. Dr. Leigh Fredrickson (left), Manager Toll (center), and Carl Korschgen checking moist soil plants in Monopoly.

The late draw-down of Monopoly did produce an estimated 1,500 acres of meadow fescue (Festuca elatior) and 1,500 acres of cup plant or loose strife (Ammannia sp.) which yielded considerable amounts of seed.

Germination of wild millet and smartweed on our moist soil plant units was excellent this spring, but a prolonged drouth greatly reduced the seed production.

Although mast production was high, no mast was available to waterfowl because forest areas were not flooded. The mast crop was utilized heavily by deer, turkey, and squirrels.

Corn and soybean production on the refuge ranged from poor to good depending on the date of planting and the maturing rate of the seed. Early planted and fast maturing corn and soybeans had good yields, but late planted crops failed because of the summer drouth.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl

a. Geese

Our wintering flock of Canada Geese peaked at 12,000 this spring. This was 4,000 less than the peak in 1968. The 1969 winter population has reached 12,000; hence, a 1970 spring peak may well exceed that of 1969.

Seven White-fronted Geese were seen this spring but none were observed this winter.

Blue and Snow Goose populations peaked at 300 or only 15 more than last year.

Peak goose populations during the last 10 years are shown in the following table.

<u>YEAR</u>	<u>CANADA GEESE</u>	<u>BLUE & SNOW GEESE</u>
1960	7,000	1,000
1961	7,000	250
1962	7,000	250
1963	6,000	150
1964	6,500	300
1965	8,000	100
1966	8,000	1,100
1967	12,000	4,000
1968	16,000	285
1969	12,000	300

This spring, as in the past, the majority of geese fed in corn fields located at the north end of the refuge. By mid-March large amounts of corn remained in fields. These fields were located primarily along the south end of the refuge. To minimize and possibly eliminate waste corn, our farming program was changed so that row crops were grown only on the north end of the refuge. The row crop fields on the south end have been converted to pasture and can be quickly changed back to row crops if necessary. This winter the geese continued to utilize corn on the north end. This should provide an ample supply to maintain the geese until migration begins. At least our present supply and demand is now in fairly good balance.

With our present objective to increase our wintering population of Canada's to 30,000, probably more corn will have to be grown in the future?

Rockhouse Cypress Marsh was the primary roosting site for geese during the spring, fall, and winter. This fall, when Monopoly began to flood, geese utilized the marsh heavily until it froze over in late December.

b. Ducks

High spring water levels resulted in good duck utilization on our rice fields, Rockhouse Cypress Marsh, and pin oak mast.

This summer all land that had been in rice production (530 acres) was converted to moist soil plants production. In late October two moist soil plant units (160 acres) were flooded to a depth of six inches. Excellent utilization by 10,000 to 15,000 ducks occurred on the units daily for 15 to 20 days. (See Fig. 3.)

Snow and cold weather occurred in late November and almost all open water on the refuge froze. The majority of ducks left the area. Later in November rainfall flooded about 1,600 acres of Monopoly Marsh. Although the water on the moist soil plant units was no longer frozen, all waterfowl on the refuge, and those being attracted to the area, began utilizing Monopoly. Daily utilization by 50,000 ducks occurred in late December when another cold wave moved into the area. Again, all open water on the refuge froze and almost all the ducks left.



Figure 3. Waterfowl use on moist soil plant unit #2. Good stands of wild millet and smartweed were produced.

In summary, the yearly overall refuge duck use days increased from 3,000,000 last year to 4,300,000 this year. However, fall and winter duck use days decreased by 500,000 from last year. Excellent spring conditions accounted for the boom, while abnormal fall conditions caused the bust.

Wood duck information is given in Section V.

c. Coots

No large concentrations of coots were observed this year. Populations peaked at 250 this spring and 100 this fall.

2. Other Water and Shore Birds

Estimates of the number of pied-billed grebes and little blue herons decreased from last year by 80 and 100 respectively. Fifteen cattle egrets were seen in the refuge pasture this fall.

Sora rails were less numerous this year, probably due to the extreme variations of our marsh habitat and the elimination of rice farming. Although the Monopoly draw-down created 3,500 acres of mud flats, shore birds were relatively scarce because the draw-down occurred too late in the summer.

3. Doves

Mourning doves remained abundant on the refuge and in the surrounding area. Southeast Missouri has some excellent dove hunting but not many hunters participate in the sport.

B. Upland Game

1. Bobwhite Quail

Several large coveys were seen in abandoned fields on the higher ground throughout the refuge. Although the population has not increased from last year, the coveys seemed to be more evenly distributed.

2. Turkey

Our turkey population increased to an estimated 100 birds. In past years turkey were seen primarily on the refuge periphery; where as, this year turkeys were seen throughout the refuge. The increased population and wider distribution enabled many visitors to see turkeys as they toured the refuge.

C. Big Game

The refuge white-tailed deer population remained stable at an estimated 600. A newly planted clover-fescue pasture attracted deer throughout the summer and fall. The pasture is located along a public use road and many people enjoyed viewing the deer.

D. Fur Animals, Predators, Rodents, and Other Mammals

1. Raccoon

The raccoon population remained stable at an estimated 1,000. Trappers removed 259.

Raccoon predation on wood duck nests in artificial cavities continued to decrease with only 1 percent occurring this year. (See Wood Duck Study - Section V.) The amount of predation which occurred on natural cavity nests was not known.

2. Mink

Mink were occasionally seen crossing roads or along ditch banks. The population remained stable as it has in the past.

3. Muskrat

Muskrat burrows in moist soil unit levees were still a problem this year. We increased the size of the exterior levees to reduce the problem. Trappers removed only 12 muskrats from a population estimated at 1,500.

4. Beaver

Beaver dams, although in several of the refuge drainage ditches, did not hamper our draw-down efforts as they did in past years.

One large beaver hut, located in the Natural Area, was seen easily from a bluff overlook. The situation served as a good demonstration area for school groups.

5. Predators

Red and gray fox rarely were seen on the refuge but local foxhunters reported many in the area.

Coyotes, locally called "wolves" were seen on only a few occasions and are not abundant.

Bobcat are uncommon **but** were seen along refuge ditches. A female and her three kittens were observed several times this spring near Red Mill Pond.

6. Rodents

Gray and fox squirrels were very common and were estimated at 10,000 and 3,000 respectively. It was surprising to see the number of visitors that get just as excited about seeing a squirrel as they do a deer, turkey, or etc. when they are touring the refuge. It's very encouraging, to see people enjoy and show an appreciation for the less magnificent, but none the less interesting, animals of the forest.

Woodchucks were seen frequently in our pastures and caused no problem. Visitors enjoyed seeing these animals which seem to cooperate, or tolerate, being observed much more than most wildlife.

7. Other Mammals

Our swamp rabbit and cottontail populations remained stable. The refuge has the only sizeable "swamper" population remaining in Southeast Missouri, estimated at 2,000. The extensive land clearing which occurred, and is continuing, in this part of the state has almost eliminated swamp rabbit habitat.

Duck Creek Wildlife Area, which borders the refuge, is heavily hunted but does contain some fair swamp rabbit habitat. This year no rabbit hunting was allowed on Duck Creek in an attempt to let the swamp rabbit population expand.

Although a river otter was seen in 1967 and 1968, none was seen this year.

E. Hawks, Eagles, Owls, and Crows

Hawks, owls, and crows were present in about the same numbers as last year. One osprey was observed flying over Rockhouse Cypress Marsh this spring.

Our wintering bald eagle population peaked at 10, which was one less than last year. Eight of the 10 were immatures which was encouraging.

F. Other Birds

The large blackbird roost which developed in 1967 failed to materialize again this year. We are sure that the Division of Wildlife Services will be as glad as we were.

G. Fish

High water in early spring provided some good gigging of non-game fish. As Monopoly Marsh began to drain, channel and bullhead catfishing became excellent. Fishing pressure quickly built-up as the word got around. The water levels in Monopoly and its accompanying drainage ditches continued to slowly decrease when in late June we experienced a fish kill of an estimated 100,000 pounds of fish. The kill was made up of 99 percent carp and buffalo. (See Fig. 4.)



Figure 4. When the kill first started we notified the public that we were draining Monopoly to let moist soil plants grow for waterfowl. We also encouraged them to take fish from the refuge by any means possible.

We had expected a fish kill due to the marsh drainage, but we had not expected one this large.

The fish kill could be attributed to the following factors: June temperatures were 90-100 degrees while only .81 inches of precipitation occurred, the silt load was excessive due to the cleanout of ditch #5, the draw-down was prolonged over a six month period, and Monopoly had not been drained since 1965.

In any event, the public outcry was tremendous. The sight of thousands of dead fish, let alone the smell, was far from pleasing. The Associated Press picked up the story and the news rapidly spread. (See Fig. 5.)

By early July no more fish were dying and the smell had become tolerable since high temperatures allowed for rapid decay. The whole event was climaxed by a visit from Congressman Bill Burlison who in a later news release commented on the fish kill and other refuge operations. (See Fig. 6.)

If our water management plan is approved, Monopoly will be drawn-down again in the spring of 1970. Fishermen will be encouraged to take rough fish by seining, gigging, dip-netting and snagging. News releases will be issued before the draw-down begins to inform the public of the liberalized fishing methods permitted. Since ditch #5 is now clean, hopefully a rapid draw-down can be achieved by mid-May; thereby, decreasing the possibility of a kill. However, if a late and prolonged draw-down occurred there would probably be another fish kill. But it would not be as large simply because there would not be as many fish in Monopoly because it was drained this year.

H. Reptiles

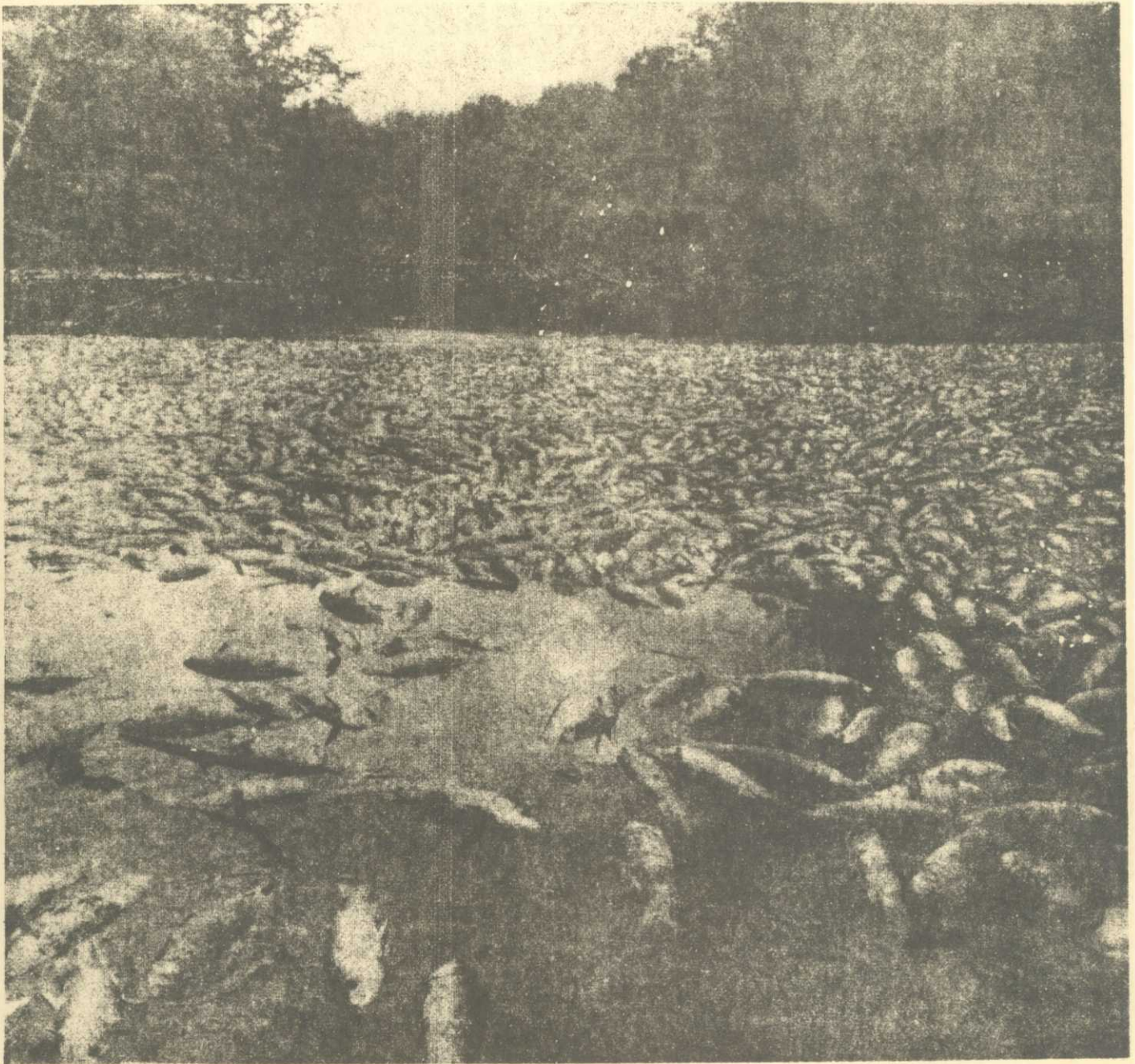
The most significant predator on wood duck nests in artificial cavities was the black rat snake. Fifteen percent predation lost was attributed to the black rat snake but this was still 18 percent less than last year. (See Wood Duck Study - Section V.)

Cottonmouth, copperhead, and canebrake rattlesnake populations remained in good numbers. Although they attract few refuge visitors, they are interesting to watch (at a safe distance).

OL. LX—No. 134

June 28, 1969

POPLAR BLUFF, MISSOURI 63901,



DEAD FISH FLOATING on the waters of the Mingo National Wildlife Refuge near Puxico are shown Friday afternoon. Refuge officials estimate at least 100,000 pounds of fish already have died, victims of oxygen depletion caused by overcrowding when the huge Monopoly Marsh was drained so that waterfowl food could be planted and

a ditch dredged out. Most of the fish shown are buffalo, but gamefish including crappie, channel catfish and bass also are dying. The view is at Flatbanks, a popular fishing spot in the refuge due west of Puxico. (Additional photo by John Stanard on Page 4 with The Outdoorsman column.

Figure 5. Corrections- we weren't going to plant anything and very few dead game fish were seen by any refuge personnel. But one picture is worth a thousand words.

FROM THE OFFICE OF:
BILL D. BURLISON, M. C.
10TH DISTRICT, MISSOURI

"BURLISON REPORTS ON MINGO INVESTIGATION"

WASHINGTON, D. C.---10th District Congressman, Bill D. Burlison, today commented on the results of an investigation he began in response to numerous letters and petitions concerning the operation of the Mingo Wildlife Refuge in Stoddard County, Missouri. Burlison's investigation encompassed personal inquiries and extensive correspondence with the U. S. Department of Interior and the Wildlife and Conservation subcommittee of the House Committee on Merchant Marine and Fisheries.

The outpouring of protest was triggered in late June when the huge Monopoly Marsh was drained, Burlison reported. The sudden draw-down in the midst of an unseasonable heat wave caused the destruction of over 100,000 pounds of fish. While insisting that the drawdown of Monopoly Marsh was in accordance with approved water management practices, the Department of Interior regretted the magnitude of the kill and admitted the public should have had more advance notice. Had adequate notice been given, Congressman Burlison believes, many of the fish could have been salvaged by local fishermen. As it was, the fish rotted in the heat and in a few days the stench was noticeable for miles.

Figure 6. A fair appraisal of the situation.

I. Disease

None observed.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

Refuge work projects accomplished by Mingo Job Corps were black topping two miles of road, re-blacktopping one mile of road, finishing construction of an eight stall equipment storage building (See Fig. 7.), building three miles of driveable dike around moist soil plant units, hauling railroad balast to headquarters, and making several signs for our archery deer hunting program.

The following list contains work projects accomplished by refuge personnel:

1. Development

- a. Constructed eight miles of levee around moist soil units
- b. Constructed six water control structures (See Fig. 8.)
- c. Posted six miles of hunting area boundary
- d. Developed two grassed waterways (See Fig. 9.)
- e. Seeded 30 acres of pasture to Garrison Grass
- f. Excavated 1,800 yds. of dirt at equipment building
- g. Extended airstrip 100 yards
- h. Dug 10 stock ponds
- i. Built portable photography blind
- j. Poured 100 foot curbing at headquarters
- k. Put in septic tank and new field at residence
- l. Installed 6X8 wooden entrance sign
- m. Made Canada goose flyway display at headquarters
- n. Converted air compressor to water pump power unit (See Fig. 10.)
- o. Put up information signs for archers
- p. Installed eight inch drains in interior levees on moist soil plant units

2. Maintenance

- a. Cleaned out $2\frac{1}{2}$ miles of Ditch #5. (See Fig. 11.)
- b. Clipped 50 miles of roadside
- c. Graded 40 miles of road
- d. Cleaned up bone yard
- e. Took down four miles of fence
- f. Repaired 4X4 Chevrolet rear-end
- g. Repaired brakes on 4X4 Dodge
- h. Adapted cutting blade to D-7
- i. Overhauled D-7
- j. Put oil seal in dragline
- k. Repaired 3010 John Deere
- l. Weekly clean-up of recreation areas
- m. Built up rollers on D-4 dozer
- n. Repaired two cattle guards
- o. Installed new water gauges
- p. Constructed new dump site
- q. Cut brush along roadside at curves
- r. Replaced water line from shop to headquarters



Figure 7. Job Corps did an excellent job in constructing this 8-stall equipment storage building at refuge headquarters.



Figure 8. Levees were pushed-up and seeded, and stop-log structures were constructed on most of our moist soil plant units.



Figure 9. Spring rainfall caused severe erosion on a newly seeded pasture at Flatbanks. This 12 foot waterway eliminated the problem.



Figure 10. Audrey Walk, our heavy duty mechanic, converted a surplus air compressor and power unit into a water pump power unit at an estimated cost savings of \$2,300.00.



Figure 11. Ditch #5, the main drainage ditch for Monopoly Marsh, had not been cleaned since being constructed in 1915 and had completely silted full.

B. Plantings

1. Cultivated Crops

All farming was done by refuge permittees. Our program was changed so no green manure crops were planted and a straight two year corn-soybean rotation was initiated.

Soil samples were taken by the refuge on all farm units and fertilizer was applied in amounts indicated by the tests.

Even with the adverse summer weather conditions corn and soybean yields were only slightly below average at 48 bu./acre and 22 bu./acre respectively.

2. Aquatics and Marsh Plants

None.

3. Trees and Shrubs

None.

4. Upland Herbaceous Plants

None.

C. Collections and Receipts

None.

D. Control of Vegetation

The Monopoly Marsh draw-down was too late to permit any mechanical vegetation control.

We had planned to spray 250 acres of willow in Rockhouse Cypress Marsh with 2,4-D, but now plan to cut the willow using a D-7 and cutting blade purchased with money that would have been used for 2,4-D.

Farm permittees used various approved herbicides to control weeds in corn and soybeans with good-to-fair success.

E. Planned Burning

None.

F. Fires

No fires occurred on the refuge but refuge personnel and equipment were used in assisting state firefighters on one occasion.

IV. RESOURCE MANAGEMENT

A. Grazing

Five hundred ninety-five acres of cropland where little waterfowl use had occurred were converted to pasture. Orchard grass, tall fescue, and ladino clover in respective 6-6-1 pounds/acre mixtures were sown. These pastures will be fenced this spring and will not be grazed until next spring. Ten stock ponds were dug to facilitate the program. (See Fig. 12.)



Figure 12. Howard Gaines, our operator general, fullthrottled a D-7 to build one pond per day.

Our four established pastures (372 acres) were subject to 1,061 A.U.M.'s of grazing by cattle. The grazing fee was \$1.00 per A.U.M; however, permittees were required to apply fertilizer top dressing in dollar amounts equal to their total A.U.M.'s X \$1.00.

B. Haying

None.

C. Fur Harvest

Trapping was permitted everywhere on the refuge except in the Natural Area. Eleven trappers participated in the program this year as compared to nine last year.

Water levels were low and a late December freeze-up resulted in a poor trapping success. The fur market crash added little incentive to the trappers enthusiasm. (See Table A.)

Table A.

	<u>1968 Season</u>	<u>1969 Season</u>
	<u>Unit Price</u>	<u>Unit Price</u>
Beaver	10.80 ea.	5.50 ea.
Muskrat	1.15 ea.	.55 ea.
Mink	12.00 ea.	5.00 ea.
Raccoon	5.25 ea.	1.80 ea.

D. Timber Removal

None.

E. Commercial Fishing

None.

F. Other Uses

None.

V. FIELD INVESTIGATIONS AND APPLIED RESEARCH

A. Moist Soil Plant Study

The climate and physiography of the Refuge are not conducive to stable production of row crops. During wet years low sites are flooded, and during dry years high sites are subject to drought. In 1969 530 acres of land with low topography were converted from rice and row crops to moist soil units for the production of naturally occurring vegetation for waterfowl food.

In June, 1969, a contract for research on productive capacities of moist soil habitats was established with Gaylord Laboratory through the Missouri Cooperative Wildlife Research Unit. Field work was initiated in March when areas were selected for the project.

The study has two phases. Initially, techniques will be developed for maximum production of moist soil plants for waterfowl food. The general requirements for production of moist soil plants are known from other studies but specific needs for Mingo are in question. Later the utilization of foods by waterfowl will be studied.

Only 30 acres of belt transect in the 530 acres of moist soil units will be studied intensively. Soil samples were taken prior to the growing season to determine numbers and diversity of seeds available. Samples were taken with a device designed from a grease gun by Audrey Walk. Workable samples can be taken rapidly from clay soils that are damp or those covered with a foot or more of water. (See Figs. 13 and 14.)

Water conditions on the units were monitored by aerial photos and water gauges along the transects. At the end of the growing season diversity and density of plants was measured. Because a graduate student was not found for the project, measurements of standing crop and seed production were not made.

Soil samples are not completely analyzed. Vegetation was sampled in a 2100 by 200 foot belt transect. Diversity was determined by a point count transect at one foot intervals parallel to the length of the belt. Density was measured in 20 X 50 cm. quadrats at 50 foot intervals along the line transect. In moist soil unit 2, the drier half of the transect (Section A) was not covered with water after April 4. The other half (Section B) had standing water until April 28, the date of draw-down.



Figure 13. Soil samples were taken to determine numbers and diversity of seeds available.



Figure 14.

This soil sampling "gun" made taking 480 samples a relatively easy job.

The mean density of all plants was the same for both sections of the transect. (A with 42 stems/m² vs. 42.3 stems/m² for B) Echinochloa frumentacea and E. crus-galli were found in the same densities in each section. (Table 1.) Smartweed (Polygonum pennsylvanicum and P. lapathifolium) were found only in section A.

The diversity of plants throughout the transect was similar, but numbers of each species varied according to location. A greater percentage of plants (millet and smartweed) of known value to waterfowl was found in the wetter section (Table 2). E. frumentacea was evenly distributed along the line but E. crus-galli was more common in Section B according to point count data. The difference between the uniform stem counts in quadrats and the increased plants in the point count (26% vs. 55%) can be explained by the growth form of E. crus-galli. In the wetter section, this species tended to stool and form more heads from each individual plant. The result being an increased point count for E. crus-galli.

Table 1. Mean number of stems/m² of plants in moist soil unit 2 on Mingo National Wildlife Refuge after the 1969 growing season.

	stems/m ²	
Species	Section A	Section B
<u>Panicum</u> sp.	23.8	3.1
<u>Digitaria</u> sp.	8.5	33.8
<u>Echinochloa frumentacea</u>	4.0	0.5
<u>Echinochloa crus-galli</u>	1.0	4.0
<u>Polygonum</u> sp.	0.2	0.0
<u>Cyperus</u> sp.	2.6	0.2
Forbes	1.9	0.5
Total	42.0	42.3

Table 2. Percentage of desirable waterfowl seed plants along a line transect in moist soil unit 2 on Mingo National Wildlife Refuge in 1969.

	Percent	
Species	Section A	Section B
<u>Echinochloa crus-galli</u>	14	46
<u>Echinochloa frumentacea</u>	9	9
<u>Polygonum</u> sp.	6	1
Total	26	56

Moist soil unit 4 was less productive of waterfowl foods than unit 2. Panic grass (Panicum sp.) and ragweed (Ambrosia sp.) were present at 75% of the points along a 3600 foot line transect. (Table 3) Both species are more xerophilous than waterfowl food plants and were found on the higher dry sites. Smartweed (Polygonum sp.), millet (E. crus-galli), and Ricecut Grass (Leersia oryzoides) were found at 10% of the points in the transect. In unit 4, millet usually grew as a single spike rather than in a clump.

The mean number of plant stems/m² was 71.5 in unit 4. The greater density of plants in unit 4 was the result of dense stands of rank, non-branching panic grass. Both smartweed and millet have a density of 1.9 stem/m². Ricecut grass had a density of 9.6 stems/m² and was second only to panic grass (54 stems/m²) in density in unit 4.

Table 3. Percentage of plants along a line transect on moist soil unit 4 on Mingo National Wildlife Refuge after the 1969 growing season.

<u>Species</u>	<u>Percentage</u>
<u>Panicum sp.</u>	47
<u>Ambrosia sp.</u>	23
<u>Digitaria sp.</u>	2
<u>Echinochloa crus-galli</u>	3
<u>Polygonum sp.</u>	3
<u>Leersia sp.</u>	6
<u>Bidens sp.</u>	10
<u>Cyperus sp.</u>	1
<u>Eleocharis sp.</u>	1
Other Forbes	1

Table 4. Mean number of stems/m² of plants in moist soil unit 4 on Mingo National Wildlife Refuge after the 1969 growing season.

<u>Species</u>	<u>Stems/m²</u>
<u>Panicum sp.</u>	54
<u>Digitaria sp.</u>	0.4
<u>Ambrosia sp.</u>	1.9
<u>Echinochloa crus-galli</u>	1.9
<u>Cyperus sp.</u>	0.4
<u>Leersia sp.</u>	9.6
<u>Carex sp.</u>	0.6
<u>Bidens sp.</u>	0.4
<u>Eleocharis sp.</u>	0.6
<u>Polygonum sp.</u>	1.9
Total	71.5

B. Wood Duck Study

The wood duck study started on Mingo National Wildlife Refuge in 1966 was continued in 1969. Primary objectives of the project are: (1) to study the results of increasing the number of nesting boxes on the Refuge in order to evaluate this technique as a means for expanding a wood duck population and (2) to develop a method for censusing wood ducks on the Refuge. This was the last year for some aspects of the study, but nest box checks and banding incubating females will continue in 1970.

Wood duck production from nest boxes increased again in 1969. Production of wood ducks for the four years has been 166, 320, 494, and 782. This increase occurred in 1969 even though the number of boxes available decreased from 270 in 1968 to 200 in 1969. Just before the 1969 nesting season, 62 old nest boxes in which predation had been the most severe were removed. The results was quite striking as nesting success in old boxes increased from 25 percent in 1968 to 58 percent in 1969, and nesting success in all boxes increased from 43 percent to 70 percent.

Seventy-two percent of the wood duck females captured in boxes in 1968 returned in 1969, suggesting a high survival rate for the population. Twelve web-tagged wood ducks also returned to nest in 1969 for the first time. Nine of these had hatched within two miles of the box where they nested, but three hatched in boxes at Duck Creek Wildlife Area, about five or six miles away. Severe competition for nest boxes at Duck Creek apparently resulted in some females searching elsewhere for nest sites.

Black rat snakes were again the major nest predators in the boxes, but they destroyed only 15 percent of the wood duck nesting attempts, compared to 33 percent the previous year. The reduction in predation rate was due primarily to removal of the 62 old boxes. Marking of individual snakes by removal of post-anal scales in 1967 and 1968 established that the same snakes continue to destroy wood duck nests from year to year. More evidence for this conclusion was collected in 1969, as 17 of 20 snakes found in nest boxes had been previously marked. Snakes found in nest boxes this year were collected and released

about 15 miles away. This probably helped to reduce snake predation, and it should help in future years as well.

Spring flight counts, brood counts, and roost counts were continued in 1969, but counts were made less frequently. The flight counts suggested that there was little change from 1968 in the wood duck breeding population, but brood counts and roost counts indicated a decrease in wood duck production for the area. Spring flight counts and roost counts appear to be useful as population indices, but brood counts may be questionable because of changing water conditions on the Refuge.

WOOD DUCK NESTING DATA

Mingo National Wildlife Refuge

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Boxes available	125	263	270	200
Nesting Attempts	61(49%)*	73(28%)*	100(37%)*	98(49%)*
Successful	15(25%)	31(42%)	43(43%)	69(70%)
Predation--Black rat snake	22(36%)	22(30%)	33(33%)	15(15%)
Predation--Raccoon	11(18%)	4(5%)	3(3%)	1(1%)
Predation--Starling	0	5(7%)	9(9%)	0
Desertion	13(21%)	11(15%)	12(12%)	13(13%)
Ducklings hatched and left box	166	320	494	782
Nesting females captured	23	38	47	69
Females returning from previous year	--	15(65%)	20(53%)	34(72%)

* = Percent usage (nesting attempts/available boxes)

IV PUBLIC RELATIONS

A. Recreational Uses

We had a considerable decrease in our overall public use from 89,000 last year to 76,000 this year. Over half of our total public use was by fishermen and the fish kill ended that type of recreation about two months early.

Our self-guided auto tour route (25-miles long) was open every Sunday afternoon during October and November. This year the route went through the Natural Area and attracted more visitors. The tour route was more enjoyable since it passed two moist soil units where heavy concentrations of waterfowl were located.

A two mile auto route around Red Mill Pond was left open all year. We had hoped that people interested in seeing waterfowl would take advantage of the short tour. But use by people and waterfowl was light.

A large cypress stump was transported from Monopoly Marsh to the lawn next to refuge headquarters. The stump has served as a visitor attraction and has also given visitors a true perspective of cypress that were once in the area. (See Fig. 15.)



Figure 15. It makes a nice hiding place from mom too.

B. Refuge Visitors

<u>Date</u>	<u>Name</u>	<u>From</u>	<u>Purpose</u>
1/15	Gerald Cummings	Havana, Illinois	Area Biologist
1/23	Marvin Duncan	Regional Office	Public Use - Planning
2/4	Wayne Sanders	Jeff. City, Mo.	Enforcement
2/26	Paul Bydler	St. Louis, Mo.	Procurement - GSA
3/3	Phillip Morgan	Regional Office	Planning
3/5	Donald Boyd	" "	"
3/5	Ed Stevenson	" "	Engineering
3/5	Ray Wright	" "	"
3/20	Lynn Greenwalt	" "	Planning
3/20	Phillip Morgan	" "	"
6/4	C.H. Wilson	Mo.Cons. Dept.	Refuge tour
7/4	Bill Burlison	Congressman, Mo. 10th District	Investigation of fish kill and closing of Egypt gate on refuge.
7/5	Joe Richey	Regional Office	Contract Inspection
7/5	Clark Wingard	" "	" "
8/22	Douglas Duff	Mo. University	Study-tour
9/4	R.W.Burwell & wife	Regional Office	Refuge Planning and meeting personnel
9/16	Ron Easton	Regional Office	Engineering
9/18	Mark Sullivan	Mo. Cons. Dept.	Tour refuge
9/25	Lyle Miller	Regional Office	Discuss Safety
9/26	V. Dorairaj	India - with Dept. of State, Agency for Interior Devel- opment.	Refuge tour
12/17	John Umberger	Regional Office	Discuss location of Sanitary landfill for Job Corps.
12/17	John Langenback	Regional Office	" " "

C. Refuge Participation

This year was one of our busiest for field work, but we still maintained a public relations program. A list of accomplishments for the year follows:

<u>Month</u>	<u>Event</u>
January	Toll, Berlinger, Shelton attended a Boy Scout dinner honoring Lonnie Hassel and Dr. Skillings (local Dr.) for many years of service. Toll acted as M. C. Berlinger and Shelton attended a Seminar at Gaylord Laboratory on parasitism in Redhead and Blackheaded Ducks by Dr. M. W. Weller.

- February Shelton's son, Steve, made Eagle Scout. Shelton, his wife, and Manager Toll attended ceremonies and provided transportation for the troop to Cape Girardeau to participate in the activities.
- March Berlinger accompanied Dr. Crouch and 6 Eagle Scouts on a bird field trip on the refuge. Toll made a camp-out with Explorer Scouts on the area.
- April Shelton conducted tour of refuge with 55 fifth graders from Puxico.
- May Shelton went with 5 school groups of 270 children of different ages from southeast Missouri on tours of the refuge. Manager Toll presented slide talk to 15 Rotary Club members at Chaffee, Missouri. Shelton assisted with boy scout pre-camporee training, Mr. Toll went with this same group to Camp Lewallen on camporee. Ninety Wayne County Saddle Club members went on trail ride through the Refuge.
- June
night Toll went with group of Explorer Scouts on overnight campout at Jacks Fork river. Mr. Berlinger took instructor and 5 Biology students on study-tour of Refuge.
- July Shelton and Berlinger accompanied Congressman Bill Burlison, Mr. Burlison's father and brother, Mayor Smith from Puxico, and Mr. Hodge from the Puxico Press on a general observation and information tour of Refuge concerning the fish kill. Mr. Toll spent day with newsman John Stanard from Poplar Bluff, explaining the fish kill, how it happened and the Refuge plans and objectives.
- August Manager Toll spent two days with Bill Royce, photographer for the Ozark Graphic Magazine, taking pictures for story about the refuge. Mr. Toll also made slide talk and toured the area with 12 Assembly of God Rangers and 7 adults from St. Louis.
- Sept. Numerous contacts were made by all refuge staff answering questions about the up-coming archery season.

- Oct. Mr. Toll gave talk and toured area with 15 Ecology students from Southwest Missouri State College, 12 members of the Business & Professional Womens Club of Cape Girardeau, and 25 State Game Agents and Duck Creek personnel. Steve Berlinger presented slide talk, toured and discussed the refuge with 10 members of the Kennett Federated Garden Club of Kennett, Missouri.
- Nov. Scheduled talks were discontinued for the month because all personnel assisted with the deer archery season.
- Dec. Berlinger presented slide talks and toured refuge with 34 Biology students from Jackson and 35 college students from Cape Girardeau, Missouri.

D. Hunting

This was the third year that archery deer hunting was permitted on the refuge. This year 2,500 additional acres were opened to hunting, bringing the total to 6,500 acres. Special permits were issued to 1,385 hunters, 175 less than last year. Archers were allowed to drive into the hunting area and parking was provided at five designated areas. (See Fig. 16.) Last years total kill was 25 deer. This year 36 deer were killed of which 26 were bucks. (See Fig. 17.)

The first refuge squirrel hunt will open in June, 1970. The squirrel hunting area will be the same as the area presently open to archery deer hunting.

Although no duck hunting was permitted on the refuge, this year we significantly contributed to the hunting success on Duck Creek State Wildlife Area which is adjacent to the refuge. The two moist soil plant units flooded in October were only one-half mile from the Duck Creek boundary. Several thousand ducks, after feeding in our moist soil plant units, would fly to Duck Creek. In the past, we have had enough water areas on the refuge to hold ducks both day and night. But this year with our lack of water and flooded waterfowl foods, the ducks moved to other areas to loaf. Hunter success on Duck Creek was the second highest in the area's history. A total kill of 6,775 made this year the fourth highest kill ever to occur on that area.



Figure 16. More gravel would have been needed if we would have had the normal amount of rainfall.



Figure 17. This little white-tail field dressed at 187 pounds. (Signs made by Job Corps)

E. Violations

Few violations occurred this year. The fine cooperation of the State Game Agents, plus an extra State Agent in Wayne County evidently was helpful in reducing violations.

The following cases were made on or near the Refuge:

Robert and Darrel Black, 10/21, litter on Mingo National Refuge, plead guilty, fine \$50.00, CC \$11.00 each.

William L. Walker, 11/16, hunt on Mingo National Refuge, plead not guilty, found not guilty.

Jackie Duane and Buddy Leon Walker, 11/16, interference with officer in line of duty, plead not guilty, found guilty, fine \$50.00, CC \$11.00 each.

Herbert Morris, 11/16, refuse inspection of camper pickup, plead guilty, fine \$25.00, CC \$11.00.

Herbert Morris, 11/16, illegal possession and transportation of wild deer meat, plead guilty, fine \$50.00, CC \$11.00.

F. Safety

Ten formal safety meetings were held this year on the first Monday of each month. In addition to the monthly meetings, safety problems and suggestions were discussed each Monday morning at our work meetings. Personnel were encouraged to discuss and correct unsafe practices.

This station had no lost time accidents for 1969. We now have 1,683 days without a lost time accident.

VII. OTHER ITEMS

A. Items of Interest

Lonnie Hassel died on May 30, 1969 from lung cancer. Lonnie had been with the refuge since 1954. His love and interest in all kinds of wildlife will long be remembered by refuge personnel.

Richard Sebree was hired in May as our new maintenanceman. Richards first job was pouring a concrete curb next to headquarters. Rich did such a good job he ended up pouring concrete water control structures during the entire summer. Rich is a hard worker and we are glad to have him with us.

B. Job Corps

The refuge and Job Corps have become completely segregated. We no longer have work meetings together to discuss present or future projects. Much of their work is being done for the U. S. Forest Service at Poplar Bluff 25 miles away. We feel we have work projects on Mingo which could entail any kind of work Job Corps would care to do. But our suggested projects are either not acceptable or not adaptable to their program.

C. Egypt Gate

After receiving a petition from local residents protesting the closure of Egypt Gate, Congressman Bill Burlison challenged our right to close the gate at all. In fact, he suggested "that the complaintants remove the gate and force the government to demonstrate its authority in court".

The gate was legally closed by court order in 1953. Even after Congressman Burlison was notified that the gate had been legally closed, he said he would stand by his statement. At least the press seemed to be on our side this time and the gate is still standing. (See Fig. 18.)

D. Credits

Berlinger completed all of report except:

Shelton typed all of report and wrote I-A, VI-B,C,E,F

Fredrickson wrote V-A

Hansen wrote V-B

Toll wrote VII-B

Issued by Naeter Bros. Publishing Co.

Evenings Except Sunday

An Independent Newspaper

Cape Girardeau Oct. 31, 1969

Jesus said unto him, Thou shalt love the Lord thy God with all thy heart, and with all thy soul, and with all thy mind.—Matthew 22:37.

Who pays the piper?

We question the soundness of the advice Rep. Bill D. Burlison gave petitioners protesting a gate blocking a road into the Mingo Wildlife Refuge and doubt seriously his contention the route is a public road.

It is rather startling for a congressman, once a prosecuting attorney, to suggest that his constituents risk arrest in the quest of a remedy.

And that is exactly what the 10th District representative in Congress has suggested. He said he thought they should remove the gate to "force the government to demonstrate its authority in court."

What happens if the court finds the petitioners had no right to remove the gate — the probable result of any test of the government's authority? Is Rep. Burlison going to pay the fine or serve the sentence of those who took his advice?

Instances of this type are the cause of many problems facing the country today. If you don't believe in a law, or if something doesn't suit your fancy, break the law or take matters into your own hands.

We believe there are remedies in the courts available to the petitioners other than by removing the gate, being arrested and then letting the government bring the issue to trial.

Mr. Burlison might have been banking on the authorities at Mingo not to do anything if the gate were removed, thereby allowing the petitioners to win by default. But if the wildlife people, and the Depart-

ment of the Interior did so, how could they ever expect to enforce any regulations on the refuge?

Apparently our congressman didn't do any homework on the status of the road before he made his suggestion that the gate be removed in his belief this was a public thoroughfare.

Stoddard County records, as The Missourian reported Tuesday, show the road was vacated by the County Court on Nov. 2, 1953. By doing so the court declared this no longer was a public road. Its use since that time has been at the discretion of Mingo authorities who have kept it closed, until this year, for 5½ months out of the year without protest. This year it was closed permanently to provide better control of refuge management.

Mingo authorities told The Missourian there are only five employees to manage 22,000 acres of refuge. They said they closed the road to help offset poaching and prevent accidents from hotrodders. Other control factors also were involved.


It is our opinion that the Mingo authorities acted properly and in the public interest to close this road. There is another route open to the public in general, one that is most commonly used.

While a few, including a relative of Rep. Burlison, may be somewhat inconvenienced by the gate across the Egypt Gate Road, the best interests of the public require the road to be closed.

Figure 18. Extra - Extra - Read all about it!

SIGNATURE PAGE

Submitted by:


John E. Toll
(Signature)

Date: February 5, 1970

Refuge Manager
Title

Approved, Regional Office:

Date: 2-12-70


(Signature)

Regional Refuge Supervisor

WATERFOWL

REFUGE Hingo National Wildlife Refuge

MONTHS OF Jan. 1 TO April 30, 19 69

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	8,000	10,500	12,000	12,000	12,000	12,000	8,000	8,000	8,000	8,000
Cackling										
Brant										
White-fronted			7	7	7	7				
Snow				3	3				10	100
Blue									25	200
Other										
Ducks:										
Mallard	20,000	14,500	10,000	24,500	28,000	35,000	22,000	37,500	38,000	30,000
Black	100	200	100	1,050	750	750	400	500	1,000	1,000
Gadwall	300	300	100		1,000	500		500	250	500
Baldpate	500	1,000	100	1,750	2,000	1,500		1,000	250	500
Pintail	2,000	1,000	500	7,000	8,000	10,000	6,000	8,000	8,000	2,000
Green-winged teal	100			700	500	500	200			
Blue-winged teal										
Cinnamon teal										
Shoveler						50				100
Wood	100	300	50		200	200	200	200	200	250
Redhead										
Ring-necked						400	300	3,000	2,000	3,000
Canvasback										
Scaup, lesser									100	200
Goldeneye										
Bufflehead										
Ruddy										
Other										
Hooded Merganser			30		50		50	50	50	50
Coot:					20	40	40	50	100	250

(Rev. March 1953)

(Continuation Sheet)

Mingo National Wildlife Refuge

MONTHS OF **January 1** TO **April 30**, 19 **69**

(1) Species	(2) Weeks of reporting period								(3) Estimated	(4) Production	
	11	12	13	14	15	16	17	18	waterfowl days use	Broods: seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:	6,000	2,000							715,500		
Canada											
Cackling											
Brant									196		
White-fronted									812		
Snow									1,575		
Blue											
Other											
Ducks:	10,000	1,000	50	50	40	20	20		1,894,760		
Mallard	100	10							11,110		
Black	300	30					10		26,530		
Cadwall		30							53,110		
Baldpate	3,000	200							309,900		
Pintail	100	100							27,500		
Green-winged teal		100	300	100	100	100	100		16,100		
Blue-winged teal											
Cinnamon teal		10	20	50	50	200	100		1,060		
Shoveler	250	350	350	350	100	100	600		30,800	10	200
Wood							1		7		
Redhead	1,000	700	300	50	10				75,530		
Ring-necked	200								1,100		
Canvasback	50						10		2,730		
Scaup & Lesser											
Goldeneye											
Bufflehead											
Ruddy		1					1		35		
Worm-eating Warbler		50	50	50	50	50	50		1,060	6	80
Other	100		30	100	100	50	50		6,580		
Coots:											
Red-billed Grebe									20		
					(over)						

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	0	0	0	Principal feeding areas <u>Rockhouse Cypress, edges of</u>
Geese	718,083	12,000	0	<u>Monopoly Lake, and refuge corn fields.</u>
Ducks	2,558,290	50,000	280	Principal nesting areas <u>Artificial nesting boxes and</u>
Coots	6,580	250	0	<u>natural cavities.</u>
				Reported by <u>John E. Toll - Refuge Manager</u>

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

WATERFOWL

REFUGE Mingo

MONTHS OF May 1 TO August 31, 1969

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	10	10	10	10	10	10	10	10	10	10
Black										
Gadwall	10									
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal	50									
Cinnamon teal										
Shoveler	20									
Wood	700	850	850	900	900	900	900	900	900	900
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Hooded Merganser	80	120	120	120	120	120	120	120	120	120
Coot:	20	10	10							

(Rev. March 1953)

(Continuation Sheet)

Mingo

MONTHS OF

May 1

TC

August 31

, 19

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen: total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada											
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	10	10	10	10	10	30	30	100	2,171		
Black											
Gadwall											
Baldpate											
Pintail											
Green-winged teal						50	100	200	2,800		
Blue-winged teal											
Cinnamon teal											
Shoveler	900	900	900	900	900	900	900	900	111,300	30	
Wood										782	
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Buddy											
Hooded Merganser	120	120	120	120	120	100	100	100	14,420	5	
Other									280	169	
Coots:											
					(over)						

	(5)	(6)	(7)		SUMMARY
	Total Days Use	Peak Number	Total Production		
Swans				Principal feeding areas	Rockhouse Cypress marsh and
Geese				Red Mill Pond Area.	
Ducks	130,831	1,310	951	Principal nesting areas	Artificial nesting boxes
Coots	280	20	0	and natural cavities.	
				Reported by	Stephen S. Berlinger - Asst. Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

WATERFOWL

REFUGE Mingo

MONTHS OF Sept. 1 TO Dec. 31, 19 69

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:					50	50	120	1,500	2,000	2,000
Canada										
Cackling										
Brant										
White-fronted								5	5	10
Snow								20	50	70
Blue										
Other										
Ducks:	100	100	100	100	100	250	250	600	7,000	16,000
Mallard									200	200
Black						20	30	1,000	2,000	500
Gadwall						150	250	200	200	300
Baldpate						20	20	100	50	2,000
Pintail			200	100	100				100	400
Green-winged teal	200	200	300	50	50		10			
Blue-winged teal										
Cinnamon teal								200	50	50
Shoveler	900	900	900	1,000	1,000	1,000	1,000	1,200	1,200	2,000
Wood										
Redhead										100
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Hooded Merganser	100	100	100	100	100	100	100	100	100	100
Coot:							50	100		50

(Rev. March 1953)

(Continuation Sheet)

MONTHS OF **Sept. 1** TO **Dec. 31,** 19 **69**

(1) Species	(2) Weeks of reporting period								(3) Estimated	(4) Production	
	11	12	13	14	15	16	17	18	waterfowl days use	Broods: seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	3,000	5,400	5,400	5,400	6,000	6,000	9,000	12,000	405,140		
Cackling											
Brant											
White-fronted											
Snow		10			30				420		
Blue		90			70				2,100		
Other											
Ducks:											
Mallard	20,000	23,000	12,000	19,000	35,000	40,000	20,000	1,300	1,315,300		
Black	200	250	100	100	200	300	200	50	12,600		
Gadwall	1,000	100	50	50	50			20	31,740		
Baldpate	400	450	200	1,000	500	500	250	10	30,870		
Pintail	1,500	1,000	500	1,000	1,000	1,500	500	10	64,470		
Green-winged teal	500		50	100	50				11,300		
Blue-winged teal									5,880		
Cinnamon teal											
Shoveler	30	400	200	50					6,560		
Wood	2,000	2,000	700	700	500	500	250	50	124,600		
Redhead											
Ring-necked	100								1,400		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy	1								7		
Other											
Hooded Merganser	100	50	20	20	20				8,200		
Coots:	20								1,540		
					(over)						

	(5)	(6)	(7)	SUMMARY
	Total Days Use :	Peak Number :	Total Production :	
Swans	:	:	:	Principal feeding areas <u>Rockhouse Cypress Marsh,</u>
Geese	<u>107,960</u> :	<u>12,000</u> :	:	<u>Monopoly Marsh, and Company Farm Moist Soil Units.</u>
Ducks	<u>1,615,187</u> :	<u>42,800</u> :	:	Principal nesting areas _____
Coots	<u>1,540</u> :	<u>100</u> :	:	
				Reported by <u>Stephen S. Berlinger</u>

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS

(other than waterfowl)

Refuge Hingo NW RefugeMonths of Jan. 1 to April 30 19569

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Pied-billed Grebe	Winter	Resident	50	3/10	2	1/30				150
Great Blue Heron	Winter	Resident	15	3/30	1	1/20				30
Little Blue Heron	2	3/30	40	1/22	Summer	Resident				60
Green Heron	1	1/9	150	1/30	Summer	Resident				200
Yellow-crowned Night Heron	1	1/5	40	1/30	Summer	Resident				50
American Bittern	1	1/3	10	1/30	1	1/30				15
Common Egret	1	1/3	30	1/20	2	1/30				40
Cattle Egret	2	1/9	7	1/12	7	1/12				10
Double-crested Cormorant	2	1/6	4	1/21	2	1/28				6
Sandhill Crane	2	1/3	2	1/3	2	1/3				2
Sora	1	1/4	50	1/4	1	1/4				50
II. <u>Shorebirds, Gulls and Terns:</u>										
Killdeer	4	3/8	60	1/30	Summer	Resident				150
American Woodcock	2	3/14	80	3/25	Summer	Resident				150
Spotted Sandpiper	1	3/25	50	1/30	2	1/30				100

(over)

(1)	(2)	(3)		(4)		(5)		(6)
III. <u>Doves and Pigeons:</u>								
Mourning dove	Resident	1,000	4/30			100	200	2,000
White-winged dove								
IV. <u>Predaceous Birds:</u>								
Golden eagle	1	2	3/14	1	4/3			2
Duck hawk, Marsh	1	25	3/1	1	3/30			50
Horned owl, Great	Resident	50	4/30			10	30	50
Naggie Barred Owl	Resident	50	4/30			10	30	50
Raven Screech Owl	Resident	50	4/30			10	30	50
Crow	Resident	550	2/3					800
Bald Eagle	1	11	1/1	1	3/26			15
Turkey Vulture	Resident	50	3/15					100
Black Vulture	Resident	25	3/15					50
Sparrow Hawk	Resident	20	4/30					40
Red-tailed Hawk	Resident	100	4/1			20	40	120
Red-shouldered Hawk	Resident	100	4/20			20	40	120
Cooper's Hawk	Resident	20	4/30					20
Loggerhead Shrike	Resident	10	2/15					20
Osprey	1	1	4/18	1	4/19			1
Reported by <u>John E. Toll</u>								

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS

(other than waterfowl)

Refuge.....Mingo NW.....

Months of May 1 to August 31 1956

(1) Species		(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name		Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:											
Great Blue Heron	summer	resident		30	8/15	summer	resident				70
Green Heron	"	"		250	8/10	"	"				400
Little Blue Heron	"	"		250	7/25	"	"				300
Cattle Egret	4	5/4		4	5/4	4	5/4				10
Common Egret	summer	resident		50	7/1	summer	resident				70
Yellow-crowned Night Heron	"	"		30	5/20	"	"				60
American Bittern	1	6/1		20	6/1	1	7/7				30
Pied-billed Grebes	2	8/26		20	8/31						30
II. Shorebirds, Gulls and Terns:											
Killdeer	summer	resident		100	7/30	summer	resident		20	50	250
American Woodcock	"	"		100	8/30	"	"				150
Spotted Sandpiper	"	"		50	7/20	"	"				100
Forster's Tern	1	5/5		30	5/16	8	6/16				40
Black Tern	5	5/16		50	5/16	5	5/16				80

(over)

(1)	(2)	(3)		(4)		(5)		(6)
III. <u>Doves and Pigeons:</u>								
Mourning dove	Resident	1,200	8/25	Resident		200	400	2,000
White-winged dove								
IV. <u>Predaceous Birds:</u>								
Golden eagle								
Duck hawk								
Horned owl, Great	Resident	20						20
Magpie Screech Owl	"	20						30
Raven Barred Owl	"	50						50
Crow	"	500	8/1					1,000
Turkey Vulture	"	30						30
Black Vulture	"	10						30
Red-tailed Hawk	"	10						30
Red-shouldered Hawk	"	50				10	30	60
Sparrow Hawk	"	10						10
Loggerhead Shrike	"	30						30
						Stephen S. Barlinger		
						Reported by.....		

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge.....Platte NF RefugeMonths of.....Sept. 1 to.....Dec. 31, 1955

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Pied-billed Grebe	2	Sept.	6	Nov.	Winter	Resident				20
Great Blue Heron	Resident		30	Oct.	Resident					60
Belted Kingfisher	"		10	Sept.						20
Little Blue Heron	Summer	Resident	50	Sept.						100
Green Heron	"	"	200	Sept.						300
Yellow-crowned Night Heron	"	"	10	"						20
Common Egret	"	"	10	"						20
Cattle Egret	5	11/17	15	Nov.						20
Sora Rail	50	Sept.	100	Sept.						100
II. <u>Shorebirds, Gulls and Terns:</u>										
American Woodcock	Summer	Resident	30	Sept.	Resident					60
Killdeer	Resident		50	Sept.						100
Spotted Sandpiper	Summer	Resident	50	Sept.						100
Common Snipe	5	Sept.	10	Oct.	10	Oct.				20

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	Resident	1,000	Sept.	Resident	2,000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk, Marsh Horned owl, Great Magpie Screech Owl Raven Barred Owl Crow Turkey Vulture Black Vulture Bald Eagle Sparrow Hawk Red-tailed Hawk Red-shouldered Hawk Loggerhead Shrike	1 9/10 4 Sept. Resident " " " " " 2 11/15 Resident " " "	4 6 15 15 50 1,000 30 60 10 10 50 50 10	Nov. Nov. Dec. Dec. Dec. Dec. Dec. Dec. Dec. Dec. Dec. Dec. Dec.	Winter Resident " " Resident " " " " Winter Resident Resident " " "	4 10 30 30 100 2,000 60 120 10 20 100 100 20
Reported by <u>Stephen S. Berlinger</u>					

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Mingo NW For 12-month period ending August 31, 1969

Reported by Stephen S. Berlinger Title Asst. Refuge Manager

(1) Area or Unit Designation	(2) Habitat		(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage			
I	Crops	1,127	Ducks	2,134,511	140
	Timber Upland	5,760	Geese	524,552	325
	Marsh	2,133	Swans	0	
	Water	500	Coots	3,771	
	Total	9,520	Total	2,663,054	
II	Crops	528	Ducks	1,423,101	300
	Timber Upland	3,676	Geese	371,557	425
	Marsh	350	Swans	0	
	Water	3,000	Coots	2,661	
	Total	7,554	Total	1,797,319	
III	Crops	612	Ducks	1,185,918	160
	Timber Upland	3,760	Geese	196,708	201
	Marsh	0	Swans	0	
	Water	200	Coots	2,215	
	Total	4,572	Total	1,384,841	
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should be equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.
- (5) Production: Estimated total number of young raised to flight age.

3-1752
Form NR-2
(April 1946)

INSTRUCTIONS
UPLAND GAME BIRDS

Refuge Mingo National Wildlife Refuge

Months of January 1 to April 30, 1969

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite	5,000	10							500	
Turkey	10,000	166.6							60	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Hingo National Wildlife Refuge

Months of May 1 to August 31, 1969

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite	5,000	10	8	60					500	
Turkey	10,000	166.6	3	28					60	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Mingo National Wildlife Refuge

Months of Sept. 1 to Dec. 31, 19 69

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
		Acres Per Bird	Number broods observed	Estimated Total		Hunting	For Re- stocking	For Research		
Common Name	Cover types, total acreage of habitat				Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite	5,000	10							500	
Turkey	10,000	100							100	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-17F
Form NR-3
(June 1945)

BIG GAME

Refuge Mingo National Wildlife Refuge

Calendar Year 1969

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
			Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	15,000		36										600	1:1

Remarks:

Reported by _____

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1754
Form No. 4
(June 1945)

SMALL MAMMALS

Refuge Mingo National Wildlife Refuge Year ending April 30, 1969

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total	
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Popula- tion
								Permit Number	Trappers Share	Refuge share				
Mink				6					4	2	Sold	Locally		200
Maskrat				12					5	7	"	"		1,500
Beaver				19					9	10	"	"		150
Raccoon				25			105		187	67	"	"		1,000
Opossum				44					44	0				2,000
Red Fox				0					0	0				20
Gray Fox				0					0	0				50
Striped Skunk				3					3	0				300
Bobcat				3					3	0				50
Cottontail Rabbit														3,000
Swamp Rabbit							2							2,000
Gray Squirrel														10,000
Fox Squirrel														3,000
Wood Chuck														200

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

John E. Toll - Refuge Manager

Reported by _____

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- (1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)
- (2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed.
- (4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.
- (5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.
- REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

DISEASE

Refuge Mingo National Wildlife RefugeYear 19 69

Botulism

Lead Poisoning or other Disease

Period of outbreak None

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.) _____

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease None

Species affected _____

Number Affected Species	Actual Count	Estimated
_____	_____	_____
_____	_____	_____
_____	_____	_____

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

Remarks: _____

3-1758
Form NF
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Mingo National Wildlife Refuge County Stoddard State Missouri

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested Acres	Bu./ Tons	Unharvested Acres	Bu. /Tons			
Corn	18	778			9	383	27	Clover for Browse	20
Soybeans	315	6,297	105	2,099			420	Pasture land for Goose Browse	80
								Fallow Ag. Land.	0

No. of Permittees: Agricultural Operations 5 Haying Operations 0 Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	43	246.25	\$324.50	117
				2. Other				
				1. Total Refuge Acreage Under Cultivation				
Hay - Wild			2. Acreage Cultivated as Service Operation					

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Mingo National Wildlife Refuge County Ney State Missouri

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested Acres	Bu./Tons	Unharvested Acres	Bu./Tons			
Corn	218	10,503			107	5,173	325	Pasture land for Geese Browse	40
Soybeans	273	6,903	91	2,301			364		
								Fallow Ag. Land.	0

No. of Permittees: Agricultural Operations 9 Haying Operations 0 Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	136	215	\$215.00	255
				2. Other				
				1. Total Refuge Acreage Under Cultivation				689
Hay - Wild				2. Acreage Cultivated as Service Operation				

DIRECTIONS FOR PREPARING FORM NR--8,
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

Totals:	372	1,061.25	\$1,139.50
Acreage grazed.....		Animal use months.....	Total income Grazing.....
Acreage cut for hay.....		Tons of hay cut.....	Total income Haying.....

TIMBER REMOVAL

Refuge Mingo National Wildlife Refuge Year 1956

[illegible]

Total acreage cut over..... Total income.....

No. of units removed B. F. Method of slash disposal.....
Cords.....
Ties.....

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number

Reporting Year

1969

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) May and June	Broadleaf weeds in corn	Various cropland areas on the refuge	300	2-4-D Amine	150 lbs.	½ lb/ac.	Water 10 gal/ac.	Broom Sprayer
(2) May and June	Broadleaf weeds in soybeans	Various cropland areas on the refuge	200	Trifluralin (Treflan)	300 lbs.	1½ lb/ac.	Water 10 gal/ac.	Ground Equip.
(3) May and June	Weeds in corn	Various cropland areas on the refuge	50	Atrazine	50 lbs.	1 lb/ac.	Water 10 gal/ac.	Ground Equip.

10. Summary of results (continue on reverse side, if necessary)

- (1) Good to excellent control.
- (2) Fair to good control depending on circumstances of application.
- (3) Good to excellent control.

WATERFOWL

REFUGE Mingo

MONTHS OF Sept. 1 TO Dec. 31, 19 69

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada					50	50	120	1,500	2,000	2,000
Cackling										
Brant										
White-fronted										
Snow								5	5	10
Blue								20	50	70
Other										
Ducks:										
Mallard	100	100	100	100	100	250	250	600	7,000	16,000
Black									200	200
Gadwall						20	30	1,000	2,000	500
Baldpate						150	250	200	200	300
Pintail						20	30	100	50	2,000
Green-winged teal			200	100	100				100	400
Blue-winged teal	200	200	300	50	50		40			
Cinnamon teal										
Shoveler								200	50	50
Wood	900	900	900	1,000	1,000	1,000	1,000	1,200	1,200	2,000
Redhead										
Ring-necked										100
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Hooded Merganser	100	100	100	100	100	100	100	100	100	100
Coot:							50	100		50

(Rev. March 1953)

WATERFOWL

(Continuation Sheet)

REFUCE Mingo National Wildlife Refuge

MONTHS OF Sept. 1 TO Dec. 31, 1969

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen: total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	3,000	5,400	5,400	5,400	6,000	6,000	9,000	12,000	405,440		
Cackling											
Brant											
White-fronted											
Snow		10			30				420		
Blue		90			70				2,100		
Other											
Ducks:											
Mallard	20,000	23,000	12,000	10,000	35,000	40,000	20,000	1,300	1,315,300		
Black	200	250	100	100	200	300	200	50	12,600		
Gadwall	1,000	100	50	50	50			20	33,740		
Baldpate	400	450	200	1,000	500	500	250	10	30,870		
Pintail	1,500	1,000	500	1,000	1,000	1,500	500	10	64,470		
Green-winged teal	500		50	100	50				11,200		
Blue-winged teal									5,880		
Cinnamon teal											
Shoveler	30	400	200	50					6,860		
Wood	2,000	2,000	700	700	500	500	250	50	124,600		
Redhead											
Ring-necked	100								1,400		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy	1								7		
Other	100	50	20	20	20				8,260		
xxxx Hooded Merganser	20								1,540		
Coots:											
					(over)						

3-1751

Form NR-1/

(Nov. 1945)

MIGRATORY BIRDS

(other than waterfowl)

Refuge Mingo NW RefugeMonths of Sept. 1 to Dec. 31, 194 69

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Pied-billed Grebe	2	Sept.	6	Nov.	Winter	Resident				20
Great Blue Heron	Resident		30	Oct.	Resident					60
Belted Kingfisher	"		10	Sept.						20
Little Blue Heron	Summer	Resident	50	Sept.						100
Green Heron	"	"	200	Sept.						300
Yellow-crowned Night Heron	"	"	10	"						20
Common Egret	"	"	10	"						20
Cattle Egret	5	11/17	15	Nov.						20
Sora Rail	50	Sept.	100	Sept.						100
II. <u>Shorebirds, Gulls and Terns:</u>										
American Woodcock	Summer	Resident	30	Sept.	Resident					60
Killdeer	Resident		50	Sept.						100
Spotted Sandpiper	Summer	Resident	50	Sept.						100
Common Snipe	5	Sept.	10	Oct.	10	Oct.				20

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons:</u>										
Mourning dove	Resident		1,000	Sept.	Resident				2,000	
White-winged dove										
IV. <u>Predaceous Birds:</u>										
Golden eagle	1	9/10	4	Nov.	Winter	Resident			4	
Duck hawk, Marsh	4	Sept.	6	Nov.	"	"			10	
Horned owl, Great	Resident		15	Dec.	Resident				30	
Magpie Screech Owl	"		15	Dec.	"				30	
Raven Barred Owl	"		50	Dec.	"				100	
Crow	"		1,000	Dec.	"				2,000	
Turkey Vulture	"		30	Dec.	"				60	
Black Vulture	"		60	Dec.	"				120	
Bald Eagle	2	11/15	10	Dec.	Winter	Resident			10	
Sparrow Hawk	Resident		10	Dec.	Resident				20	
Red-tailed Hawk	"		50	Dec.	"				100	
Red-shouldered Hawk	"		50	Dec.	"				100	
Loggerhead Shrike	"		10	Dec.	"				20	
Reported by Stephen S. Berlinger										

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Mingo NW Refuge For 12-month period ending August 31, 1969

Reported by Stephen S. Berlinger Title Asst. Refuge Manager

(1) Area or Unit Designation		(2) Habitat Type Acreage		(3) Use-days	(4) Breeding Population	(5) Production
I	Timber	Crops	1,127	Ducks	2,134,511	140
		Upland	5,760	Geese	524,552	325
		Marsh	2,133	Swans	0	
		Water	500	Coots	3,991	
		Total	9,520	Total	2,663,054	
II	Timber	Crops	528	Ducks	1,423,101	300
		Upland	3,676	Geese	371,557	425
		Marsh	350	Swans	0	
		Water	3,000	Coots	2,661	
		Total	7,554	Total	1,797,319	
III	Timber	Crops	612	Ducks	1,185,918	160
		Upland	3,760	Geese	196,708	201
		Marsh	0	Swans	0	
		Water	200	Coots	2,218	
		Total	4,572	Total	1,384,844	
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should be equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) Breeding
Population: An estimate of the total breeding population of each category of birds for each area or unit.
- (5) Production: Estimated total number of young raised to flight age.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Mingo National Wildlife Refuge

Months of Sept. 1 to Dec. 31, 19 69

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite	5,000	10							500	
Turkey	10,000	100							100	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1777
Form R-3
(June 1945)

BIG GAME

Refuge Mingo National Wildlife Refuge

Calendar Year 1969

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
			Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
Common Name	Cover types, total Acreage of Habitat	Number												
White-tailed Deer	15,000		36										600	1:1

Remarks:

Reported by _____

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1754
Form NH
(June 1945)

SMALL MAMMALS

Refuge Mingo National Wildlife Refuge Year ending April 30, 1969

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
								Permit Number	Trappers Share	Refuge share				
Mink				6								Sold Locally		200
Muskrat				12								" "		1,500
Beaver				19								" "		150
Raccoon				254			105					" "		1,000
Opossum				44										2,000
Red Fox				0										20
Gray Fox				0										50
Striped Skunk				3										300
Bobcat				3										50
Cottontail Rabbit														3,000
Swamp Rabbit								2						2,000
Gray Squirrel														10,000
Fox Squirrel														3,000
Wood Chuck														200

List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

John E. Toll - Refuge Manager

Reported by _____

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- (1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)
- (2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed.
- (4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.
- (5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.
- REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

DISEASE

Refuge Mingo National Wildlife Refuge

Year 19⁶⁹

Botulism

Lead Poisoning or other Disease

Period of outbreak None

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.) _____

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease None

Species affected _____

Number Affected Species	Actual Count	Estimated
_____	_____	_____
_____	_____	_____
_____	_____	_____

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

3-1757

Form NR-7

Rev. June 1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

(1)

Refuge Mingo National Wildlife RefugeYear 19 69

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
NONE	-	-	-	-	-	-	-	-	-	-	-	-	NONE

(1) Report agronomic farm crops on Form NR-8

(2) C = Collections and R = Receipts

(3) Use "S" to denote surplus

Total acreage planted:

Marsh and aquatic

Hedgerows, cover patches

Food strips, food patches

Forest plantings

Remarks:

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Mingo National Wildlife Refuge County Stoddard State Missouri

Cultivated Crops Grown	Permittee's		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Share	Harvested	Harvested		Unharvested				
			Acres	Bu./ Tons	Acres	Bu. /Tons			
Corn	18	778	105	2,099	9	383	27	Clover for Browse	20
Soybeans	315	6,297					420	Pasture land for Goose Browse	80
									Fallow Ag. Land.

No. of Permittees: Agricultural Operations 5 Haying Operations 0 Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	43	246.25	\$324.50	117
				2. Other				
				1. Total Refuge Acreage Under Cultivation				447
Hay - Wild				2. Acreage Cultivated as Service Operation				

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Mingo National Wildlife Refuge County Wayne State Missouri

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water-fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested Acres	Bu./Tons	Unharvested Acres	Bu./Tons			
Corn	218	10,503			107	5,173	325	Pasture land for Goose Browse	40
Soybeans	273	6,903	91	2,301			364		
								Fallow Ag. Land.	0

No. of Permittees: Agricultural Operations 9 Haying Operations 0 Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	136	815	\$815.00	255
				2. Other				
				1. Total Refuge Acreage Under Cultivation				689
Hay - Wild				2. Acreage Cultivated as Service Operation				

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

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Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

HAYING AND GRAZING

Refuge Mingo National Wildlife Refuge Year 19 69

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
Howard Shelton	34	GU-24	75	19 $\frac{1}{4}$		4/1 - 10/31	\$2.00	\$38.50	
John E. Toll	35	GU-24	75	26 $\frac{3}{4}$		" "	per AUM	\$53.50	
Audrey Walk	37	GU-24	75	17 $\frac{1}{2}$		" "	"	\$35.00	
John A. Sifford	38	GU-24	75	14 $\frac{3}{4}$		" "	"	\$29.50	
Herman Dublin	39	GU-23	42	168		" "	\$1.00	\$168.00	\$1.00 worth of
Ray Dean Hodge	40	GU-13	120	285 $\frac{1}{2}$		" "	per AUM	\$285.50	fertilizer per
Claud Walk	41	GU-15 and 16	135	529 $\frac{1}{2}$		" "	"	\$529.50	AUM also required. " "

Totals:

Acreage grazed 372 Animal use months 1,061.25 Total income Grazing \$1,139.50
Acreage cut for hay _____ Tons of hay cut _____ Total income Haying _____

TIMBER REMOVAL

Refuge Mingo National Wildlife Refuge Year 1969

[illegible]

Total acreage cut over..... Total income.....

No. of units removed B. F. Method of slash disposal

Cords.....

Ties.....

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number

Reporting Year

1969

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) May and June	Broadleaf weeds in corn	Various cropland areas on the refuge	300	2-4-D Amine	150 lbs.	$\frac{1}{2}$ lb/ac.	Water 10 gal/ac.	Broom Sprayer
(2) May and June	Broadleaf weeds in soybeans	Various cropland areas on the refuge	200	Trifluralin (Treflan)	300 lbs.	$1\frac{1}{2}$ lb/ac.	Water 10 gal/ac.	Ground Equip.
(3) May and June	Weeds in corn	Various cropland areas on the refuge	50	Atrazine	50 lbs.	1 lb/ac.	Water 10 gal/ac.	Ground Equip.

10. Summary of results (continue on reverse side, if necessary)

- (1) Good to excellent control.
- (2) Fair to good control depending on circumstances of application.
- (3) Good to excellent control.