

SHIAWASSEE NWR
NARRATIVE REPORT - 1967

Shiawassee National Wildlife Refuge

Annual Narrative Report

1967

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United States Department of the Interior

Fish and Wildlife Service

Bureau of Sport Fisheries and Wildlife
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C O N T E N T S

	<u>Page</u>
I. General	
A. Weather Conditions.....	1
B. Habitat Conditions.....	2
1. Water.....	2
2. Food and Cover.....	3
II. Wildlife	
A. Migratory Birds.....	3
B. Upland Game Birds.....	8
C. Big Game Animals.....	8
D. Fur Animals, Predators, Rodents, and Other Mammals.....	8
E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies.....	9
F. Other Birds.....	10
G. Fish.....	10
H. Reptiles.....	10
I. Disease.....	10
III. Refuge Development and Maintenance	
A. Physical Development.....	11
B. Plantings.....	13
C. Collections and Receipts.....	14
D. Control of Vegetation.....	14
E. Planned Burning.....	14
F. Fires.....	14
IV. Resource Management	
A. Grazing.....	14
B. Haying.....	15
C. Fur Harvest.....	15
D. Timber Removal.....	15
E. Commercial Fishing.....	15
F. Other Uses.....	15
V. Field Investigation or Applied Research	
A. Wildlife Mgt. Study No. 1	16
B. Wildlife Mgt. Study No. 2	19
C. Marsh Transect Survey	21
D. Banding	21
E.	
VI. Public Relations	
A. Recreational Uses.....	22
B. Refuge Visitors.....	22
C. Refuge Participation.....	24
D. Hunting.....	27
E. Violations.....	32
F. Safety	34
VII. Other Items	
A. Items of Interest.....	34
B. Photographs.....	Appended
C. Signature.....	37

I. GENERAL

A. Weather Conditions.

	<u>Month</u>	<u>Precipitation</u>		<u>Max.</u> <u>Temp.</u>	<u>Min.</u> <u>Temp.</u>
		<u>Normal</u>	<u>Snowfall</u>		
January	2.33	1.11	25.6	56	- 5
February	1.33	1.76	14.0	50	-12
March	.96	1.28	10.4	75	- 6
April	2.24	3.35	T	72	23
May	2.07	3.08	-	80	29
June	4.35	3.89	-	98	39
July	3.89	3.56	-	98	47
August	1.56	2.74	-	89	41
September	2.61	2.39	-	86	31
October	3.31	3.54	10.0	87	24
November	1.13	3.93	.5	62	12
December	1.72	1.75	2.9	61	- 9
Annual Totals	<u>27.50</u>	<u>32.38</u>	<u>63.4</u>	Extremes <u>98</u>	<u>-12</u>

1967 provided the usual unusual Michigan weather for the Saginaw Valley. The year opened with low temperatures and a five inch blanket of snow on the ground. Abnormal high temperatures created a "January thaw" between January 22 and 25 and the snow was gone by the 24th. On that date a new record high of 60 degrees was established, surpassing a 56 degree reading on January 24, 1909. Severe thunderstorms with tornado warnings occurred that evening also. Snow flurries, beginning about noon on January 26, developed into the worst snow storm in the valley since 1949. Heavy snowfall accompanied by high winds continued through the 27th, with a resultant complete stop to all normal activities. All local stores, schools, and industries closed on the 27th for the first time in memory. Total snowfall totalled 26 inches, with roads blocked by drifts up to 10 feet high. All roads were not open to normal traffic until January 31.

An additional 14 inches of snow was received during February and the cold weather continued through the early part of March. The lowest temperature of the year was recorded on February 12, -12°.

With the general thaw of late March, flood conditions occurred through most of April. Summer precipitation and temperatures were near normal for the valley but unusual conditions again prevailed through the fall months. There were 19 days in a row without precipitation in September, but precipitation was recorded 18 days in October, 21 days in November and 16 days in December. More than two inches of rain was received during the first eleven days in December.

The first snow was received on October 26 with a ten inch drop. This had all melted by the 29th and the ground has been free of snow since that date. Warm, sunny days and cool nights were common during the last half of December with weather conditions more like the spring than winter until just before Christmas. The year ended with near zero temperatures and fresh snow on the ground.

B. Habitat Conditions.

1. Water. The general spring thaw started on March 10 and run-off was rapid causing all rivers to rise above flood stage. Initial flooding of refuge impoundments occurred on March 27 when Pool 2 dikes were overtopped by the Shiawassee River. On the following day flood waters entered Pool 1 across the Pool 1B spillway. Water washed through the low level dike and out across the pool 1A spillway causing severe dike damage. As levels in the pools and rivers stabilized, the peak flood elevation of 588.00 occurred the first week in April.

Flood conditions prevailed all through the month of April. Emergency dike repairs were completed on April 14 so that it would be possible to maintain pool water elevations as the river dropped. Heavy rains were received on April 16 and a second flooding occurred on April 18. Again washing out sections of dikes of Pools 1A and 2. Dike repairs were completed again by May 1 but Pool 1A was almost dry by this time due to drainage through a major dike washout along the Ferguson Bayou.

Surplus waters in Pool 1B were drained into Pool 1A to equalize levels and pumping was started to bring pools to approved elevations. After two days of pumping a breakdown in the Pool 1 pump engine left us without a water supply for Pool 1 for the rest of the summer.

Pool 2 levels were maintained near approved elevation throughout the summer and fall months, but Pool 1 gradually dried up during July and August. A replacement engine was finally installed at the Pool 1 pump in early September and pumping immediately commenced to bring levels to approved elevations. After two weeks of pumping, as levels were nearing approved elevation, the gears in the old, obsolete, pump head wore out and we have been without a pump for Pool 1 since mid-September.

In general, refuge water conditions were characterized by too much or too little throughout most of 1967. The excessive fall precipitation left the ground saturated and ditches bank full at freeze-up. Higher levels in the Great Lakes, returning to normal after several low level years, are reflected in the Shiawassee River marshes which again held water all during the year.

2. Food and Cover.

Food and cover conditions were excellent for all wildlife species during the year, with the exception of the heavy snow cover during late January and most of February. Spring migrants again fed exclusively in flooded corn fields where the refuge share of the 1966 crop had been knocked down during the winter. As marshes opened up, floods occurred so only limited use was made of the natural foods in this area during the spring migration.

There was an abundance of natural foods available in the pools during summer months and with low water levels, cover conditions were ideal. The goose flock, with goslings of the year, fed primarily on new growth of farm crops in Crop Unit 1 during the early part of the summer but moved into Pool 1 as natural foods matured.

An excellent crop of smartweed was again produced in Pool 1 as water levels were low most of the summer. As levels were raised in September, the natural foods were heavily utilized by dabbling ducks as the seed heads were made readily available. As the harvest of farm crops progressed, feeding flights to harvested grain fields increased, and major feeding activity was then observed in grain fields during fall months.

Approximately 120 acres of barley and/or wheat, received as the refuge share from the farm program was mowed with a rotary mower, and grains were completely utilized by mallards, blacks and geese during August and September. Soybeans were also heavily utilized by ducks during October.

The Canada geese again fed extensively and almost exclusively on sugar beet residues during late October and November. Winter wheat and other green browse was also utilized during this period.

The refuge share of corn grown this year has again been left standing and will be knocked down during the winter to provide food for spring migrants.

II. WILDLIFE

A. Migratory Birds.

1. Whistling Swans. The first migrants were observed on March 14 with the arrival of two swans. Twelve were observed on March 17 and numbers increased to 500 by March 26. The peak population, 2000, was recorded on April 5.

First observations were in the Shiawassee River marshes east of the electric pumps but as flooding progressed on agricultural lands, the birds moved into flooded corn fields and most feeding

and loafing activity then occurred on crop lands with little use of pool areas, presumably because of flood conditions.

With flood conditions prevalent in the valley during April, extensive use of private croplands by the swans was noted with up to 400 swans commonly observed on the east side of heavily travelled State Highway 13, approximately three miles east of the refuge.

As flood conditions subsided late in April, and croplands were dewatered, the swans started to pull out and the last observation was recorded on May 12.

During the spring migration three color-marked swans, marked during the fall migration of 1966, were observed frequently mixed in with the large concentrations. Between March 31 and May 10 one swan was observed with black wings and a black ring around its neck. This bird had a numbered aluminum band on its right leg and a red band attached to its left leg above the tarsus. It was learned this might have been one of several swans that had been dyed purple at Patuxent Wildlife Research Center. Similarly marked swans were also reported at Pte. Mouille on the Detroit River and Fish Point on Saginaw Bay during this period.

The fall swan migration was apparently normal as few were seen. Thirty six swans were observed the last week of October in Pool 1B but use of the refuge was very limited. A major movement apparently occurred the second week of November as several large flights were reported and observed over-flying this area.

One Mute Swan established residence on the refuge, in Pool 1A, in May and spent all summer and fall on the area.

2. Geese. There were 2,500 Canada geese present on the refuge at the beginning of the year. The major numbers departed shortly before the big snow of January 26 and no geese were observed using the refuge after travel was again possible. Local observers reported small flocks of 15 to 25 geese throughout the winter and we suspect a few wintered on the Tittabawassee River, which generally does not freeze over during the winter.

The first spring migrants arrived on March 11 and 340 geese were present at that time. Numbers increased rapidly as the migration progressed with 4,400 geese censused on March 22, and the peak spring population, 19,400, recorded on April 5. Migrants had moved on by the early part of May after which only the 600+ geese representing our nesting flock remained on the area. During the spring migration period only one snow goose and three blue geese

were observed. A single White-fronted goose was observed in Pool 1A, with the Canada geese, on April 12. The bird was captured on April 27 while cannon net trapping Canada geese. It was banded and photographed to document this rare observation. This was only the seventh authentic documented observation, and the first White-front to be taken in the state of Michigan.

Nesting activity was first observed during the third week of March. All signs indicated a banner year for goose production but the flooding of pools which started on March 27 destroyed or caused abandonment of most of the nesting that were underway. Re-nesting attempts were hard hit by the second flooding, but apparently a second re-nesting attempt was made by several pairs. The result was that nests were hatching over a period of several weeks.

The first nesting survey was conducted during the last week of April. Thirty one active nests were located at this time, and a late survey in mid-May located an additional seven nests, for a total of 38 nests this year, as compared to 39 nests in 1966. The first goose brood was observed on April 19 and the last nest hatched about June 14. Gosling production in 1967 totalley 180 as compared to 193 produced in 1966.

Goslings were drive trapped in Pools 1A and 1B on July 3 and July 13 and a total of 141 were banded at that time. All goslings were marked with a white plastic leg band with a blue stripe to identify them as 1967 young.

The first fall migrant Canada geese were observed the third week of September bring the refuge population to 950 geese. Numbers increased slowly and 7,200 geese were present on October 23. Some of these geese apparently pulled out with the snow storm of October 26 as the total population was only 4,100 the following week. Numbers again increased until the fall peak of 9,300 was reached on November 11. This fall peak was disappointing when compared to a fall peak of 18,300 Canada geese in 1966. This decrease has been attributed to a generally late migration with many flocks over-flying this area. The geese started to move out the third week of November but 4,500 are remaining on the area at the end of the year.

Total goose use days for 1967 was 1,132,129, a decrease of 19.5% from the 1966 total of 1,408,078 use days.

The migrant geese utilized the available barley and wheat early in the period and moved to winter wheat as soon as it germinated. When the sugar beet harvest started in late October, geese immediately moved into the harvested areas and used the beet

fields for loafing and feeding almost exclusively. This was dramatically illustrated as the goose kill in the public hunting area dropped to almost zero when the beet harvest started, and geese no longer flew out of the refuge to feed in stubble fields. Late in the year the geese fed primarily on corn.

Observations of neck-banded geese during the year were as follows:

March 15	Solid White	(Yazoo NWR)
	Solid Green	(White River NWR)
March 21	White/Green	(Moss Island)
October 21	Orange/Green	(Wapanocca NWR)

3. Ducks. At the beginning of the year there were 1,300 ducks, Mallards and Black ducks, on the area and these birds remained until the last week of January, pulling out just ahead of the snow. A few ducks wintered on the area again this year. The first spring migrants moved into the area on March 15, about two weeks later than normal. Pintails, Mallards and Black ducks were the first returning species and were followed by Common Mergansers and Goldeneyes on March 18, Buffleheads on March 20, Ring-necked ducks on the 23rd, Canvasbacks on March 24, Wood ducks and Hooded Mergansers on March 25, Shovelers and Blue-winged teal on March 27, Redheads, American Widgeon and Green-winged teal on March 28, Lesser Scaup on March 31, and finally Ruddy ducks on April 10.

As a result of flood conditions in the valley, the spring migrants did not concentrate on the refuge but were observed throughout the area in every flooded field. The spring peak was a meager 7,800 ducks during the second week of April, a 53 percent decrease from the 1966 peak. Most of the migrants had moved on by May 1 and the summer population had stabilized at an estimated 600 ducks.

The first brood, Wood ducks, was observed on June 9. No brood counts were conducted other than random brood observations during the summer. Estimated total production of ducks was 500.

Duck populations began to increase the last week in July with numbers reaching 6,800 on August 8. There were 12,200 ducks using the refuge by September 1 and the numbers continued a dramatic weekly increase until the peak population of 71,200 was reached the second week in November. This was a new refuge record, far surpassing the previous peak duck population of 41,420 recorded in 1966.

As the season progressed, ducks moved on until only 800 Mallards and Black ducks are still present at the end of the year.

Total duck use days for the year was 4,042,094, an increase of 32 percent over the 1966 total of 3,080,959 duck use days.

Major feeding activities of ducks during the early summer were on natural foods in the pools. Pool 1 again produced excellent stands of smartweed and wild millet which were heavily utilized well into the fall. As harvest operations started with winter wheat in mid-July, feeding flights to stubble fields were observed. As the harvest progressed feeding on wheat and barley stubble fields increased. Later in the fall the mallards and black ducks fed exclusively on soybeans, both harvested fields and in standing beans, and at the end of the migration period corn was the primary attraction for feeding ducks.

Movement of ducks between the refuge and the Shiawassee River State Game Area to the southwest were common throughout the fall months, as the flooded corn fields on the Game Area provided a strong attraction.

4. Coots and Gallinules. The first coots were observed on April 5 in Pool 2. The spring peak of 300, recorded the last week of April, remained in the area until the middle of May, after which a summer breeding population of 50 coots remained in the area. Production was again below normal reflecting the small breeding population. At no time during the fall did a build-up occur and the last observation was recorded on November 22.

Common gallinules were not observed until July 14, at which time a female with a brood of four was seen in Pool 2. Numbers again were low all during the summer. The last gallinule observation was on October 23.

5. Other Water Birds. First arrival observations of various species occurred over a three month period beginning with observations of four Great Blue Herons and one Sandhill Crane on March 26, followed by Pied-billed Grebe on April 1, Green Heron on May 5, Black-crowned Night Heron on May 6, Common Egret on May 19 and American Bittern and Least Bittern the first week of July. Populations of the various species were estimated to be about normal with an exception that 18 Common Egrets were observed on October 16 which was both the latest and the greatest number observed at this station.

A lone Sandhill Crane appeared in Pool 1 on August 28 and established a residence. This particular bird appropriated the Pool 1B cannon-net trapping site and for a ten day period succeeded in harassing ducks and geese to the extent they could not feed on the bait. In desperation we net-trapped and banded the crane on September 22, and upon release he was seen no more.

A single Cattle Egret was observed on October 26, the second recorded observation for the refuge.

Most marsh birds had departed by the end of October but Great Blue Herons were commonly observed until early December.

6. Shorebirds, Gulls and Terns. Recorded spring arrival dates are as follows: Killdeer on March 26, Greater Yellow-legs on April 3, unidentified Sandpipers on April 5, Long-billed Dowitcher and Black-bellied Plover on May 13, Woodcock on July 12, Wilson's Snipe on July 14, Common Tern, Black Tern, and Caspian Tern in early July and Ring-billed Gulls were present all during the winter. Late summer migrations of shore birds passed through the area the last week of July and all species, except gulls which spend most of the year on the area, had departed by early November.

B. Upland Game Birds.

Ring-necked Pheasants have continued their general decline in this area. Periodic observations throughout the year indicate few pheasants using the refuge area. For the first time, there were no recorded brood observations during 1967. The total refuge population is estimated at 100 birds.

Mourning Doves were commonly observed throughout the year as several winter at the secondary headquarters corn crib.

C. Big Game Animals.

White-tailed deer are commonly observed throughout the year. On March 20 a ground count of deer was made in the corn fields of crop unit 1 and an actual count of 269 deer was tallied. Production figures are not available but observations indicate another bumper crop with many twins and triplet fawns seen during the summer. The peak herd population was again estimated at 500 deer prior to the hunting season. It is estimated that 100 deer were removed during the 16 day bucks only season, November 18 through December 3, of which 60 were legal bucks and 40 were illegal antlerless deer. This is about par for the course with the great Michigan deer hunter.

On December 2, the day before the hunting season closed, a ground count in the corn fields of crop unit 1 (within the closed area) tallied 346 deer. It is interesting to note that of that 346 deer, there was only one antlered animal seen.

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

The muskrat population remains at a high, relatively stable level. Muskrat activity is easily observed in Pools 1 and 2 areas, with many burrows in dikes exposed as water levels recede. The current

The current population, from house counts, is estimated at 2,500 muskrats and permittee trapping operations are presently underway to reduce the population. Muskrat activity has and should continue to provide valuable service in opening up cattails to create better waterfowl habitat.

The several beaver colonies have remained quite active in the Pool 1 area, and a new lodge was constructed in Pool 2 this fall. The beaver have continued their project of removing trees from the Pool 1 dikes, and except when the trees fall across the dike and block traffic, we appreciate their efforts.

Mink and weasel populations remain at very low levels. Neither species has been observed although an occasional track is seen in the snow.

Raccoons remain numerous and the population appears to have stabilized. Predation on waterfowl nests and duck traps was minimal during the year.

Skunks are observed infrequently and appear to be present in normal numbers.

Red foxes are numerous and commonly observed hunting for small rodents in the crop units. The role of the fox in the refuge program continues to be the scavenger to remove sick or injured birds from the waterfowl populations. A single Gray fox was observed in the area of the new Pool 3 dike on December 1.

E. Hawks, Eagles, Owls, and Crows.

Marsh hawks, red-tailed hawks, sparrow hawks, Cooper's hawks and turkey vultures are summer residents and commonly observed during the year. American Rough-legged hawks, winter residents, arrived in mid-November.

The first observation of a Bald Eagle was recorded on March 10. During June and July three eagles, 2 adult and 1 immature, were commonly observed in the Pool 1 area, perched on a large dead elm. The last observation was recorded in early December.

One adult Golden Eagle was observed by Frye on May 18 along the Shiawassee River in a tree on the Riverside Dike.

Great horned owls, short-eared owls, long-eared owls, and screech owls are residents and observed infrequently.

Snowy owls were observed on January 25, February 10, and November 27.

Crows were commonly observed from early March through late December. A peak, estimated at 300, was observed during the period October 27 through November 12.

F. Other Birds.

No unusual observations during the year.

G. Fish.

The major fish species continues to be carp. Control measures are useless so long as the refuge is subjected to periodic floods. Other species common to the area include common suckers, black bullheads, Northern pike, yellow perch and crappies.

H. Reptiles.

Common reptiles, identified on the area, include fox snake, red-bellied snake, common garter snake, snapping turtle, box turtle, Blandings turtle, map turtle and painted turtle.

I. Amphibians.

Amphibians that have been identified on the refuge include mudpuppy, Tiger salamander, American toad, bullfrog, pickeral frog, leopard frog, green frog, wood frog and spring peeper.

J. Disease.

On January 13 an unexplained die-off of Canada geese was observed on the Shiawassee River. Four dead geese were observed on the ice and one live but sick bird was on the dike top. The sick goose started to fly off and died suddenly. The refuge trapper also brought to the office three dead geese he had found that day. Daily observations through January 20 revealed increased numbers of sick and dead birds. Prior to January 18 all sick and dead birds were geese but on that date several apparently sick ducks were observed. Twenty three known dead geese were observed during the period but the total loss is unknown as the sick birds sought cover in dense cattails inaccessible to observation or retrieval.

During the outbreak the weather was generally cold and overcast with light snow cover. All water in the pools was frozen over and the Shiawassee River was ice-bound except for a few small open water areas. The geese had been feeding in harvested corn fields on the refuge adjacent to private lands that been hunted heavily about ten days during the hunting season.

Four goose specimens were taken to Dr. Archibald Cowan at the University of Michigan at Ann Arbor and three geese and one mallard were sent to Dr. Carleton Herman at Patuxent Wildlife Research Center, Laurel, Maryland. Preliminary findings by Dr. Cowan revealed symptoms of acute lead poisoning. All four birds had lead shot in the gizzard. The following is an excerpt from Dr. Herman's reply:

"The mallard showed typical inclusion bodies in kidney tissue which are characteristic of lead poisoning."

"Cause of death in the Canada geese was not determined. All three had a good deal of hemorrhage in their body cavities but cause of this hemorrhage was not evident. No aspergillosis was found. The extensive hemorrhage was probably cause of death and conceivably could have been due to some type of toxin. None of the typical lead poisoning inclusion bodies were seen in the kidney sections but this does not rule out lead. Although several parasites were present they were not in sufficient numbers to be considered contributory. Unfortunately tissues were not saved for chemical analysis. The positive finding of lead poisoning in the mallard is suggestive that the geese also might have had a lethal dose but we cannot draw this conclusion from the data available."

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development.

1. Dikes and Ditches.

Contracts were let for construction of the new Pool 3 dike. Timber clearing was completed in July and dike construction was started in August. The contractor worked with power scrapers until high water tables prevented further use of this equipment in mid-September. The dike is about 60 percent completed and work will be continued, using draglines, as soon as weather and water conditions permit.

A new flap gate was constructed in the refuge shop and installed on the tube in the Eastwood Drain under the approach to Crop Unit 1.

Drainage ditches on Farm Units 9B and 9C were cleaned out and bottoms brought to correct grade for tile drainage systems.

Approximately 600 feet of dike was relocated along the north side Farm Unit 9C to eliminate a wash-out problem.

Flood damage repairs of a stop-gap nature were completed to sections of the Pools 1 and 2 dikes. If and when flood damage funds are available the repairs and rehabilitation of the pool dike system will be completed.

2. Roads and Trails.

All refuge roads were graded periodically as required during the year.

New gates were constructed and installed to close Curtis, Moore, Littlejohn, Houlihan, and Evon Roads following abandonment of the sections inside the refuge boundary by Saginaw County Road Commission.

Repairs, including partial redecking, were completed to the bridge across the Miller Drain for access to Crop Unit 6.

3. Fencing and Posting.

The entire refuge boundary was checked and reposted where needed prior to the waterfowl hunting season. Prior to the deer hunting season public hunting areas were posted, and signs were immediately removed at the close of the season.

Boundary fences were checked and repairs completed where needed.

Three trips were made to Lake St. Clair Refuge for setting out buoys to mark refuge boundaries in a manner to satisfy the Michigan Conservation Department. Additional open water areas were buoyed, against our better judgement, and as expected when buoys were picked up in December, 76 buoys had been lost to wave action, theft, etc. At \$7.70 each, it cost the Bureau a minimum of \$800.00 to comply with the posting wishes of the State.

Wyandotte Refuge was marked with buoys prior to the waterfowl season and buoys were later picked up in December.

4. Miscellaneous Jobs.

Additional electrical outlets were installed in the office and interior painting completed.

New work benches and cabinets were constructed in the headquarters shop.

The foundation for the equipment building at Secondary Headquarters was reinforced to stop further tilting from frost action.

All trees and brush were removed from the ditches along Littlejohn Road and Farm Unit 9B.

Grass strips were seeded to provide permanent field boundaries for all farm units in Crop Unit 1.

The managed goose hunt required considerable effort to set up the program this initial year and included construction and placing of blinds, and setting up a central check station and information center at refuge headquarters.

All regular and routine repairs and maintenance of refuge vehicles, heavy equipment, pumps, and buildings was completed on schedule.

B. Plantings.

1. Aquatic and Marsh Plants.

None.

2. Trees and Shrubs.

None.

3. Upland Herbaceous Plants.

Approximately 25 acres in major crop units were seeded to grass mixtures to provide permanent grass strips along field borders and to provide permanent field boundaries within various farm units.

4. Cultivated Crops.

Farm crops were planted on 3,061 acres of refuge croplands, with all farming operations conducted under cooperative farming agreements with local farmers. Refuge crops and yield data are summarized on NR-8 and in the following tabulations. Eight crops were produced on refuge lands including wheat, barley, oats, corn, soybeans, white beans, buckwheat, and sugar beets.

Yields were somewhat below normal due to unfavorable weather conditions. The cold wet spring that delayed seeding operations was followed by a dry summer and heavy rains and early snow finished out the crop year. Below normal yields, with low crop prices, combined to make 1967 a rather sad year for area farmers. The average gross income per acre for refuge crops was \$98.72 but production and delivery costs reduced this figure drastically.

Totals of 12 acres of wheat, 163 acres of barley, 140 acres of corn, 27 acres of buckwheat, and 20 acres of soybeans were left in the field, as refuge share of crops produced for wildlife use. The wheat and barley was chopped using a rotary mower during late July and early August and had been completely utilized by mid-September. The 140 acres of corn has been left standing in strips to be knocked down during the winter to make it available for the spring migrants. Twenty-four acres of corn, 1,420 bushels, was harvested and put in storage for refuge use, and for transfer to Seney and Ottawa Refuges.

Cover crops seeded for erosion control, green manure, and goose browse totalled 1,120 acres and included ryegrass in corn, clover in small grains, and wheat, rye and oats browse on white bean-ground.

SHIAWASSEE NATIONAL WILDLIFE REFUGE

REFUGE CROPS - 1967

<u>CROP</u>	<u>TOTAL ACRES</u>	<u>% OF TOTAL ACREAGE</u>
Wheat	89	2.8
Barley	321	10.5
Oats	5	.1
Corn	812	26.5
Soybeans	916	30.2
White Beans	780	25.4
Buckwheat	27	.9
Sugar Beets	111	3.6
<hr/> TOTALS	<hr/> 3,061	<hr/> 100.0

CROP YIELDS - 1967

WHITE BEANS

<u>Cooperator</u>	<u>Acres</u>	<u>CWT/Acre</u>	<u>\$/CWT</u>	<u>\$/Acre</u>
I. Almy	96	15.2	8.09	122.97
Benkert Bros.	27	7.4	7.75	57.35
D. Boese	70	12.2	7.84	95.65
M. Boese	99	13.5	8.09	109.22
G. Bremer	90	15.4	7.84	120.74
R. Bremer	63	10.9	7.34	80.01
Bowden Bros.	60	13.2	7.34	96.89
J. Bruns	20	11.6	8.33	96.63
C. Gosen	76	18.7	7.50	140.25
H. Gosen	24	18.2	7.50	136.50
M. Hart	46	5.8	7.84	45.47
Schemm Farm	38	20.7	7.84	162.29
A. Schluckebier	36	16.4	7.10	116.44
C. Schramke	20	12.2	8.09	98.70
W. Wasmiller	15	15.2	7.84	119.17
<hr/> TOTALS	<hr/> 780	<hr/> AVE. 13.8	<hr/> 7.76	<hr/> 108.02

CROP YIELDS - 1967

CORN

<u>Cooperator</u>	<u>Acres</u>	<u>Bu./Acre</u>	<u>\$/Bu.</u>	<u>\$/Acre</u>
I. Almy	153	64	.90	57.55
D. Boese	149	97	.96	93.18
M. Boese	109	113	.96	108.46
G. Bremer	27	77	.82	62.92
R. Bremer	79	83	.87	56.80
J. Bruns	12	22	.95	20.51
H. Fawcett	20	100	.88	88.00
J. Gempel	5	est. 75	Not harvested	
C. Gosen	52	92	.87	80.48
M. Hart	11	est. 75	Put in silo - not sold	
A. Peaphon	93	85	1.01	85.24
C. Schramke	40	87	.86	60.43
A. Schluckebier	38	100	1.02	83.77
W. Wasmiller	24	21	.82	16.29
<hr/> TOTALS	<hr/> 812	<hr/> AVE. 77.9	<hr/> .91	<hr/> 67.80

CROP YIELDS - 1967

SOYBEANS

<u>Cooperator</u>	<u>Acres</u>	<u>Bu./Acre</u>	<u>\$/Bu.</u>	<u>\$/Acre</u>
I. Almy	18	12.2	2.45	29.89
Benkert Bros.	15	17.5	2.36	41.38
D. Boese	68	40.0	2.40	96.00
M. Boese	92	28.9	2.40	69.48
Bowden Bros.	90	24.3	2.39	58.11
R. Bremer	35	29.1	2.40	69.94
J. Bruns	4	Not harvested		
H. Fawcett	90	16.7	2.39	39.94
J. Gempel	49	22.6	2.39	53.92
C. Gosen	87	26.0	2.50	65.01
M. Hart	60	16.8	2.36	39.71
E. Jakones	53	18.7	2.39	44.77
C. Pagel	70	28.1	2.40	67.54
A. Peaphon	106	33.2	2.39	79.28
C. Schramke	20	33.3	2.39	79.68
W. Wasmiller	21	23.3	2.40	55.86
R. Weigl	38	17.3	2.38	41.07
<hr/> TOTALS	<hr/> 916	<hr/> AVE. 24.3	<hr/> 2.40	<hr/> 58.22

CROP YIELDS - 1967

BARLEY

<u>Cooperator</u>	<u>Acres</u>	<u>Bu./Acre</u>	<u>\$/Bu.</u>	<u>\$/Acre</u>
D. Boese	70	80 est.	1.10 est.	88.00
M. Boese	46	72	1.15	82.41
Bowden Bros.	51	96	1.12	107.52
R. Bremer	18	80 est.	1.10 est.	88.00
J. Bruns	15	40	1.14	45.29
C. Gosen	62	70	1.15	80.50
H. Gosen	10	77	1.09	83.93
M. Hart	9	80 est.	1.10 est.	88.00
<u>A. Peaphon</u>	<u>40</u>	<u>72</u>	<u>1.09</u>	<u>78.48</u>
TOTALS	321 AVE.	74.1	1.12	82.46

SUGAR BEETS

<u>Cooperator</u>	<u>Acres</u>	<u>Tons/Acre</u>	<u>\$/Ton</u>	<u>Gross \$/Acre</u>
I. Almy	57	18.3	10.00	183.24
H. Gosen	24	18.8	10.40	195.70
<u>A. Schluckebier</u>	<u>30</u>	<u>24.6</u>	<u>10.10</u>	<u>249.03</u>
TOTALS	111 AVE.	20.6	10.17	209.03

WHEAT

<u>Cooperator</u>	<u>Acres</u>	<u>Bu./Acre</u>	<u>\$/Bu.</u>	<u>\$/Acre</u>
D. Boese	20	57	1.24	70.68
M. Boese	25	50	1.27	63.70
H. Gosen	14	36	1.25	45.00
<u>A. Peaphon</u>	<u>30</u>	<u>66</u>	<u>1.33</u>	<u>87.78</u>
TOTALS	89 AVE.	52.3	1.27	66.79

The soil capability classification was completed by Soil Conservation personnel late in 1966, and the new Land Use Plan was prepared and approved early in 1967.

Two meetings were held at the refuge office, with all farming cooperators to discuss farm program changes, crop yields, etc.

C. Collection and Receipts.

1. Animal Specimens.

None.

2. Refuge Herbarium.

Additional plant specimens were collected and added to the herbarium, and several old specimens replaced with new material by Wildlife Aid Giffin.

D. Control of Vegetation.

All weed control on croplands was completed by the farming cooperators at their expense as a condition of the Cooperative Farming Agreement.

Chemical weed control, by refuge personnel, was limited to spraying of weeds and brush along fence lines, dikes and ditch banks, using a mixture of 2,4-D and 2,4,5-T. Spraying was completed in June and July on approximately 18 acres, with estimated 80 percent kill and slight regrowth.

Mechanical brush control was completed along roads and ditches following closure of several public roads.

E. Planned Burning.

None.

F. Fires.

No fires occurred on refuge lands during 1967.

IV. RESOURCE MANAGEMENT

A. Grazing.

One grazing permit was in effect during 1967. Of an allowable 120 animal use months, only 46.11 AUM's were actually utilized for a total grazing income of \$46.11.

B. Haying. None.

C. Fur Harvest.

The general muskrat house count was made on November 21 in order to get an estimate on the current muskrat population. From information gathered on the count it was estimated that the current muskrat population is 2,500 animals, or approximately equal to recent year estimates.

The trapping season in Michigan extends from November 25, 1967 through January 31, 1968. Permits were issued to three local trappers for removal of the surplus muskrats. As of December 31, 1967, only 158 muskrats have been taken due to daily fluctuations in water levels in the river and unfavorable weather conditions that have hampered the trappers efforts.

The 1966-67 trapping season ended on January 31, 1967. Inspection of furs taken by the trapper was made by refuge personnel to determine sex and age ratios. A total of 386 muskrats were taken, and of the 376 that were sexed and aged, the following was determined:

<u>Adult</u>		<u>Immature</u>	
<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
111	71	110	85

Adult : Immature = 1:1.1

Male : Female = 1.4:1

All furs were sold by the trappers for the best price they could get and 40 percent of the proceeds were payable to the Bureau as our share. Total price received by the trappers for 396 pelts was \$368.00, an average price of \$.93 each. Total refuge share amounted to \$147.20.

D. Timber Removal. None

E. Commercial Fishing. None

F. Total Cash Receipts - C.Y. 1967.

<u>Source of Receipts</u>	<u>Total Amount</u>
Sale of surplus farm crops:	
White beans	\$18,468.20
Soybeans	8,334.14
Sugar beets	8,872.50
Fur harvest receipts	147.20
Grazing	41.16
Public hunting program:	
User fees	2,126.00
Decoy rental fees	533.00
Miscellaneous receipts	450.00
Total Cash Receipts	\$38,972.20

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Wildlife Management Study No. 1

1967 was the fourth year of this five year study. Principle objectives of the study include life history, nesting phenology, and success of the refuge Canada goose flock. Also to be investigated are correlation of populations with changes in nesting habitat, determination of mortality, and migration behavior.

The original Canada goose flock, consisting of 435 semi-domestic geese received from the Michigan Conservation Department, were released at three years of age, about 100 each year. An estimated 60 pairs were nesting in 1962, 50 pairs in 1963, 35 pairs in 1964, 28 pairs in 1965, and 39 pairs in 1966. Gosling production ranged from a high of 225 in 1962 to the low of 115 in 1965.

Results and General Conclusions

The first migrants were observed on the refuge March 11 with the arrival of 340 Canada geese. Numbers increased to 4,400 on March 22 and a peak of 19,400 was reached on April 5. A gradual decline in numbers was noted through April with the population stabilizing at about 600 resident birds.

During the migration period, resident birds, identified by colored leg ba nds, generally segregated themselves from the migrant flock.

Feeding was primarily upon corn and ryegrass of Farm Units 1B, 1C and 3A. Loafing sites were primarily on the islands of Pool 1 and a harvested sugar beet field in Farm Unit 3B. During the early portion of the migration, large numbers of geese were observed feeding in Farm Unit 3A and loafing in the Shiawassee River near the electric pumps.

The first prenesting activity of resident birds was observed during the third week in March. Segregation of the resident flock from the migrant flock was especially evident at this time. The following observations of pre-nesting activity of color leg banded resident birds were made:

3/13/67 8 geese with green/white leg bands

3/14/67 1 pair, both with white leg band, one right leg, one left leg

3/16/67 3 geese with yellow/white leg band (1 pair obvious)
2 geese with red/white leg bands
1 goose with green/white leg band

- 3/18/67 3 geese with green/white leg bands
 1 goose with all white band
 1 goose with what appeared to be green/white band paired
 with all white band
- 3/20/67 Several pairs inspecting islands - many green/white bands
- 3/22/67 2 pair marked with plastic bands
 3 geese with green/white leg bands, 1 unidentified
- 3/26/67 1 pair - 1 red/white leg band, 1 yellow/white leg band

The first observed nesting activity was recorded on March 25 when 3 pairs were seen on the islands in Pool 2, several pairs on islands of Pool 1 and 1 pair in a tub in the goose pen. The start of nesting appeared to be over a 3-4 week period.

During the spring the refuge area was twice inundated by high water and the nesting chronology was twice disrupted due to the high water. Renesting attempts were carried out by many of the pairs after the first flooding, but once again high water destroyed some of the nests. Some pairs attempted to nest for the third time. Not all nests were destroyed by high water and this resulted in the young goslings hatching out over a period of several weeks. The forced renesting of a sub-adult female (distinguished by green/white leg band as a 1966 local bird) contributed towards non-successful efforts by these birds.

During the last week of April and the first week in May the first nesting survey was conducted. Thirty-one nests were located during the initial survey. During the second and third week of May seven additional nests were found, again bearing out the fact that renesting had occurred. The total number of nests found was 38. This compares favorable with the 39 nests found in the 1966 nesting survey. Maps 1, 2, and 3 show the location of all nests.

A total of 207 eggs were found with an average of 5.4 eggs per clutch. As in past years, nesting islands accounted for the majority of nest sites with 29 or 76.3% of the total. One nest was recorded in a nesting tub in Pool 1B and two nests were recorded on brush piles, one in Pool 1B and the other on private land adjacent to the refuge. This accounted for 2.6% and 5.3% respectively of the total nest sites. The 5 dike sites represent an increase in dike nest sites (13.1% vs. 2.6%) over 1966, and no muskrat houses were utilized this year (5 or 12% in 1966). These facts reflect the high water levels which were present.

High pool elevations and winds caused considerable damage to the nesting islands in the pools. The number of available sites was probably reduced due to the above conditions.

A variety of nesting cover was utilized including cattail (Typha spp.), smartweed (Polygonum spp.), willow (Salix spp.), grasses (Graminae), and Sweet clover (Melilotus spp.). Certain instances were noted where the nest was located on bare ground. In the majority of cases, vegetation of the dominant cover type provided the needed nesting material. Where the nest was located on bare ground the nesting material consisted for the most part of down.

Twenty-eight nests were located in Pool 1A, with heavy concentrations in the NW and SE corner. An increase in the number of nests on the crescent shaped islands in the NW corner of Pool 1A was noted (2 in 1966, 7 in 1967). Nine nests were located in the Pool 1B area and the remaining nest located on private land. Many of the islands which had remained in relatively good condition were utilized. The degree of defense of the nest was about the same as in past years with increased defense activity as incubation progressed.

Observation of bands on the nesting pairs yielded the follow data:

<u>Type of Band</u>	<u>Male</u>	<u>Female</u>
White	1	3
Yellow/white	1	1
Red/white	1	2
Green/white	0	0
FWS only	0	5
No bands	15	15
Unknown	20	12
	<u>38</u>	<u>38</u>

The large number of unknown bands is reflected in the fact that either the pairs flushed before the observer was close enough to see the band or the pairs were not in the vicinity of the nest. The above information is recorded by nesting pairs in the refuge file.

The first successfully hatched broods were observed on April 19, 1967, when a total of 15 broods were seen in Pool 1A and 1B. A re-survey of the nests was conducted May 10-23, 1967 to determine hatching success. Two especially late nests were rechecked on June 9 and 14, 1967. Hatching success information was believed to be most reliable since there were very few observed instances of predation. Nest number 22 appeared to have been destroyed by an avian predator. In some instances it was believed that high water may have caused some eggs to float away. This has a bearing on hatching success determination, but it was not believed to be a serious problem. The vast majority of the nests appear to have hatched either completed or partially.

An indication of hatching success was obtained during the month of June when 110 goslings were observed during a weekly waterfowl inventory. This would indicate a hatching success of a minimum of 53 percent. The

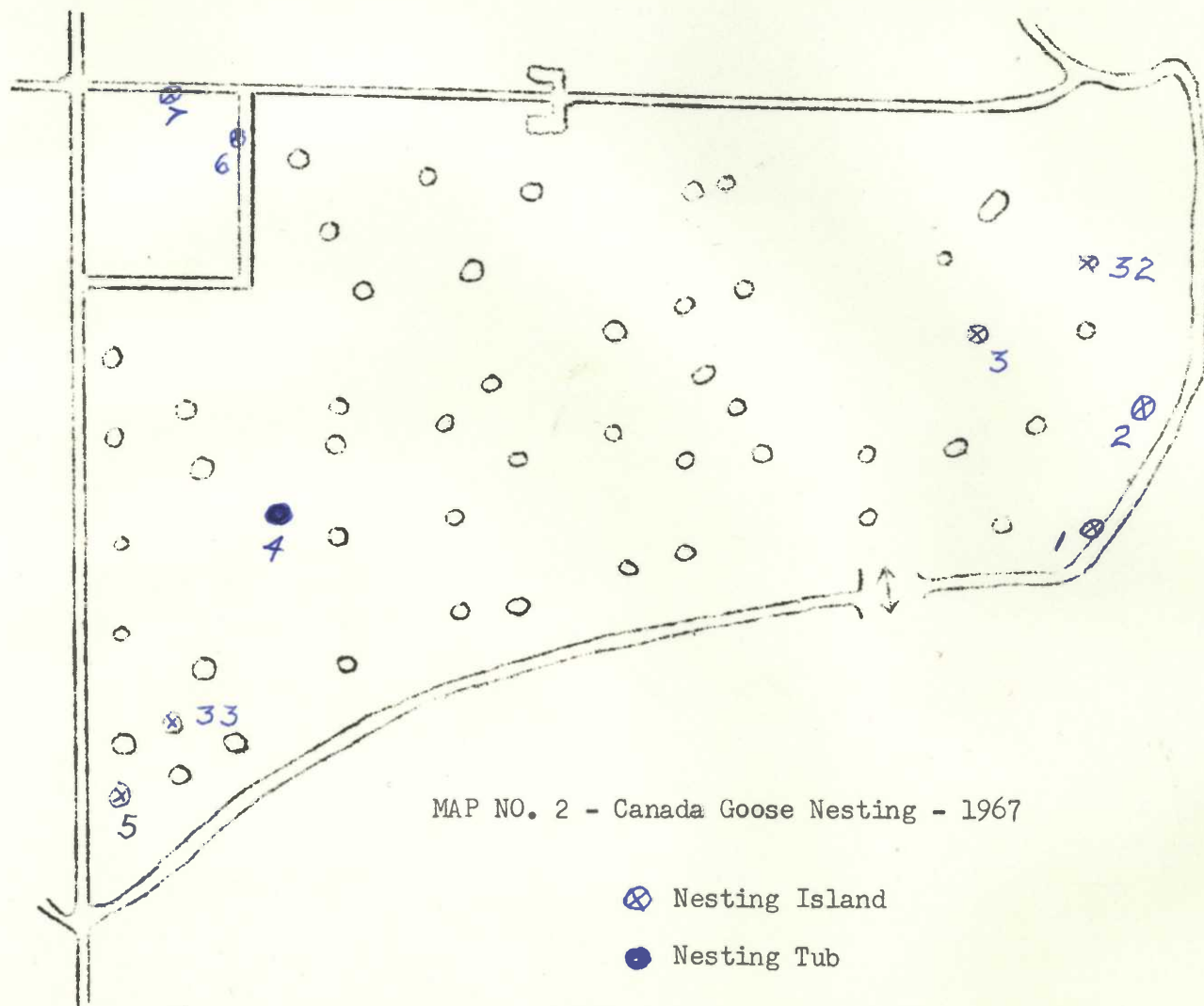
MAP NO. 1 - Canada Goose Nesting - 1967

⊗ Nesting Island

● Nest on Dike



Pool 1A



nesting re-survey conducted to show hatching success showed 180 young hatched or 86.9 percent success.

In late June two drive traps were constructed in Pool 1A on the north spillway and the north-west corner of Pool 1B. Typical feeding patterns into the edges of the bordering farm units by young goslings did not occur as it had in past years. Drive traps could not be constructed in Farm Unit 1A and 1C but had to be constructed in the pools where gosling activity was centered. On July 3 and 13, two drives were conducted by refuge personnel. On August 2 and 10, two cannon-net shots were made. Local goslings captured during these operations totalled 141 including 69 males and 72 females.

There were no known losses incurred during trapping operations. Although several birds appeared very exhausted following capture it was believed that they recovered fully.

One dead gosling was found on the banding mound of Pool 1A. The bird was unbanded. This brings the minimum number of birds successfully hatched to 142 or a hatching success of 68.6 percent. The refuge hatching success would fall between 86.9% and 68.6% with the true hatching success percentage believed to be closer to the former. The 141 local birds banded represents 78 percent of the years production banded.

Prior to trapping, gosling activity centered in Pool 1. Feeding probably occurred on succulent browse and invertebrate life. Only late in the season was any advance into the cropland observed.

A suspected outbreak of lead poisoning occurred during the month of January. This is reported in the disease section of Part I.

This study is to be terminated following the 1968 nesting and brooding season and the final report completed and submitted at a later date.

B. Wildlife Management Study No. 2.

The study of the ecology of the Whistling Swan on the Shiawassee Refuge is now in its fifth year. The primary objectives of this study are to: determine habitat preferences, migration patterns, morphological characteristics of species, sex, and age classes, and origin and extent of all mortality; provide improved methods for trapping and marking swans; and correlate current and future land management practices with annual population numbers.

The first observation of migrant Whistling swans (*Olor columbianus*) was made on March 14 when two birds were sighted. By March 26 the population had built up to 500 with a peak of 2,000 reached the week of April 5. Swans began to pull out about April 10 with only a few hundred present on April 11. Numbers of swan on the refuge continued to decline steadily with the last bird observed the week of May 12.

Concerning age ratio data, the following observations were made:

<u>Date</u>	<u>No. of Groups</u>	<u>Adults</u>	<u>Immature</u>	<u>Total</u>
3/17/67	1	2	3	5
3/22/67	1	2	4	6
3/22/67	*	27	9	36
3/18/67	1	2	3	5
3/20/67	*	20	6	26
	<u>3</u>	<u>53</u>	<u>25</u>	<u>78</u>

* Family groups were not recorded as such unless readily distinguishable as a group.

It will be noted that very few family groups were able to be distinguished.

On March 28, two swim-in traps of design used in previous years were constructed in flooded fields of Farm Unit 1A and 1C. After observation of bird use it was decided to remove the traps in Farm Unit 1A and enlarge the trap in Farm Unit 1C. In addition a cannon net trap was installed in the dry portion of Farm Unit 1C. Only 2 swans were captured and banded during the spring of 1967. A third swan was captured but escaped before being banded. All birds were captured by means of the cannon net trap. Heavy bird use was centered around the swim-in trap in Farm Unit 1C but for some reason the birds would not enter the trap. When the electric pumps began to dewater Farm Unit 1C bird use dropped off and there was no more chance of capturing any birds.

On March 28, a color marked swan which had been banded and marked the fall of 1966 was observed on the refuge in Farm Unit 1C feeding in flooded corn field. On April 6, 3 color marked swans were observed in Farm Unit 2A, also a flooded corn field, with a group of 500 other swans. The color was distinct but quite faded. During the period March 31 - April 5 a flooded field off the refuge was receiving heavy use. One of the refuge cooperators reported sighting another color marked swan which we believe to be another of the birds marked during the fall of 1966. This brings the total to 4 color marked birds of fall of 1966 which had been observed passing through the area during the spring of 1967.

An additional sighting correspondance was found from June 1966 from Agassiz Refuge which had not been recorded to date.

The first migrant Whistling swans used the Shiawassee River between the electric pumps and the old pump house. As the population built up a definite use pattern was established. Feeding occurred in flooded corn field of Farm Unit 1A and 1C. Loafing areas were primarily centered in the Shiawassee River and sugar beet fields

MORPHOLOGICAL CHARACTERISTICS AND OBSERVATIONS

WHISTLING SWAN - 1967

Bird No.	67-01	67-02
<u>Band Number</u>	509-20573	509-20574
<u>Date</u>	4/5/67	4/8/67
<u>Total Weight (lbs. - oz.)</u>	12-4	10-0
<u>Age *</u>	Immature	Immature
<u>Sex</u>	Female	Female
<u>Bursa of Fabricus</u>	Present	Present
1. <u>Depth (mm)</u>	12	6
<u>Oviduct</u>	Closed	Closed
<u>Penis</u>		
1. <u>Diameter (mm)</u>	-	-
2. <u>Length (mm)</u>	-	-
3. <u>Small & Corkscrew</u>	-	-
4. <u>Sheathed</u>	-	-
5. <u>Color (pink)</u>	-	-
6. <u>Appearance (Wrinkled)</u>	-	-
<u>Sphincter Muscle</u>		
1. <u>Diameter (mm)</u>	19	17.7
2. <u>Shape</u>	Convex	Convex
3. <u>Color (flesh pink)</u>	Yes	Yes
<u>Wing & Primary Feathers</u>		
1. <u>Wing length (cm)</u>	42.1	43.8
2. <u>Length 1st primary ** (cm)</u>	32.9	32.9
3. <u>Max. width 1st primary ***** mm</u>	40.6	39.1
4. <u>Wear 1st primary ***</u>	Pointed	Pointed
<u>Spur Wing</u>		
1. <u>Feathered or bare</u>	Feathered	Feathered
2. <u>Knobby or smooth</u>	Smooth	Smooth
<u>Breast & Belly Feathers</u>		
1. <u>Average width (mm)</u>	20.9	17.7

MORPHOLOGICAL CHARACTERISTICS AND OBSERVATIONS

WHISTLING SWAN - 1967

Bird No.	67-01	67-02
<u>Tail Feathers</u>		
1. No. Rectrices	-	-
2. Notched Rectrices	Notched	Notched
3. Length longest rectrice (cm)	14.5	12.9
4. Median width vane of longest rectrice (mm)	42.9	27.8
<u>The Legs</u>		
1. Dia. Tarsus mid-point **** (cm)	2.08	2.07
2. Total length Tarsus (cm)	11.9	10.3
<u>The Bill</u>		
1. Total length (mm)	90.4	89.1
2. Width of bill at nostrils (mm)	30.7	31.6
3. Width of nail (mm)	17.9	15.0
4. Distance of nostril from tip of bill (mm)	41.2	38.6
5. Yellow area in lore	Absent	Absent
6. Area of yellow spot (mm ²)	-	-
7. Color of bill	Flesh	Blotched
<u>General Characteristics</u>		
1. Body temperature	105.6	101.8
2. Color of head & neck	Grey	Grey

* Immature = Up to one year of age
 Sub-adult = 1-3 years of age
 Adult = 3+ years of age

** Distal Primary

*** Wear determined from tips of primaries

**** Diameter taken at lateral dimension of Tarsus

***** This measurement made as median width in past years

of Farm Unit 1A. Some feeding activity took place on natural foods in the Shiawassee River south of Farm Units 11A and 11B. Dewatering of Farm Units 1A and 1C and subsequent flooding of Farm Unit 2A caused the birds to alter their feeding pattern to the flooded corn stubble of Farm Unit 2A. In addition some use was observed for loafing in sugar beet field of Farm Unit 3B. Moderately heavy use of flooded fields off refuge land was observed primarily east of M-13 between Evon and Houlihan Roads. Very little use was made of the pool areas. Corn comprised the staple portion of the diet. Some browsing of ryegrass in the corn was believed to have occurred. Generally little feeding on natural food was observed. The swan use for the most part segregated from duck and goose use. Although some ducks were intermingled in areas where swans were present, very few instances of goose and swan use together were noted. Courtship display was commonly observed during the period. Swan use declined as dewatering operations increased.

Data were taken concerning the morphological characteristics of the two swans captured.

On March 30, a dead swan was observed along a ditch between Farm Units 1A and 1B. Due to high water the bird was unable to be retrieved. On April 8 the bird was observed at hand and found to have been mutilated by predators. Lead poisoning was suspected but no determination was made concerning cause of death. An estimated 12 swans died in the refuge area this spring.

Fall use of the refuge was normal in that few swans were observed during the migration.

C. Marsh Transect Survey.

The nine line intercept transects established in 1964 were surveyed during August and early September by Wildlife Aid Giffin, following established guidelines and techniques.

Quadrats established on the old transects, established in 1956, were surveyed and photographed during August and slides added to transect slide files.

Data collected from the transect survey is not in the refuge files, as the Wildlife Aid has never compiled the data and submitted his final report.

D. Banding.

Duck banding was initiated in early July when Wildlife Aid Giffin started wood duck brood trapping attempts in Pools 1 and 2. The "Colorado trap" was re-constructed and cannon-net trap sites in Pools 1A and 1B utilized also. As in past years duck banding success

SUMMARY OF BANDINGS

Banding Area **Shiawassee NWR**

Period of Operation April 5 - October 24, 1957

AOU No.	Species	Age and Sex*									Total
		LOCAL			IMMATURE			ADULT			
		M	F	?	M	F	?	M	F	?	
132	Mallard		1		112	59		147	135		858
133	Hind Duck				17	11		23	20		71
140	Blue-winged Teal				25	19		8	14		55
139	Green-winged Teal							1			1
143	American Widgeon				1	2		2	1		5
144	Wood Duck	11	5		12	9		7	5		50
	Sub-total	11	5		157	104		188	175		652
219	Common Gallinule			5			2			2	9
221	American Coot			5			2			3	11
315	Mourning Dove				2	1	1	10	2	1	17
	Sub-total			11	2	1	5	10	2	5	37
172	Canada Goose	70	70		74	102		174	139		629
180	Whistling Swan								2		2
205	Sandhill Crane									1	1
TOTAL		81	75	11	243	207	5	372	319	7	1321

*Enter age in column headings as Nestling; Local, Immature, Sub-adult, Adult. Indicate number and type of traps or methods used: 9 Walk-in bait; 2 Swim-in bait; 2 Cannon nets; Mist nets; 4 Daytime drive traps; Night-time traps; Night-lighting units; Other (specify)

Kind of bait used, if any: **Shelled corn and barley**

BANDING SUMMARY AND COST RECORD

BANDING COST RECORD

1. Total man-hours spent on banding:

<u>145</u>	@ \$	<u>3.32 (ave.)</u>	= \$	<u>485.00</u>
<u>57</u>	@ \$	<u>2.80</u>	= \$	<u>150.00</u>
	@ \$		= \$	
	@ \$		= \$	
Total				\$ <u>545.00</u>

2. Vehicle miles driven on banding:
- 400
- @ \$.06 \$
- 24.00

3. Bait used:
- 500
- bushels or lbs. @
- \$.10 (handling)
- \$
- 50.00

4. Miscellaneous other costs (shells for cannons, transportation of bait, wire, minor repairs to traps, nets, or cannons, etc.) List:

Cannon charges: 104 @ .93 = \$ 97.00Net & trap set-up, etc. 279.00\$ 375.00

5. Depreciation of equipment:

Cannons and nets (\$700.00 x 1/4) \$175.00Weldwire 30.00\$ 205.00

6. Total Costs \$
- 1300.00

Remarks:

115 ducks trapped in baitn traps using 57 hours labor @ 2.80 = \$ 150.00
 535 ducks trapped in cannon-net traps using 32 hours labor @ 3.32(ave.) 105.00
 155 geese trapped in drive traps using 55 hours labor @ 3.32 (ave.) 215.00
 453 geese trapped in cannon-net traps using 45 hours labor @ 3.32 (ave.) 149.00
 22 2 swans trapped in cannon-net trap using 4 hours labor @ 3.32 (ave.) 13.00

Bander: John R. Frye, Refuge ManagerDate: November 28, 1957

was hampered due to a difficulty in baiting ducks to the trap sites. Carp activity, an abundance of food and low duck populations, are the primary handicaps to summer duck banding success at this station.

Canada goose banding, using cannon-net traps, was limited to periods during spring and fall migrations. Drive-trapping of the year's goslings was completed in July, and again nearly 80 percent of the year's hatch was banded.

Total bandings in 1967 included 652 ducks, 628 Canada geese and 2 Whistling swans. Complete banding totals are contained in the following Banding Summary and Cost Record.

VI. PUBLIC RELATIONS

A. Recreational Uses.

The demand for public recreational use of the refuge continues to increase annually as more people "discover" the refuge. The greatest demand has been for observation of wildlife, from the automobile window of course, especially during the spring migration period. The only limiting factors in numbers of individuals who would descend on the refuge each spring are: (1) physical limitations on numbers of individuals that can be accommodated and (2) road conditions that prohibit travel in the refuge during the spring flood periods.

During the winter public use was confined to limited ice fishing on the Shiawassee River and frequent use of the nature trail. With the first warm days in March, week-end traffic started as people came looking for geese and swans, even before the first migrants returned. During late March and April heavy traffic was recorded, with monumental traffic jams, as people came to see the swans. Roads inside the refuge were impassable to automobiles due to flood conditions so the 300 to 500 carloads of people were continually on the move into and out of the general area of Crop Unit 1.

Use of the nature trail continued to be popular all through the summer and fall months and has exceeded our estimates of possible use considerably. The construction of this six mile trail has been one of the best accepted projects we have completed for public use.

The camping area on Green Island, operated by the Boy Scout Council, has been used to capacity all during the camping season.

B. Refuge Visitors.

<u>Date</u>	<u>Name</u>	<u>Affiliation</u>	<u>Purpose</u>
Jan. 12	Omar Doran	FWS, Seney Refuge	Corn transfer
25	Dennis Nelson	M.S.U., E. Lansing, Mich.	Economic study
Feb. 6	J. Sanculius	U.S. Probation Officer	Investigations

<u>Date</u>	<u>Name</u>	<u>Affiliation</u>	<u>Purpose</u>
Feb. 23	Marv Johnson	MCD, Rose Lake	Goose hunting
27	John Hakala	FWS, Seney Refuge	Student interviews
27	Norman Hines	FWS, Jordan River NFH	Student interviews
Mar. 14	John Hakala	FWS, Seney Refuge	Property transfer
20	Frank McAnear	U.S. Dept. of Justice	Condemnation
21	Ed Bosak	USGMA, Columbus, Ohio	Pick up vehicle
21	Udell Meyers	USGMA, Pt. Clinton, Ohio	Pick up vehicle
27	Forrest Carpenter	FWS, Refuges, Mpls. Minn.	Goose hunting and
27	Frank R. Martin	FWS, Refuges, Mpls. Minn.	Michigan Islands
27	Daniel Janzen	Greenville, S.C.	Michigan Islands
29	Bill Gustafson	Saginaw News Photographer	Visit
31	Raymond Jaenicke	Saginaw Co. Drain Comm.	Visit
31	Bill Gustafson	Saginaw News Photographer	Visit
31	James Brown	Saginaw News Editor	Visit
Apr. 11	E. Juderjohn	MCD, Jackson, Mich.	Radio repairs
13	Gerry Gehl	WMSB-TV, E. Lansing	TV film
13	David Kelley	WMSB-TV, E. Lansing	TV film
13	Kenneth Paulson	Saginaw Bay Council, BSA	Scouting use
13	Dick Best	Saginaw Bay Council, BSA	Scouting use
19	M. D. Pirnie	M.S.U., E. Lansing	Photography
19	Wm. Freeman	G.M.C., Olds. Div., Lansing	Photography
19	Ben Wallace	SCS, Saginaw, Michigan	Watershed tour
19	Ford Allen	Soil Conservation Service	Watershed tour
19	Elmer Taylor	Soil Conservation Service	Watershed tour
28	Richard Wetzel	FWS, Wildlife Services	Visit
28	M. D. Pirnie	M.S.U., E. Lansing	Photography
25	Frank McAnear	U.S. Dept of Justice	Land acquisition
May 10	Jim Pulliam	FWS, Washington	Visit
15	John Ramsour	FWS, Engineering, Mpls.	Dike survey
15	Bill Fuchs	FWS, M&E, Lansing	Prosecution reports
June 26	Andrew Meyer	FWS, R.O., Mpls.	Admin. Inspection
29	George Marsil	U. S. Marshal, Detroit	Wells eviction
July 5	Ralph Towne	FWS, Lake Andes Refuge	Visit
10	William Green	FWS, Winona, Minn.	Inventory Plans
10	Frank McGilvery	FWS, Patuxent R. C.	Wood duck habitat
Aug. 18	Marv Johnson	MCD, Rose Lake	Managed goose hunt
18	Harold Dykema	MCD, St. Charles	Managed goose hunt
18	Robert Strong	MCD, Lansing	Managed goose hunt
28	O. H. Hammer	Dow Chemical Co., Midland	Discuss pesticides
Sept. 4	Paul Dumont	SCS, I & E, Howell, Mich.	Refuge land use
12	Joe Richey	FWS, Engineering, Mpls.	Dike survey
12	John Ramsour	FWS, Engineering, Mpls.	Dike survey
28	James J. Williams	U.S. Geological Survey	Refuge boundary info.
Oct. 18	Tom Opre	Detroit Free Press	Outdoor article
23	William Green	FWS, Winona, Minn.	Goose hunting program
27	Ed Mikula	MCD, Lansing	Goose hunting program
27	Ray Voss	Grand Rapids Press	Goose hunting program
27	Howard Shelley	"Michigan Outdoors"	TV program film
27	Dick Black	"Michigan Outdoors"	TV program film
Dec. 18	Jack Tucker	Saginaw News Outdoor Editor	General Refuge info.
27	George Hunt	U of M, Ann Arbor, Mich.	Discuss research
27	David Kitchen	U of M, Ann Arbor, Mich.	Discuss research

C. Refuge Participation.

1. Refuge Tours.

- March 31 - Arthur Hill Science Club. (Frye and Kerschbaum - 87)
- April 4 - Boy Scout Troop 420. (Poma - 18)
- 5 - Hemlock School, 1st Grade. (Kerschbaum and Robinson - 110)
- 10 - Cub Scout Pack 57. (Poma - 40)
- 10 - Boy Scout Troop 87. (Kerschbaum - 32)
- 10 - Saginaw County Agriculture Council. (Frye and Kerschbaum - 12)
- 11 - Morley School, 4th, 5th, 6th Grades. (Poma and Kerschbaum - 40)
- 13 - Saginaw Bay Area Council Officials, BSA. Frye
- 15 - YMCA Indian Guides. (Frye - 13)
- 12 - Hoyt School 4th and 5th Grades. (Poma - 45)
- 12 - Blue-birds Group. (Poma - 15)
- 27 - YMCA Indian Guides. (Poma)
- May 16 - Boy Scout Group. (Frye - 16)
- 19 - North Intermediate School. (Self guided nature trail - 50)
- July 26 - Cub Scout Nesting Box Erection Project. (Giffin - 5)
- September 26 - St. Casimir Campfire Girls. (Kerschbaum - 65)
- October 1 - Saginaw Audubon Club. (Kerschbaum - 35)
- 6 - Hemlock School 3rd Grades. (Kerschbaum and Poma - 106)
- 7 - Walther League, Peace Lutheran Church. (Frye - 42)
- 21 - Lansing Audubon Club. (Frye - 40)

- November 6 - Cub Scout Pack. (Poma - 15)
- 9 - Arthur Hill Science Club. (Kerschbaum and Poma - 70)
- 15 - Cub Scout Pack. (Poma - 15)
- December 28 - Cub Scout Pack. (Frye - 12)

2. Meetings.

- February 6-8 - Michigan Canada Goose Seminar at Kensington Metropolitan Park. Frye and Kerschbaum.
- 8 - Posting and enforcement problems at Lake St. Clair Refuge discussed with Michigan Conservation Department personnel at Haven Hill Lodge, Highland Recreation Area, Highland, Michigan. Frye, Kerschbaum and Robinson.
- 11 - Youth Power Conference - Career Day at Delta College. Frye and Kerschbaum.
- 13 - Saginaw County Senior Government Day at Bridgeport High School. Frye.
- 28 - Job Interviews, Michigan State University. Frye, Hakala and Hines.
- March 1 - Job Interviews, University of Michigan. Frye, Hakala and Hines.
- 27 - Public Goose Hunting Plans with Michigan Conservation Department, Lansing. Frye, Martin, and Carpenter.
- 29 - Michigan Islands Wilderness Hearing, Petoskey. Frye, Martin, Carpenter, Hakala, Dundas, and Janzen.
- April 25 - Pre-Trial Conference regarding evictions from Tracts 122 and 135, U. S. Court, Bay City. Frye and Robinson.
- May 28 - Saginaw Human Relations Committee meeting regarding federal job opportunities for Negroes. Frye.
- Sept. 17-19 - I.M.E.A.C. Conference, Detroit. Frye
- 27 - Spaulding Township Planning Commission. Frye

Monthly meetings of the Saginaw County Agricultural Council were attended by Frye and Kerschbaum. Periodic informal meetings were held with Soil Conservation Service personnel, Cooperative Extension Service, and farming cooperators throughout the year.

3. Slide Talks.

- | | | | |
|----------|----|---|---|
| January | 17 | - | Saginaw Bay Power Squadron Auxiliary. (Frye - 42) |
| | 18 | - | Westdale Elementary School PTA. (Kerschbaum - 43) |
| | 24 | - | Saginaw Audubon Society. (Frye - 33) |
| | 25 | - | Salina Lodge, "Masons". (Frye - 100) |
| February | 6 | - | Michigan Canada Goose Seminar (color marking of waterfowl). (Frye - 20) |
| | 14 | - | Zilwaukee School PTA supper. (Kerschbaum - 100) |
| | 20 | - | Frankermuth JC's. (Frye - 120) |
| | 27 | - | M.S.U. Wildlife-Fisheries Club. (Frye - 43) |
| March | 1 | - | Shield's Lion's Club. (Kerschbaum - 30) |
| | 2 | - | Spaulding Township Volunteer Fire Department. (Frye - 34) |
| | 6 | - | Arthur Hill Science Club. (Frye - 80) |
| | 13 | - | University of Michigan Wildlife & Fisheries Seminar. (Frye - 27) |
| | 13 | - | Campfire Girls - Saginaw. (Kerschbaum - 150) |
| April | 10 | - | South Saginaw Businessmen's Club. (Frye - 66) |
| | 17 | - | Saginaw Retired Men's Club. (Frye - 112) |
| | 19 | - | Boy Scout Troop 430, Saginaw. (Poma - 30) |
| | 28 | - | Cub Scout Pack 39, Saginaw. (Frye - 96) |
| May | 16 | - | Longstreet Club, Saginaw. (Frye - 56) |
| June | 6 | - | McBrite School 4th Grade. (Kerschbaum - 67) |
| July | 6 | - | North Intermediate School. (Kerschbaum - 30) |
| Sept. | 6 | - | Muskamoot Bay Duck Club, St. Clair Shores. (Frye - 120) |

- Sept. 27 - Northwest Kiwanis Club, Saginaw. (Frye - 30)
- October 11 - Saginaw County Fire Association. (Kerschbaum - 72)
- 12 - Kochville Methodist Church Men's Club. (Frye - 60)
- 19 - Downtown Kiwanis Club. (Frye - 63)
- November 6 - Sheridan Ave. Methodist Church Men's Club.
(Kerschbaum - 14)
- 8 - St. Casimer School, 1st - 5th grades. (Poma - 200)
- 12 - St. Thomas Aquinas Church Men's Club Father and
Son Breakfast. (Poma - 200)
- December 6 - Saginaw Bay Area Council, Boy Scouts of America
Executive Council. (Frye - 36)

4. Student Interviews.

Frye, John Hakala (Seney NWR Manager) and Norman Hines (Jordan River NFH, Asst. Manager) conducted student interviews at Michigan State University on February 28 and at the University of Michigan on March 1.

5. Other.

Radio. The five minute program on Station WKNX and 90 second program on Station WSGW was presented bi-weekly through June with Kerschbaum, Frye and Poma alternating.

Television. Swan activity on the refuge was presented as a segment of the outdoors show on WXYZ-TV, Detroit, on May 14. On November 2 a filmed feature on the public goose hunting program, featuring an interview with Manager Frye, was shown on the syndicated "Michigan Outdoors" program, and was carried by local TV all over the state.

Extracurricular Activities of Personnel. Poma capably served as Assistant Scoutmaster for his local troop; Robinson worked with a boy's baseball team; Frye served with the Spaulding Township Volunteer Fire Department, officiated as President of the Saginaw County Agriculture Council for 1967, and coached a boy's baseball team of 8 and 9 year olds.

D. Hunting.

Approximately 500 acres of refuge lands were designated a Public Hunting Area for goose hunting only in 1967, as described in the approved Refuge Hunting and Fishing Plan. Under Michigan regulations the goose

hunting season opened on October 16 and extended through November 17 in the specially designated Saginaw County Goose Management Area. Special regulations within this management area included one-half day shooting, from sunrise until noon, and a daily bag and possession limit of one Canada goose. Only geese could be taken from refuge public hunting areas, while ducks and geese could be taken from the adjoining Shiawassee River State Game Area and from private lands within the management area.

Application cards for advance mail reservations for blinds (Exhibit 1) to be located within the refuge public hunting area were distributed as widely as possible in the southern one-third of the State. A delay in the receipt of application cards from the printer until September 15 resulted in considerable difficulty in having cards available to interested applicants in as large an area as had been planned. Availability of application cards and limited advance publicity were undoubtedly the major reasons for receipt of only an estimated 2,000 applications for this initial hunt. Applications were also accepted on postcards if required information was included.

The hunting plan provided that 20 blinds would be available for each day of the 32 day season. The blinds were constructed and placed in four hunting areas by refuge personnel prior to the opening date of the season. Provision was made to limit two hunters to a blind, and applications were to be made by parties of two hunters. Since the season extended for 32 days, there was a total of 640 reservations available. As individuals that submitted duplicate applications, incomplete applications, etc. were automatically disqualified from consideration, a total of 1,159 valid applications was processed for the 640 available reservations.

The drawings for blind reservations were completed in the refuge office on October 3 by Mr. Leo Rushlow, long-time active member of the Saginaw Field and Stream Club and one of the earliest supporters for the establishment of the refuge. Successful applicants were notified by use of their application card on which was stamped information as shown on attached Exhibit 2. Notices to successful applicants were mailed to 143 cities and towns in southern Michigan, indicating a fairly widespread distribution.

Final preparations for the hunt were completed one day prior to the opening day with all 20 blinds in place and modification of the equipment building at refuge headquarters for use as a check station.

As they arrived at the check station each day, hunters were required to produce for inspection their reservation card, hunting license, Migratory Bird Hunting Stamp, and their shotguns. If all was in order, one member of the party was then permitted to draw one of 20 numbered wooden balls from a container to determine their blind assignment. Blinds were assigned only by luck of the draw and hunters were not permitted to select a particular blind. Upon collection of the user

fee of \$2.00 per head, and fees for rental of goose decoys if desired, hunters were then issued armbands numbered to correspond to the assigned blind. Armbands were to be worn at all times hunters were in the field. Hunters were then furnished a review of all regulations and directed to their assigned blind.

If hunters with reservations were not present at the check station at one hour before sunrise, reservations were cancelled and at that time any stand-by hunters were given the opportunity to draw for any vacant blinds. Drawing was done in the same order the stand-bys had signed in each morning.

At the conclusion of the hunt, hunters were required to check out through the check station. Arm bands and decoys were returned, any geese taken were sexed, aged, and weighed, and comments were solicited from each hunting party regarding the opportunity, operation of the program, etc.

There was at least one "no-show" reservation each day during the season, and stand-by hunters drew for the vacancies as they occurred. There was only one day during the season that all stand-bys were not offered hunting positions. All 20 blinds were filled on only 9 days during the season, even with stand-by drawings.

There had been some concern that the kill might be too great, with locally hatched geese taking the brunt of the kill. Goose populations varied from 7,200 at the time the season opened to a peak of 9,300 during the last week of the season. If every blind had been filled every day of the 32 day season, and if every hunter had filled out, a total of 1,280 Canada geese could have been taken from the refuge public hunting area. At no time did the harvest approach the possible legal kill. During the season a total of 107 Canada geese, 2 snow geese, and 2 blue geese were killed from the refuge blinds, an average of 3.5 geese per day. A total of 207 Canada geese were taken with 51.7% of the kill from refuge blinds; 26.6% from the State Game Area; and 21.7% from private lands.

During the hunt only 20 of our locally produced geese from the refuge nesting flock were taken; geese were identified by colored plastic leg bands. The season was apparently not detrimental to the local flock. Only four of the local birds were taken from refuge blinds, while seven were taken from private lands, and nine were taken from the State Game Area.

Weights, sex, and age data from the 113 Canada geese processed through the refuge check station, including birds taken on private lands, indicate a ratio of 1 adult : 1.83 immatures. Twenty adult males (17.7%), 20 adult females (17.7%), 42 immature males (37.2%), and 31 immature females (27.4%) were processed through the check station during the hunt.

Total costs for preparation of the hunting program were \$3,646.38, exclusive of labor charges for processing applications, drawings, notification of the successful applicants, etc. Costs include construction of blinds, purchase of goose decoys, printing costs, fabrication of armbands, setting up the check station, etc.

Each hunter was charged a user fee of \$2.00 each day and goose decoys were available for rental at a charge of \$1.00 per dozen per day. The decoy rental service was very popular with the hunters and it would have been possible to have rented out all decoys almost every day, except that hunters were limited to two dozen per blind to insure that there would be decoys available for all interested hunters. Many of the hunter parties brought their own decoys and rented decoys in addition. All decoys were not rented out every day, but might have been had earlier parties not been limited to two dozen. The decoys cost \$542.92 and rental fees for the season totalled \$533.00, almost off-setting acquisition costs. Decoys used were hollow body shell type made of high-impact plastic, were well liked by the hunters, and held up over the entire season with practically no breakage. Total receipts, including both the hunter user fee and goose decoy rental fee, were \$2,659.00.

Of the 1,063 hunters who participated, we had only one disgruntled hunter who felt he was taken advantage of and did not get his money's worth. (This same individual has previously been unhappy because he can no longer drive into the center of the refuge to see deer since the main access roads were closed.). The majority of comments received from hunters indicated they were well satisfied with the opportunity to participate in a quality type program with good blinds (except there were no seats in the blinds) spaced far enough apart to eliminate conflicts between parties. With few exceptions, participating hunters indicated they would be back next year if lucky enough to have their names drawn. The only disparaging remarks received came from certain Michigan Conservation Department personnel who we suspect were unhappy that we did not offer them special treatment over other hunters.

One hunter suffered a fatal heart attack while going to his blind on October 25.

In future years it is recommended that the program be continued under the same basic guidelines, as set down in the Hunting and Fishing Plan. It will be possible to expand the number of blinds to at least 25 within the present public hunting area with no conflict to our 200 yard minimum blind spacing. Some leasing of pits occurred on private lands adjacent to the refuge on the north side of the Shiawassee River this year. Consideration should be given to the inclusion of public hunting area in that portion of the refuge in future years. The limiting factor at the present time is access to refuge lands for public hunting. It must be determined if costs for construction of access roads and parking areas are feasible and funds must be made available for the project before the hunting area can be established.

Any additional blinds established at this location could still be handled through the present check station at refuge headquarters as distance involved are no greater than presently on the State Game Area, and it has been well accepted there.

A public restroom must be provided at the check station for use by hunters. The refuge office facility is not adequate for general public use, even if the office were open during the time hunters are checking in and out.

Dr. Green's report of November 3 suggested use of temporary employees in manning the check station. While it is true that most normal refuge operations stopped during the hunting period, I feel this is an integral part of the future refuge operation and work schedules can be prepared to plan for this now that we have some idea of what is involved in the operation of a manned hunting program. I do not feel that temporary personnel would be qualified to man the check station and be prepared to answer the many involved questions that come up. Observations of use of temporary personnel by the State Game Area in their program this year convinced me that we do not need this type of assistance in our program.

Dr. Green also suggested a provision for an extension telephone in the check station to maintain normal communications during the hunting period. This will be provided in future years.

Now that we have survived the first managed goose hunt, we are in a much better position to prepare for future hunts. Major problems encountered this year and suggested solutions are as follows:

1. Application Cards: Approval to have cards printed locally in future years will eliminate the problems encountered this year. The cards were lost in shipping between Minneapolis and Saginaw and were not received in this office until September 15. Major printing errors and elimination of desired information found in this year's cards can be remedied before cards are printed if we are having the work done by a local contractor.

Distribution of the application cards should be more wide-spread in future with more time to get them out. We have been promised cooperation by the Michigan Conservation Department in having all of their field stations supply applications to all interested individuals.

2. Blind Locations: The go-ahead for the program was received this year after the farming season was underway resulting in undesirable crops being grown in certain locations within the proposed hunting areas. In future years we can plan the crop program so that there will be no conflict between the farmer and the hunting program. We also now have a better idea as to proper location of blinds so that all blinds will offer approximately equal opportunity for the hunter to take geese.

APPLICATION TO HUNT GEESE ON THE SHIAWASSEE NATIONAL WILDLIFE REFUGE

1. PLEASE FILL IN THE CARD BELOW COMPLETELY.
2. ADDRESS THE CARD TO YOURSELF BY PRINTING YOUR NAME AND ADDRESS ON THE REVERSE SIDE.
3. TEAR OFF THE CARD WITH YOUR NAME ON IT AND PLACE IT IN AN ENVELOPE ADDRESSED TO:

Shiawassee National Wildlife Refuge
6975 Mower Road
Saginaw, Michigan 48601

Each person may apply only once, and applications must be postmarked not later than October 1. Hunters must be in parties of 2 to be eligible for a hunting blind. Hunting dates are from October 15 through November 17, with the exception of October 20 when morning hunting is prohibited by State law.

ONLY SUCCESSFUL APPLICANTS WILL BE NOTIFIED

(Tear off here)

APPLICATION TO HUNT GEESE ON THE SHIAWASSEE NATIONAL WILDLIFE REFUGE

Name and address of first applicant _____

Signature _____

Name and address of second applicant _____

Signature _____

(Do not write in this space)

Write in Date You Wish To Hunt	
Month	Day

Exhibit I. Application card made available to interested goose hunters.

APPLICATION TO HUNT GEESE ON THE SHIAWASSEE NATIONAL WILDLIFE REFUGE

Name and address of first applicant _____

Signature _____

Name and address of second applicant _____

Signature _____

(Do not write in this space)

Write in Date You Wish To Hunt	
Oct.	31
Month	Day

A blind has been reserved for you on the date indicated on the left. Blinds will be selected by drawing at Refuge Headquarters one hour before legal shooting time on the day of the hunt. If you are not present for this drawing your blind reservation will be cancelled.

Exhibit II. Self-addressed half of application card validated by stamp and returned to the successful applicant.

_____ Dozen Blind No. _____

DECOY RESPONSIBILITY

I have inspected the decoys rented to me by the Bureau of Sport Fisheries and Wildlife and find them to be in good condition.

I agree to pay for those decoys lost or damaged while in my possession at the cost price to the Bureau. Individual heads or stakes lost or damaged will be paid for at a proportionately lower rate.

Date: _____ Signed _____

Exhibit III. Form used to have hunter assume responsibility for rented goose decoys.



SHIAWASSEE NATIONAL
WILDLIFE REFUGE

Flint River

Area 1

P

Curtis Road

Area 2

Crawswell Road

Area 3

W. Moore Road

Area 4

Houlihan Road

Littlejohn Road

Even Road

Mower Road

Refuge
Hdqts.

LEGEND

/// Refuge Boundary
P Parking Area

→
Hwy M-13

SHIAWASSEE NATIONAL WILDLIFE REFUGE
HUNTING REGULATIONS - MANAGED GOOSE HUNTING AREA

Managed goose hunting on Shiawassee National Wildlife Refuge includes several restrictions that apply only to the Saginaw County Goose Management Area, as designated by the Michigan Conservation Department. These special restrictions are as below listed:

1. Goose hunting opens on October 16, 1967 - one week later than the opening for other waterfowl species.
2. The season extends through November 17, 1967 with the exception of October 20 when there will be no hunting.
3. Hunting will be limited to half-days, from sunrise until noon.
4. The daily limit and possession limit is one Canada Goose per hunter.

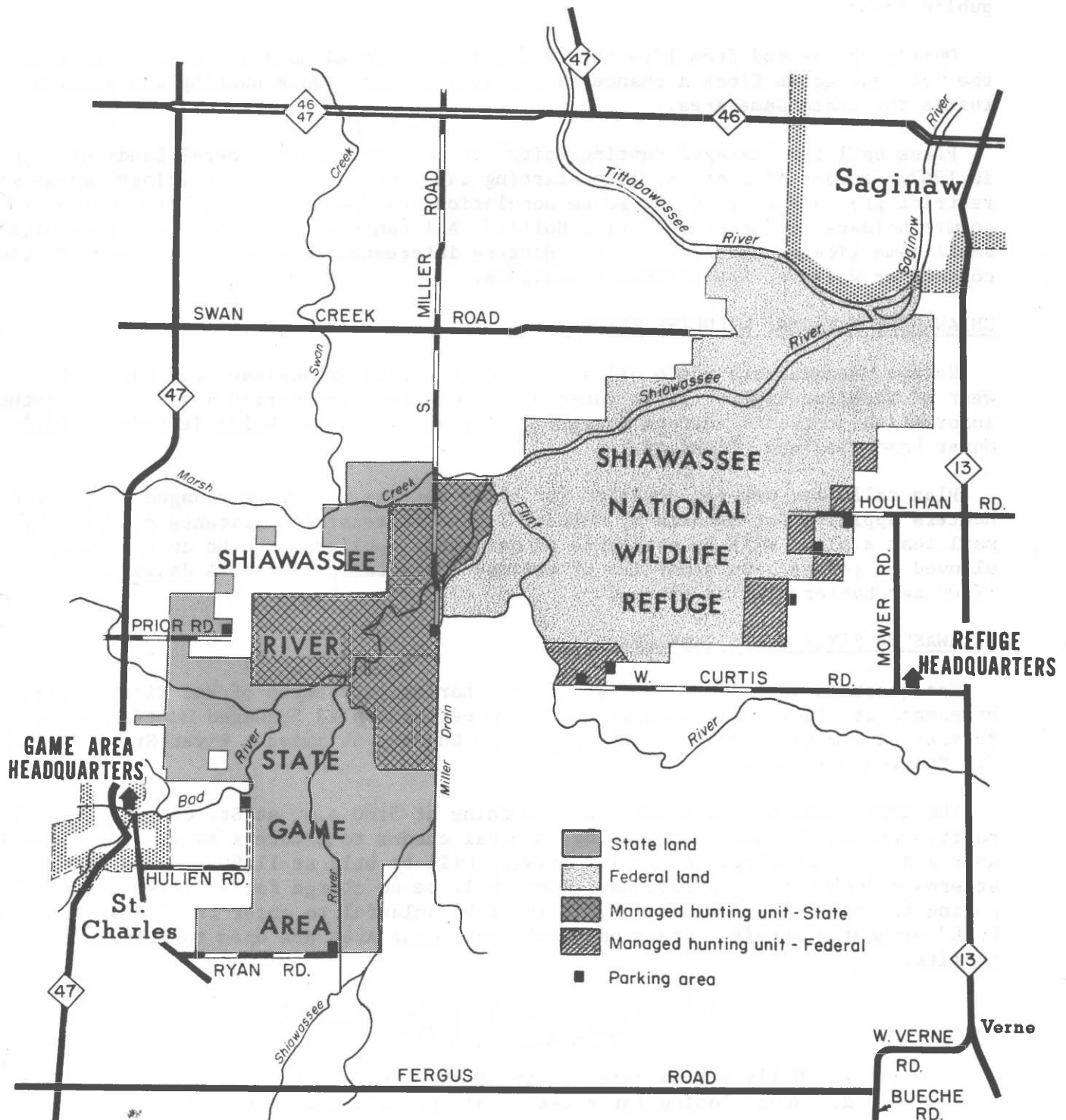
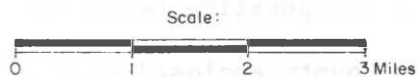
Additional restrictions that apply to hunters in the managed hunting area on National Wildlife Refuge lands are:

1. Successful applicants for goose hunting permits must present blind reservation card on morning of the hunt. A \$2.00 per hunter fee will be collected at that time.
2. Goose hunting only. Duck hunting is not permitted on refuge lands.
3. Hunting will only be from assigned blinds. Successful applicants must be present at the refuge headquarters one hour prior to sunrise on the day of the hunt, at which time a drawing will be conducted to determine blind assignments.
4. Only two hunters will be permitted in each blind.
5. Only shotguns 16 gauge or larger may be used. Shells must be loaded with No. 4 shot or larger.
6. After completion of the days hunt, all hunters must proceed to refuge headquarters for check-out and the submission of geese for examination.

General information regarding location of blinds is as follows:

- Area 1: Blinds No. 1 through 9
- Area 2: Blinds No. 10 through 15
- Area 3: Blinds No. 16 through 18
- Area 4: Blinds No. 19 and 20

SAGINAW COUNTY GOOSE MANAGEMENT AREA



SAGINAW COUNTY GOOSE MANAGEMENT AREA

The Shiawassee River State Game Area and Shiawassee National Wildlife Refuge are located in the center of this "Managed Waterfowl Area" in north-central Saginaw County. Seventeen thousand acres of public land dedicated to waterfowl management provide a major resting and feeding area for ducks and geese. Agricultural crops in both areas are being produced on a co-operative basis with local landowners.

Area includes that part of Saginaw County enclosed by M-13 on the east; M-46 on the north; M-47 on the west; and Fergus, Bueche, and Verne Roads on the south. All private lands within these boundaries have the same hunting restrictions as public lands.

During the period from 1964-66, this area was closed to goose hunting to give the resident goose flock a chance to get established. Duck hunting was allowed inside the State Game Area.

Plans call for "Managed Hunting Units" on both State and Federal Lands starting in 1967. Number of hunters, late starting date, noon closing, and closed areas will restrict pressure on resident goose population and also assure quality hunting for permit holders in "Managed Hunting Units." All hunters must have current Michigan small game license and duck stamp. Hunters interested in applying for permits should contact or write to the following stations:

SHIAWASSEE NATIONAL WILDLIFE REFUGE

Refuge Headquarters are 6 miles south of the city of Saginaw, one half mile west of Michigan Highway 13 at Intersection of Mower and Curtis Roads. For further information, contact: Refuge Manager, Shiawassee National Wildlife Refuge, 6975 Mower Road, Saginaw, Michigan.

Plan calls for pre-registration for blind hunting on refuge managed areas with hunters applying for permits by October 1, and successful applicants notified by mail that a blind will be available on date they applied for. No duck hunting allowed on refuge. Only parties of two may apply for permits. A daily fee of \$2.00 per hunter will be charged.

SHIAWASSEE RIVER STATE GAME AREA

Headquarters is located in town of St. Charles just north of Bad River Bridge. Personnel at station will answer questions pertaining to "Managed Hunting Unit." For further information, contact: Biologist In Charge, Shiawassee River State Game Area, St. Charles, Michigan.

The State will hold a drawing each morning at 5:00 a.m. at St. Charles with all parties present at that hour having an equal chance to secure a permit for morning duck and goose hunting. A similar drawing will be held at 11:00 a.m. to determine afternoon duck hunting positions. There will be no charge for permits on state land. During the open waterfowl season, it shall be unlawful to enter the "Managed Hunting Unit" without a permit. Other parts of State Game Area are open to hunting without permits.

SAGINAW COUNTY GOOSE MANAGEMENT AREA SPECIAL RESTRICTIONS

1. Daily & possession limit of one Canada Goose per hunter.
2. Noon closing for geese within goose management area. This includes all private land.
3. Goose hunting opens the 2nd week of waterfowl season.

3. Publicity: The program has been well advertised this year. Hunters that participated in the program have been our best salesmen. We received excellent publicity during the season from news media all over the state, especially in the Detroit and Flint areas. The program was well illustrated, in color, and explained on the syndicated "Michigan Outdoors" television show on November 2.

Bow and arrow hunting for deer is not permitted on refuge lands. The Michigan gun deer season in 1967 extended from November 18 through December 3, 1967. This year the season opened on the same date in both upper and lower peninsulas of Michigan and as a result hunter use was down about 50 percent from last year, when the season opened in the upper peninsula one week before that in the rest of the state. Thus, in 1967 hunters could not hunt up north the first week and then return to the lower peninsula for an additional two weeks. The decline in hunters use illustrates that in 1967 hunters were forced to decide early where to hunt and hunters were not concentrated in the southern one-third of the state the latter part of the season as has happened in past years.

From daily car counts, during the 16 day season, it was estimated that 3,843 hunter days produced a legal kill (bucks only) of 60 deer. The illegal kill of antlerless deer is estimated at 40 or about normal for a bucks only season.

E. Violations.

The following cases were prosecuted in Federal District Court at Bay City during the year. Many were hold-over cases from 1966.

<u>Name</u>	<u>Violation</u>	<u>Court Action</u>
A. Granberry	Hunting on Refuge	\$25.00 - 1 yr. probation
H. Granberry	Hunting on Refuge	\$25.00 - 1 yr. probation
D. Kerr	Hunting on Refuge	\$25.00 - 1 yr. probation
R. Mertes	Hunting on Refuge	\$25.00 - 1 yr. probation
H. Prince	Hunting on Refuge	\$25.00 - 1 yr. probation
H. Smith	Hunting on Refuge	\$25.00 - 1 yr. probation
H. Wendt	Illegal firearm	\$25.00 - 1 yr. probation
S. Benjamin	Hunting on Refuge	\$25.00 - 1 yr. probation
A. Martinez	Hunting on Refuge	\$25.00 - 1 yr. probation
T. Metcalf	Hunting on Refuge	\$25.00 - 1 yr. probation
W. Miller	Hunting on Refuge	\$25.00 - 1 yr. probation
R. Reppuhn	Hunting on Refuge	\$25.00 - 1 yr. probation
T. Sanchez	Hunting on Refuge	\$25.00 - 1 yr. probation
F. Wiesermaier	Hunting on Refuge	\$25.00 - 1 yr. probation
D. Evanchek	Illegal firearm	\$25.00 - 1 yr. probation
G. Goodenough	Illegal firearm	\$25.00 - 1 yr. probation
W. Heyse	Hunting on Refuge	\$25.00 - 1 yr. probation

<u>Name</u>	<u>Violation</u>	<u>Court Action</u>
W. Jackson	Hunting on Refuge	\$25.00 - 1 yr. probation
W. Kuhlman	Hunting on Refuge	\$25.00 - 1 yr. probation
C. Lincoln	Hunting on Refuge	\$25.00 - 1 yr. probation
L. Lukowski	Hunting on Refuge	\$25.00 - 1 yr. probation
D. Roberts	Hunting on Refuge	\$25.00 - 1 yr. probation
E. Beythan	Hunting on Refuge	\$35.00 - 1 yr. probation
E. Eimers	Hunting on Refuge	\$35.00 - 1 yr. probation
D. Gross	Hunting on Refuge	\$25.00 - 1 yr. probation
G. Gross	Hunting on Refuge	\$25.00 - 1 yr. probation
D. Miller	Hunting on Refuge	\$25.00 - 1 yr. probation
R. Miller	Hunting on Refuge	\$25.00 - 1 yr. probation
E. Tank	Hunting on Refuge	\$25.00 - 1 yr. probation
R. Weir	Hunting on Refuge	\$25.00 - 1 yr. probation

In addition, the following were prosecuted in State Court with cooperation of local Conservation Officers.

R. Hall	Hunting with resident license	\$35.00 fine - \$11.00 Costs
H. Cage	Hunting with no license	\$10.00 fine - \$10.30 Costs
J. Sobel	Hunting on Refuge	\$10.00 fine - \$10.30 Costs
B. Hollingsworth	Hunting on Refuge	\$10.00 fine - \$10.30 Costs
M. Lewis	Hunting on Refuge	\$10.00 fine - \$10.30 Costs
W. Day	Hunting on Refuge	\$10.00 fine - \$10.30 Costs
W. Miller	Unplugged Gun	\$10.00 fine - \$10.30 Costs
D. Stewart	Hunting on Refuge	\$10.00 fine - \$11.00 Costs
F. Allen	Hunting on Refuge	\$10.00 fine - \$10.30 Costs
C. Roby	Hunting on Refuge	\$10.00 fine - \$10.30 Costs
J. Stinger	Hunting squirrels during closed season	\$10.00 fine - \$10.30 Costs
O. Johnson	Hunting squirrels during closed season	\$10.00 fine - \$10.30 Costs
K. Penney	Hunting squirrels during closed season	\$10.00 fine - \$10.30 Costs
R. Smith	Hunting on Refuge	\$20.00 fine - \$11.00 Costs
E. Thon	Hunting on Refuge	\$10.00 fine - \$10.30 Costs
J. Nickelberry	Hunting without license	\$10.00 fine - \$10.30 Costs
E. Wedding	Hunting on Refuge	\$70.00 fine - \$10.90 Costs
R. Bianchini	Killed mallard during closed season	\$35.00 fine - \$10.00 Costs
L. Gail	Illegal firearm	\$10.00 fine - \$10.00 Costs
R. Novak	Shot Whistling Swan	\$30.00 fine - \$11.00 Costs
M. Kubiak	Hunting on Refuge	\$10.00 fine - \$11.00 Costs

Nuisance and vandalism violations continue to plague the station. Numerous trespass violations by individuals using snowmobiles keep staff members busy in the winter, and unless we weaken and acquire one for the refuge, they are impossible to apprehend. Dumping of

trash and garbage has been almost eliminated since all roads were gated at the refuge boundary, but incidents involving broken locks on gates have increased. Gasoline was stolen from the Secondary Headquarters storage tank twice during the year, but this too has been largely eliminated by the new gates. Shooting of refuge signs continue to be a major and unending problem.

F. Safety.

The station Safety Committee, Kerschbaum, Robinson and Poma, again set a schedule for regular staff safety meetings during the year. Scheduled safety meetings were as follows:

- January 3 - Review of 1966 record and accomplishments. Goals for 1967. (Frye)
- January 30 - Film "First Aid for Burns". (Kerschbaum)
- March 6 - Film "First Aid for Injuries to Bones, Joints, and Muscles". (Poma)
- April 3 - Operation of Air Boat. (Robinson)
- May 2 - Use and storage of flammable liquids. (Mayle)
- June 5 - Film "First Aid - General". (Shelley)
- August 28 - Pesticides - Labels, etc. Talk by Dr. Hammer, Dow Chemical Company. (Giffin)
- October 9 - Film "Hunting Safety". (Kerschbaum)

On the job safety discussions were held periodically, especially when temporary employees were assigned different jobs.

There were no lost time accidents during the year and the station safety record now stands at 5,219 days without a lost-time accident.

VII. OTHER ITEMS

A. Trips.

- January 11-12 - Frye to Selfridge AFB for winter waterfowl inventory flight with U. S. Coast Guard helicopter.
- February 6-7 - Frye and Kerschbaum to Kensington Park, Milford, Michigan, for Michigan Canada Goose Seminar.
- February 15-18 - Poma to Minneapolis for Refuge Clerk's Workshop.

- February 27 - Frye to Ann Arbor and East Lansing for student
to March 1 interviews.
- March 13 - Frye to Ann Arbor for University of Michigan
Wildlife Seminar.
- March 28-29 - Frye to Petoskey, Michigan, with Carpenter, Martin,
and Janzen for Michigan Islands Wilderness Proposal
Hearing.
- April 15 to - Kerschbaum to Arden Hills, Minnesota, for Refuge
May 20 Manager Training School.
- August 3 - Kerschbaum to Cadillac, Michigan to inspect potential
refuge area.
- September 15-17 - Frye to Lake St. Clair Refuge to work early teal
season.

In addition to the above, trips were made to the Detroit Tank Plant, and Selfridge AFB, to screen or pick up excess property items at various times during the year.

B. Personnel.

James R. Mayle, Operator General (Heavy), transferred to the San Luis Refuge, Los Banos, California, on May 20, 1967 as Maintenance man II.

Matthias A. Kerschbaum, Assistant Refuge Manager since August of 1966 departed on Military Furlough on November 10, 1967. With the draft board reaching for him, Matt enlisted for a three year hitch in the U. S. Army and was last heard from deep in basic training activities at Fort Knox, Kentucky. A copy of this report is being sent to Matt for his information.

Lawrence J. Blazo EOD as Operator General (Heavy) to replace Jim Mayle on December 11, 1967. Larry, a Michigan native presently living in St. Charles, is married and has three children.

Louis D. Robinson received a Special Act Award of \$200.00, under the Incentives Awards Program, on December 23, 1967, for superior performance during the period the Operator General position was vacant.

C. Land Acquisition.

Final action has now been completed on all but two tracts included under the condemnation action of November 1965.

A milestone of sorts was achieved in May when, following public hearings by the Saginaw County Road Commission, all public roads that enter the refuge, were abandoned beyond the point of entry into refuge lands. Gates were immediately installed to close access into refuge lands from Curtis, Moore, Littlejohn, Houlihan, and Evon Roads. South Center and Willing Roads on the north side of the refuge, are to be gated as soon as possible. This one action which now permits controlled access to the refuge has practically eliminated many of the serious problems we have experienced in the past (vandalism of Secondary Headquarters buildings, garbage dumping, etc.). As expected local people are not too happy about the new gates as they can no longer drive into the heart of the refuge to see deer from their vehicle windows, have no secluded areas for beer parties, and now have to haul their trash and garbage to established dumps.

D. Photographs.

All photographs were taken with refuge equipment and processed in our office bathroom-darkroom.

E. Credits.

Kerschbaum - Sections VA and VB.
Poma - Typing and assembly.

Little could have been accomplished during 1967 except through the excellent cooperation and high degree of enthusiasm displayed by all refuge staff personnel. With personnel vacancies, extra work-loads due to floods and the public hunting program, and the usual shortage of funds, the impossible was accomplished.

SIGNATURE PAGE

Submitted by:


(Signature)

John R. Frye

Refuge Manager

Title

Date: January 19, 1967

Approved, Regional Office:

Date: **JAN 20 1968**
(Signature)*Acting Asst.*

Regional Refuge Supervisor

WATERFOWL

REFUGE SHIAWASSEE

MONTHS OF JANUARY TO APRIL, 1957

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	2	2	2	1	1	1	1	1	1	1
Trumpeter										
Geese:										
Canada	3,850	2,130	50	30	25	25	25	25	25	75
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	1,000	1,000	340	180						
Black	350	350	150	50						
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:										

3 -1750a

Cont. NR-1

(Rev. March 1953)

WATERFOWL
(Continuation Sheet)REFUGE SHIAWASSEEMONTHS OF JANUARY TO APRIL, 19 57

(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	12	117	1,550	2,000	300	50	30		28,557		
Trumpeter											
Geese:											
Canada	500	4,400	11,150	19,400	15,300	11,300	2,300		501,970		
Cackling											
Brant											
White-fronted						1	1		14		
Snow				1	2	1	1		35		
Blue				3	4	3	3		91		
Other											
Ducks:											
Mallard	50	300	300	2,200	3,000	3,000	300		81,590		
Black	50	100	100	950	900	900	100		28,140		
Gadwall											
Baldpate			100	500	400	200	50		9,450		
Pintail	20	300	300	1,500	2,500	1,500	200		44,940		
Green-winged teal			10	20					210		
Blue-winged teal			20	50	150	200	200		4,340		
Cinnamon teal											
Shoveler			10	20	20	20	20		530		
Wood			10	300	300	300	300		8,470		
Redhead			10	40					350		
Ring-necked			30	20					350		
Canvasback		3	30	150	150				2,331		
Scaup			15	50	150	100	50		2,555		
Goldeneye	2		30	20	20				504		
Bufflehead			10		30				280		
Ruddy					1				7		
Other											
Common merganser	1		10	3	50	30	30		1,078		
Hooded merganser		1	2						21		
Coot:		3		40	130	220	300		5,951		
				(over)							

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans	28,557	2,000		Principal feeding areas <u>Crop Units 1, 3, 7 and 11</u>
Geese	502,110	19,404		
Ducks	185,345	7,570		Principal nesting areas _____
Coots	5,951	300		
				Reported by <u>Refuge personnel</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 **SHILAWASSEE**Months of **JANUARY** to **APRIL** 195**7**

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Sandhill crane	1	3/25	1	3/25	1	3/25				1
Great Blue Heron	4	3/25	20	4/30						20
Pied-billed Grebe	1	4/1	10	4/30						10
II. Shorebirds, Gulls and Terns:										
Killdeer	5	3/25	20	4/30						20
Greater yellow-legs	5	4/3	12	4/30						12
Spotted sandpiper	5	4/5	10	4/30						10
Ring-billed Gull	2	3/28	150	4/30						150
Herring gull			25	April						25

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons</u> :	Winter resident		50	4/30						50
Mourning dove										
White-winged dove										
IV. <u>Predaceous Birds</u> :										
Golden eagle										
Duck hawk										
Horned owl	Resident		10	4/30						10
Magpie										
Raven										
Crow	35	3/7	150	4/13						150
Bald eagle	2	3/10	2	3/22	1	4/13				2
Red-tailed hawk	1	3/11	8	4/30						8
Marsh hawk	2	3/12	10	4/30						10
Coopers hawk	1	1/5								1
Sparrow hawk	Winter resident		40	4/30						40
Snowy owl	1	1/25	1	2/10	1	2/10				2
Short-eared owl	2	3/27	2	4/13						2
Reported by <u>Refuge personnel</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.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge SHIAWASSEE

Months of JANUARY

to APRIL, 19 57

(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 obs'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Croplands, bottom- land hardwoods, & marshes - 8,000 ac.	80			1:5				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.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge SHIAWASSEE

Year ending April 30, 1957

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion (Estimated)	
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				
Cottontail Rabbit	8,000 acres, cropland, bottomland hardwoods, and marshes													Unknown
Fox Squirrel	"													Unknown
Opossum	"													30
Raccoon	"				9									50
Striped Skunk	"													10
Red Fox	"													30
Woodchuck	"				12									50
Red Squirrel	"													Unknown
Muskrat	1,000 acres, cattail marsh, rivers, and drainage ditches			384				T-9929 T-9930	230	153	153			2,500
Beaver	"													50
Mink	"													Unknown
Weasel	"													Unknown

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

Reported by John R. Frye, Refuge Manager

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 unprime-ness 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.

REFUGE GRAIN REPORT

Refuge SHIAWASSEE

Months of JANUARY through APRIL, 1957

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD (bu)	(3) RECEIVED DURING PERIOD (bu)	(4) TOTAL (bu)	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD (bu)	(7) PROPOSED OR SUITABLE USE*		
				Transferred (bu)	Seeded (bu)	Fed (bu)	Total (bu)		Seed (bu)	Feed (bu)	Surplus (bu)
Barley	100	-	100	-	-	20	20	80		80	
Shelled Corn	1,920	-	1,920	327	-	100	427	1,493		1,493	
Ear Corn	300	-	300	-	-	20	280			280	

(8) Indicate shipping or collection points _____

(9) Grain is stored at refuge granaries at Secondary Headquarters.

(10) Remarks _____

*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

W A T E R F O W L

REFUGE SHIAWASSEE

MONTHS OF MAY TO AUGUST, 19 67

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling Trumpeter	6	1								
Geese:										
Canada	620	600	500	500	500	500	500	500	500	500
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	400	300	400	400	400	400	400	400	400	400
Black	100	100	100	100	50	50	50	50	50	50
Gadwall										
Baldpate	50									
Pintail	300	50								
Green-winged teal					20	20	20	20	20	20
Blue-winged teal	300	300	100	50	50	50	50	50	50	50
Cinnamon teal										
Shoveler	20	20								
Wood	300	300	100	100	100	100	100	100	100	100
Redhead										
Ring-necked										
Canvasback										
Scaup	100	50								
Goldeneye										
Bufflehead										
Ruddy									4	
Other (Mute Swan)									1	1
Coot:	300	300	50	50	50	50	50	50	50	50

3 -1750a

Cont. NR-1

(Rev. March 1953)

WATERFOWL
(Continuation Sheet)REFUGE SHIAWASSEEMONTHS OF MAY TO AUGUST, 19 67

(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									49		
Trumpeter											
Geese:											
Canada	500	500	500	500	560	560	600		61,542		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	400	360	980	1125	5320	5320	9500		188,377		
Black	50	40	175	275	1330	1330	2400		44,030		
Gadwall											
Baldpate									357		
Pintail									2,450		
Green-winged teal	20	T	T	T	T	T	T		2656		
Blue-winged teal	50	50	50	50	50	100	150		10,829		
Cinnamon teal											
Shoveler		T							350		
Wood	100	100	100	150	150	150	150		16,065		
Redhead											
Ring-necked											
Canvasback											
Scaup									1,050		
Goldeneye											
Bufflehead											
Ruddy									28		
Other (Mute Swan)	1	1	1	1					42		
Coot:	50	50	50	50	50	50	50		9,401		

(over)

	(5) Total Days Use	:	(6) Peak Number	:	(7) Total Production	SUMMARY
Swans	49	:	6	:		Principal feeding areas Pool 1, Pool 2, Farm Units 1A,
Geese	61,542	:	620	:	180	1B, 1C, 3A, 3B, and 5.
Ducks	266,329	:	12,210	:	135	Principal nesting areas Pool 1 and Pool 2.
Coots	9,401	:	300	:	40	
						Reported by <u>Refuge personnel</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.....Shiawassee.....

Months of.....May.....to.....August.....1967.....

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Pied-billed Grebe			12	August						1-10
Great Blue Heron			150	August						50-100
Green Heron	1	5/5/67	20	August						1-10
Common Egret	1	5/19/67	8	7/29/67						8
Black-crowned Night Heron	3	5/6/67	50	August						10-50
Least Bittern	1	8/15/67	6	August						6
American Bittern	1	7/2-7/9/67	20	August						10-50
Sandhill Crane	1	8/27-8/31/67	1	August						1
Sora Rail	-	-	50	August						50
Common Gallinule	6	7/8/67	45	August						45
II. Shorebirds, Gulls and Terns:										
Killdeer			50	July						10-50
American Woodcock	1	7/12/67	T	July						T
Common Snipe	1	7/14/67	40	August						10-50
Scalpated Sandpiper	-	-	100	August						50-100
Yellowlegs	-	-	50	August						10-50
Bowditcher	30	5/13/67	60	August						10-50
Ring-billed Gull	-	-	100	8/19/67						100
Common Tern	-	-	10	June						10
Caspian Tern	12	8/23/67	15	August						15

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove		100	August		100
White-winged dove					
IV. <u>Predaceous Birds:</u>					
Golden eagle					
Duck hawk					
Horned owl		10	August		10
Magpie					
Raven					
Crow		150	8/5/67		50-100
Bald Eagle		3	6/26/67		3
Marsh Hawk		10	June		1-10
Cooper's Hawk		1	8/22/67		1-10
Red-tailed Hawk		5	July		1-10
Sparrow Hawk		20	7/23/67		10-50
Reported by.....				Refuge Personnel	

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.

3-1750
Form NR-1B
(December 1956)

UNITED STATES
DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge _____ For 12-month period ending August 31, 1967

Reported by John E. Frye

Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type Acreage	(3) Use-days	(4) Breeding Population	(5) Production
Total Refuge	Crops 3,163	Ducks 2,723,660	100	135
	Upland 4,323	Geese 1,371,369	100	180
	Marsh 1,172	Swans 31,283	-	-
	Water 172	Coots 29,301	100	100
	Total 8,830	Total 4,155,613	300	355
.....				
	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		
.....				
	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)

Best possible image.

UNITED STATES
3-1750
Form NR
(December)
Refuge
Reported by

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 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.

INSTRUCTIONS

- (1) **Area or Unit:** A geographical unit that, 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. Estimated acreage of each unit should be indicated.
- (2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland consists of 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 the water category includes all other water areas inundated most or all of the growing season and extends from the deeper edge of the marsh zone to strictly open-water areas, 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 each type should be kept as accurate as possible through reference to available maps supplemented by periodic field observations and should agree with unit acreage.
- (3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven.
- (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 SHIAWASSEEMonths of MAY

to

AUGUST, 19 67

Form NR-2 - UPLAND GAME BIRDS

(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 obs'v'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Croplands, bottom- land hardwoods, & marshes - 8,000 ac.	30	0	30	1:5				100	

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

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.

WATERFOWL

REFUGE SKIAWASSEE

MONTHS OF September TO December, 19 57

(1) Species	Weeks of reporting period ⁽²⁾									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling Trumpeter									2	3
Geese:										
Canada	600	600	600	950	4,000	5,100	6,900	7,220	4,000	5,200
Cackling										
Brant										
White-fronted										
Snow				1	4	4	5	6	7	11
Blue					3	9	35	35	84	110
Other										
Ducks:										
Mallard	16,000	16,000	16,000	17,000	24,600	24,500	17,000	25,000	40,000	40,000
Black	3,000	3,000	3,000	3,000	4,100	4,100	3,000	5,000	8,000	8,000
Gadwall									2	2
Baldpate		200	200	300	500	500	500	500	500	500
Pintail		40	40	100	300	400	400	1,500	1,500	1,500
Green-winged teal		20	20	100	200	400	400	400	500	500
Blue-winged teal	250	400	400	400	500	500	500	50		
Cinnamon teal										
Shoveler										
Wood	300	300	300	300	200	100	100	50	50	50
Redhead								100	100	100
Ring-necked								350	350	300
Canvasback								10	50	10
Scaup										
Goldeneye								10	50	10
Bufflehead										
Ruddy							2			
Other										
Mute Swan		1-	1	1	1	1	1	1	1	1
Coot:	50	70	70	100	100	100	100	100	100	100

3-1750a

Cont. NR-1

(Rev. March 1953)

WATERFOWL
(Continuation Sheet)REFUGE SHIAWASSEEMONTHS OF SEPTEMBER TO DECEMBER, 19 67

(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									35	
Trumpeter										
Geese:										
Canada	7,800	9,300	4,500	5,400	4,700	4,700	4,500	4,500	563,990	
Cackling										
Brant										
White-fronted										
Snow	11	28	1	1	1				623	
Blue	110	132	32						3,864	
Other										
Ducks:										
Mallard	40,000	61,000	20,000	28,000	16,000	8,000	3,200	700	2,891,700	
Black	8,000	9,200	6,000	6,000	4,000	1,000	800	100	555,100	
Gadwall	21								175	
Baldpate	300	300							30,100	
Pintail	700	700							50,260	
Green-winged teal	300								19,880	
Blue-winged teal									21,000	
Cinnamon teal										
Shoveler										
Wood									12,250	
Redhead									2,100	
Ring-necked									7,350	
Canvasback									480	
Scaup										
Goldeneye										
Bufflehead										
Ruddy									14	
Other Mute Swan									70	
Coots:										
									6,230	
					(over)					

	(5)	(6)	(7)		SUMMARY
	Total Days Use :	Peak Number :	Total Production		
Swans	105	3		Principal feeding areas	Pools 1 and 2; Refuge Farm
Geese	568,477	9,460		Units	
Ducks	3,590,419	71,200		Principal nesting areas	
Coots	6,230	100			
				Reported by	Refuge Personnel

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 SHILAWASSEEMonths of September to December 1947

(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			20	Sept.	1	11/8				20
Great Blue Heron			150	Sept.	3	12/5				150
Green Heron			40	Sept.		Oct.				40
Common Egret			18	10/16	18	10/16				18
Cattle Egret			1	10/25	1	10/25				1
American Bittern			20	Sept.		Sept.				20
Bl.-Gr. Night Heron			50	Sept.		Oct.				50
Sandhill Crane			1	Sept.	1	Sept.				1
Sora Rail			50	Sept.	2	Oct.				50
Common Gallinule			50	Sept.	1	10/23				50
II. <u>Shorebirds, Gulls and Terns:</u>										
Killdeer			50	Sept.		Nov.				50
Common Snipe	1	7/14	100	Sept.	3	Nov.				100
Ring-billed Gull			300	Oct.	Still present					300
Herring Gull			20	Oct.	Still present					20

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons</u> :					
Mourning dove	Summer resident	200	Sept.	Still present	200
White-winged dove					
IV. <u>Predaceous Birds</u> :					
Golden eagle					
Duck hawk					
Horned owl	Resident species				10
Magpie					
Raven					
Crow		300	Sept.	2 Dec.	300
Bald Eagle	Summer resident	4	Sept.	1 Dec.	4
Marsh Hawk	Summer resident	20	Sept.	1 Dec.	20
Cooper's Hawk		1	Sept.	1 Nov.	1
Red-tailed Hawk	Summer resident	10	Sept.	3 Nov.	10
Am. Rough-legged Hawk	1 10/25	5	Dec.	Winter resident	5
Sparrow Hawk	Summer resident	30	Sept.	1 Dec.	30
Turkey Vulture	Summer resident	30	Sept.	Oct.	30
Snowy Owl	1 11/27	1	Dec.	Still present	
Reported by _____ Refuge personnel					

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.

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURV...

Refuge SHIAWASSEE

Year 1967

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/15-22	228	747	Canada goose (70); Mallard (1)*	71	15	87	228	87
10/23-30	245	1187	Canada goose (20); Blue Goose (2); Snow goose (1)	23	1	24	245	24
10/31-11/5	259	934	Canada goose (7); Snow goose (1)	8	4	12	259	12
11/5 -12	227	940	Canada goose (3); Whistling swan (1)*	4	0	4	227	4
11/13-17	104	489	Canada goose (7)	7	1	8	104	8
TOTALS:	1,063	4,297	Canada goose (107); Blue goose (2); Snow goose (2); Whistling swan (1); Mallard (1) * Mallard and whistling swan illegally killed on public hunting area.	113	22	135	1,063	135

(over)

INSTRUCTIONS

- (1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.
- (2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.
- (3) Record the total number of hours the hunters spent hunting on the refuge.
- (4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).
- (5) Record total numbers of waterfowl bagged.
- (6) Record total numbers of waterfowl reported knocked down but not recovered.
- (7) Total of Columns 5 and 6.
- (8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).
- (9) Kill sample projected to 100 percent. $\text{Column 9} = \frac{\text{Column 8}}{\text{Column 2}} \times \text{Column 7}.$

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge SHILAWASSEE

Months of September to December, 19 57

(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 obs'v'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Croplands, bottom- land hardwoods, & marshes- 8,000 ac.	80	1	10	1:5				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.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge SHIAWASSEE

Calendar Year 1967

(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	Bottomland hardwoods, crop- lands, sedge meadows, and cattail marsh (8,000 ac.)	200	50				20 (Illegal Kill)		10			500	400	1:10

Remarks: 345 deer counted in refuge cornfield on afternoon of December 2, 1967.

Reported by Refuge personnel

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.

DISEASE

Refuge SHIAWASSEE

Year 1957

Botulism

Period of outbreak _____

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	_____	_____

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 _____

Lead Poisoning or other Disease

Kind of disease Lead Poisoning

Species affected Canada goose. Mallard

Number Affected	Actual Count	Estimated
Species		
<u>Canada goose</u>	<u>89</u>	<u>200</u>
<u>Mallard</u>	<u>7</u>	<u>100</u>

Number Recovered Unknown

Number lost est. 300

Source of infection Unknown

Water conditions River - frozen over

Food conditions birds feeding in corn fields

Remarks 4 specimens were post-mortemed at University of Michigan and 3 at Patuxent Wildlife Research Center.

PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge SHIAWASSEECalendar Year 1967

1. Visits

a. Hunting 4,906 b. Fishing 390 c. Miscellaneous 5,293 d. TOTAL VISITS 10,589

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl	<u>1,063</u>	<u>500</u>	<u>Bureau</u>
Upland Game			
Big Game	<u>3,843</u>	<u>6,000</u>	<u>Bureau</u>
Other			

Number of permanent blinds 20Man-days of bow hunting included above 0Estimated man-days of hunting on lands adjacent to
refuge 3,000

1b. Fishing (area open to fishing on refuge lands)

TYPE OF AREA	ACRES	MILES
Ponds or Lakes		
Streams and Shores		<u>6</u>

1c. Miscellaneous Visits

Recreation 4,469 Official 24Economic Use 800 Industrial _____

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	ON REFUGE		OFF REFUGE	
	NO. OF GROUPS	NUMBER IN GROUPS	NO. OF GROUPS	NUMBER IN GROUPS
Sportsmen Clubs			<u>1</u>	<u>120</u>
Bird and Garden Clubs	<u>2</u>	<u>75</u>	<u>1</u>	<u>33</u>
Schools	<u>7</u>	<u>508</u>	<u>8</u>	<u>590</u>
Service Clubs			<u>7</u>	<u>386</u>
Youth Groups	<u>12</u>	<u>254</u>	<u>4</u>	<u>291</u>
Professional-Scientific	<u>2</u>	<u>18</u>	<u>1</u>	<u>20</u>
Religious Groups	<u>1</u>	<u>42</u>	<u>3</u>	<u>316</u>
State or Federal Govt.			<u>3</u>	<u>56</u>
Other			<u>5</u>	<u>360</u>

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	<u>19</u>	Radio Presentations	<u>8</u>
Newspapers (P.R.'s sent to)	<u>7</u>	Exhibits	
TV Presentations	<u>2</u>	Est. Exhibit Viewers	

INSTRUCTIONS

Item 1: Total of a, b, and c, equal d.

"Visit" - definition. Any person who is on refuge lands or waters during a day or part thereof for the purpose of: hunting, fishing, bird-watching, recreation, business or economic use, official visit, or similar interest. INCLUDE - those who stop within the refuge while traveling on a public highway because of an interest in the area. EXCLUDE - persons engaged in oil or other industry not directly related to the refuge, persons using refuge as most direct route or principal avenue of traffic, and those boating on navigable rivers or the Intercoastal Canal, unless they stop to observe wildlife on the refuge.

Computing visits. Where actual counts are impractical, "sampling" is used with midweek and week-end samples varied by season or weather. A conversion factor of 3.5 (of passengers per car) is used when accurate figures are not available. Each refuge will develop a conversion factor for boats based on range of usage. Count a camper once for each 24-hour period or fraction thereof.

Item 1a: Acres - of refuge open for each type of hunting.

Managed hunts require check in and out of hunters, issuance of permits, or assignment of blinds.

Other - INCLUDE crow, fox, and similar hunting.

Lands adjacent to refuge. Normally considered within 1 mile or less of boundary, unless established sampling procedures cover a wider area. For big game hunting, the distance may be greater.

Item 1b: Acres of streams open to fishing, if practical; otherwise just miles open. Information on "shores" is primarily for coastal fishing.

Item 1c: Recreation. INCLUDE photography, observing wildlife, picnicking, swimming, boating, camping, visitor center use, tours, etc. TOTAL Recreation, Official, and Economic Use visits under Item 1.

Industrial. INCLUDE persons engaged in industry, i.e., oil industry or factories. EXCLUDE these from Item 1.

Item 2: INCLUDE the "On Refuge" groups in Items 1c and 1. In "Off Refuge" column include only those group meetings in which refuge employees actually participate. EXCLUDE these from Items 1c and 1.

Item 3: Exhibits - INCLUDE displays, fairs, parades, and exhibits OFF the refuge; EXCLUDE those ON.

3-1757
Form NR-7
(Rev. June 1960)

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge SHIAWASSEE

Year 19 57

Collections and Receipts (Seeds, rootstocks, trees, shrubs)							Plantings (Marsh - Aquatic - Upland)						
Species	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
Bromegrass Ryegrass Tall fescue mixture	1000 #	R	4/57	P.O.	\$288	1,000 lbs	Farm Units 1A; 1B; 1C; 2B; 3A; 3B; 4; 5; 9A; 9B; 9E; 9F	24#/acre	25 acres		April & May	100%	

- (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 25
Food strips, food patches _____
Forest plantings _____

Remarks: Farm Unit grass strips seeded for permanent field boundaries.

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge SHIAWASSEE

County SAGINAW

State MICHIGAN

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		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
White Beans	610	13,333 8,199.32 GWT	170	4,555 2,733.05 GWT	-	-	780	Ryegrass in corn	358
Soybeans	754	18,180	142	3,995	20	600	916	Clover in sm. grain	401
Field Corn	648	54,337	24	1,424	140	13,707	812	Wheat, Rye or Oats cover crop	361
Wheat	77	4,214	-	-	12	664	89		
Barley	158	11,734	-	-	163	12,903	321		
Oats	5	351	-	-	-	-	5		
Buckwheat	-	-	-	-	27	300	27	Fallow Ag. Land	0
Sugar Beets	83	1,676.38	28	558.80	-	-	111		

No. of Permittees: Agricultural Operations 21 Haying Operations 0 Grazing Operations 1

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
0	0	0	0	1. Cattle	21	46.11	46.11	120
				2. Other				
				1. Total Refuge Acreage Under Cultivation				3,061
Hay - Wild	0	0	0	2. Acreage Cultivated as Service Operation				0

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.

REFUGE GRAIN REPORT

Refuge SHIAWASSEE

Months of September through December, 19567

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Barley	100	-	100	-	-	50	50	50		50	
Ear Corn	300	144	444	144	-	100	244	200		200	
Shelled Corn	1,920	1,379	3,290	572	-	600	1,172	2,127		847	1,280

(8) Indicate shipping or collection points _____

(9) Grain is stored at refuge granary at secondary headquarters and at commercial elevator, Birch Run, Michigan

(10) Remarks 1,280 bu. dry shelled corn in commercial elevator available for transfer. 400 bu. earmarked for Seney
Refuge and 400 bu. for Ottawa Refuge.

*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

TIMBER REMOVAL

Refuge SHIAWASSEE Year 1956 57

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
NONE								

Total acreage cut over NONE

Total income: NONE

No. of units removed B. F. _____

Method of slash disposal _____

Cords _____

Ties _____

SHIAWASSEE

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number

Reporting Year

1957**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)
5/15 - 7/5	Willow, cottonwood, milkweed, Canada thistle, velvetleaf	Eastwood Drain, Riverside Dike, Woodside Dike, Center Dike, Pool 1 Dike, Houlihan Road ditches	18	2,4,5-T/2,4-D	35 lbs.	2# a.i./acre	H2O 2.5 pt. chem. per 100 gals.	Tractor powered sprayer

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

The 2,4,5-T/2,4-D mixture was very effective on trees and brush with an 80% kill with slight regrowth. A 90% top kill was evident immediately on broad-leaved weeds, but there was a 50% regrowth.



Jack Frye
Refuge Manager



Matt Kerschbaum
Asst. Refuge Manager



Sam Poma
Refuge Clerk



Louis Robinson
Biological Technician



Kenneth Shelly
Operator General



Larry Blazo
Operator General



67-10; 01-30-67; JRF

Refuge office following record snow
of January 26 & 27, 1967.



67-72; 04-05-67; JRF

Flood waters overtopped pool 1 dike.
Shiawassee River on left, pool 1A
on right.



67-113; 04-14-67; JRF

Major washout in pool 1 dike as rivers started to drop.



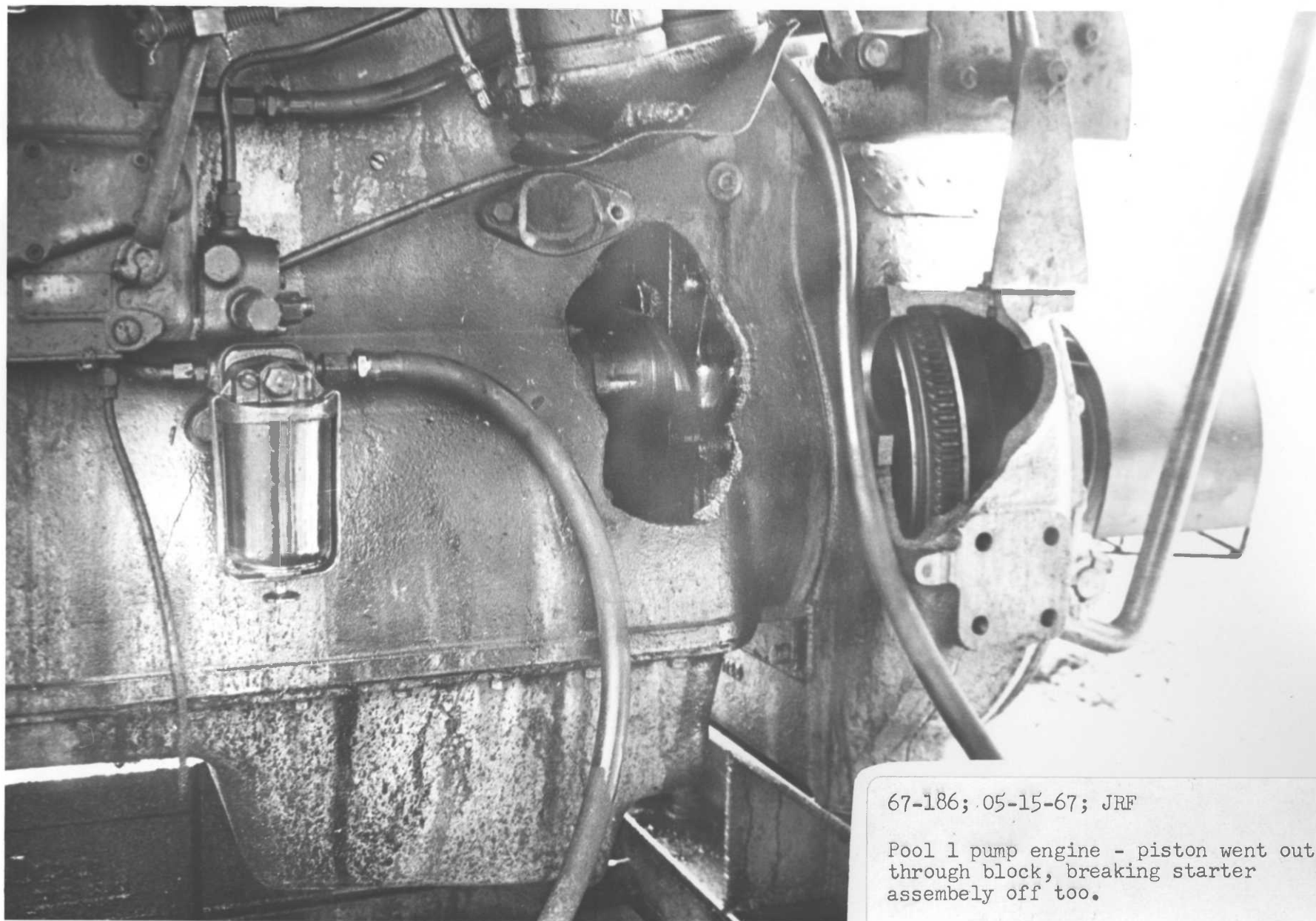
67-137; 04-18-67; JRF

Second flood peak - Pool 1A on left,
Ferguson Bayou on right.



67-152; 04-27-67; JRF

Flood damage to Pool 1A dike.



67-186; 05-15-67; JRF

Pool 1 pump engine - piston went out
through block, breaking starter
assembly off too.



67-35; 03-31-67; JRF

Cars line up at headquarters at start
of refuge tour for High School Natural
Science Club.



67-74; 04-05-67; JRF

Even during flood conditions tours
for youth groups are conducted if
road conditions permit.



57-258; 07-25-57; JRF

"Shiawasse Salmon" fighting its way
upstream to spawn.



67-27; 03-28-67; JRF

Flooded corn fields attract Whistling Swans.



67-47; 04-04-67; JRF

Corn is main food for spring migrants.



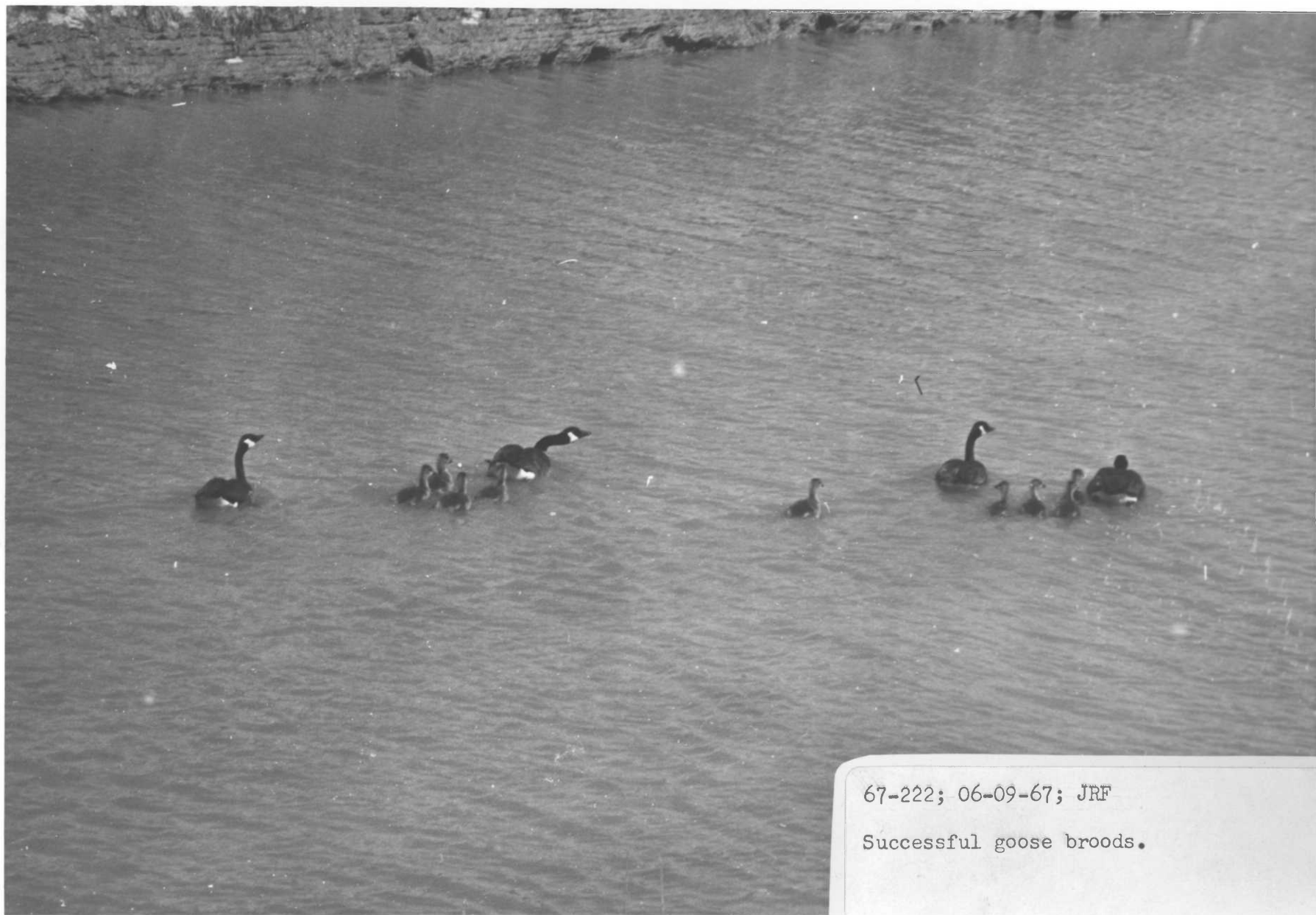
67-145; 04-27-67; JRF

White-fronted Goose - First ever
reported captured in Michigan.



67-202; 05-18-67; JRF

Close scrutiny will disclose goose on nest in one of the "broiler tubs" in Pool 1B.



67-222; 06-09-67; JRF

Successful goose broods.



67-307; 08-03-67; JRF

Chopped barely was readily accepted
and heavily utilized by ducks and geese.



67-211; 05-19-67; JRF

One of seven Wood Duck nest boxes
constructed by Campfire Girls and set
out by refuge personnel.



67-423; 12-28-67; JRF

Bees took over five of the seven
Wood Duck boxes set out.



67-250; 07-13-67; JRF

Final act of annual drive trapping to band the local goslings. Student-laborer Bob Blohm in action.



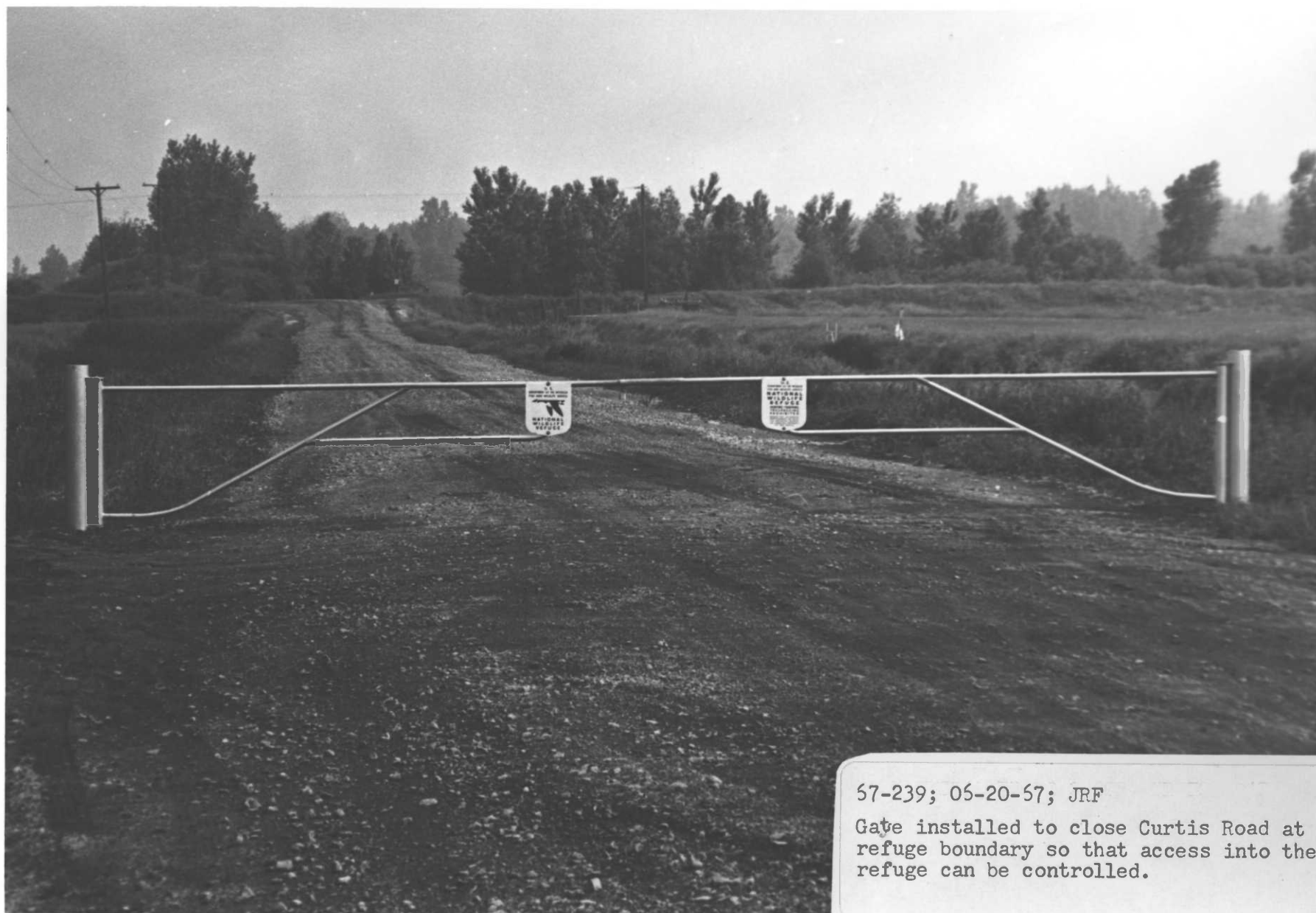
67-385; 11-28-67; JRF

Corn harvested in strips with refuge
share left standing during the fall
but later knocked down for spring use.



67-406; 12-19-67; JRF

Contrasts - Private lands in area are
all fall plowed.



67-239; 06-20-67; JRF

Gate installed to close Curtis Road at
refuge boundary so that access into the
refuge can be controlled.



57-245; 07-12-57; JRF

Someone drove through Evon Road gate the day after road was closed. Kerschbaum surveys damage to gate. Auto was towed away.



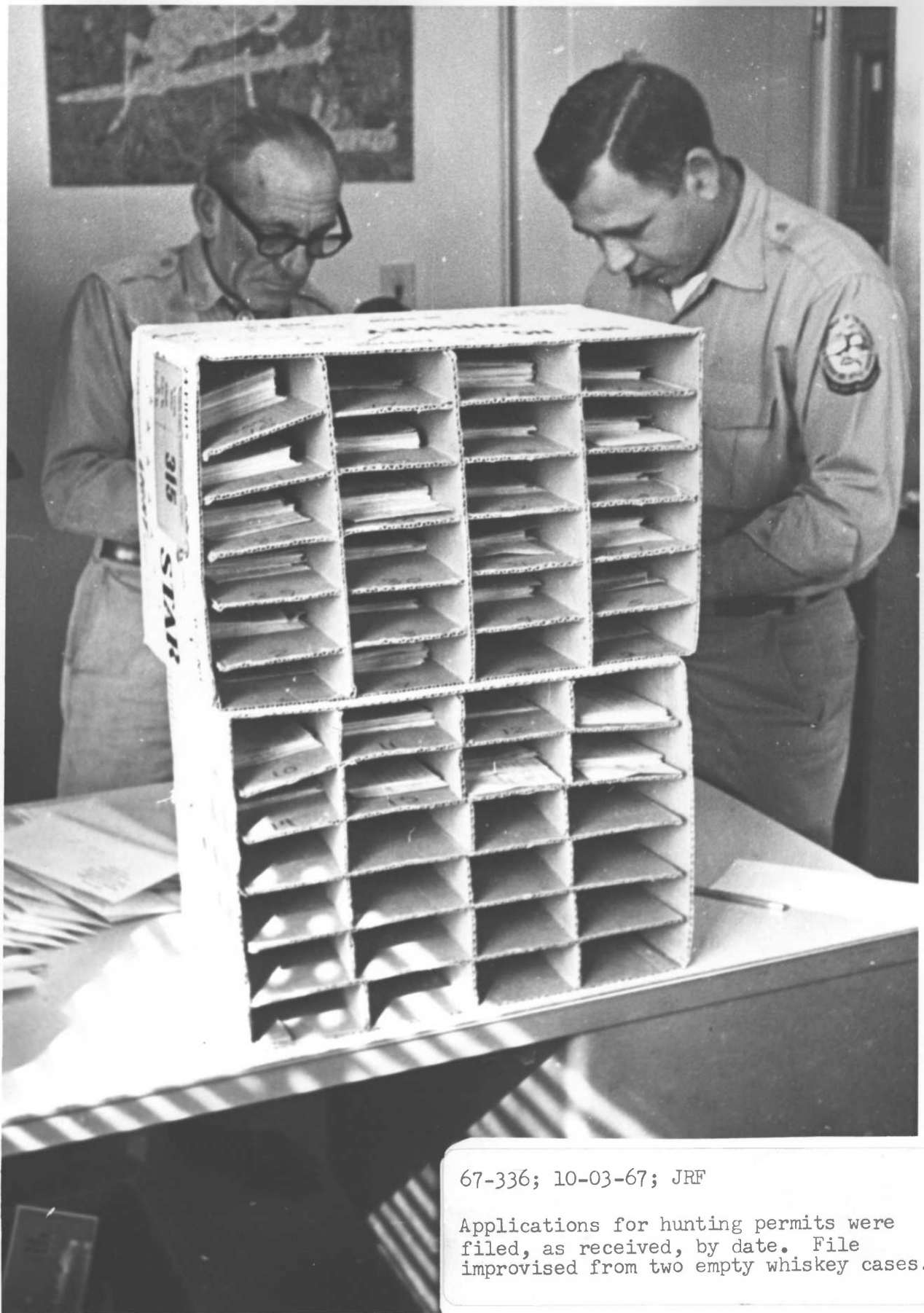
67-316; 09-30-67; JRF

Construction of the new Pool 3 dike was about 60% completed at the end of the year.



67-228; 06-13-67; JRF

3/4 Northwest Crane acquired excess
from Corps of Engineers at Detroit.



67-336; 10-03-67; JRF

Applications for hunting permits were filed, as received, by date. File improvised from two empty whiskey cases.



67-337; 10-03-67; JRF

Drawings for successful applicants for permits for the managed goose hunt were completed in the refuge office by Mr. Leo Rushlm, local sportsman.



67-345; 10-13-67; JRF

Goose blind for use in managed goose
hunt.



67-346; 10-13-67; JRF

Blinds, located in barley stubble,
illustrating goose use of area the
week before the season opened.



67-352; 10-19-67; JRF

A pair of happy, successful hunters
from blind no. 8.



67-435; 12-28-67; JRF

Deer again concentrated in farm lands of Crop Unit 1 following the November hunting season.



67-403; 12-19-67; JRF

4,500 Canada Geese were still present
at the end of the year.