

HORICON NWR
NARRATIVE REPORT - 1967

HORICON NATIONAL WILDLIFE REFUGE
ROUTE 2, MAYVILLE, WISCONSIN

NARRATIVE REPORT
1967

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
HORICON NATIONAL WILDLIFE REFUGE

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I. GENERAL

A. Weather Conditions

	<u>Month</u>	<u>Precipitation</u>		<u>Max.</u>	<u>Min.</u>
		<u>Normal</u>	<u>Snowfall</u>	<u>Temp.</u>	<u>Temp.</u>
January	<u>1.73</u>	<u>1.11</u>	<u>10.3"</u>	<u>48</u>	<u>-24</u>
February	<u>.90</u>	<u>1.11</u>	<u>16.5"</u>	<u>45</u>	<u>-15</u>
March	<u>.92</u>	<u>1.75</u>	<u>3.0"</u>	<u>76</u>	<u>- 3</u>
April	<u>2.48</u>	<u>2.46</u>	<u>T</u>	<u>72</u>	<u>24</u>
May	<u>-2.74</u>	<u>3.48</u>	<u>T</u>	<u>89</u>	<u>30</u>
June	<u>4.19</u>	<u>4.21</u>	<u>_____</u>	<u>89</u>	<u>45</u>
July	<u>1.19</u>	<u>2.62</u>	<u>_____</u>	<u>92</u>	<u>42</u>
August	<u>2.62</u>	<u>3.19</u>	<u>_____</u>	<u>87</u>	<u>39</u>
September	<u>1.01</u>	<u>3.85</u>	<u>_____</u>	<u>83</u>	<u>30</u>
October	<u>5.20</u>	<u>2.37</u>	<u>1.0"</u>	<u>85</u>	<u>22</u>
November	<u>1.96</u>	<u>2.01</u>	<u>.5"</u>	<u>60</u>	<u>6</u>
December	<u>1.46</u>	<u>1.12</u>	<u>.5"</u>	<u>51</u>	<u>- 4</u>
Annual					
Totals	<u>26.40</u>	<u>29.28</u>	<u>31.8"</u>	<u>Extremes 92</u>	<u>-24</u>

The above weather data were obtained from the U.S. Weather Bureau station at Burnett, Wisconsin.

The weather for 1967 can be described by one word-cool. Precipitation and temperatures were above normal during January, February and March. April was a little warmer than usual with about average precipitation. May was cool and dry. July, August and September were dry. Precipitation during October was above normal and below normal during November and December.

Freezing temperatures occurred in the lower portions of the marsh every month except June.

B. Habitat Conditions

1. Water

The following table shows the planned water levels compared to actual levels for the main pool (I-1).

<u>Period</u>	<u>Planned Elevation</u>	<u>Actual Elevation</u>
January-February	75.00	76.16
March	76.00	76.55
April-June	76.50	77.18
July	76.00	76.89
August	75.50	76.51
September-December	75.00	76.28

As the above table indicates, water levels for the main pool (I-1) were generally higher than had been planned. The temporary stoplog type fish barrier below the radial gate prevented us from releasing enough water in the spring to reach our planned elevation. Some water was released over the stoplogs, however. On May 19 the stoplogs broke and the radial gate was closed to prevent carp migration into the main pool.

The summer drouth followed and the main gate was kept closed pending further drouth into the fall in an effort to keep water levels as high as possible for muskrat trappers. The gate was open for three days in early October to provide water for duck hunting in the Wisconsin State Wildlife Area downstream from us.

Heavy fall rains ended the drouth and the radial gate was open 2' from November 7 to year's end. Carp control, unexpected fall rains, and high water levels for muskrat trapping resulted in higher than planned water levels in the main pool for 1967.

As in past years, water levels in the subimpoundments were held at maximum until December when the gates on I-3, I-4, I-8, and I-9 were opened to lower water levels prior to planned burning.

Using the Regional Engineer's formula, total refuge water gain was computed to be 36,364 acre-feet for 1967. Stream flow records from the Rock River, thought to be our largest water source, show an inflow of 14,556 acre-feet. As the figures indicate, our largest source of water in 1967 was not the Rock River but the surrounding drainage basin and two small creeks on the west side of the refuge. It must be noted also that the above gain figure does not include releases through the main gate which was open in the spring, three days in October, and from November 7 to year's end. The amount of release is unknown, at present, but substantial and would be added to the above refuge gain figure to further reinforce the importance of the surrounding drainage basin as a refuge water supply.

2. Food and Cover

Conditions for resident wildlife were less than desirable in early 1967. Snow depths in January averaged 12" which made food hard to get at. Good harvest weather in the fall of 1966 left little corn standing in the fields to further complicate the resident species' winter. Conditions improved after that, however, as snowfall was light during the remaining winter months. Most fields were blown clear and deer and pheasants could be seen feeding during the daytime. The remainder of the year was good for resident species except for the summer drouth. During the fall, deer could be seen feeding on refuge hay and corn fields most any day around dusk.

The growing season started out as a good one for Canada geese. Good rainfall in the spring brought pastures along nicely and there was ample food for the spring migrants. Crops were in on time, although there was considerable damage to newly planted corn by blackbirds. Everything normal about this year's growing season ended right there. The summer drouth coupled with unusually cool temperatures slowed corn development. The end of a drouth is normally a joyous event but in 1967 it coincided exactly with corn picking time and continued in to December setting the stage for a mammoth depredations problem (see Section VII, A). One bright spot was corn production on refuge farmed peatland units. The tiled portion of F-22 produced one of the finest corn crops in refuge history as it was not affected by drouth (we have to pump it to keep the water out) and we do not have to worry about harvesting it. Literally all of the refuge corn production was consumed. Our sorghum production was practically nil as frost occurred on the peatland every month of the summer except June. It was a good fall for winter wheat and our entire 480 acres were trimmed to ground level by late October (see Section III, B, 4).

Pastures were in good condition in the spring but were hurt by the summer drouth.

High water levels in the marsh led to good aquatic vegetation production. Dense stands of coontail in the ditches made navigation difficult. One problem that remains with us is that of carp. Carp have roamed up and down the Rock River for years and their presence in the marsh greatly hinders growth of aquatic vegetation. The installation of a new fish screen below the main gate plus the efforts of the state's rough fish removal crew will, we hope, reduce this problem. Chemical control with antimycin is also a possibility.

II. WILDLIFE

A. Migratory Birds

1. Geese

No geese overwintered on the refuge this year except two at the

Refuge Manager's corn crib. The first spring migrants appeared on March 10 and soon numbered about 30,000. The spring peak of 48,000 occurred about the middle of April and by the first of May all had left for the breeding grounds. No geese spent the summer here although several pairs were reported to have raised young on the state area to the south.

The first fall migrants arrived on September 20, 8 days later than last year. Numbers built rapidly to our season peak of 113,330, counted on October 19. The 1966 record high of 147,150 were counted on November 15. Until the latter part of October the geese had food on the refuge and depredations problems were not acute. At that time, however, refuge food ran out and the geese began wandering far and wide. The problem was compounded by the extremely poor fall harvest conditions in Wisconsin. Wet, warm weather prevailed which kept corn from maturing and drying out on time. The weather also induced the geese to stay on longer than they normally would. Goose numbers remained fairly static from October 28 (95,480) to December 3 (69,600), the period of our greatest depredation problems (see Section VII A).

After the refuge food supply was decimated, the birds moved farther north and west. Instead of roosting on refuge waters at night the geese chose to roost on such lakes as Green, Maria, Emily, Puckaway, Fox, and Beaver Dam. Some geese flew northeast feeding in the lowlands between the refuge and Lake Winnebago and roosting on the Thornton Area (Clark farm).

By December 14, only 24,150 geese were present and our depredation problems were largely over as the crops were harvested. About 25,000 remained until year's end when frigid weather finally drove them out.

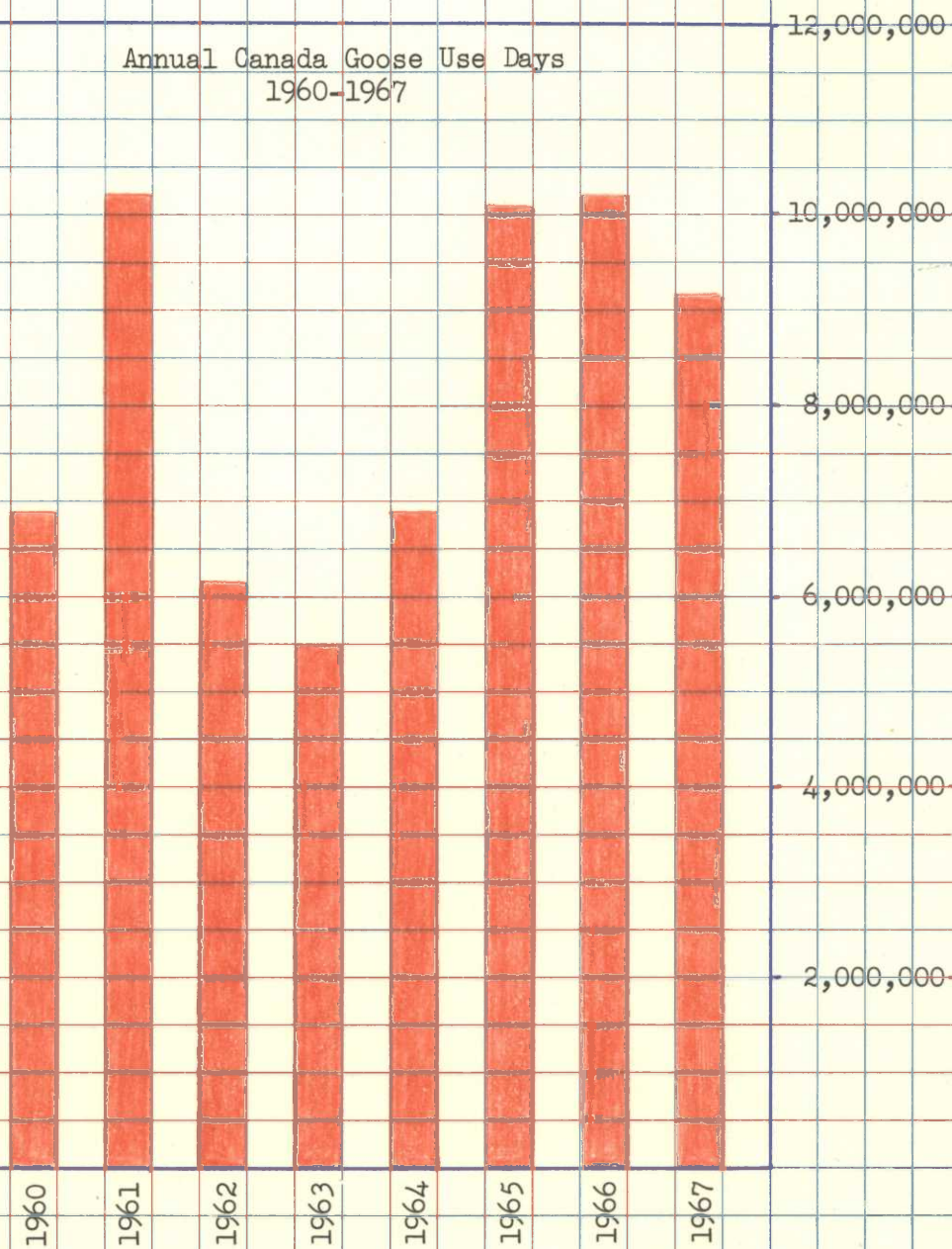
Blue and snow goose numbers were low this past year with a peak of only 125 in the spring migration and 1,200 in the fall. Very few were shot during the hunting season.

2. Ducks

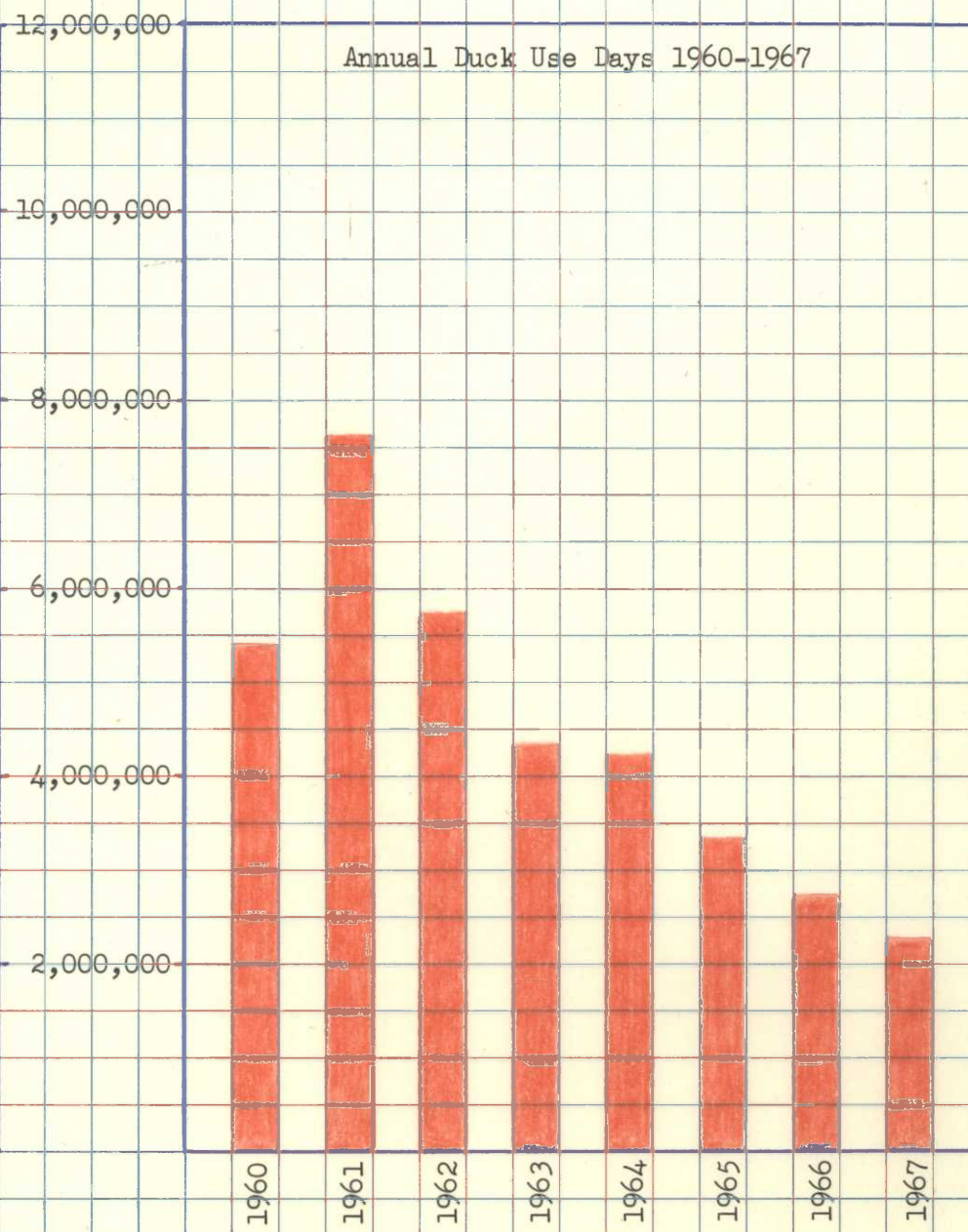
The spring duck migration began with 300 mallards returning the second week in March. By early April we had our full complement of species and peak duck populations were reached the last of April when 9,566 ducks were present.

The breeding-pair count was made on May 9. We estimate 1,842 pairs were on the refuge at that time. The most abundant species was blue-winged teal with 1,050 pairs, followed by shovelers with 240, redheads with 147, and mallards with 111. Regarding duck nesting, 1967 will be remembered as the year of the redhead. Redheads had an excellent nesting year. It was not uncommon to see 6-8 broods on the main ditch in a two mile stretch. As a result, an effort was made to band as many redheads as possible during the summer. A total of 70 young and adults were banded using "Ohio type" and floating traps. We hope

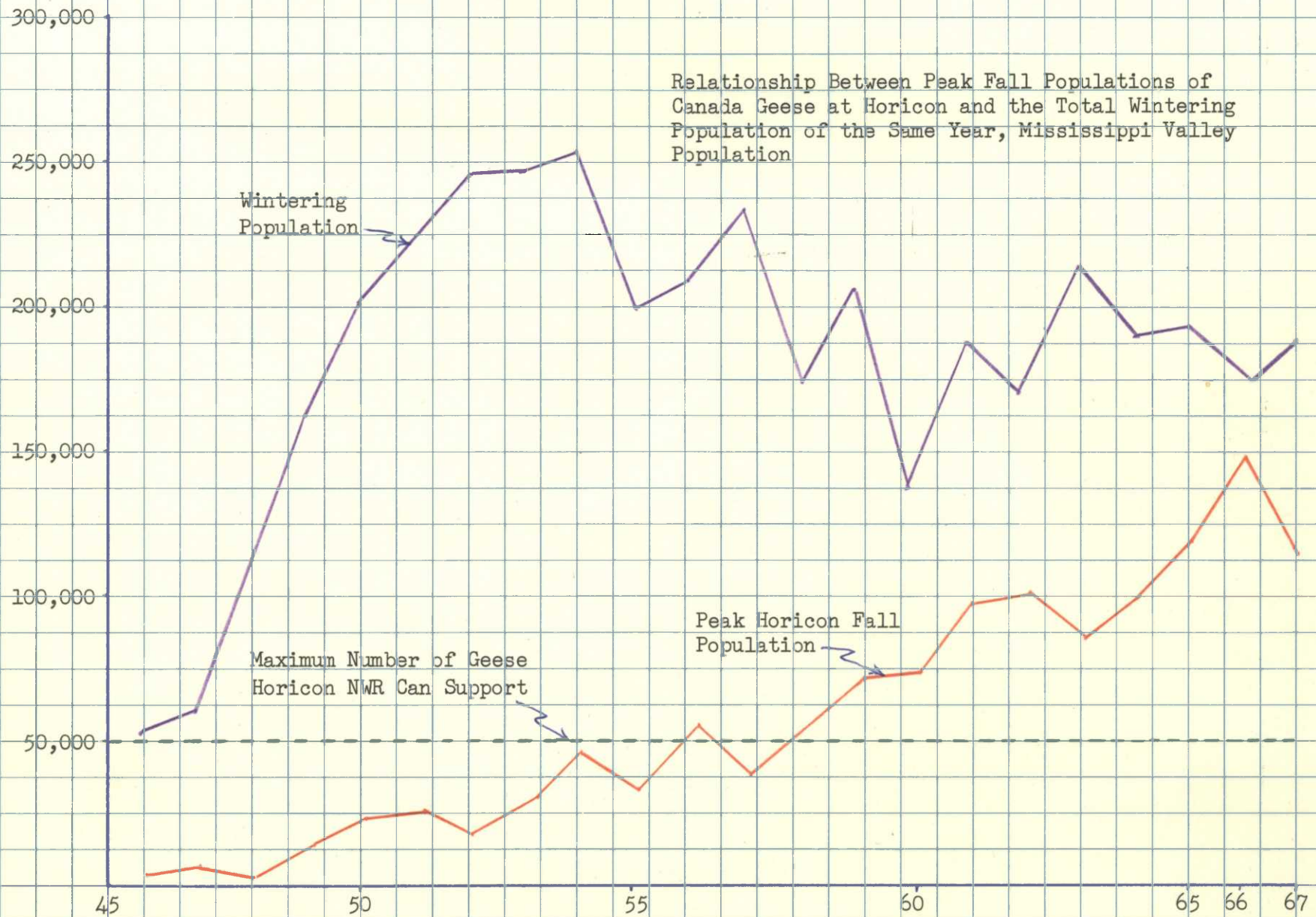
Annual Canada Goose Use Days
1960-1967



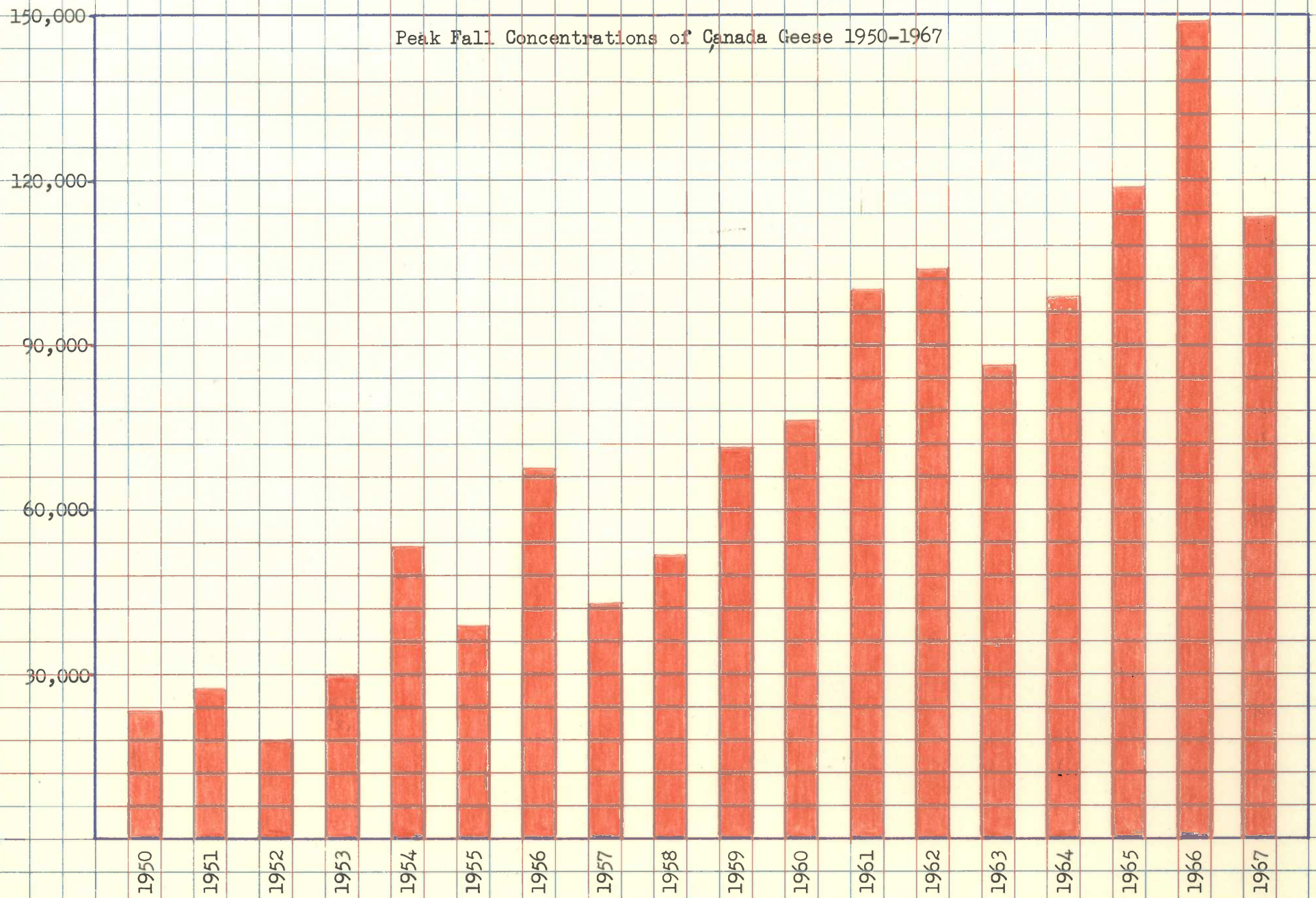
Annual Duck Use Days 1960-1967



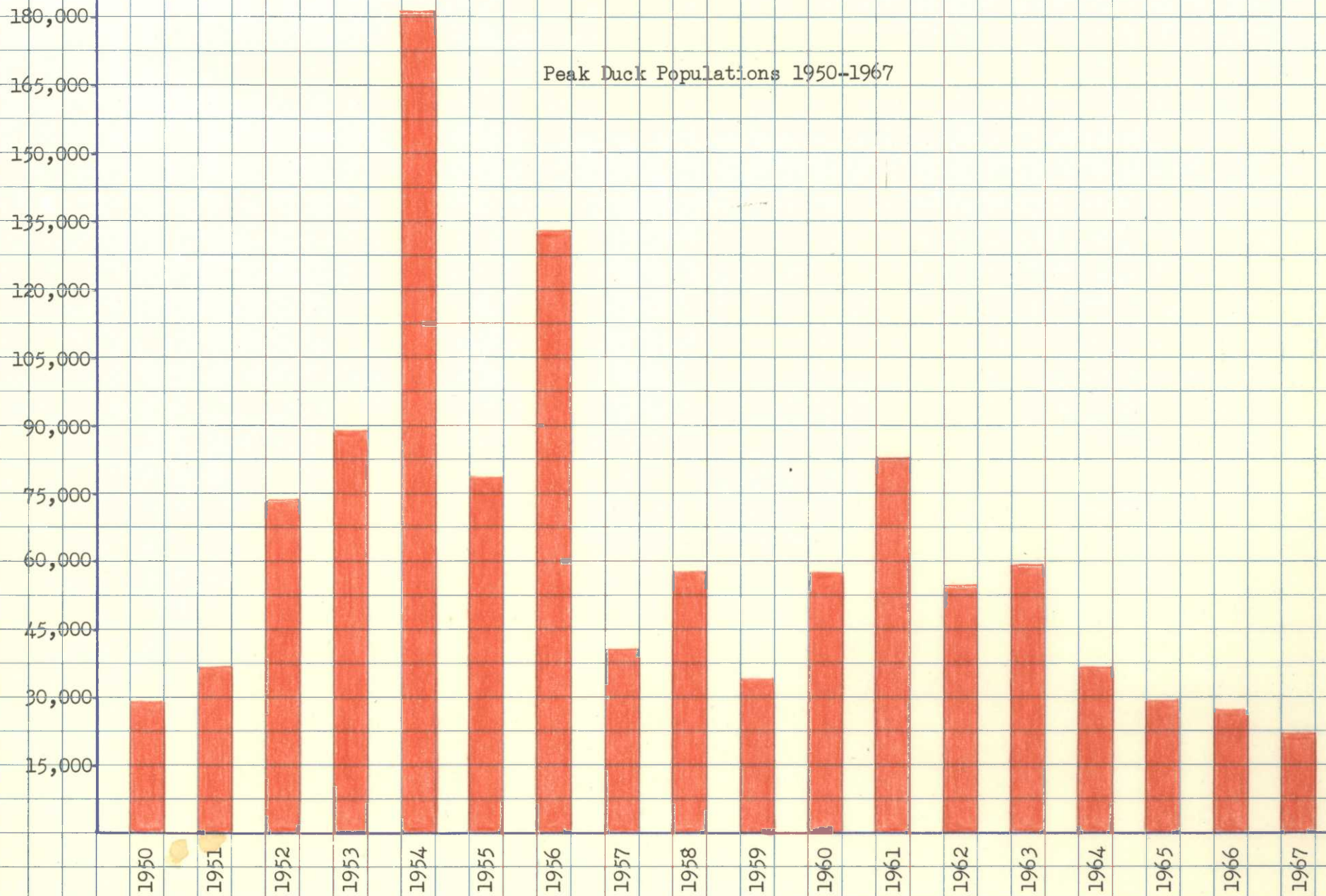
Relationship Between Peak Fall Populations of
Canada Geese at Horicon and the Total Wintering
Population of the Same Year, Mississippi Valley
Population

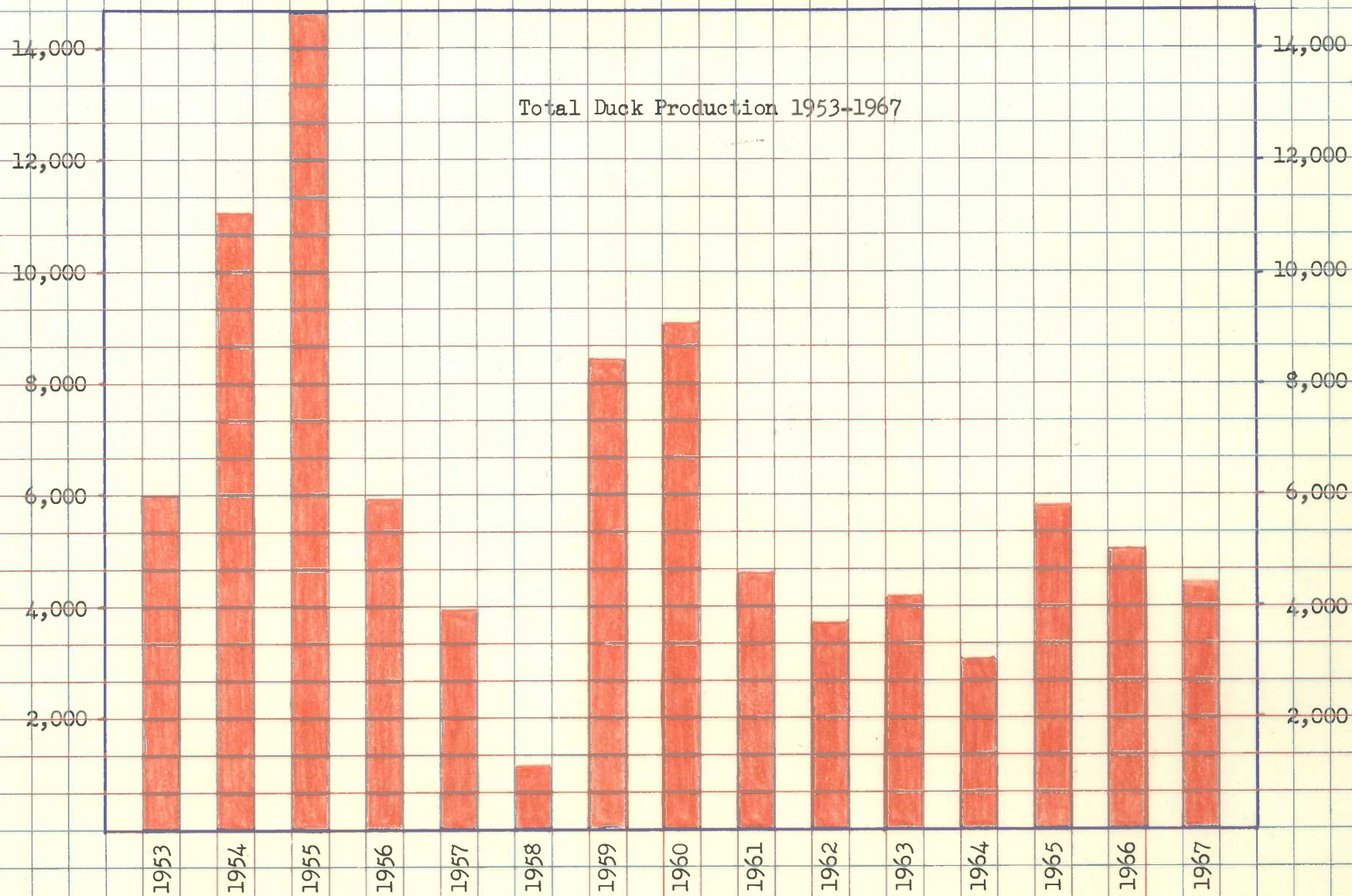


Peak Fall Concentrations of Canada Geese 1950-1967



Peak Duck Populations 1950-1967





to get some returns on these birds as little is known about Wisconsin redhead movements (see Section V, A, 1 for previous years comparisons of breeding pairs).

The fall duck migration was disappointing. Peak numbers declined for the fifth straight year with this years high of 21,340 occurring the last week in October.

3. Swans

Swans do not have a tradition of using the refuge in any great numbers. They were first seen in the spring on March 17 when 4 were seen flying east over the south end of the refuge. The peak population of 25 occurred the first week in April. Only one sighting was made in the fall. This occurred on November 15 when one of our muskrat trappers saw 12 near the main dike.

4. Other Migratory Birds

Although not present in abundant numbers, other migratory birds provide a lot of enjoyment for the visiting public. Most common are great blue herons, common egrets, black-crowned night herons, and American bitterns. One glossy ibis was spotted on May 29. Common snipe were present in good numbers (about 3,000) at the end of summer. A pair of Virginia rails were still present on December 14. One great blue heron and one American bittern stayed near the radial gate on the main dike until the year's end.

B. Upland Game Birds

Pheasants were scarce on the refuge this past year. Winter losses plus a poor nesting season probably accounted for the reduction over last year's high population. Pheasant hunting was poor around the refuge this year.

Three coveys of gray partridges totaling 33 birds were sighted during the past year. Two of the coveys were seen along the east boundary in January and one in neighbor Clarence Schaumburg's pasture in March.

No sightings of ruffed grouse this past year.

C. Big Game Animals

The refuge white-tailed deer population remains high although presumably stable judging from hunter success on the refuge over the past few seasons. During the state managed gun hunt, 172 deer were taken compared to 154 last year and 238 the year before. Late bow season hunters collected an additional 35 deer this year for a total removal of 207 animals (see Section VI, D, 3). We estimate about 450 deer survived the hunting season and headed into winter.

Some deer damage was sustained to refuge and neighbors corn fields both just after the corn came up and again after ears had formed. Many of the ears were nipped off before they dried out and hardened. Deer do eat crops that are provided for geese so reduction of the herd to provide more goose food may be advisable.

D. Fur Animals, Predators, Rodents and Other Mammals

1. Muskrats

Muskrat numbers are increasing. This year's high water levels undoubtedly contributed greatly to our increase. The increase was not apparent until fall housebuilding was in full swing. Two flights were taken to assess the rat population, one on September 27 and the other on October 12. These flights did not reveal much activity and we thought our muskrat population was probably still low. Upon the advice of state biologists, however, we had a trapping program, the first since the spring of 1963. Lucky we did. Muskrat trappers reported many more rats than we had anticipated and they had little trouble making their efforts worthwhile. In all, fall and winter muskrat trapping yielded about 2,800 pelts to 7 trappers. We estimate our population to be about 10,000 at year's end. We still need more muskrats, better distributed, to help control the dense stands of cattails we have on the refuge.

2. Mink

The refuge mink population remains low. Sightings were rare during the summer and permittee trappers had little success in trapping these predators. We can probably expect an increase, however, as the muskrat population grows.

3. Raccoon

The raccoon population remains too high. Our Student Assistant's trapping program this past summer yielded 40 coons and we feel that coons are one of our biggest duck nest predators.

4. Opossum

Opossum numbers may be decreasing. Only 10 adults were trapped during the summer trapping program compared to 30 in 1966. Sightings are common, however, so we should not let our guard down.

5. Fox

Red fox numbers appear to be slightly higher than last year. Tracks are common and trappers are having better success than last year. At their present population level, foxes probably do more good than harm with their scavenging, rodent catching habits.

6. Skunks

Only one skunk was removed during the summer trapping program and very little sign has been noted on the refuge.

7. Other Mammals

One dead otter was picked up along the main ditch north of highway 49. The cause of death was unknown. The animal was partially deteriorated so the pelt could not be saved. The skull will be cleaned and retained. A sighting occurred on April 21 when a large specimen was spotted along Lehner's Ditch; in December tracks of a pair were seen on Townline Ditch.

Weasels are rarely sighted and their numbers are thought to be low.

Badgers are uncommon but occasional diggings are noted.

Fox squirrels are present in good numbers on the few acres of timber present on the refuge.

E. Hawks, Owls, Eagles, and Crows

Rough-legged hawks, red-tailed hawks, and marsh hawks are our common wintering hawks and were present in normal numbers in early and late 1967. Summer hawks include marsh hawks, sparrow hawks, and an occasional redtail.

Great horned owls were present all year. Screech owls were occasionally heard and short-eared owls were present in good numbers during the fall particularly along the main dike. One snowy owl was seen in December.

Eagle sightings during the past year include: 1 adult bald eagle on August 12, 1 immature bald eagle on November 6, and 1 adult golden eagle on December 3.

F. Other Birds

One kingfisher was seen on March 3. Three sandhill cranes were spotted on F-22 by laborer Schaumburg. One greater yellowlegs was seen on F-44 on September 12.

Upland plovers were present in good numbers over the summer. Many individuals were seen on F-22 and it is presumed they had a good hatch.

G. Fish

During February, a test was conducted on the effects of Antimycin as a fish toxicant. Conducting the tests were James Powers, Wisconsin Alumni Research Foundation, Phil Gilderhus, BSFW LaCrosse Fish Lab, and

Jim Helm, Wisconsin Department of Resource Development. Refuge personnel assisted in the operation. The test was run below Chester Bridge on the Rock River. Drip stations were set up to test the effects of the chemical on carp held in cages downstream from the drip sites. The test was a failure as additives caused the Antimycin to gel and not be released to the water.

Carp remain our most abundant nuisance fish. They abound in the shallow warm refuge waters and hinder aquatic vegetation growth. Efforts were begun this past year to prevent their seasonal migration into the refuge from the state area below. Stoplogs were placed below the radial gate on the main dike last year. In early spring this year, a screen was placed on the logs (see photo section). This was found to be unsatisfactory as the stoplogs broke due to water pressure which meant closing the gate to prevent carp influx. A complete fish screen will be constructed in 1968 to go in place of the stoplogs and allow free passage of water while keeping the carp out.

The rough fish removal crew from the Wisconsin Division of Conservation removed 250,005 pounds of fish during the early part of the year with fish averaging 2 5/8 pounds. In addition, 85,275 pounds were taken during December with fish averaging 3 5/8 pounds. These removals probably do little to reduce the carp population on the refuge but does make use of this excess "resource" and does give us a public relations ploy. We hope the fish screen described above, plus the yearly winter kill, does more towards eradication.

Refuge water has been thought to be the source of excessive winter fish kills on the state area downstream from us. Our shallow water coupled with thick ice and snow cover lowers the oxygen content and winter releases through our main gate permit this dead water to flow into the state area. An informal agreement was made with state personnel to close the main gate when the oxygen content is low enough to present a hazard to fish. This will occur after our normal late fall drawdown in preparation for the spring runoff. This past fall's mild weather with resulting thin ice kept oxygen levels within tolerable limits and the gate had not been closed at year's end.

Winter public carp dipping yielded little and should be considered a recreational use rather than a management tool. This year's summer fishing program was restricted to the main dike at the main ditch, Strook's Ditch, and the Rock River at Chester Bridge and Peachey Road. Northern pike fishing was poor all through the summer and what was caught was small. The main attraction again was bullheads and carp.

H. Reptiles and Amphibians

A total of 225 snapping turtles were taken by one permittee during the summer. The total catch of 2,800 pounds averaged just over 12 pounds per turtle with the largest weighing 43 pounds. This compares with 397 turtles, averaging 15 pounds, taken in 1966 by a single trapper. In addition, snappers were dispatched by refuge personnel whenever found.

The western painted turtle was present in good numbers again as many specimens could be seen on dike roads.

Eastern garter snakes were abundant.

The normal complement of toads and frogs (millions) were present.

I. Disease

No disease or die-offs occurred on the refuge or surrounding areas.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Building Removal

The old shop building at headquarters was given to South Byron Company. Attempts were made to sell the building with no success. This building was moved here in 1949 from Crab Orchard Refuge where it had been used for ammunition storage. The contractor completed the job in April. Mayville Construction Company was hired to remove the cement floor. The removal of this building has improved the appearance of the headquarters site.

2. Sale of Buildings & Equipment

The following buildings and barn equipment were sold on bids during August.

<u>Item</u>	<u>High Bidder</u>	<u>Amount</u>
Q-21 Residence	Al Franke	\$76.00
Shed (Q-21 site)	Elmer Schaumburg	3.05
Barn (Q-14 site)	Al Franke	256.00
Barn Cleaner (Q-56 site)	John M.F. Feucht	107.00
Stanchions (Q-56 site)	John M.F. Feucht	16.25
Calf Pens (Q-56 site)	John M.F. Feucht	5.25

All of the above items had been removed at the end of the period.

3. F-22 Access

A 48" x 56' culvert was installed in the Old Marsh Road ditch at the southeast corner of F-22 by Mayville Construction Company. Total cost of installation was \$546.00. This access permits entry to F-22 at both the north and south ends of the unit.

4. Maintenance

Below are listed some of the major work projects for the year.

Constructed and erected 141 duck nest stands.

Constructed and installed fish barrier at radial gate.

Built up stone sections of entrance signs at each end of State Highway 49. (See photo section).

Disked and seeded 26,600 feet of spoil bank on lateral ditches at F-22.

Graded roads as needed.

Reinforced floor and patched holes in granary at Q-56 site.

Removed old roofing, installed plywood and put new roofing on entire fur shed roof.

Repaired pumps for use at F-21, F-44 and F-45.

Hauled fill to Townline Road to widen eroded areas.

Posted Spider, Hog and Gravel Islands located in Lake Michigan off Door County, also inspected islands for waterfowl use.

Removed rotted roof boards, installed plywood and re-shingled front porch roof at Q-14.

Constructed and installed school bus shelter at Q-14 entrance road.

Ground valves on 1963 Plymouth.

Replaced damaged boundary signs on entire refuge boundary.

Repaired oil house roof. Replaced trim and repaired overhang section.

Installed wiring in metal storage building.

Installed new interior and storm door at office.

Constructed and installed storage cabinet at Q-56.

Constructed cabinets for shop.

Repaired barn floor at Q-56 site.

Leveled approximately 1 mile of dike slopes at F-45.

Constructed drainage ditch at F-18 to remove water from low portion of field.

Dike and roadside mowing.

Mayville Construction Company cleaned 7,260 feet of ditch at F-21 at a cost of \$1995 (133 hours at \$15.00 per hour).

Installed new water softener at Q-14.

Preventive maintenance and repairs were made to 10 vehicles, 7 farm tractors, dozer and grader to keep them in operating condition.

B. Plantings

1. Aquatic and Marsh Plants

None

2. Trees and Shrubs

Eleven maneyii junipers, 1 blue spruce, and 1 dundee juniper were planted around the headquarters area in June.

3. Upland Herbaceous Plants

About 26,600 lineal feet of ditch spoil on F-22 was seeded the second week in May with a mixture of timothy, alfalfa, canary grass, alsike, and winter wheat as a cover crop. Survival was low as the area was mostly grown up to weeds by late summer.

4. Cultivated Crops

The following table lists by acres the crops grown this year and previous years to 1960.

<u>Year</u>	<u>Corn</u>	<u>Alfalfa</u>	<u>Grain w/ Seeding</u>	<u>Wheat Browse</u>	<u>Buck- wheat</u>	<u>Millet</u>	<u>Other</u>	<u>Total</u>	<u>Change</u>
1960	556	513	125	Too wet	34	-	-	1,228	
1961	550	376	327	116	115	24	59	1,567	+ 339
1962	474	517	208	144	129	-	8	1,480	- 87
1963	710	503	217	209	117	15	10	1,781	+301
1964	785	445	201	308	78	-	9	1,826	+ 45
1965	793	401	152	374	67	-	-	1,787	- 39
1966	430	307	333	85	-	-	17	1,172	-615
1967	519	394	160	480	-	-	65*	1,618	+446

*Grain sorghum

This past year's cropping program was an effort to provide as much goose food as possible on the refuge. The big reduction in the 1966 acreage was an effort to induce the geese to migrate because of less food combined with the hazing operation. This year's increase over last year was an effort to give the tag hunting system (see Section VI, D) a fair test in as near normal feeding conditions as possible.

Of the 1967 total acreage, 126 acres of corn, 480 acres of wheat browse, and 65 acres of grain sorghum were raised by refuge personnel. The following table lists planting dates for those crops raised by refuge personnel.

<u>Crops</u>	<u>Acres</u>	<u>Date Planting Started</u>	<u>Date Planting Ended</u>
Corn	126	5/24/67	6/2/67
Grain sorghum	65	6/6/67	6/23/67
Wheat	480	8/15/67	9/6/67

This past year will be remembered as one of the better corn years on the refuge as far as service-grown corn is concerned. The drouth and frost did not seriously affect our low peatland units and, in spite of the cool summer, we had a good corn crop.

Our grain sorghum did not fare so well. Frost hit the F-22 peatland unit every month last summer except June and this warm weather plant could not stand the cold weather. We did have hopes of getting some return until a hard freeze hit the lowlands the night of August 30. We question the wisdom of trying to raise sorghum in this climate with a slim chance of getting a crop when near 100 bushels per acre of corn can be raised next to it. We originally planted 110 acres of sorghum. With the crop failure we decided to disk up 55 acres of it and seed it to wheat browse. Portions of it had Atrazine applied to it in July. Normally wheat should not be seeded for two seasons in an area where Atrazine has been applied. In light of our low application rate ($1\frac{1}{2}$ - $2\frac{1}{2}$ lbs./acre with 1 gallon of crop oil) we decided to experiment with wheat seeded only 1 month after the Atrazine application. We could tell no difference in vigor or growth rate of the wheat seeded in the Atrazine as compared to the area with no Atrazine. No doubt our peatland conditions had a lot to do with the wheat's success. The high leach rate of the peat undoubtedly caused much of the chemical to flush out before wheat planting time although late summer was extremely dry. We don't advocate this for other areas, but we have given evidence that, under our conditions, wheat browse can be grown fairly soon after Atrazine application if the application rate is low.

Service-grown wheat had a good year. The wheat was in the ground on time and the wet mild fall produced a lot of green browse. We will experiment with earlier planting next year in an effort to get more foliage above ground by the time the geese arrive.

Permittee grown crops ran the full spectrum of quality. The majority of our farmers are conscientious and farm refuge land like it was their own. We do have 3-4 individuals farming on the west and southeast portions of the refuge who will need "jacking" up this coming crop year. We will have to initiate stricter controls on fertilizer requirements and weed control. Some of the permittees were hit hard by blackbirds and deer and many were cleaned out by geese before

they had a chance to harvest their share of refuge corn. Perhaps this explains, in part, why they are not willing to put out much effort for a crop of corn on the refuge.

C. Collections and Receipts

1. Seed or Other Propagules

Eighteen hundred and sixty-five bushels of winter wheat were transferred from DeSoto Refuge in July for use as seed.

2. Specimens

A dead otter was found near the main ditch north of Highway 49 during the late bow season in December. The animal was retrieved and the skeleton was saved. The hide was rotted. Forty immature male mallards were cannon netted and taken to Frost Game Farm for experimental purposes.

D. Control of Vegetation

The information called for in this section is included in NR-12 except costs, which are listed below for vegetative control on refuge farmed land.

Materials	\$1,672.30
Labor	360.00
Equipment Operation	<u>160.00</u>
Total	\$2,194.30

E. Planned Burning

A total of 690 acres were burned in 1967. Of this, 80 acres were burned on April 3 along the west edge of F-22. Fall burning included 610 acres south of Luebke Ditch, east of the main dike near the main ditch, Potato Lake, and a small area east of I-3 and I-4. All burning was in accordance with our approved Prescribed Burning Plan. The purpose of the burning is to retard willow and dogwood growth. Secondary benefits include ridding ourselves of the litter that normally accumulates on the marsh bottom which will eventually fill up the marsh. Some limited benefit is received in opening up the dense stands of cattails to make way for more valuable aquatic vegetation.

Costs

Materials	2 new fire starters	\$76.00
	8 propane cylinders	7.72
	10 fusees	1.00
Labor and operations cost		<u>50.00</u>
Total		\$134.72

Conditions Prior to Burning

Wildlife use of the areas before burning was practically nil except for an occasional muskrat and a few deer that head out into the marsh when hunting pressure gets too great on the upland. We hope increased muskrat numbers in the future will cut down the amount of burning we have to do. The areas burned were almost exclusively cattails with scattered willows and dogwood. Most of the areas burned had standing water over them and care was taken not to start any peat fires.

Conditions Following Burning

This past year's high water levels hindered burning. The refuge muskrat population is increasing so the openings left by them also made burning difficult. Good burns were obtained, however, in portions of Potato Lake and those areas burned close to the main dike. We had lesser success burning I-2 and I-3 and areas east of these subimpoundments. Most of the scrub brush burned was probably either killed or retarded. We will know better next summer. The areas burned require annual burning if we are to keep ahead of the brush infestations. At this time, burning is more economical than control of the brush by chemical or mechanical means.

F. Fires

None

IV. RESOURCE MANAGEMENT

A. Grazing

Grazing was permitted on 827 acres of marsh edge and upland. Permits were issued to 13 farmers to graze 290 head of cattle from May 15 to September 15. A fee of \$1.50 per AUM was charged. Total receipts for 1967 amounted to \$1338.99.

B. Haying

Permits were issued to cut 29 acres of wild hay at \$1.00 per acre.

C. Fur Harvest

A muskrat trapping season was held on the refuge for the first time since the spring of 1963. Seven permits were issued for trapping muskrats, mink, raccoon, fox, opossum and skunks beginning October 25. A survey made about the middle of October indicated that the muskrat population was increasing but was still at fairly low levels. At the end of October house building showed a sharp increase and the population appeared higher than first anticipated. It now appears that a spring trapping season will be necessary.

Below is a tabulation of animals trapped by permittees through December 31.

Muskrats	2,871
Mink	6
Raccoon	17
Foxes	40
Opossum	52
Skunk	4

The Fur Harvest Plan was amended this year to give 100% of the furs to the trapper. This was done to get more interest in trapping. The low fur price the past several years has made many trappers lose interest. Most of the trappers we had this year were trapping for the sport and a chance to get away from it all rather than to supplement their income.

Two trappers that have sold their furs averaged \$.75 and \$.80 each for muskrat pelts.

D. Timber Removal

None

E. Commercial Fishing

None

F. Other Uses

Three bee keeping permits were issued for keeping 183 hives on the refuge. A charge of \$.10 per hive is made giving total receipts of \$18.30 for 1967.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report

1. Waterfowl Production Inventory

The coordinated air-ground count for breeding pairs was made on May 9. The following table lists breeding pairs for 1967 as well as the past four years.

	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>% Change Over 1966</u>
Blue-winged teal	1133	1015	1568	760	1050	+ 38
Shoveler	67	44	220	106	240	+126
Mallard	560	206	134	190	111	- 42
Redhead	106	95	86	570	147	- 74
Gadwall	90	57	67	148	37	- 75
Pintail	21	51	48	21	37	+ 76
Ruddy	-	-	30	84	37	- 56
Scaup	-	13	29	21	92	+340
Ringneck	-	-	19	63	18	- 71
Baldpate	17	32	19	22	18	- 18
Black	-	-	14	21	-	-100
Green-winged teal	20	25	10	42	18	- 51
Bufflehead	-	-	10	21	-	-100
Totals	2014	1598	2254	2111	1842	

The increases over last year in blue-winged teal and shovelers were encouraging but the real story this past year was with redheads. The above figures do not indicate this, but 1967 was one of the best nesting years for redheads in refuge history. We had near ideal conditions for redheads with large expanses of open water covered with emergent vegetation. This past year's high water levels no doubt encouraged redhead nesting. (See Section II, A, 2).

Systematic brood counts were made to determine nesting success, but the thick emergent vegetation prevented us from getting much useful information.

2. Summer Banding

Summer banding goals in 1967 included banding as many mallards, blue-winged teal, and wood ducks as possible. In light of this year's redhead hatch we attempted to band as many redheads as possible in an effort to find out something about their movements from Horicon. Few redheads had previously been banded at Horicon. The following table lists all ducks summer banded by age group.

	<u>Adult Male</u>	<u>Adult Female</u>	<u>Immature Male</u>	<u>Immature Female</u>	<u>Total</u>
Redheads	1	21	24	24	70
Mallards	1	15	1	1	18
Wood ducks	53	10	0	0	63

At the time of this report, no direct recoveries of the above banded birds had been received.

Ohio wood duck traps and floating traps of two designs were used to catch the birds. The Ohio wood duck traps were by far the most productive as all the birds were trapped with them except for several mallards.

An attempt was made to band mourning doves during the summer. Student Laborer Phil Janik was in charge of the project in addition to the summer duck banding. Wire walk-in traps were used to catch the birds. A total of 221 trap-days were expended with a total catch of only 31 doves. The high cost of such an operation greatly outweighs the information gained from trapping 31 doves and the program will probably be discontinued. The following is a tabulation of doves banded during the summer.

<u>Adult Male</u>	<u>Adult Female</u>	<u>Immature and Unknown</u>
16	5	10

We did receive one direct recovery by the time this report went to press. It was banded on August 10 as an adult male and was recovered on September 24 at Port Arthur, Texas.

3. Dewline Banding

Our "Dewline" banding quota this past year consisted of 1,000 mallards and 250 wood ducks, with as close to an even split of age groups as possible. The results are shown in the following table:

	<u>Adult Male</u>	<u>Adult Female</u>	<u>Immature Males</u>	<u>Immature Female</u>	<u>Total</u>
Mallard	210	728	177	328	1,443
Wood duck	36	3	1	1	41
Pintail	5	2	-	-	7
Black duck	7	4	4	4	19
MallardxBlack	1	-	2	-	3
			Total		1,513

All birds were caught with cannon nets at the Towline and headquarters cannon net sites. As of January 30, 1968 only two direct recoveries had been received; one adult drake mallard banded on September 20 and recovered on October 8 near Juneau, Wisconsin about 15 miles from the refuge and one mallardxblack hybrid banded on August 28 and recovered near Fox Lake, 10 miles west, on October 9.

Since "Dewline" banding was initiated in 1961 we have banded 22,041 mallards. Very little has been done with the wealth of returns on these birds. Our returns, coupled with those gathered by the Wisconsin Division of Conservation could supply some interesting data concerning Wisconsin mallards. Some of the questions we feel could be answered are:

1. From retrap data, mallards hatched in Illinois, Indiana, Ohio, Ontario, and Michigan apparently migrate to Wisconsin the same summer they are hatched. Similarly mallards hatched at Horicon move north and west before the hunting season.

2. Does Wisconsin get early migrating adult males from the north? We assume they do if they act like Horicon banded adult males. What really is the source of the majority of the mallards shot in Wisconsin?

What we need is a complete breakdown of data by age and sex classes on the migration habits of mallards going to and migrating from Wisconsin.

4. Preseason Canada Goose Banding

Our quota this past fall was again 1,000 birds. Cannon net trapping was begun on September 25 and was concluded on October 12, two days before the goose season began. A total of 662 birds were trapped and banded. The following lists the birds by age class.

<u>Adult</u> <u>Male</u>	<u>Adult</u> <u>Female</u>	<u>Immature</u> <u>Male</u>	<u>Immature</u> <u>Female</u>	<u>Total</u>
306	197	81	78	662

The above figures indicate an immature percentage of 24.

5. Duck Nest Stands

A total of 241 artificial duck nest structures have been set out at Horicon. They can be divided into two separate projects. One, a study set up by Bill Renaker, Biological Technician at Necedah Refuge, consists of 100 structures, half fiberglass and half garbage can lids. This past year was the second year of a three year study to determine if they will be used at Horicon. So far, the results have been virtually negative. A total of five nest structures have been used in the past two years. Three were blue-winged teal and two were mallards.

The other project consists of 141 structures of which 94 are garbage can lids and 47 are the wooden type with wire mesh. They were set out in February of 1967 and none were used this past nesting season. The structures are located in the central marsh and will be moved further back into the vegetation in early 1968 in an effort to induce birds to use them.

6. Blasted Artificial Potholes

In December of 1963, 41 potholes were blasted in the southeast portion of the refuge. The potholes were measured in the summer of 1965 by Harold Mathiak, Wisconsin Division of Conservation. He found no significant change in depth or diameter. Measurements will be made again in early 1968 as it appears they are filling up somewhat.

A capsulized evaluation of them would be good when water levels are low and not so good when water levels are high. We have 24 of

the potholes north of the Main Dike, where water levels have been consistently high since 1965 and 17 south of the Main Dike where levels are consistently low. With low water levels the potholes keep water in them and the spoil provides excellent nesting sites. With high water the spoil is inundated and thus serves no purpose for nesting. In both cases, however, open water without cattail growth is provided for aquatic vegetation production plus loafing and brood rearing sites.

VI. PUBLIC RELATIONS

A. Recreational Uses

LAWCON fees were not charged at Horicon this past year much to the relief of the visiting public and to the people who had to collect them.

The controversy of the refuge in recent years plus the spectacular sights available have contributed greatly to our public use. Again, the main public attraction of the refuge is....geese. Goose viewing from highway 49 crossing the refuge has become a regular fall legend much to the chagrin of the highway department and to the delight of the viewing public. Fortunately, no accidents or injury occurred on this stretch of highway this past year while people were watching geese. The new public viewing and recreation area scheduled for completion in 1969 should relieve the pressure on this highway. Of lesser magnitude is the influx of people to view spring migrating geese as there are less geese, they are more spread out, and the publicity is not as great.

Portions of the refuge were open again in January and February to winter fishing although pressure was light. Most people visit the refuge in the winter time at night to spotlight deer feeding in open fields.

Summer fishing on the refuge was again popular although fishing was poor with the exception of bullheads. The refuge will probably never have good fishing as we have a high winter kill and the installation of the fish screen at the radial gate will keep game fish out as well as carp.

The two-day shotgun season plus the late bow season for deer were the only public hunting activities on the refuge this year. Some conflict between hunters and permittee trappers regarding tampering with traps and catch was noted. There was no goose hunting on the refuge this past year.

In addition to organized groups guided through the refuge by refuge personnel, permits were granted to R. C. Zuelsdorf, state licensed guide, Horicon, Wisconsin, to conduct tours for 1,100 people through the refuge. Mr. Zuelsdorf does a fine job and tells the refuge story well.

The following table lists public access to the refuge on federal, state and township roads as well as the period they are open to car travel.

	<u>Miles</u>	<u>Period Open to Cars</u>
Main Dike Road	3.0	Jan.-Feb. & July 15-Sept. 15
Headquarters Road	.7	All year
Strooks	.7	All year
State Highway 49	2.3	All year
Old Marsh Road (west end)	.5	Jan.-Feb. & May 21-Sept. 15
Peachey Road	.5	All year
Neitzel Road	.3	All year
Sommers Road	.5	All year
Total	8.5	

B. Official Visitors

2/7 Phil Gilderhus, LaCrosse Fish Lab, antimycin project.
 2/7 Jim Powers, Wis. Alumni Research Foundation, antimycin project.
 2/20 Richard E. Johnson, Univ. of California, visit.
 2/22 Jim Powers, Wis. Alumni Research Foundation, antimycin project.
 2/22 Phil Gilderhus, LaCrosse Fish Lab, antimycin project.
 2/27 Walt Schaefer, R.O., Horicon Goose Alliance meeting.
 2/27 Milt Reeves, R.O., Horicon Goose Alliance meeting.
 3/7 Gilbert Lea, SCS, farm plans.
 3/14 Clair Rollings, R.O., farming program.
 3/14 Gilbert Lea, SCS, farming program.
 3/14 Al Taber, SCS, farming program.
 3/15 Gilbert Lea, SCS, farming program.
 3/15 Al Taber, SCS, farming program.
 3/22 Norm Johnson, R.O., visit.
 3/22 Don Johnson, R.O., civil rights compliance.
 4/6 C.W. Brasure, Sinclair Refining Co., magazine article.
 4/6 Harold Arbeen, Sinclair Refining Co., magazine article.
 4/8 Dr. Poulter, Iowa Wesleyan, refuge tour.
 4/10 Dave Smith, R.O., land purchase.
 4/10 Gordon Jensen, R.O., land purchase.
 4/26 J.J. Armstrong, Ontario Dept. Lands & Forests, visit.
 4/26 Syed Salamat, Forest Service Pakistan, visit.
 4/26 J.W. Lockwood, Dept. Lands & Forests, Toronto, visit.
 4/26 J.D. Hughes, Dept. Lands & Forests, Toronto, visit.
 4/26 D.G. O'Reilly, Ontario, Canada, visit.
 4/26 Ronald Hawkins, Ontario, Canada, visit.
 6/27 Paul Zurkowski, Congressman Kastenmeier's ass't., goose problem.
 6/27 Larry Jahn, Wildlife Management Institute, goose problem.
 7/6 Wm. Green, Wildlife Biologist, wildlife inventory plans.
 7/12 Wm. Renaker, Necedah Refuge, nest stand survey.
 7/25 Hugh J. Lavery, Australia, visit.
 7/25 Ernest Ables, Univ. of Wisconsin, visit.
 8/18 Dave Smith, R.O., land acquisition.
 8/21 Jim Lenartson, Necedah Refuge, deliver nets.

9/12 L.R. Swanberg, R.O., cadastral survey.
 9/12 John Kane, R.O., cadastral survey.
 9/12 Paul Haquist, R.O., cadastral survey.
 9/26 Ed Collins, Necedah Refuge, pick up ducks for Frost Game Farm.
 9/26 Chuck Griffith, R.O., recreation area inspection.
 9/26 Joe Knecht, R.O., recreation area inspection.
 10/13 Forrest Carpenter, R.O., visit.
 10/13 James R. Fielding, R.O., visit.
 10/13 Milt Reeves, Patuxent, Flyway Council meeting.
 10/21 Andy Meyer, R.O., visit.
 10/22 W.F. Anderson, BCF Seattle, visit.
 10/23 Frank Gimbel, U.S. Attorney, visit.
 11/7 Ed Mikula, Michigan Conservation Dept., goose hunt observation.
 11/7 Chuck Harris, Michigan Conservation Dept., " " "
 11/7 Dave Kennedy, Ill. Dept. Conservation, goose hunt observation.
 11/7 George Arthur, Ill. Dept. Conservation, " " "
 11/8 Wilbur Stites, Wis. Cons. Dept., make tape recording.
 11/13 State Disaster Committee, depredations
 11/21 Charles Lawrence, C.O., visit.
 11/24 Paul Ferguson, Union Slough Refuge, visit.
 11/26 Ron Osika, RCMP Winnipeg, visit.
 12/6 Kermit Wilhelm, R.O., cadastral survey.
 12/6 John Kane, R.O., cadastral survey.
 12/6 Paul Haquist, R.O., cadastral survey.
 12/6 L.R. Swanberg, R.O., cadastral survey.
 12/12 Robert F. Scott, C.O., visit.
 12/12 George Laycock, writer, visit.
 12/12 C.W. Schwartz, Missouri Conservation Commission, visit.
 12/12 Robert Delaney, Missouri Conservation Commission, visit.
 12/12 Carl R. Noren, Director Missouri Conservation Dept., visit.
 12/16 Gilbert Gerdman, Div. Resource Development, Madison, visit.
 12/16 Jeffrey Yarne, Div. Resource Development, Madison, visit.

In addition to the above, the following made numerous visits to the refuge throughout the year:

Marshall Stinnett, USGMA
 Miles Camery, USGMA
 Lloyd Lindvall, USGMA
 John Winship, Regional Office
 Wm. Green, Wildlife Biologist

The following Bureau personnel were assigned here during part of the 1967 goose season to assist with law enforcement and depredation activities:

Harry Pinkham, USGMA, Minnesota
 Ben Crabb, USGMA, Alaska
 Dave Swenson, USGMA, Minnesota
 Marcein Hudson, USGMA, Tennessee
 Andrew Pursley, USGMA, Arkansas

Al Niemeyer, USGMA, Utah
 Don Combs, USGMA, Montana
 Chalmers Richardson, USGMA, Alabama
 Laverne Broyles, USGMA, Kansas
 Charles Stribling, USGMA, Idaho
 Robert Kinghorn, USGMA, New Mexico
 Ken Baer, USGMA, New Mexico
 Sam Miller, USGMA, Pennsylvania
 John Cross, USGMA, Michigan
 John Buckalew, USGMA, New York
 Dan Russ, USGMA, Massachusetts
 Bonar Law, USGMA, South Dakota
 John Minick, USGMA, Illinois
 Dave Kirkland, USGMA, New York
 Harold Steele, USGMA, South Carolina
 John Hague, USGMA, Missouri
 Charles Heumeier, USGMA, Texas
 Malvern Cecil, USGMA, Kentucky
 Harlan Morgan, USGMA, Missouri
 Richard Gimby, USGMA, Illinois
 Robert Wheeler, USGMA, Nebraska
 Rowe Meyer, USGMA, Wyoming
 Glen Orton, USGMA, Minnesota
 Dave Fischer, USGMA, South Dakota
 Vic Blazevic, USGMA, North Dakota
 Lyman Reynoldson, USGMA, North Dakota
 Gus Bonde, USGMA, Nebraska
 Tom Sechrist, USGMA, Indiana
 Bill Fuchs, USGMA, Michigan
 Dick Branzell, USGMA, Michigan
 Howard Lovrien, USGMA, South Dakota
 Roger Priest, USGMA, Wisconsin
 Eric Lawson, Upper Mississippi Refuge
 Jim Voelzer, Crab Orchard Refuge
 Richard Nord, Mark Twain Refuge
 Robert Wright, Upper Mississippi Refuge
 Ed Nichols, Crab Orchard Refuge
 Dick Baesler, Crab Orchard Refuge
 Gene Patten, Upper Mississippi Refuge
 Bart Foster, Upper Mississippi Refuge
 Brad Hubbard, Seney Refuge
 Ollie Thornbloom, Rice Lake Refuge
 Barney Schrank, Sherburne Refuge
 George Orlich, Seney Refuge
 L.E. Hovell, Crab Orchard Refuge
 Wayne Wier, Mingo Refuge
 Tom Charmly, Upper Mississippi Refuge
 Ross Hanson, Regional Office
 Marshall Stinnett, Central Office

Flick Davis, Doug Swanson and George Brakhage, M&E-Minneapolis,
 made numerous trips to Horicon to coordinate and supervise law enforce-
 ment activities during the season.

C. Refuge Participation

Jan. 25 & 26 - Personius attended goose management meeting in regional office.

Jan. 26 - Crews presented slide talk to 45 Wauwatosa Kiwanis members.

Jan. 30 - Personius attended meeting with Wisconsin Conservation Department personnel at regional office regarding 1967 goose hunt.

Feb. 2 - Personius attended meeting of Flyway Council at St. Louis regarding goose management.

Feb. 9 - Crews presented slide program to 60 students and teachers at Oshkosh High School.

Feb. 15 - Personius and Crews attended and assisted with hearing on Wisconsin Island Refuges at Sturgeon Bay, Wisconsin.

Feb. 27 - Personius, Stinnett, Reeves and Schaefer attended meeting with Horicon Goose Alliance at Beaver Dam, Wisconsin.

Feb. 27 - Personius presented slide talk to 40 men of Brown County Conservation Alliance at Green Bay, Wisconsin.

March 20 - Personius and Crews showed films for Wildlife Week at 2 grade schools in Beaver Dam and 3 in Waupun.

March 21 - Personius and Crews showed films for Wildlife Week at 5 grade schools in Waupun and 2 in Beaver Dam.

March 22 - Personius attended public hearing at Fort Atkinson on goose tag hunt.

March 22 - Personius showed films for Wildlife Week at 1 grade school in Beaver Dam and 1 in Horicon.

March 23 - Personius showed films for Wildlife Week to 3 different classes at Beaver Dam grade school.

March 27 - Personius showed film and discussed Wildlife Week at Horicon Rotary.

March 30 - Personius showed film and discussed goose management at Menasha Sportsmen Group meeting.

April 4 - Personius gave slide talk to Mayville fourth graders.

April 6 - Personius served on State personnel selection oral exam board.

April 8 - Personius explained refuge operations to Dr. Poulter and students from Iowa Wesleyan College.

April 10 - Personius attended Dodge County Game Hearings in Horicon.

April 11 - Personius attended and answered questions on goose problems at Milwaukee Conservation Alliance meeting in Milwaukee.

April 12 - Personius conducted tour of refuge for 85 Rosendale High School students.

April 13 - Personius presented slide talk to 10 members of Shrine Club, Oconomowoc, Wisconsin.

April 17 - Personius presented goose problem and answered questions at Horicon Goose Alliance meeting in Horicon.

April 18 - Personius spoke to 150 members of Winnebago Sportsmen's Club at Oshkosh.

April 19 - Personius attended Conservation Congress hearing in Portage, Wisconsin.

April 20 - Personius discussed goose problems at Congress hearing in Milwaukee.

April 22 - Personius attended meeting of Wisconsin Wildlife Federation in Stevens Point, Wis.

April 22 - Bushweiler conducted tour of refuge for 20 ornithology students from Whitewater State University.

April 25 - Personius conducted tour of refuge for 35 Manitowoc Junior High School students.

May 1 - Personius gave talk on goose management to Green Bay Duck Hunters Association.

May 6 - Personius conducted tour of refuge for 25 Madison (Milwaukee) High School students.

May 10 - Personius spoke to 20 members of Watertown Sportsmens Club on goose management.

May 11 - Personius conducted tour of refuge for 60 sixth graders from Shorewood School.

May 13 - Personius conducted tour of refuge for 30 high school students from Nathan Hale High School.

May 25 - Personius spoke to 80 Rotarians in Manitowoc on goose management.

June 14 - Personius attended Civil Defense meeting in Chicago.

June 15 - Personius conducted tour of refuge for 15 Oshkosh High School science students.

June 15 - Personius spoke to 25 members of Fond du Lac County Conservation Alliance on goose management.

June 20 - Personius presented slide talk to 40 Waupun Rotarians.

June 27 - Personius conducted tour of refuge and explained operations to Mr. Paul Zurkowski, Congressman Kastenmeier's assistant.

June 29 - Personius talked to sportsmen's group in Green Bay about National Wildlife Refuge for Barkhausen reserve.

July 5 - Personius conducted tour of refuge for 30 Janesville High School students.

July 11 - Personius attended meeting at regional office regarding goose tagging system.

July 12 - Brownlee conducted tour for class from Marian College, Fond du Lac.

July 18 - Personius conducted tour of refuge for 40 Sheboygan High School students.

July 27 - Personius conducted tour of refuge for 5 members of Lawrence College ecology class.

July 27 - Personius spoke to 15 members of Oakfield Lions Club.

Aug. 9 - Brownlee conducted tour of refuge for 60 Waupun Girl Scouts.

Sept. 5 - Personius spoke to 50 Lions Club members at Manitowoc.

Sept. 7 - Personius conducted tour of refuge for 80 Kewaskum High School biology students.

Sept. 9 - Personius presented talk on Managing a National Wildlife Refuge to 35 delegates at Sportsmen's Leadership Conference in Poynette.

Sept. 11 - Personius showed film and talked to Schultz Rod & Gun Club in Hales Corners, Wis.

Sept. 19 - Bushweiler conducted tour of refuge for two sixth grade classes from Lake Bluff School, Shorewood, Wis.

Oct. 3 - Bushweiler took tour guides for Waupun Fall Festival bus tours on tour of north end of refuge and explained operations.

Oct. 3 - Personius was interviewed by TV-11 crew from Green Bay, also took crew on refuge for goose pictures.

Oct. 10 - Bushweiler gave short talk on refuge to busload of retired people from Wauwatosa, Wis.

Oct. 12 - Brownlee showed movie and gave talk at Sheboygan Izaak Walton League meeting in Sheboygan, Wis.

Oct. 16 - Personius made tape for radio station WFOX.

Oct. 18 - Personius gave talk to 80 school children from Kewaskum.

Oct. 19 - Personius showed film "Honkers Prepaid" and gave talk to 25 members of Denmark Lions Club.

Oct. 21 - Personius gave talk to 25 students from Farnsworth Junior High School.

Nov. 8 - Personius cut tape for WCD Wilbur Stites, TV-2 Green Bay, and Wm. Green on goose situation.

Nov. 14 - Personius participated in radio program on WBEV Beaver Dam regarding goose hunt.

Nov. 28 - Personius presented paper at panel discussion for annual growers dinner presented by W.G. Glascoff.

Dec. 6 - Personius gave talk to 10 members of Waupun Sportsmen's Club.

Dec. 10-13 - Personius attended Midwest Wildlife Conference in Madison.

Dec. 13 - Brownlee attended Midwest Wildlife Conference in Madison.

D. Hunting

There was no goose hunt on the refuge this past year. It was felt there was ample opportunity to hunt on adjacent farmland and the state area to the south in light of the reduced number of hunters in the field at any one time due to the tagging system. Also, the location of the blinds in previous managed hunts kept geese off refuge fields.

The tagging system was the first used in Wisconsin for waterfowl although it has been used in other parts of the country. It was necessitated by the vast overkill of Canada geese in recent years in Wisconsin. Under the system Wisconsin was given a quota of 20,000 geese to kill. A zone was set up around Horicon, known as the "Horicon Zone", in which 75% of the kill was to take place. Within the zone, hunters successful in a drawing were given one tag and assigned one of six periods in which to hunt. The first period was 2 days long and each one thereafter was 7 days long with a season length of 37 days. An additional 7,500 tags, valid for 21 days, were released at the end of the regular season when it became apparent that the expected 90% success ratio was closer to 70%. Anyone was eligible for a tag in the extended season provided he had not taken his season limit of 1 goose within the Horicon Zone or 2 outside the zone. In the remainder of the state, all applicants were given 2 tags with a full 70 day season in which to fill them.

Generally the tag system was accepted by the hunters. One obvious benefit of the system is that the hunting was spread out among many more hunters. There were many hunters in the field that had never hunted geese before and it was certainly a pleasurable experience for them. About the only hunters that were irate were the long standing hunting club members who this year could only shoot one goose instead of their usual dozens. All of the farms next to the refuge had blinds for rent on a daily basis rather than their usual seasonal blind or farm rentals. With the reduced number of hunters in the field some farmers complained that they weren't making as much money as they had in the past. Most of them must have made money, however, with this year's 58 day season rather than the short seasons in the past (2½ days in 1966) when early closures were necessary to prevent further decimation of the Mississippi Valley Flock of Canada geese. Further information regarding the tagging system as it affected depredations can be found in Section VII, A, 1.

Most of the hunting pressure took place around the north and west boundary of the refuge, the same direction as the bulk of the feeding flights. It was no problem, however, to get a goose anywhere around the refuge in the early morning when the geese were on the move.

Within the Horicon Zone, a total of 24,000 tags were issued, including the extended season. As of January 3, the kill within the zone, determined from mandatory reports on the use of the tags by the hunters, was 11,595 with 2,632 non-respondents. The remainder of the state showed a kill of 3,868 with 24,506 still unreported. The grand total for the state as of the date of this report is 15,463 which is a far cry from the 31,193 calculated kill of 1966. We assume that the vast majority of non-respondents did not kill geese. With the illegal kill and crippling loss of about 20% the harvest in Wisconsin will probably be close to 20,000.

As practically all of the kill of the Mississippi Valley Population of Canada geese takes place in Wisconsin and Illinois, the following table lists quota and season lengths for the past several years.

<u>Year</u>	<u>Wisconsin</u>		<u>Illinois</u>	
	<u>Quota</u>	<u>Season Length</u>	<u>Quota</u>	<u>Season Length**</u>
1960	7,000	10*	14,000	44
1961	12,000	19*	20,000	44
1962	8,000	8*	10,000	44
1963	12,000	36*	20,000	50
1964	11,000	12*	15,000	29*
1965	11,000	13*	15,000	46
1966	14,000	2½*	20,000	45
1967	20,000	58	20,000	45*

*Emergency closure necessary.

**This includes the quota zone only for Illinois. The state usually sets a shorter season in its quota area than that offered by federal regulations.

Although the 1967 Wisconsin quota is larger than in previous years, the kill is more realistic because of the tagging system. For example, with a quota of 14,000 in 1966, the kill was calculated to be over 31,000 for the 2½ day season. The same can be said of previous years.

The entire refuge was open for the two day any deer shotgun season. The gun season took place when there still were about 75,000 Canada geese in the area and it was feared there might be a problem with the hunters knocking off a goose now and then. The problem failed to materialize, however, as no violations of this nature were detected.

The deer hunt was again managed by the Wisconsin Division of Conservation with 300 hunters assigned to each of the two days. The check stations were not used this year as the hunters picked up permits and armbands at the state's Horicon headquarters and registered their deer in the normal fashion at designated points in the area. With about 500 hunters in the field each for one day the registered kill for the gun hunt was 172. The following table lists this years kill and hunter effort as compared to previous years.

<u>Year</u>	<u>No. of Hunters</u>	<u>Kill</u>	<u>% of Success</u>
1957	627	162	26
1958	647	161	25
1960	629	146	23
1964	655	213	33
1965	509	238	47
1966	513	154	30
1967	500 (est.)	172	34 (est.)

The entire refuge was open for the late bow season with no restrictions placed upon the hunters other than Wisconsin regulations. The registered kill was 35 deer. This brought the total refuge deer harvest through hunting to 207.

E. Violations

Since this was the first year for a goose tag system of hunting in Wisconsin, it was felt that law enforcement would play a big part in making the tag system successful. A total of 58 U.S. Game Management Agents and refuge personnel assisted with enforcement activities during the season. Below is a breakdown of violation cases made by federal and state officers.

	<u>Federal</u>	<u>State</u>	<u>Total</u>
Transport untagged Canada goose	103	15	118
Hunt Canada goose w/o permit	52	24	76
Exceed limit on Canada geese	25	7	32
Failure to report goose kill	1	0	1
Early or late shooting	9	2	11
Improperly plugged gun	13	17	30
Hunt w/o Duck Stamp	16	0	16
Hunt on refuge closed area	11	9	20
Hunt with aid of bait	1	0	1
Wanton waste	2	0	2
Hunting during closed season	0	2	2
Miscellaneous state regulations	<u>6</u>	<u>23</u>	<u>29</u>
Total	239	99	338

Federal cases were taken before a newly appointed U.S. Commissioner in Fond du Lac.

F. Safety

Seven safety meetings were held during 1967. Each staff member was responsible for choosing a subject and conducting the meeting. Eight safety films were shown pertaining to home safety, use of seat belts, slips and falls, bleeding and bandaging, artificial respiration and safe use of pesticides.

There were no accidents during the period.

This station has had no lost time accidents for 2,764 days. Previous safety record was 2,546 days.

VII. OTHER ITEMS

A. Items of Interest

1. The story of the year at Horicon again centered on Canada geese.

For some years everyone has agreed that there are too many geese for the amount of food available in the refuge and that this forces the birds to leave the sanctuary and seek food on private land. When this happens crops are damaged and the birds become easy prey to the hunter. No combination of hunting regulations has been found to hold the kill within the assigned quota.

Past efforts to solve the "Horicon Problem" included hand feeding in 1965, and hazing to induce early migration in 1966. Nothing has worked.

In 1967, to reduce the overkill, the state and the Bureau worked out a tagging system of hunting Canada geese. It was hoped that the state would manage the hunt, however, the state legislature would not provide the enabling law so the Bureau had to take over. To ensure compliance extra federal personnel were brought in for additional law enforcement. Although there were many violations, the tag hunt seemed to be successful and most hunters cooperated and apparently approved the system.

Everything seemed to be going fine until it started to rain. This prevented the farmers from continuing to operate equipment in corn fields. So the geese took over from the corn pickers and we were in the middle of a depredation situation.

It had been hoped that the long, continuous goose season would provide hunting pressure to keep geese out of unharvested corn. However, there were so few tags available for the size of the area in which geese were feeding that the hunters failed to protect crops except near the refuge boundary.

To alleviate the damage threat, the enforcement crew was assigned to spend part of their time answering farmers' complaints. When a farmer called the refuge or the local state conservation department office, a car in the field was radio-dispatched to the scene. Extra exploding devices were brought in and pie plate scarecrows were provided for federal crews to assist farmers.

Our effort involved over 180 complaints answered and certainly saved substantial amounts of many farmers' crops. Despite the magnitude of our effort, however, the farmers were extremely angry about the whole "Horicon mess" and were critical of the tag hunting system and the failure of state and federal agencies to solve the problem of too many geese. Many of them refused to cooperate with our field men's efforts to help them contending that it was the federal responsibility to care for the "federal geese".

Although the number of complaints was high and crop damage did take place, the total loss was apparently not as bad as expected. As of January 12, 1968 there were 43 damage claims totalling \$9,559.20. The state waterfowl damage claim law was amended in

January, 1968 to allow payment for damage occurring during the hunting season. This made it possible for all damage to be compensated for. As previously provided in the law, the farmer still had to deduct the amount earned from sale of hunting privileges. Despite the small number of tags, the length of season did make it possible for many of the favorably located farms to make a substantial income from blind rentals. The amended law increased the total fund to \$25,000 and individual claims to \$1,500 maximum. The farmer is still required to cooperate with state personnel in any attempt to scare geese out of their crops.

Adverse publicity during the depredation period resulted from dissatisfaction with the tag system from several quarters (conservation department, private goose clubs, farmers, etc.). This, heaped on the depredations threat, caused a mild furor in the press and a flood of adverse mail to legislators and public officials. At one point the Dodge County Disaster Committee suggested federal assistance to farmers whose crops were being damaged by geese. The state committee made a field inspection of the situation and ruled that "a disaster which would justify action on a disaster relief application did not exist".

The weather remained open well into December so many geese remained in the area. The depredation threat lessened, however, as drier weather allowed the corn harvest to continue. There are a growing number of farmers that do not ever want geese on their land because they run hogs in their picked corn or sustain damage to new alfalfa seedings in rainy weather.

2. On February 15 a hearing was held in Sturgeon Bay on the proposed Wisconsin Islands (Spider, Gravel and Hog) Wilderness Area. Except for a couple of cautious duck hunters, no one opposed the idea. The islands are now national wildlife refuges located in Lake Michigan off the east shore of the Door Peninsula.

3. This year the manager finally got out from under an 8 year "non-profit" job. Since 1959 he had been the Interior Department's defense liaison officer to the national civil defense agencies' (Office of Emergency Planning and Office of Civil Defense) region four (Wisconsin, Michigan, Minnesota, Illinois and Indiana). The appointment was transferred to the Interior field coordinator.

4. The refuge increased by 48 acres this year when a private goose club was purchased along highway 49. The land was acquired with \$35,000 from the Land and Water Conservation Fund, and will be developed as a parking overlook with comfort facilities and interpretation signs. The area will fill a long standing need to accomodate the people who come to see the geese. Previously they have had to park along a high speed highway.

5. Vandalism continues to occur. Some of it is not random. On November 9, 1967, in apparent dissatisfaction with the goose hunting

regulations, vandals ice picked the tires on the manager's government station wagon in a barn at his residence. They passed up his personal car parked nearby. On the night of January 8, 1968, vandals shot through the headquarters office windows and riddled the yard light. So far, no riots.

6. When it began to look like there would be a tag hunt for Canada geese in Wisconsin, several of the operators of large private goose clubs decided to fight it. The tag system limited the take to one goose per hunter and also limited the total number that could hunt in the Horicon area. This made their investment in land pretty costly for the return in game they could shoot. They formed the Horicon Goose Alliance and tried to enlist area farmers as members. Most of the farmers chose to ignore the Alliance. Despite their small numbers, they stirred up quite a fuss with mass meetings and letters to state and Federal officials. Apparently they had little effect on modifying the regulations.

7. For most of the year, several sportsmen's groups in the Green Bay area have been gathering support for the establishment of a national wildlife refuge in that area. At year's end they were still working on it and making some progress.

8. Relations with local governing bodies were mostly good this year, although Leroy Township still has not rebuilt the headquarters road. This failure has been blamed on the complete turnover of the town board officers. The new group says the old group (that promised us the road) left them bankrupt.

9. As a result of his extra effort during the 1966 hazing program, Harold Bushweiler received a quality increase in salary.

10. Credits for preparation of this report are as follows:


Personius - Section VII and editing.

Brownlee - Sections IB; II; IIIB, C, D, E, F; V; VIA, D.

Bushweiler - Sections IA; IIIA; IV; VIB, C, E, F; typing and assembling.

SIGNATURE PAGE

Submitted by:


(Signature)

Date: February 8, 1968

Robert G. Personius
Refuge Manager
Title

Approved, Regional Office:

Date: FEB 13 1968


(Signature)

Atty. Gen.
Regional Refuge Supervisor

Refuge Clerk Harold Bushweiler received a quality step increase in June for his splendid all-around job. Harold is a real asset to the refuge and the step increase is well deserved. Refuge Manager Personius made the presentation. Roll 3-67, Exp. 12

A stoplog structure with a fish screen above it was installed at the radial gate on the Main Dike in early spring. Because of water pressure, however, the logs broke in May and the radial gate was closed to prevent influx of carp from the state area below. A new permanent fish screen will be made in 1968 to stop carp and permit free flow of water. Roll 1-67, Exp. 15



141 artificial nesting structures were placed in the central marsh in February to promote duck nesting. We now have a total of 241 structures on the refuge. Use of the structures has been practically nil as only 5 of the structures placed in 1966 have been used and none of those placed in 1967. Roll 1-67, Exp. 4

Nest material placed in the structures consisted of marsh hay or flax straw. We have three types in use at Horicon; garbage can lids, shown here, wood and metal, shown above, and plastic cones made by Kenco Co., Necedah, Wis. This was one of the structures that brought off a hatch. Roll 3-67, Exp. 14



1967 will be remembered as one of the better years for refuge farmed peatland corn. The crop shown here was grown on the 80 acres we have tilled. The bare ground in the foreground was seeded to wheat in August. Roll 5-67, Exp. 11

The refuge sorghum crop, shown here in the foreground, froze out almost completely in August. Part of our corn crop on F-22 is shown in the background. Roll 5-67, Exp. 12



Four excess buildings and the silo shown here were disposed of during the past year. The buildings were sold on bids and we hired the silo blown down in the foundation of the old barn at Q-14. Roll 9-67, Exp. 3

Practically all of the farms surrounding the refuge offered daily blind rentals to hunters. This one was located on the Ernie Bleifuss farm. The "Goose Haven Gun Club", headed by Mr. Bernie Poole, Beloit, Wis., included the Bleifuss farm as well as several refuge neighbors. Mr. Poole claims to have lost a lot of money on the venture this past fall. Roll 6-67, Exp. 17



Owen J. Gromme, author of "Birds of Wisconsin", demonstrates his homemade goose call. The call is constructed to simulate the voice box of a Canada goose. Roll 8-67, Exp. 12

Mr. Gromme has turned down a lot of money for his one of a kind goose call. The workmanship, as seen by this photo, is excellent. Roll 8-67, Exp. 13



Dr. Denis Raveling, Canadian Wildlife Service,
was at Horicon this past fall to measure
Canada geese and take family group counts.
Dr. Raveling measures while Jim March,
Wisconsin Division of Conservation, records.
Refuge Manager Personius offers moral support.
Roll 8-67, Exp. 1

The statement, "geese were everywhere" can
be interpreted literally in some cases.
This photo was taken at refuge headquarters.
Roll 9-67, Exp. 8



As people flock to Horicon to see the geese in the fall, Highway 49, crossing the refuge, becomes a bottleneck of congestion. The new recreation area, to be built on land purchased this past year should take the pressure off the highway. Roll 8-67, Exp. 7

Several interviews were filmed and taped for the press this past fall. Here a reporter from WFRU-TV, Green Bay, interviews Refuge Manager Personius in early October, before the real "action" started. Roll 7-67, Exp. 22



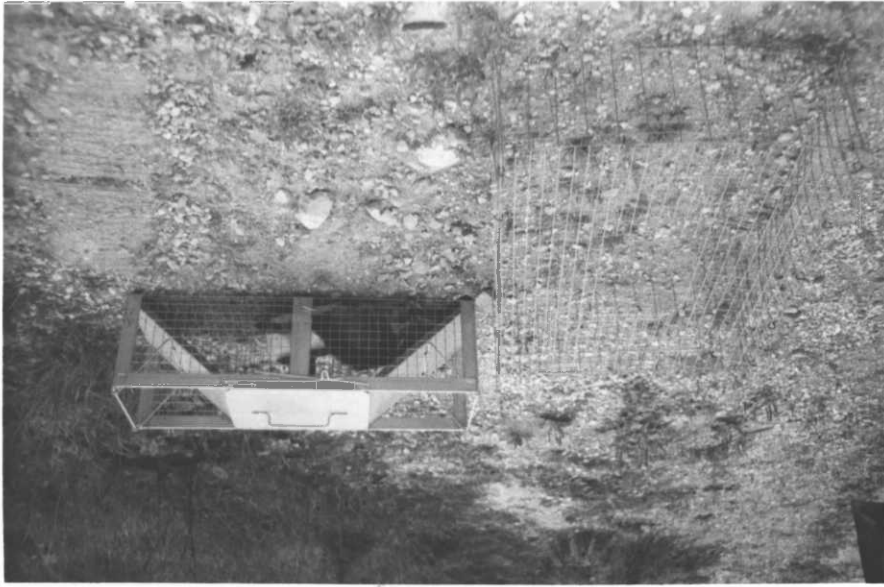
Canada geese were not the only depredators this past year. Blackbirds damaged a lot of corn just as it was coming up and again after the ears had started to fill, as shown in this photo taken in late October. Roll 7-67, Exp. 4

A total of 690 acres was burned under our Prescribed Burning Plan this past year. Burning, in most areas, is the cheapest way we have of controlling scrub brush and cattails. This photo was taken near the main dike in December. Roll 8-67, Exp. 19



Posting was completed of the Green Bay and Gravel Island National Wildlife Refuges this past year. Spider and Gravel Islands, making up Gravel Island NWR were posted in the spring and Hog Island (Green Bay NWR) was posted in September. The islands are located off Wisconsin's Door County Peninsula in Lake Michigan. Roll 6-67, Exp. 12

Raccoons were the most abundant predator caught during our summer trapping program. This specimen was caught in a live trap near one of our dove traps. Roll 6-67, Exp. 2



The Wisconsin Division of Conservation's rough fish removal crew removed 250,005 pounds of carp during the past year. This is the machine they use to sort and load the catch. Roll 9-67, Exp. 10



1967

HORICON NATIONAL WILDLIFE REFUGE

R E G U L A T I O N S

Horicon National Wildlife Refuge is designated by Federal law as a sanctuary for wildlife; unauthorized entry is prohibited. Public use is encouraged, however, and people are allowed to enter some Refuge areas when their presence would not disturb wildlife, and their safety would not be threatened.

Public Use Areas - Roads open to auto traffic at all times are State Highway 49; township roads including Peachey, Sommers, Strooks, Neitzels' and Headquarters. Federal Refuge roads open part of the year are the Old Marsh Road (Old 49) from west gate to Chester Bridge (Rock River) and the Main Dike Road from east gate to Main Ditch. The Old Marsh Road to Chester Bridge is open from May 21 to September 15 and January 1 to March 1 for fishing. The Main Dike Road is open for hiking during spring waterfowl migration and for driving during summer and winter fishing. Federal Refuge roads may be closed without notice because of moisture conditions, construction, waterfowl banding, duck nesting, etc.

Wildlife Sanctuary Areas - No one may walk or drive on any other part of the Refuge without a special permit. All Federal marsh waters are closed to boating.

Nature Study - Wildlife study is encouraged. Schools and other organized groups may obtain a special permit for nature study.

Fishing - From May 21 to September 15 and from January 1 to March 1, fishing is permitted during daylight hours only in areas marked by signs near Chester Bridge, Main Dike, Peachey Road and Strooks Ditch.

Regulations for Safety and Protection - Swimming, ice skating, camping and fire building are not permitted. Destruction or removal of government property is prohibited; this includes flowers, shrubs, trees, soil and all types of animal life.

PRESERVE OUR WILDLIFE HERITAGE



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



3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Horicon National Wildlife Refuge

MONTHS OF January TO April 30, 19 67

[illegible]

3 -1750e

Cont. NR-

(Rev. March 1953)

WATERFOWL
(Continuation Sheet)REFUGE Maricopa National Wildlife RefugeMONTHS OF January TO April 30, 1967

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total
	3/12-18 11	3/19-25 12	3/26-4/1 13	4/2-8 14	4/9-15 15	4/16-22 16	4/23-29 17	4/30 18		
Swans:										
Whistling Trumpeter		8	20	25	4	2			413	
Geese:										
Canada	34,000	42,000	45,000	48,000	48,000	48,000	45,000	40,000	2,660,000	
Cackling										
Brant										
White-fronted				2				1	21	
Snow	25	20	12	10	10	8	6	4	805	
Blue	100	85	60	50	50	30	22	15	3,234	
Other										
Ducks:										
Mallard	200	750	1280	1000	1120	900	840	600	48,930	
Black	12	220	330	200	80	130	150	125	8,729	
Gadwall			4	46	120	280	365	310	7,875	
Baldpate			7	10	32	225	280	285	5,873	
Pintail				8	14	125	180	240	3,969	
Green-winged teal		190	270	300	290	340	675	1020	21,595	
Blue-winged teal		2	12	850	780	1800	2820	3250	66,598	
Cinnamon teal										
Shoveler		18	85	140	165	590	1200	1580	26,446	
Wood							2	6	56	
Redhead		25	30	60	160	160	500	740	11,725	
Ring-necked		4	70	140	145	220	360	560	10,493	
Canvasback		2	40	50	8	20	18	15	1,071	
Scaup		40	280	325	420	550	720	750	21,595	
Goldeneye	7	180	210	105	10	4			3,612	
Bufflehead			1	2	15	18	34	37	749	
Ruddy			1	5	8	14	40	48	812	
Other										
Hooded merganser	2	18	140	150	60	20	4		2,758	
Common merganser	12	75	110	60	50	18			2,275	
Coot:		8	16	160	1250	2200	6000	6500	112,938	
				(over)						

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	413	25		Principal feeding areas <u>Refuge and neighboring pastures and</u>
Geese	2,664,060	48,062		<u>hayfields and entire edge of marsh</u>
Ducks	245,161	9,566		Principal nesting areas _____
Coots	112,938	6,500		_____
				Reported by <u>Wendell E. Crews</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).

3-1750

Form NR-1

(Rev. March 1953)

WATERFOWL

REFUGE Horicon National Wildlife RefugeMONTHS OF May TO August, 19 67

(1) Species	(2) Weeks of reporting period									
	: 5/1-5/6	: 5/7-5/13	: 5/14-5/20	: 5/21-5/27	: 5/28-6/3	: 6/4-6/10	: 6/11-6/17	: 6/18-6/24	: 6/25-7/1	: 7/2-7/8
	: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	: 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada								2		
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	225	225	225	225	300	400	500	600	820	1100
Black	25	25	25	25	25	25	25	25	50	50
Gadwall	75	75	75	50	50	50	50	50	50	50
Baldpate	40	40	20	20						
Pintail	85	75	25							
Green-winged teal	50	40	20							
Blue-winged teal	2200	2100	1800	2000	2100	2150	2200	2200	2300	2300
Cinnamon teal										
Shoveler	500	480	300	100						
Wood	80	75	50	50	50	50	50	75	125	250
Redhead	350	200	200	250	300	350	500	500	500	500
Ring-necked	80	40								
Canvasback										
Scaup	195	185	150	75	25					
Goldeneye										
Bufflehead										
Ruddy	80	75	25							
Other										
Coot	6000	5000	4250	3500	3600	3700	3800	4000	4200	4200

3 -1750a

Cont. NR--

(Rev. March 1953)

WATERFOWL
(Continuation Sheet)REFUGE Horicon National Wildlife RefugeMONTHS OF May TO August, 19 67

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production : Broods: Estimated : seen : total	
	7/9-15 11	7/16-7/22 12	7/23-29 13	7/30-8/5 14	8/6-12 15	8/13-19 16	8/20-26 17	8/27-31 18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada									7		0
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	1100	1100	1100	1200	2000	4000	5000	6500	177,065		266
Black	50	50	75	100	100	100	150	150	7,511	U	25
Gadwall	50	50	50	50	50	75	75	75	7,350	U	89
Baldpate							25	50	1,365	U	41
Pintail						25	50	50	2,170	U	89
Green-winged teal									770	U	
Blue-winged teal	2300	2300	2300	2300	2300	2400	2450	2500	281,400	U	2531
Cinnamon teal											
Shoveler									9,660		576
Wood	250	250	300	350	400	700	800	1000	4,905		89
Redhead	500	500	500	500	500	600	650	700	56,700		353
Ring-necked									840		43
Canvasback									4,410		229
Scaup											
Goldeneye											
Bufflehead											
Ruddy								50	1,610		89
Other											
Coot:	4250	4500	4500	4550	5000	5100	5300	5500	794,150		4800
				(over)							

	(5) Total Days Use	:	(6) Peak Number	:	(7) Total Production	SUMMARY
Swans	0	:	0	:	0	Principal feeding areas <u>All portion of refuge.</u>
Geese	7	:	2	:	0	
Ducks	550,286	:	11,075	:	4,420	Principal nesting areas <u>southeastern portion of refuge.</u>
Coots	794,150	:	6,000	:	4,800	

Reported by Michael B. Brownlee, Ass't. Refuge Manager

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

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

W A T E R F O W L

REFUGE Horicon National Wildlife Refuge

MONTHS OF September TO December, 19 67

(1) Species	(2) Weeks of reporting period									
	9/1-9 1	9/10-16 2	9/17-23 3	9/24-30 4	10/1-7 5	10/8-14 6	10/15-21 7	10/22-28 8	10/29-11/4 9	11/5-11 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada			2,700	25,800	65,375	100,690	113,330	95,840	80,000	78,495
Cackling										
Brant										
White-fronted										
Snow				8	25	400	600	25	290	
Blue					30	395	600	25	300	
Other										
Ducks:										
Mallard	6,750	6,800	7,000	7,100	9,000	12,000	15,000	16,000	17,000	17,000
Black	100	150	250	500	1,000	1,200	1,200	1,800	1,800	1,800
Gadwall				50	150	200	300	300	300	300
Baldpate	1,200	1,250	1,300	1,325	1,350	1,450	1,500	1,500	500	200
Pintail	200	350	500	550	750	1,000	1,000	1,000	750	300
Green-winged teal	700	400	200	300	800	1,200	900	300	50	
Blue-winged teal	2,000	1,350	850	900	500	400	150	50		
Cinnamon teal										
Shoveler	75	150	200	300	250	200	200	75		
Wood	900	800	700	550	150	75				
Redhead					20	50	75	75	75	75
Ring-necked						20	75	150	200	200
Canvasback							20	20		
Scaup								20	50	75
Goldeneye										
Bufflehead										
Ruddy	75	100	150	150	200	200	150	50	25	
Other										
	6,000	7,000	7,500	8,000	8,500	8,500	6,000	5,000	2,000	1,000
Coot:										

3 -1750*

Cont. NR

(Rev. March 1953)

W A T E R F O W L
(Continuation Sheet)

REFUGE Horicon National Wildlife RefugeMONTHS OF September TO December, 1967

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total
	11/12-18 11	11/19-25 12	11/26-12 13	12/3-9 14	12/10-16 15	12/17-23 16	12/24-31 17	18		
Swans:										
Whistling	12								24	
Trumpeter										
Geese:										
Canada	76,990	74,330	71,460	68,700	23,800	26,300	25,120		6,499,990	
Cackling										
Brant										
White-fronted										
Snow									9,436	
Blue									9,450	
Other										
Ducks:										
Mallard	17,000	12,000	7,000	100	50				1,048,600	
Black	1,700	1,500	900	50					101,150	
Gadwall	200	75							13,125	
Baldpate									81,025	
Pintail									44,800	
Green-winged teal									33,950	
Blue-winged teal									43,400	
Cinnamon teal										
Shoveler									10,150	
Wood									22,225	
Redhead	75	25							3,290	
Ring-necked	200	75	50	20	10	10	2		7,084	
Canvasback									280	
Scaup	100	100	75	50					3,290	
Goldeneye										
Bufflehead										
Ruddy									7,700	
Other										
Coot:	500	400	200	50	20	5			424,725	
				(over)						

	(5) Total Days Use	:	(6) Peak Number	:	(7) Total Production	SUMMARY
Swans	<u>24</u>	:	<u>12</u>	:		Principal feeding areas <u>Geese-all croplands.</u>
Geese	<u>6,518,876</u>	:	<u>114,530</u>	:		<u>Ducks-croplands and shallow water areas.</u>
Ducks	<u>1,420,069</u>	:	<u>21,340</u>	:		Principal nesting areas _____
Coots	<u>124,725</u>	:	<u>8,500</u>	:		
						Reported by <u>Michael B. Brownlee</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).

MIGRATORY BIRDS
(other than waterfowl)

Months of January to April 30 1967

(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	4	4/7	200	4/30	Still present					200
Great blue heron	1	4/14	40	4/30	"	"				40
Common egret	2	4/14	30	4/30	"	"				30
Black-crowned night heron	1	4/15	120	4/30	"	"				120
American bittern	1	4/21	50	4/30	"	"				50
Sora rail	3	4/21	300	4/30	"	"				300
II. <u>Shorebirds, Gulls and Terns:</u>										
Killdeer	2	3/17	200	4/30	Still present					200
Common snipe	1	3/23	500	4/30	"	"				500
Greater yellowlegs	1	3/25	40	4/30	"	"				40
Herring gull	3	4/20	20	4/30	"	"				20
Wilson's phalarope	2	4/24	10	4/30	"	"				10

(over)

(1)	(2)	(3)		(4)		(5)		(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	Winter resident	60	4/30	Still present				60
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	Winter resident	12	4/30	Still present				12
Sparrow hawk	"	80	4/30	"	"			80
Red-tailed hawk	"	20	4/30	"	"			20
Rough-legged hawk	"	30	4/30	"	"			30
Marsh hawk	"	60	4/30	"	"			60
	"	40	4/30	"	"			40
Reported by <u>Mandell E. Crews</u>								

INSTRUCTIONS

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

3-1751
Form NR-1/
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Horicon Refuge

Months of May to August 19567

(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	Present		750	8/31	Present			Unknown		750
Great blue heron			60	8/31						60
Green heron			60	8/31						60
Common egret			80	8/31						80
Black-crowned night heron			200	8/31						200
Least bittern			50	8/31						50
American bittern			80	8/31						80
Sandhill crane	3	7/6	3	7/6	3	7/6	0	0	0	3
King rail	Present		Unknown		Present					Unknown
Virginia rail	"		"		"					"
Sora rail	"		"		"					"
Common gallinule	"		100	8/31	"					100
II. <u>Shorebirds, Gulls and Terns:</u>										
Killdeer	Present		500	8/31	Present			Unknown		500
Common snipe			3000							3000
Wilson's phalarope			70							70
Herring gull		8/22	75	8/31						75
III. <u>DOVES AND BIRDS</u>										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove	Present	150	Present	Unknown	150
White-winged dove					
IV. <u>Predaceous Birds:</u>					
Golden eagle					
Duck hawk					
Horned owl	Present	20	Present	Unknown	20
Magpie					
Raven					
Crow	"	75	"	"	75
Red-tailed hawk	"	25	"	"	25
Bald eagle	1 8/12	1	1 8/12	"	1
Marsh hawk	Present	35	Present	Unknown	35
Sparrow hawk	"	30	"	"	30
Reported by <u>Michael B. Brownlee, Ass't. Ref. Mgr.</u>					

INSTRUCTIONS

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

3-1751

Form NR-1A

(Nov. 1945,

MIGRATORY BIRDS
(other than waterfowl)Refuge Horicon RefugeMonths of September to December 1957

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimated
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Number
I. Water and Marsh Birds:										
Pied-billed grebe	Present		750	9/1		Oct.				750
Great blue heron	"		60	9/1	1	12/31				60
Green heron	"		60	9/1		Sept.				60
Common egret	"		80	9/1		Sept.				80
Black-crowned night heron	"		200	9/1		Oct.				200
Least bittern	"		50	9/1		Oct.				50
American bittern	"		80	9/1	1	11/31				80
King rail	"		Unknown			Oct.				Unk.
Virginia rail	"		"		2	12/14				"
Sora rail	"		"			Oct.				"
Common gallinule	"		100	9/1		Sept.				100
II. Shorebirds, Gulls and Terns:										
Killdeer	Present		500	9/1		Oct.				500
Common snipe	"		3,000	9/1		Oct.				3,000
Greater yellowlegs	1	9/12	1	9/12	1	9/12				1
Wilson's phalarope	Present		70	9/1		Sept.				70
Herring gull	"		75	9/1	Present					75
Ring-billed gull	1	9/25	25	Nov.	2	12/3				25

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. <u>Doves and Pigeons:</u>									
Mourning dove	Present		80	9/1	Present				80
White-winged dove									
IV. <u>Predaceous Birds:</u>									
Golden eagle	1	12/3	1	12/3	1	12/3			1
Duck hawk									
Horned owl	Present		20	9/1	Present				20
Magpie									
Raven									
Crow	Present		75	9/1	Present				75
Red-tailed hawk	"		25	9/1	Present				25
Rough-legged hawk	"		100	9/1	Present				100
Bald eagle	1	11/6	1	11/6	1	11/6			1
Marsh hawk	Present		35	9/1	Present				35
Sparrow hawk	"		30	9/1		Sept.			30
Snowy owl	1	11/27	1	11/27	1	12/3			1
Short-eared owl	Present		25	11/1	Present				25
Reported by <u>Michael B. Brownlee</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.

3-1750b
Form NR-1B
(Rev. Nov. 1957)

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

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Horicon Refuge

For 12-month period ending August 31, 1967

Reported by M. B. Brownlee

Title Ass't. Refuge Manager

(1) Area or Unit Designation	(2) Habitat		(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage			
I	Crops	145	Ducks	275,350	190
	Upland	502	Geese	655,300	0
	Marsh	45	Swans	0	0
	Water	5	Coots	137,300	520
	Total	697	Total	1,067,950	710
II	Crops	614	Ducks	525,300	170
	Upland	1460	Geese	3,175,700	0
	Marsh	500	Swans	49	0
	Water	160	Coots	150,875	240
	Total	2734	Total	3,851,924	410
III	Crops	8	Ducks	305,750	184
	Upland	23	Geese	1,250,300	0
	Marsh	490	Swans	0	0
	Water	50	Coots	176,400	780
	Total	571	Total	1,732,450	964
IV	Crops	805	Ducks	875,360	1870
	Upland	2925	Geese	3,675,370	0
	Marsh	4500	Swans	210	0
	Water	7000	Coots	256,350	2320
	Total	15230	Total	5,807,290	4190
V	Crops	141	Ducks	325,475	1158
	Upland	225	Geese	925,375	0
	Marsh	360	Swans	0	0
	Water	45	Coots	137,650	820
	Total	771	Total	1,388,500	1978
VI	Crops	49	Ducks	171,882	112
	Upland	20	Geese	824,879	0
	Marsh	650	Swans	224	0
	Water	65	Coots	77,083	120
	Total	784	Total	1,074,068	232
Total	Crops	1762	Ducks	2,479,117	3684
	Upland	5155	Geese	10,506,924	0
	Marsh	6545	Swans	483	0
	Water	7325	Coots	1,435,658	4800
	Total	20,787	Total	14,422,182	8484

(over)

INSTRUCTIONS

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

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

3-1750c

Form NR-

(Sept. 1, 50)

WATERFOWL HUNTER KILL SURVEY

Refuge Horicon National Wildlife Refuge

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
			No waterfowl hunting on refuge.					

(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 -2

(April 1946)

UPLAND GAME BIRDS

Refuge Horicon RefugeMonths of January to April 30, 19 67

(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	Farmland 1762 Grazing 1223 Upland 5545 Marsh 5330 Water 6957	30			3:1				700	
Gray partridge		595							35	

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.

UPLAND GAME BIRDS

Refuge Horicon Refuge

Months of May to August, 19 67

(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	Farmland 1762 Grazing 1223 Upland 5545 Marsh 5330 Water 6957	28.1	6	410	3:1		none		740	
Gray partridge	As above	1388							15	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

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

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

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Horicon Refuge

Months of September to December, 1967

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked pheasant	Farmland 1912 Timber 32 Grass 3007 Marsh & water 15925	26.8			3:1		None		780	
Gray partridge	Same as above	1391			Unknown		None		15	

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.

3-17'
Form R-3
(June 1945)

BIG GAME

Refuge Horicon National Wildlife Refuge

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		At period of Greatest use	As of Dec. 31	
Common Name	Cover types, total Acreage of Habitat	Number								Number	Source		
White-tailed deer	Farmland	1912	Unk.	172*		None					785	450	1:1
	Timber	32		35**									
	Grass	3007											
	Marsh & water	15925											

Remarks: *Shotgun season
**Late bow season

Reported by Michael B. Brownlee

INSTRUCTIONS

Form NR-3 - BIG GAME

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

3-1754
Form NH 4
(June 1945)

SMALL MAMMALS

Refuge Horicon Refuge

Year ending April 30, 1967

(1) Species	(2) Density	(3) Removals					(4) Disposition of Furs					(5) Total		
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Popula- tion
								Permit Number	Trappers Share	Refuge share				
Mink	20,796 acres of marsh & water with			12					6	6	6			130
Weasel	scattered woodlots			3					3					300
Otter														1
Muskrat														12,000
Badger														15
Raccoon				58					58					350
Striped skunk				14					14					200
Opossum				130					130					400
Red fox				38					38					60
Cottontail														500
Fox squirrel														400

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS: Following predators were removed in conjunction with Dummy Nest Study.

Opossum	179	Foxes	4
Raccoon	27	Weasels	1
Skunks	12	Mink	1

Reported by Wendell E. Crews

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:	(2) DENSITY:	(3) REMOVALS:	(4) DISPOSITION OF FUR:	(5) TOTAL POPULATION:
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.)	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.	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.	On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.	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.

3-17
For R-5

DISEASE

Refuge Horicon National Wildlife Refuge

Year 19 67

Botulism

Lead Poisoning or other Disease

Period of outbreak None detected

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 _____

Kind of disease None detected

Species affected _____

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

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

3-1756
Form NR-
(April 1-46)

FISH

Refuge Horicon National Wildlife Refuge

Year 1967

Species	Relative Abundance	Sport Fishing		Commercial Fishing		Restocking		Number removed for Restocking
		Man days Fishing	Number Taken	No. of Permits	Pounds Taken	Number Stocked	Area Stocked	
Bullhead	1	Unk.	Unk.	None		None		None
Carp	2	Unk.	Unk.	None	335,280	None		None
Northern Pike	3	Unk.	Unk.	None		None		None
	Total	556						

REMARKS:

PUBLIC RELATIONS
(See Instructions on Reverse Side)

Refuge Horicon RefugeCalendar Year 1967

1. Visits

a. Hunting 2,800 b. Fishing 1,335 c. Miscellaneous 157,185 d. TOTAL VISITS 161,320

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl			
Upland Game			
Big Game	2,800	20,924	*State and Bureau
Other			

*Managed shotgun deer hunt

Number of permanent blinds _____

Man-days of bow hunting included above 2,300

Estimated man-days of hunting on lands adjacent to
refuge 13,500

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

TYPE OF AREA	ACRES	MILES
Ponds or Lakes		
Streams and Shores		24

1c. Miscellaneous Visits

Recreation 154,685 Official 500Economic Use 2,000 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			13	1,120
Bird and Garden Clubs				
Schools	15	523	19	620
Service Clubs			8	315
Youth Groups	1	60		
Professional-Scientific				
Religious Groups				
State or Federal Govt.				
Other	2	50	1	100

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	31	Radio Presentations	12
Newspapers (P.R.'s sent to)	35	Exhibits	
TV Presentations	3	Est. Exhibit Viewers	

3-1757
Form NR-
Rev. June 1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

(1)

Refuge Horicon National Wildlife Refuge

Year 1967

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

- (1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Remarks:

Total acreage planted:

Marsh and aquatic

Hedgerows, cover patches

Food strips, food patches

Forest plantings

① 3-1758
Form }
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Horicon Refuge

County Dodge

State Wisconsin

Cultivated Crops Grown	Permittee's		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Share Harvested		Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Corn	137.4	6,870 bu.			277.2	15,460 bu.	414.6		
Oats with seeding	153.6	9,220 bu.	153.6	9,220 bu.			153.6		
Hay	382.0	764 T.					382.0		
Grain sorghum					65.0	200 bu.	65.0		
Wheat					370.0	555 T.	370.0	wheat (goose browse)	370.0
Permanent nesting cover							144.0		
								Fallow Ag. Land.	

No. of Permittees: Agricultural Operations 17 Haying Operations 5 Grazing Operations 11

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alfalfa	859	429.5		1. Cattle	235	736.83	1,105.26	662
				2. Other				
				1. Total Refuge Acreage Under Cultivation				1385.2
Hay - Wild	43.5	29	\$29.00	2. Acreage Cultivated as Service Operation				475.0

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.

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Horicon National Wildlife Refuge County Fond du Lac State Wisconsin

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	Acres	Bu./ Tons	Acres	Bu. /Tons			
Corn					103.9	6,272 bu.	103.9		
Oats with seeding	6.5	105 bu.					6.5		
Hay	12.5	25 T.					12.5		
Wheat					110.0	165 T.	110.0	Wheat (goose browse)	110.0
Permanent nesting cover							17.0		
								Fallow Ag. Land.	2.1

No. of Permittees: Agricultural Operations 1 Haying Operations _____ Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE	
Alfalfa	12.0	6.0		1. Cattle	55	155.82	233.73	165	
Red clover	13.0	6.5		2. Other					
				1. Total Refuge Acreage Under Cultivation					232.9
Hay - Wild	0			2. Acreage Cultivated as Service Operation					196.4

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.

(3)

3-1570
NR-28
(11/51)

REFUGE GRAIN REPORT

Refuge Horicon National Wildlife RefugeMonths 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
Winter wheat (Variety unknown)	28	1,865	1,893	0	1,153		1,153	740	740		
Ear corn	1,200	0	1,200	0	0	1,100 (bait)	1,100	100		100	

(8) Indicate shipping or collection points Knowles Produce, Knowles, Wisconsin(9) Grain is stored at refuge granaries.

(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.

(4)

3-176
Form 1
(2/46)

TIMBER REMOVAL

Refuge Horicon National Wildlife Refuge Year 1967

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.....

Total income.....

No. of units removed B. F.

Method of slash disposal.....

Cords.....

Ties.....

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number
1, 2 & 3

Reporting Year
1967

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)
5/25-6/2	Rootworms and wireworms	F-18, 19, 22 and permittee units	225	Diazinon 14.3% gran.	675 lbs.	3#/acre	Planter attachment, no carrier	attach-
6/20-23	Grasses in corn when 4" high	F-18, 19, 22 and permittee units	425	Atrazine 80% W.P.	1,275 lbs.	2-4 #/acre	Water, 5 gal/acre & crop oil 1 gal/acre	Boom sprayer
7/14-7/18	Grasses in sorghum, 4" high	F-22	50	Atrazine 80% W.P.	90 lbs.	1-2 #/acre	"	Boom sprayer
7/6-11	Broadleaves in sorghum, 4" high	F-22	110	2,4-D Amine 49.5% E.C.	83 pints	3/4 pt/acre	Water, 20 gal/A.	Boom sprayer
6/20-7/20	Broadleaves in corn when 4" high	Permittee units	100	2,4-D Amine 49.5% E.C.	75 pints	3/4 pt/acre	Water, 20 gal/A.	Boom sprayer
7/14-18	Grasses in sorghum	F-22	50	Herbicidal oil	50 gallons	1 gal/acre	Water, 5 gal/acre w/Atrazine	Boom sprayer
7/2-8/24	Willows and dogwood	Dikes & roadsides	80	2,4-D and 2,4,5-T (Brushrap) 75.8% E.C.	3 pints	Spot application	Water, 100 gal per pt.	Hand sprayer

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

Diazinon - good

Atrazine in corn and sorghum - excellent with herbicidal oil, fair results on peatland without oil.

2,4-D - good

Herbicidal oil - excellent when used in conjunction with Atrazine

No detrimental effects apparent.