NECEDAH NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

1970

DEPARTMENT OF THE INTERIOR

U. S. FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

NECEDAH, WISCONSIN

Necedah National Wildlife Refuge

Necedah, Wisconsin

PERSONNEL

David J. Brown* - - - - to 6/24 - - - - - Refuge Manager

Gerald H. Updike** - from 7/12 - - - - - Refuge Manager

Grady E. Hocutt*** - EOD 6/1 - - - - - Ass't. Refuge Manager

Theodore A. Johnson - - - - - - - - - - - Forester

Vern E. Rudolph - - - - - - - - - - - - - Clerk

Robert W. Arrowsmith - - - - - - - - - - Mechanic

Harold R. Carter - - - - - - - - - - - - Maintenanceman

TEMPORARY

Paul E. Woggon, WAE - - from 4/6 - - - - Tractor Operator

Steven L. Stewart - - 6/22 - 8/21 - - - Conservation Aid

Larry Knickelbein - - 4/6 - 9/18 - - - Laborer

Marvin Jones - - - - 4/6 - 9/18 - - - Laborer

* Transferred to Columbia NWR, Washington

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I. GENERAL

A. Weather Conditions

	Precipitation			Max.	Min.
	Month	Normal	Snowfall	Temp.	Temp.
January	.59	1.02	8.50	45	- 29
February	.19	1.01	6.25	48	- 24
March	2.01	1.91	8.50	48	2
April	2.23	2.65		89	16
May	5.61	4.38		88	26
June	1.59	4.98		94	38
July	3.10	3.77		96	39
August	2.27	3.33		91	36
September	6.95	3.35		87	30
October	3.46	2.27		78	17
November	3.10	2.24	2.00	55	0
December	1.54	1.36	14.00	57	- 17
Annual Totals	32.64	32.27	39.25	Extremes 96	- 29

Temperatures during January ranged as much as 30 degrees below normal for a two week period. A typical January thaw arrived on January 24 with temperatures well above normal during the last week. February precipitation amounted to only .10" until the last day of the month when 5 inches of snow fell bringing the total on the ground to 19 inches. During March thawing daytime temperatures and freezing nights allowed the snow to melt without any appreciable spring runoff. At month's end all pools were still over 90 percent ice-covered.

A strong wind on April 10 blew most of the ice onto pool shores. Temperatures soared into the 80's on several occasions. May temperatures and precipitation were well above normal. The last spring frost occurred on May 6. Extensive low pressure areas

in the Western States resulted in a stationary front for several days in June causing much warm gulf air to flow over this area from the southwest. Only 1/3 the normal amount of precipitation was received.

July was very hot and humid with little precipitation. August was also hot with many days of southerly winds. A wet weather pattern established itself in late August, resulting in more than twice the normal amount of late summer and fall precipitation. The first killing frost came on September 29 which is about two weeks later than average.

October weather was mild. The first snow fell on November 3 but melted the same day. The ground was bare at the end of November due to unseasonably warm weather. The first significant amount of snow fell on December 10 when 8 inches was recorded. At the end of the year the ground was covered with approximately one foot of snow.

B. Habitat Conditions

1. Water

Water Management at Necedah is dependent upon precipitation and the watershed just to the north. Precipitation of 32.64 inches during calendar 1970 was close to the ten year average of 32.27 inches. Distribution over time, however, was very poor with heavy rainfall occurring in late May-early June, near drought conditions from mid-June until late August and very heavy rains during the first ten days of September. Runoff effects from spring thaws were minor because of a mild winter and gradual thaw.

High water during late May and early June had some detrimental effect on initial waterfowl nesting. Water levels were held constant during June to facilitate renesting. Field observations and subsequent brood checks indicated that renesting success was quite good.

Extremely hot and dry conditions with high evaporation rates prevailed from mid-June until late August. Subsequent water level reductions became acute in mid-August for prescribed burning and other operations. Inflowing water was passed directly through Pools 13, 18, 19 and 27 into the Sprague Pool. Controlled amounts were then released from this larger reservoir into the Rynearson Pools as needed. Heavy rains in September allowed a return to planned operations.

Water level potential and manipulation during 1970 allowed normal to good nesting success, provided adequate water for prescribed

burning and insured normal to good aquatic plant and farm crop production. Freeze-up occurred during the third week of November with pools near normal winter levels.

2. Food and Cover

Food abundance and availability was adequate to good. Mast production of oaks, after the bumper crop of 1969, was predictably less. Acorns were in fair supply and good utilization was made by turkey and white-tailed deer. Prescribed burn areas produced excellent blueberries which attracted greater sandhill cranes. Raspberry and blackberry production benefited ruffed grouse, turkey and many species of songbirds.

Aquatic plant production, especially waterweed and wild celery, was very good in Rynearson 1 Pool. These foods supported most of our diving duck use during fall migration. Unusually large numbers of widgeon (4,500) and many coot found extensive beds of elodea to their liking in Sprague Pool. Large, exposed flats of succulent needlerush in Sprague Pool sustained 4,000 - 6,000 Canada, snow and blue geese for over six weeks in the fall.

Rynearson 2 Pool was drained most of the summer. The exposed flats were disced and millet was planted. Extensive drought like conditions were apparently prohibitive to germination and the crop was poor. Extensive stands of smartweed came in and provided excellent fall feed for mallards, teal and geese. Efforts in this unit next year will be to encourage smartweed and not plant millet.

Remains of the 1969 corn crop were rotary mowed during the winter and excellent spring use was made by geese. Fall waterfowl use of corn, buckwheat and millet was light because of the late migration, fewer birds and an abundance of aquatic moist soil plants in the Sprague and Rynearson 2 Pools. Use of agricultural crops was limited to areas in the Canfield Units that were flooded by water diversion.

II. WILDLIFE

A. Migratory Birds

1. Swans

Swan use is quite variable with peaks occurring during the spring in some years and fall in others. The area is frequently bypassed entirely. A peak number of 160 which came into Rynearson 1 Pool on the afternoon of November 12 represented the most whistling swans in the fall since 1946.

2. Geese

Spring migration began the week of March 28 with the arrival of 90 Canada geese. The population peaked at 2,300 during the week of April 18 and decreased over the next three weeks before stabilizing at 125 summer residents.

Nesting occurred, primarily, in the Sprague and Rynearson Pools. Approximately 80 goslings were produced. There were 250 geese here in mid-August as birds from surrounding state areas staged on the refuge. These geese migrated out, as in past years, in early September.

Fall goose migration may be typified as later and fewer. The peak of 9,000 Canada geese and 1,000 snow/blue geese occurred near the end of October, one month later than normal. The initial movement arrived two days before Wisconsin's waterfowl season opened on October 3. "Sky-busting" hunters along the state firing-line prevented the establishment of flights into adjacent state managed croplands. Fall goose peaks for the past five years are shown in the following table:

Fall Goose Peaks

Year	Canada Geese	Blue-Snow Geese
1970	9,000	1,000
1969	15,200	1,200
1968	12,530	100
1967	9,750	215
1966	10,950	910

An interesting event occurred during late afternoon of November 23. Approximately 8,000 intermediate and large sized Canada geese were observed coming into the Sprague Pool from the north-northeast. This occurred three days after all pools had frozen and with fewer than 1,000 of the original peak left. Most of the 8,000 alighted on the ice in three distinct concentrations and spent the night. All but 3,500 left during the afternoon of November 24 and fewer than 1,000 remained by mid-morning on November 25. All geese were gone by December 1.

3. Ducks

A five year comparison of peak numbers, by seasons, is shown in the following table:

Peak Duck Populations

Year	Spring	Summer	Fall
1970	6,745	3,690	17,500
1969	12,190	4,880	14,500
1968	3,070	3,560	22,730
1967	7,190	4,770	19,505
1966	3,615	3,595	15,915

Spring migration was typical for this refuge. Breeding pairs were scattered throughout the refuge with maximal activity occurring around the margins of Sprague Pool, Pool 19 and the Rynearson Pools. An estimated 1,340 ducks were produced in 1970. This estimate is based upon an aerial breeding pair count and the mean brood size of 48 observed broods older than class IIIa. The following table shows these relationships:

Species	No. Broods Seen	Relative Percentage	Est. Production
Mallard	25	52	697
Blue-winged teal	11	23	308
Green-winged teal	5	11	147
Wood duck	2	4	54
Ringneck	2	4	54
Black duck	2	4	54
Hooded merganser	1	2	26
	48	100%	1,340

Assumptions:

Breeding Pair Count = 670

Hatching Rate = 40% (670) (40) (5) = 1,340

Comb. (All spp.) Brood Size (IIIa and Older). = 5.0

4. Coots

Coots arrived during the second week of April and peaked shortly afterward at 175. Production was approximately 25. Fall migrants peaked at 6,000 with heaviest use occurring in beds of elodea in the Sprague and Rynearson 1 Pools. Many visitors were treated to the "bunching" behavior of these birds as bald eagles made frequent passes.

5. Other Water Birds

The arrival of common or American egrets in mid-September established a new peak-number for the refuge. Most stayed for two weeks and heaviest use occurred in Sprague Pool. The confirmed sighting of a cattle egret represented a new addition to the bird list. Recent range expansion of this species, however, indicates it's probable unobserved presence here in the past.

Approximately 55 great blue herons were produced at the rookery in Sprague Pool. Numbers of pied-billed grebes, green herons, American bitterns and rails (Sora and Virginia) approximated those of recent years. Four black-crowned night herons - two adults and two immatures - were observed in Sprague Pool during early September. Greater sandhill cranes are discussed in Section II-J.

Killdeer, woodcock, snipe and yellowlegs were commonly seen throughout the summer and early fall. A few flocks of 10-20 greater yellowlegs were observed in the Sprague Pool during late September and early October. Infrequent sightings of herring and ring-billed gulls represented the only gull use. About 12 common snipe got themselves caught in a walk-in duck trap in Rynearson 1 Pool. Black terns and mosquitoes were common during the summer.

6. Doves

An estimated peak population of 600 mourning doves occurred in late summer. Age ratios derived from banding efforts (Section V-A) indicated a poor production year. One very unusual occurrence was the continued presence of 25 doves in refuge buckwheat fields during December.

B. Upland Game Birds

Wild turkeys continue to recover well from the severe winter of 1968-69. An estimated population of 175-200 turkeys shows a substantial increase from the summer 1969 population of 50-70. The winter of 1969-70 was relatively free of ice and deep snow and several good sized broods were seen last summer. Over 130 individual sightings were recorded.

Ruffed grouse numbers in central Wisconsin approximated a 20 year high during 1970. Information from state personnel and random sightings on the refuge indicated that winter survival and productive success were excellent.

A remnant population of sharp-tailed grouse remains in the Blair Unit. The only sightings were of two grouse during October. Five man-days were spent mowing jack pine and aspen in an attempt to open up this unit where the last known dancing ground exists. Future plans call for reintroduction of sharp-tailed grouse and possibly prairie chicken in conjunction with the prairie restoration program.

C. Big Game Animals

Late winter and early spring was favorable for pregnant white-tailed deer. Random observations in mid-summer indicated a ratio of 1.2 fawns : 1 female. This ratio is a crude index of extremely good fawn survivorship.

Total harvest of deer was 290; 250 were taken during gun season and the remainder during two archery seasons. Age and sex data were collected by the assistant manager during routine enforcement patrol. The randomized sample represented 18 percent of the total kill and is representative of the age structure of antlered refuge deer. Data are also shown for female deer taken under archery and party-quota gun regulations. These data are shown in the following table:

MALES

Age	No. of Deer	Percent of Kill	$\bar{X}$ Beam Diameter cm	Range cm	$\bar{X}$ No. Points cm	Range cm
1.5	27	64.30	1.50	1.10-1.90	2.3	1 - 4
2.5	5	11.90	1.72	1.60-2.15	4.0	3 - 5
3.5	6	14.30	2.31	1.90-2.50	7.3	5 - 9
4.5	3	7.12	2.92	2.40-3.65	7.3	7 - 8
5.5	1	2.38	2.35	-	6.0	-
	42	100.00%				

FEMALES

Age	No. of Deer	Percent of Kill
1.5	2	20.00
2.5	3	30.00
3.5	2	20.00
4.5	1	10.00
5.5	1	10.00
9.5	1	10.00
	10	

Certain observations can be made from these data:

(1) Average age of males harvested was 2.1 years and 3.8 for females.
(2) Males are cropped closely in this intensively hunted area.
(3) Data from age class 2.5 indicate that the severe winter of 1968-69 did have an adverse effect upon production and survivorship.
(4) Impressive beam diameters (X-directional one-inch above the burr) do not occur in the mineral-poor soils associated with this area.
(5) Based on a small sample, females were not over-harvested under existing either-sex archery and quota-system hunts.

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

Coyotes were often observed during the past year; it might be expected that the prairie restoration program will result in increased numbers of this species. Beaver and otter numbers, based upon extraneous evidence of their activity, are probably increasing. 1970 was a vegetatively productive year and muskrat numbers responded as expected. Raccoon in this area of central Wisconsin will continue to be ubiquitous. Other fur animals observed were mink, weasel, woodchuck, badgers, fox and skunk. Population status of any species mentioned is a guess.

E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies

Red-tailed, marsh and sparrow hawks were the most common hawks occurring on the refuge. A few immature red-tailed hawks became conditioned to dove traps and created minor problems.

Bald and golden eagles were most numerous during spring and fall waterfowl migrations. Peak numbers probably occurred on October 26-27 when nine golden and 17 bald eagles were seen in the vicinity of the Sprague and two Rynearson Pools. Road killed deer placed on an exposed hilltop attracted concentrations of up to 18 eagles.

Barred and great horned owls are the most common members of this family. Short-eared owls were common during late fall and two snowy owls were seen in late November.

F. Other Birds

Major migrations of certain species of birds were recorded during the fall. Yellow-shafted flickers were observed in small groups of 5 - 30 throughout late August and September. Many flocks of 10 - 50 robins were seen on and near prescribed burn areas during the second and third weeks of September. Slate-colored juncos were present in flocks of 25 - 200 for the first three weeks of October. Large flocks of snow buntings were first observed the week of November 22.

G. Fish

The major game fish is the northern pike. Populations are substantial in the Sprague and Rynearson 1 Pools with the average size caught approximating 20 - 22 inches. These fish are supported, in part, by over-abundant, stunted brown bullheads as well as golden shiners and three species of true shiners (*Notropis* spp.).

H. Reptiles

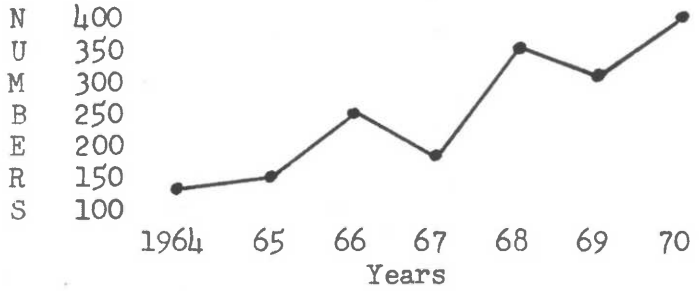
The most readily observable member of this class is the common snapping turtle (*Chelydra* spp.). Turtles are believed to be too numerous even with the egg-digging of raccoon and skunk.

I. Disease Nothing to report.

J. Rare and Endangered Species

An actual count showed 400 greater sandhill cranes on October 21. This number represents one-fifth of the estimated 2,000 birds comprising the eastern population of this rare species. A relationship appears to exist between the prairie restoration program and increased fall utilization. Population figures are shown as follows:

Peak Greater Sandhill Crane Numbers



An estimated 100 - 125 greater sandhill cranes were residents during the summer. An estimated 15 - 20 young were produced.

Two confirmed sightings of ospreys were listed during 1970. These included a total of three separate birds seen in the Sprague and Rynearson 1 Pools.

III. Refuge Development and Maintenance

A. Physical Developments

1. Water Management

Built one-half mile of low dike east end of Sprague Pool to isolate damaged water control structure # 29.

A culvert was placed under Sprague Road to divert water into upper Canfield Unit.

2. Roads and Trails

Contracted 3½ miles of road graveling east of Rynearson 1 Pool from Speedway Road to Grand Dike Road.

Cutler Township repaired and graveled two miles of auto tour route near the Irontop Bridge.

Kingston Township graveled one mile of road between the Sprague and Goose Pools.

3. Fencing and Posting

Six large entering-leaving signs were erected along public roads entering the refuge.

Interpretive signs were placed along the Nature Walk.

All vehicle gates were repaired and remodeled in late summer.

4. Buildings

Quarters 8 received most of the attention this year. A new furnace with automatic humidifier was installed. A new basement floor was poured to stop water in the basement and a water softner-filter was installed.

Quarters 1 was painted and new combination storm-screen windows were installed. The living room and one bedroom were painted.

Quarters 11 had new combination storm-screen windows installed.

Two wooden storm doors were installed on the office.

An information A-frame shelter with four display panels was built near the observation tower.

A weather instrument shelter was erected at headquarters.

Stained drinking water showed up in the line in August. Cause was very acidic water reacting with the one-half mile of 3-inch iron pipe between the well and headquarters. A conditioner at the well site to raise pH and iron filter at headquarters are planned for early 1971.

5. Equipment and Miscellaneous

Newly transferred low-bed trailer was wired.

New equipment included a 3020 John Deere 4 wheel drive farm tractor, Ranger all-terrain-vehicle and trailer for the Ranger.

Dumps at headquarters and Quarters 8 were cleaned up and covered over. A land fill type dump was started away from headquarters.

Also see Section VI F.

B. Plantings

Farming of 104 acres was done by refuge personnel and equipment. This year 43 acres of corn were planted, 51 acres of buckwheat and 10 acres of rye. Production was good, especially considering the dry summer. Yields of 65-70 bushels/acre on corn and 16 bushels/acre on buckwheat were somewhat above average. Crops were grown in strips alternated with tame grass strips. The grass strips were mowed and burned and provided browse as well as gave the geese, ducks and cranes a place to land and loaf.

Mature rye was rotavated under and sprouting provided fall browse. No fertilizer or seed was used.

C. Collections and Receipts

1. Seed or other Propagules

Nearly 200 bushels of shelled corn were transferred from DeSoto NWR for the waterfowl banding program.

2. Specimens Nothing to report.

D. Control of Vegetation

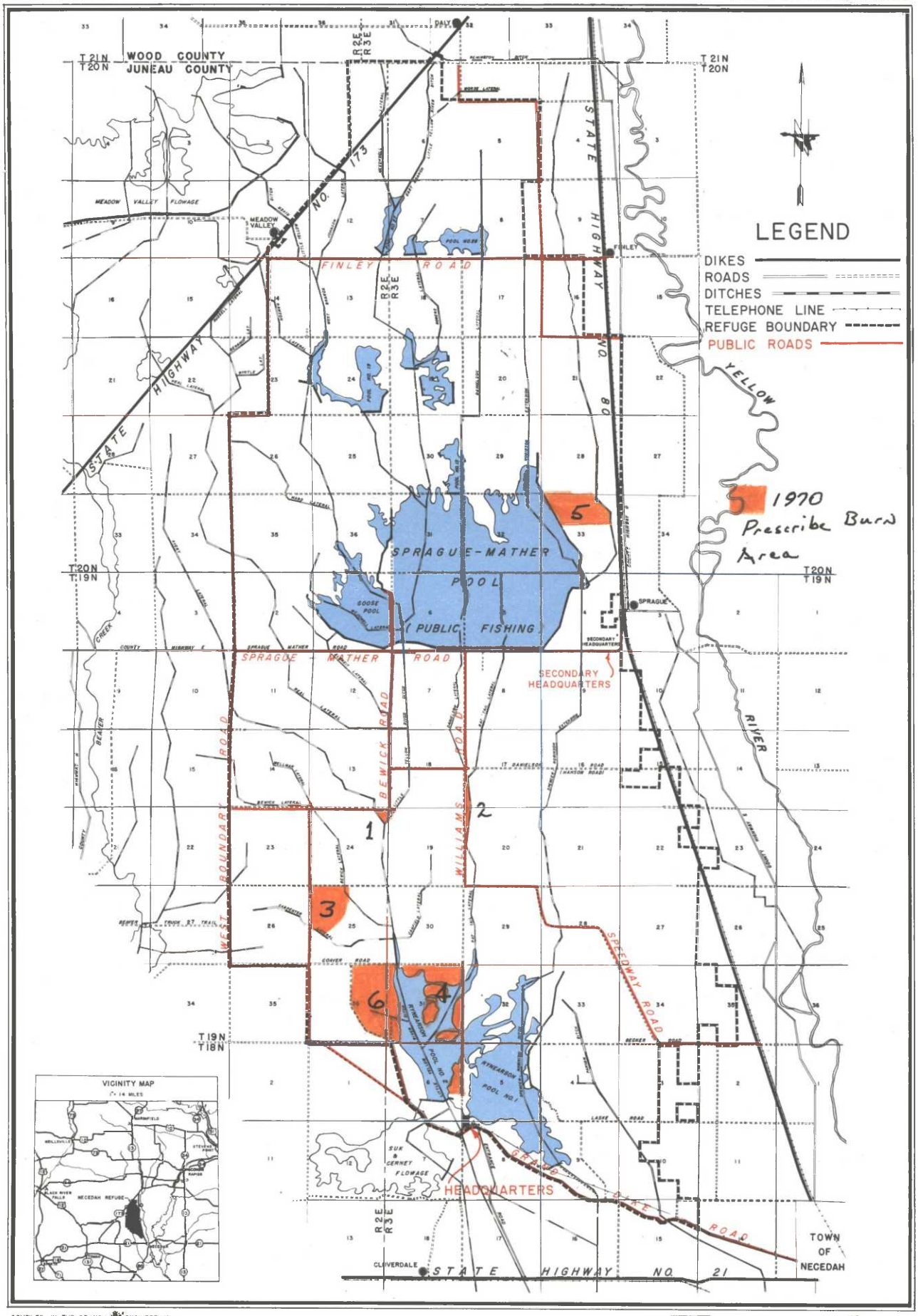
The only spraying was with Atrazine 80W by boom sprayer to control quackgrass in corn. Application rate was 3 pounds/acre diluted with 32 gallons/acre of water. Results were good.

NECEDAH NATIONAL WILDLIFE REFUGE

JUNEAU COUNTY, WISCONSIN

UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



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FOURTH PRINCIPAL MERIDIAN

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Brush control was undertaken through rotary mowing and prescribed burning. The Blair Unit, 160 acres; opening west of middle Canfield, 40 acres; and Sprague Field, 40 acres, were rotary mowed. Thirty-three miles of road-fire break combination were mowed for brush control. Burning to control brush is covered in the next section.

E. Planned Burning

In 1970 there were six prescribed burns covering 1,168 acres at an average cost of $1.69/acre. The three spring burns were to control willow and remove rank vegetation while the three summer burns were for killing oak sprouts and to reestablish native grasses. Contrary to past experience, the summer burns presented more problems than did spring fires. This was due in part to extremely dry conditions and low relative humidity.

One fire, Number 6 on the map, covered 400 acres and was very interesting. Because of the concentration of fuel (aspen, oak and jack pine slash) and unstable atmospheric conditions, a fire storm started (see photo section). The tornado-like condition lasted only 20 minutes but they were anxious moments to say the least. Because this phenomenon is rare, the North Central U. S. Forest Service Experiment Station, St. Paul, Minnesota, was contacted. They are presently evaluating all the data and color photos and plan to publish a paper on this burn and the fire whirls it created.

It is necessary to burn large areas in one day because prescribed burning is so dependent upon proper weather. This makes good fire breaks a necessity. In 1970 four miles of fire break roads were repaired. This program will have to be increased as the burning program increases. The following table and map shows location, weather data and costs:

Date	Area	Acres	Temp.	Wind	Spread Index	Buildup Index	Relative Humidity	Total Cost	Cost/acre
3/31	1	30	45	NW-5	23	27	45	$22.00	$ .45
3/31	2	21	45	NW-5	23	27	45	29.00	.73
4/27	3	244	88	SE-6	50	37	50	110.00	1.37
8/14	4	320	85	NW-10	20	34	47	160.00	.50
8/17-19	5	164	80	SW-5	8	44	41	867.00	5.29
8/20-21	6	408	76	SW-15	11	50	29	778.00	1.91

F. Fires

Five wild fires occurred in 1970 and burned 6.1 acres. Two started from railroad exhaust, two by motorists and one originated from a prescribed burn. The refuge is very vulnerable to incendiary fires. Evidently the unsuccessful goose and deer hunter has not yet thought of this method of retaliation.

IV. RESOURCE MANAGEMENT

A. Grazing

One grazing permit was issued to Oscar Baumgart in Unit 6. He grazed only a part of the season and forfeited his down payment of $5.00, which came to more than the grazing bill at $.20/AUM. It is evident that grazing, at less than very intensive rates, will not control woody vegetation on this refuge. The work involved, along with bad esthetic values, more than offsets any benefits derived from grazing. Fire and rotary mowing, when needed, are to be used for brush control in the future and no more grazing permits will be issued.

B. Haying

Two permits were issued for removal of alfalfa on farm units. A total of 33 tons were cut at $2.50/ton for a revenue of $82.70. The cut areas made good browse for geese, turkey and deer. No one was interested in cutting the tame grass strips in the Canfield Unit. For good wildlife utilization, these had to be rotary mowed and burned at refuge expense.

C. Fur Harvest

Beaver and muskrat are most sought after in this area. The refuge had four beaver trapping units from January 9 - March 1 and 72 beaver were removed; state limit was 25 per trapper. Trappers were permitted to take all as beaver are numerous and cause problems. Pelts averaged less than $10.00 each. Only four applications were received for the muskrat season of November 15 - December 31. These four trappers caught 118 muskrats and two mink. The refuge received one-half the pelts and sold them for $.85/muskrat and $1.50/mink for a total revenue of $51.65. The Fur Management Plan will be changed so a flat charge per trapper may be made and the trapper can take all the pelts.

D. Timber Removal

There were 25 timber permits in force during 1970. Revenue amounted to $28,889.58 for 6,444.18 cords.

Gross amount received by permittees at local pulpwood mills was $140,000. This income is generally brought back to this economically depressed area through labor, gas, oil, equipment, etc.

The following tables gives cordage removed and average price by species:

Species	Cords	Revenue	Average price/cord
Jack pine	4,135.18	$26,217.78	$ 6.34
Oak	1,365.00	1,636.80	1.20
Aspen	819.00	1,035.00	1.26

As of December 31, nine active timber permits were in force. Form NR-11 summarizes timber sales for 1970.

Refuge sales are let out on a lump sum bid basis. The timber is cruised standing and an estimate made of the volume in a particular block of land. Refuge roads may be used by loggers but new roads are put in by the permittee. This leads to one of the major problems of timber sale operations. Refuge roads are not adequate to handle the increased size of logging equipment. Permittees are required to repair road damage but they seldom have the equipment nor the experience to handle road repair. Hopefully, some day, we can establish a road system adequate for timber operations.

Seventy-six acres of red pine plantation (35 years old) were thinned to a basal area of 60-70. All double, suppressed, scarred and some sound trees were removed to reduce basal area to the required level. With increased sunlight, grass and woody plants should come into a previously bare forest floor.

Land clearing has been completed on 40 percent of the 6,000 acres being reverted to grassland. During 1970 permittees clear cut on 1,427 acres. After an area is commercially logged, it is roller chopped and prescribed burned. This discourages woody vegetation and allows native grasses and forbs to reestablish themselves. Excellent prairie stands have been reestablished on areas already treated. (See Section VII A).

E. Commercial Fishing

Nothing to report.

F. Other Uses

One beekeeping permit was issued. A charge of $.10/hive brought a revenue of $2.00.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Banding

Efforts during 1970 were directed toward mourning doves, wood ducks and Canada geese. All other birds were released unbanded as we had no quota for them. Age/sex data and totals are shown in the following table:

		Adults		Immatures				
Species	Quota	M	F	M	F	Unknown	Totals	Retraps
Mourning Dove	500	122	29	5	5	47	208	10
Wood Duck	500	181	63	78	52	7	381	15
Canada Geese	500	33	25	20	30	-	108	5

Mourning Doves Eighteen rectangular dove traps were converted into six new design traps (see photo section). The six modified traps were operated on eight trapping dates with millet the preferred bait. Traps were checked at dusk and again at 8 AM. An average of 26 doves were banded each trapping date at a cost of $1.03/dove. Recaptures ranged from 0 initially to 30 percent at the end.

Juvenile : adult age ratios of 1:4 indicated that production and/or survivorship was very poor. Trapping sites were monitored in mid-day as well as morning and evening for possible differential feeding times of juvenile doves. The 1:4 age ratio persisted during all checks. Reasons for this production lag were not known.

Wood Ducks A total of 50 wood ducks were banded in Rynearson 1 Pool on four trapping dates between July 22 and August 6. Trapping was curtailed until a larger concentration of birds could be located.

A three-compartment duck trap (see photo section) was constructed when 100 wood ducks were located on the east end of Sprague Pool. The trap was set up, baited with corn and the birds conditioned for five days. Exit doors were closed on September 18 and the trap was checked at dusk. Over 350 ducks were in the trap; six had suffocated and more than 50 were immediately released to alleviate overcrowding. A total of 267 were banded. The doors were closed again on September 23 and 71 wood ducks were banded.

A total of 381 wood ducks were banded at a cost of $1.25/duck. Over 550 mallards, 70 black ducks and 30 green-winged teal were released unbanded.

Canada Geese Efforts to capture Canada geese with cannon-nets were frustrated by an unusually late migration. Three shots, two nets fired into each other, did result in the banding of 108 geese (22, 37 and 49 respectively). Most geese were of the interior type with a few large and two lesser geese.

B. Artificial Waterfowl Nest Structures

A three-year study of 134 fiberglass goose nesting structures was terminated in 1969. The student charged with this project withdrew from his graduate program and did not submit completed data or a report. However, the following generalizations were available:

(1) Only one goose clutch was laid on a structure; it was abandoned before incubation started.

(2) Nine goose clutches were moved from the ground onto structures in 1967; five hatched successfully.

(3) Imprinting attempts were apparently not successful as the structures were not used during the next three years.

Approximately 50 of these structures were dismantled for shipment to western refuges where use is substantial.

C. Simulated Nest Study and Animal Control

The first phase of the dummy nest study - corresponding to initial waterfowl nesting - was effected in late May and early June. Eighty-three percent of 200 eggs placed along 16 transect lines were destroyed. The second phase - corresponding to renesting - was not implemented due to changes in personnel.

Limited animal control - raccoon trapping - was carried out by refuge personnel during May. A total of 27 raccoon were taken. Attempts were not made to relate this insignificant reduction in raccoon population to the dummy nest study or to waterfowl production. The expense of animal control would appear to be questionable in any locale where potential waterfowl production is low and raccoon density exceedingly high. Habitat improvement will be stressed over predator removal.

VI. PUBLIC RELATIONS

A. Recreational Use

Total refuge visits during 1970 numbered 54,066 - 20,000 fewer than 1969. The decrease occurred almost exclusively in the category of wildlife observations. Primary reason for the reduction was placement of a second traffic counter to better determine public use. Other contributing factors were unusually hot weather, an extended mosquito season and less visible waterfowl on the refuge.

Wildlife observations accounted for 55% of all recreational use.

Deer were especially visible this summer in open fields and along roads where they could partially escape the clouds of mosquitoes. Wild turkey and ruffed grouse numbers were up and many sightings were made by visitors.

Deer hunting (gun and bow) was responsible for 20% of refuge visits. An estimated 5,000 gun hunters went away happy in that most saw deer during the nine day season. Opening day of the late bow season (December 5) again attracted the peak number - 3,300 of refuge visitors in a single day.

The 11-mile auto tour route, in it's second year of operation, accounted for 12% of refuge visits. The walking type nature trail was expanded from 0.4 mile to one mile in length; it now loops back to the parking area. More intensive use will result when impoundments and signing are completed.

Fishing for northern pike in the Sprague Pool was an important adjunct to the summer program. Restrictions by the state on fish consumption from the mercury-contaminated Wisconsin River had the effect of pushing many resident and non-resident anglers onto refuge waters. The entire refuge was opened to ice fishing in December. Many people were taking advantage of this resource until the 16" snowfall on January 4, 1971.

The blueberry crop was good in prescribed burn areas. The mosquito crop also experienced another good year. Those brave souls capable of quick movements on windy days did find some very productive blueberry patches.

B. Refuge Visitors

Date	Name	Organization	Purpose
2/23	Joe Scott	Tamarac NWR, Minn.	Visit
3/17	Vernon Faust	FHA, Milwaukee	Housing appraisal
3/18	Darold Walls	BSFW, WS, Mpls	Predator control
4/13-15	Darold Walls	"	"
5/14	John Winship	BSFW, RF, Mpls	Aerial waterfowl count
6/14	John Wilbrecht	Seney NWR, Mich.	Prescribed burning
6/15	Samuel Robbins	Cadot, Wis.	Ornithologist
6/19	William Tans	DNR,Madison, Wis.	Scientific area
"	Michael Lee	"	"
"	Richard Vogt	"	"
6/23	Larry Gregg	DNR, Rhinelander, Wis.	Dove survey
6/23	James Monnie	BSFW, RF, Mpls	Inspection
7/2	Fred Samson	Patuxent WRC, Md.	Banding records
7/10	W. Wolfarth	Florida Aud. Society	Photographs
7/30	Darold Walls	BSFW, WS, Mpls	Predator control
"	James Elder	"	"
8/4	Emil Huebner	Wis. Bowhunter Ass'n.	Archery deer seasons

Date	Name	Organization	Purpose
8/7	Darrell Uptegraft	Crab Orchard NWR, Ill	Visit
8/10	Dennis Dooley	Ill. Nat. His. Survey	Visit
"	Gerald Walker	Cargill, Ill.	Visit
8/19	John Wilbrecht	Seney NWR, Mich.	Prescribed burning
8/26	Bill Anderson	" " Retired	Visit
9/4	Wes Thompson	Sherburne NWR, Minn	Equipment transfer
9/14	James Monnie	BSFW, RF, Mpls	Horicon PR program
"	Robert Personius	Horicon NWR, Wis	"
"	Jay Hammernick	Upper Miss NWR Minn.	"
"	Jerry Leinecke	"	"
9/15	Miles Camery	USGMA, Madison, Wis	Enforcement plans
9/30	Rodney Sando	NCFES, St. Paul, Minn	Prescribed burning
"	Don Haines	"	"
"	Gene Miller	"	"
10/3	Carl Fermanich	Retired Bureau employee	Visit
10/4	Tony Parisot	BSFW-Trainee, Wash. D.C.	Tour of refuge
10/5	Don Johnson	Milwaukee Sentinel	Outdoor editor-news
10/21	Norm Oldfield	Galt, Ontario, Canada	Tour of refuge
"	Clayton Gillett	"	"
"	Earl Pierce	Grand River Conservation	"
"	Adolf Ridzins	Authority	"
10/21	Ed Franks	DNR, Madison, Wis.	Visit
10/26	Clair Rollings	BSFW, RF, Mpls	Soil & Moisture

Frequent Jim Lennartson, Seney NWR, Mich. Forester
Roger Priest, USGMA, Eau Claire, Wis.
Ron Kubisiak & Ben Little, DNR State Wardens
Clarence Smith, local DNR Game Manager

C. Refuge Participation

1/21 Brown gave talk to a meeting of 30 game managers from Wisconsin Department of Natural Resources.

1/27 Johnson gave slide talk to 25 members of Elroy Rotary Club.

2/26 Brown gave talk to 100 Sparta High School students for career day.

3/2-4 Brown attended refuge managers workshop held at Madison, Wis.

3/23-25 Brown attended 35th North American Wildlife and Natural Resources Conference in Chicago.

3/23 Carter attended County Conservation Hearing.

4/20 Johnson gave talk to Mauston J.C.'s.

4/18-19 Refuge Open House - 55 people toured refuge.

4/21 Brown - Environmental teach-in Mauston High School-250 students.

5/7 Johnson gave slide talk to 96 4th grade students at Mauston.

5/8 Brown gave talk on effects of environmental pollution on wildlife to 250 New Lisbon High School students.

5/13 Brown & Johnson attended Juneau Co. Professional Agriculture Society picnic.

5/26 Johnson gave slide talk and tour of refuge to 21 students from Conservation Class of Mauston High School.

6/14 Brown attended board of directors meeting of Wis. Bowhunters Association held at refuge headquarters.

6/23 Hocutt and Johnson talk to 4-H group at Camp Upham Woods, near Wisconsin Dells, Wisconsin.

6/29 Hocutt tour to 35 4-H Conservation Award Winners from throughout the state of Wisconsin.

7/1 Hocutt gave tour of refuge to 3 & 4 grade from Mauston school.

7/20 Johnson gave radio talk over Mauston station WRJC.

7/23 Updike, Hocutt and Stewart gave talk and tour to Juneau County 4-H Group.

7/27 Updike attended Juneau County Rural Development Council meeting.

8/15 Hocutt gave talk and tour of refuge to 30 4-H youngsters.

8/17 Hocutt gave talk to 50 Boy Scouts from Illinois.

8/17-18 Updike attended Bureau Objectives Workshop in Minneapolis.

8/24 Hocutt gave talk and tour to a group of 35 4-H students.

9/7 Updike gave a radio presentation on Mauston station WRJC.

9/14 Updike - slide talk to Mauston Kiwanis Club.

9/15 Refuge staff attended enforcement meeting at headquarters with USGMA Miles Camery.

9/18-20 Johnson and Updike attended Midwest Prairie Conference at Madison, Wisconsin.

9/21 Johnson toured refuge with Mauston J.C.'s.

9/26-27 Updike to Horicon Refuge for Highway 49 public relations program.

10/3 Rudolph gave tour to 40 members of Chicago Color Camera Club.

10/5 Rudolph tour of refuge with Don Johnson, outdoor editor from Milwaukee Sentinel.

10/14 Hocutt tour with 70 High School biology students from Viola, Wis.

10/14 -17 Updike to Elk River, Minn. for environmental education training with Charles Allen, Necedah High School biology teacher.

10/20 Johnson gave tour to Juneau County Professional Agriculture Society.

10/21 Johnson gave tour to personnel from the Grand River Conservation Authority, Galt, Ontario and Ed Franks, Supervisor of small game from Wisconsin Department of Natural Resources.

11/24 Updike talked to 70 people at the Tomah Rotary Club.

12/16-18 Johnson and Updike attend forestry workshop at Hayward, Wis.

D. Hunting

Waterfowl

The entire refuge was closed to waterfowl hunting. Biggest hunting attraction in this part of Wisconsin is the "firing-line", a state operated area near the refuge which includes croplands closed to trespass and hunting between the refuge and these crops. Any Canada goose flying out over the "line" gets shot at; height is no factor. There is a retrieving zone between the "line" and refuge boundary which keeps hunters from sitting on our sign posts and dropping geese in the refuge.

Opening day, October 3 at noon, saw 800 hunters crowded along five miles of "firing-line". However, only 57 geese were registered as few migrants had arrived and none had set up feeding flights to the state croplands. Any birds flying out met with such heavy fire they were forced back. With a warm fall, good refuge feed and heavy hunting pressure, geese were satisfied to stay on the refuge and hunting was very poor. Final counts are not in but the kill is estimated at 400 geese as compared with 1,150 in 1969. A way to improve hunting quality and reduce crippling loss in this wooded "firing-line" area is certainly needed. The refuge appears to be in direct competition with the state as we try to hold geese while state managers attempt to lure them out to hunting areas.

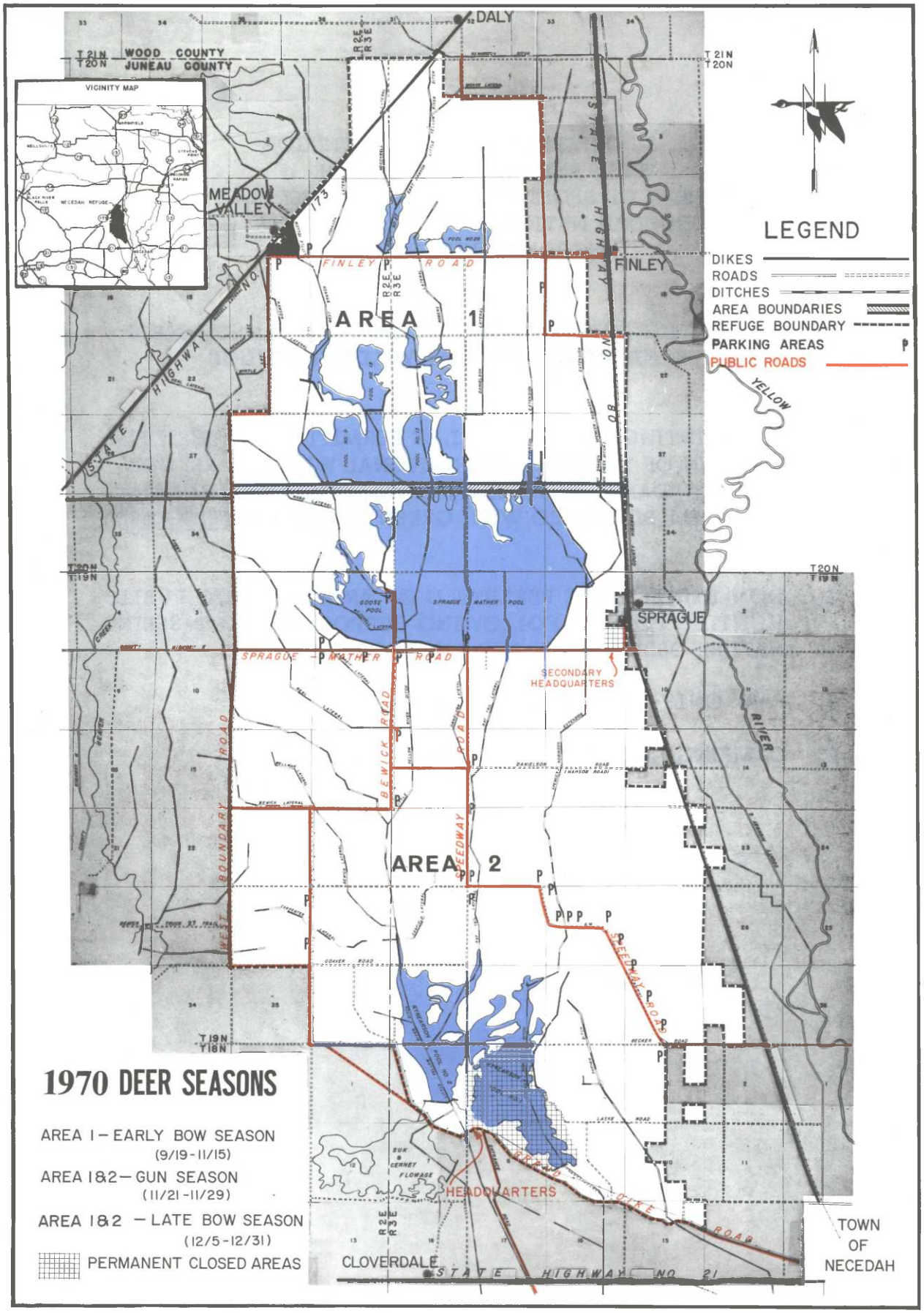
Duck hunting in central Wisconsin was very poor. A bag limit of

NECEDAH NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

JUNEAU COUNTY, WISCONSIN

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



TOWNSHIP DIAGRAM

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

RULES COVERING DEER HUNTING DURING THE 1970 SEASONS
ON THE NECEDAH NATIONAL WILDLIFE REFUGE

1. THE HUNTING OF DEER WILL BE PERMITTED ON THE OPEN PORTION OF THE NECEDAH NATIONAL WILDLIFE REFUGE IN ACCORDANCE WITH STATE LAWS. THE OPEN HUNTING AREA WILL BE POSTED WITH GREEN PUBLIC HUNTING AREA SIGNS.

2. NON-HUNTERS ARE PERMITTED ON AREAS OPEN TO PUBLIC HUNTING FOR THE FOLLOWING PURPOSES: SIGHT-SEEING, NATURE OBSERVATION AND PHOTOGRAPHY.

3. PARK ONLY IN DESIGNATED AREAS.

4. CAMPING AND FIRES ARE PROHIBITED.

four was in effect for the October 3 - November 26 season. Wood duck hunting was good the first few days in the Yellow River bottoms but soon dropped off to nothing.

The Milwaukee Journal began a series entitled "Where Did the Ducks Go" shortly after the season ended.

Deer

Early Bow Season 9/19 - 11/15 The north portion of the refuge was open to bow hunting with over 750 hunters on opening day. Most hunters saw deer and appreciated the season. Fewer than 10 deer were taken and no problems were encountered. Gun Season 11/21 - 11/29 The entire refuge, except Rynearson 1 Pool area, was open to gun hunting. Pressure was up 30 percent opening day with 1,800 hunters being counted. Pressure was evenly distributed and no problems were encountered. Cold windy weather reduced hunter numbers considerably during the week. Success was very good with many bucks being registered; total kill was estimated at 250 deer. Late Bow Season 12/5 - 12/31 Former refuge hunting Area 3, open only to the late bow hunter, attracted upwards of 7,000 hunters to the 6,000 acre area before 1970. This was considered a very poor quality type of hunt. In 1970 part of former Area 3 was closed to all hunters. The remaining part was open to gun hunting which prevented a concentration of deer from building up. Not everyone heard about the change and 3,300 hunters (30 percent fewer than 1969) showed up opening morning for the kill. Many were disappointed to find no concentration of deer to chase and accused the refuge of all sorts of trickery and betrayal. Only 25 deer were registered as compared with 100-250 in recent years. The program change was successful in that next year fewer hunters will show up and the quality of the hunt will be greatly improved.

E. Violations

Problems of trespass and hunting in closed areas were encountered. This is primarily because of the many public roads crossing the refuge. Following is a summary of 1970 cases:

STATE COURT

Date	Name & Address	Violation	Fine
9/19	James Erickson, Janesville	Hunt in closed area	34.00
"	Richard Valentine, LaCrosse	"	34.00
10/3	Gerald Jessop, LaValle	"	34.00
"	Russell Jessop, "	"	34.00
10/22	James Pollard, Adams	"	34.00
11/6	Roger Lee, Mauston	" Juvenile	.00
"	John Lee, Union Grove	" "	.00
11/7	William Finney, Sycamore, Ill.	Shine deer w/bow in poss	100.00
"	Richard Justice, Beloit	Hunt in closed area	34.00

Date	Name & Address	Violation	Fine
11/14	James Carpenter, Roscoe, Ill.	Shine deer w/bow poss.	109.00
"	Dennis Duorik, Racine, Wis.	Hunt in closed area	34.00
"	Norman Anderson, Racine, Wis.	"	34.00
11/18	James Molepske, Wis. Rapids	"	34.00
11/21	Robert Chitek, LaCrosse	"	34.00
"	Michael Chitek, Bangor	"	34.00
11/29	John Lang, Oregon, Wis.	Possess illegal doe	59.00
12/6	Larry L. Blaney, Kenosha	Hunt in closed area	34.00

FEDERAL COURT U. S. Commissioner Emmett Farmer, Tomah, Wis.

10/14	Robert Swertfeger, LaCrosse	Trespass-closed area	10.00
"	Steven Muller, LaCrosse, Wis.	"	10.00
10/28	Russel Stainbrook, Necedah	Unauthorized entry	Dismissed
12/4	Randy Brow, Kenosha	Motor-bike-closed area	9.00

There was one additional case of hunting in a closed area. The hunter was confused by our green "Public Hunting" signs and thought he could hunt all game in the area. Other cases of the same nature were handled by state courts when the defendants pled guilty or forfeited bond. With this case, the hunter entered a plea of not guilty and the state dismissed the case. No federal action was taken.

Because of the ease in handling and obvious differences in fines, as many cases as possible were handled in state court.

F. Safety

No accidents occurred at this station during the year. Safety meetings were held concerning the following subjects:

Driving
Heavy Equipment Operation
Accident Reporting
Safety Policy
General clean-up and the Implications to Safety

One safety film was shown on Drinking and Driving.

Ass't. Manager Hocutt attended the Defensive Driving course in Rushford, Minnesota. Roll bars and seat belts were installed on the TD-9 crawler tractor and on our all-terrain-vehicle. A brush guard was made and installed on the new John Deere farm tractor.

VII. OTHER ITEMS

A. Items of Interest

1. In September Refuge Manager Updike presented a 30-year pin to Mechanic Robert W. Arrowsmith and a 10-year pin to Maintenanceman Harold R. Carter.

2. Steve Stewart, our summer student from Iowa, possessed a combination of educational qualifications, personal integrity, motivation, and maturity that should allow him to perform well as a biologist. Steve, an Izaak Walton League referral, had just graduated from high school and it was the feeling of the staff that he has more potential than any student with whom they have associated.

3. Mercury pollution drew much attention because of the nearby Wisconsin River. Numerous paper mills are located along this river which empties into the Mississippi River. In May the Wisconsin Department of Natural Resources closed the river to all fishing from Wisconsin Rapids to The Dells (75 miles). However, after much protest from tourist groups, it was reopened in June to sport fishing but people were advised not to eat over one meal of fish per week. Numerous public meetings have been held by the DNR with conservation, tourist and paper mill interests going at it hot and strong. Portions of this river were also closed to swimming and boating in August as waste disposal from some cities created problems. Aldo Leopold, who lived along the Wisconsin River 50 miles south of the refuge, would find these Sand Counties very much different from the ones he wrote so well of not many years ago.

4. The prairie restoration program, mentioned in part throughout this NR, began in 1965. Briefly, this program is to revert 6,000 acres of brush and woodland around pool margins back to native grasses. Before 1920 central Wisconsin was primarily tall grass prairie with some pine and oak. Man lowered the ground water table by digging many miles of ditches in a futile attempt to farm this sand country. In the 1930's, efficient fire control got started and the grasslands no longer burned over. Fire control, along with the lowered water table, allowed trees and shrubs to grow unchecked. At this time there were countless sharp-tailed grouse and prairie chickens. Deer were fewer than today but other grassland birds and animals flourished. Today there are no prairie chickens at Necedah and the sharp-tailed grouse population is estimated at less than ten.

   Initial treatment of the 6,000 acres mentioned is to be completed by 1974. Almost 3,000 acres have been cleared to date. The

restoration process takes years and involves the following steps: (1) All commercial timber is sold to pulpwood operators. (2) Unmerchantable trees and shrubs are knocked down by rolling chopper or cut by chain-saw. (3) The area is burned during August to discourage woody plants and resprouting from the original trees. (4) It is necessary to burn every-other-year, when litter has built up, for six years or three burns on each area. (5) After this, burning will be done every three or four years on a rotation basis to keep woody plants from re-invading.

Results have been spectacular. Response by grasses, warm and cool season species, and forbs is unbelievable. Remnants of some prairie species can be found in forest openings and along roads but the area comes alive with these species in the spring following a burn. Big bluestem over six feet tall and little bluestem measuring 50 inches may be found. Forbs flowering from late March into October can also be seen. Wildlife has responded well as greater sandhill cranes flock to these small prairie areas. The program will insure the continuance of sharp-tailed grouse and possibly prairie chickens can be reintroduced. Waterfowl nesting and utilization will certainly receive a big boost. The area will also provide habitat variety so necessary for wildlife species from the butterflys and small rodents right up the line.

B. Photographs

The photographer's name and the station photo number are listed under each photo.

Credits: Updike: III A-D; IV A-C, F; VI D; VII A. Editing

Hocutt: I B; II; V; VI A.

Johnson: III E-F; IV D-E; VI E-F.

Rudolph: I A; VI B-C; VII A. Typing, photo mounting and assembly.

SIGNATURE PAGE

Submitted by:

Gerald H. Updike
(Signature)

Gerald H. Updike

Refuge Manager
Title

Date: January 29, 1971

Approved, Regional Office:

Date: FEB 22 1971

James B. Mounie
(Signature)

ASST

Regional Refuge Supervisor

R3-454
(9/68)

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

WATERFOWL

REFUGE Necedah

MONTHS OF ~~Jan. 1~~ TO ~~April 30~~, 19 ~~70~~

(1) Species	Weeks of reporting period (2)									
	1 ~~1/1-3~~	2 ~~1/4-10~~	3 ~~1/11-17~~	4 ~~1/18-24~~	5 ~~1/25-31~~	6 ~~2/1-7~~	7 ~~2/8-14~~	8 ~~2/15-21~~	9 ~~2/22-28~~	10 ~~3/1-7~~
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling				WATER AREAS FROZEN						
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard										
Black										
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:										

Int. Dup. Sec., Wash., D.C. 37944

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Necedah MONTHS OF January 1 TO April 30, 19 70

(1) Week ending / Species	(2) Weeks of reporting period: 3/14 (11)	3/21 (12)	3/28 (13)	4/4 (14)	4/11 (15)	4/18 (16)	4/25 (17)	4/30 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada			90	300	895	3000	5110	500	72,065		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard			25	165	1080	2300	1200	700	37,870		
Black					25	250	230	150	4,585		
Gadwall						75		10	595		
Baldpate					10	150	35	20	1,435		
Pintail						375	20		2,365		
Green-winged teal					35	425	360	200	7,000		
Blue-winged teal					260	500	455	375	11,130		
Cinnamon teal											
Shoveler					25	50	35	35	1,015		
Wood					10	300	295	250	5,985		
Redhead											
Ring-necked				30	85	800	430	430	12,425		
Canvasback							5		35		
Scaup					130	200	45	45	2,940		
Goldeneye				35	390	590	15		6,930		
Bufflehead				25	405	700	105	50	8,995		
Ruddy						50			350		
Other Common Merganser					10	20	25		355		
[redacted] Hooded Merganser							10	10	140		
Coots:					10	175	160	75	2,940		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	0	0	0
Geese	72,065	5,310	0
Ducks	104,580	6,745	0
Coots	2,940	175	0

SUMMARY

Principal feeding areas Canfield farm units, Sprague Pool, Rynearson Pools 1 & 2.

Principal nesting areas

Reported by David J. Brown
David J. Brown, 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).

Interior Duplicating Section, Washington, D. C.
1953

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

WATERFOWL

REFUGE Necedah

MONTHS OF May 1 TO Aug. 31, 19 70

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
	5/1-2	5/3-9	5/10-16	5/17-23	5/24-30	5/31-6/6	6/7-13	6/14-20	6/21-27	6/28-7/4
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	500	125	120	125	130	145	165	175	180	190
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	700	650	730	730	730	820	920	1,070	1,220	1,370
Black	150	75	30	30	30	35	50	60	70	80
Gadwall	10	10								
Baldpate	20	20								
Pintail										
Green-winged teal	200	140	150	150	150	170	200	250	275	290
Blue-winged teal	375	250	250	250	250	300	375	475	525	575
Cinnamon teal										
Shoveler	35	35								
Wood	250	200	150	150	150	155	170	180	190	200
Redhead										
Ring-necked	430		10	10	10	15	30	40	50	60
Canvasback										
Scaup	45									
Goldeneye										
Bufflehead	50									
Ruddy										
Other Hooded Merganser	10	10	20	20	20	25	33	33	33	33
Common Merganser		10								
Coot:	75	25	10	10	10	10	15	25	30	35

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3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Necedah MONTHS OF May 1 TO August 31, 19 70

(1) Week ending: Species	(2) Weeks of reporting period: 7/11 11	7/18 12	7/25 13	8/1 14	8/8 15	8/15 16	8/22 17	8/31 18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	200	200	200	200	205	220	225	230	22,705	8	80
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	1,427	1,427	1,427	1,427	1,427	1,427	1,427	1,500	142,500	25	697
Black	84	84	84	84	84	84	84	180	8,336	2	54
Gadwall									90		
Baldpate									180		
Pintail											
Green-winged teal	297	297	297	297	297	297	350	400	31,349	6	147
Blue-winged teal	585	585	585	585	585	585	800	1,500	67,170	12	308
Cinnamon teal											
Shoveler									315		
Wood	204	204	204	204	204	204	100	50	21,033	2	54
Redhead											
Ring-necked	64	64	64	64	64	64	70	70	6,243	2	54
Canvasback											
Scaup									90		
Goldeneye											
Bufflehead									100		
Ruddy											
Other Hooded Merganser	33	33	33	33	33	33	35	35	3,555	1	26
Coots: Common Merganser	35	35	35	35	35	35	50	65	70 3,615		25

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	0		0
Geese	22,705	500	80
Ducks	281,031	3,655	1,340
Coots	3,615	75	25

SUMMARY

Principal feeding areas Rynearson Pools 1 & 2, Sprague-Mather Flowage, Pools 13 & 19.

Principal nesting areas Rynearson Pools 1 & 2, Sprague-Mather Flowage, Pools, 13, 18, & 19.

Reported by Grady R. Hocutt
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).

Interior Duplicating Section, Washington, D. C.
1953

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

WATERFOWL

REFUGE Necedah Refuge

MONTHS OF Sept. 1 TO Dec. 31, 19 70

(1) Species	Weeks of reporting period (2) 1	2	3	4	5	6	7	8	9	10
	9/1-5	9/6-12	9/13-19	9/20-26	9/27-10/3	10/4-10	10/11-17	10/18-24	10/25-31	11/1-7
Swans:										
Whistling							1			
Trumpeter										
Geese:										
Canada	265	325	500	950	5,760	7,010	7,900	8,350	9,000	4,475
Cackling					40		100	150		25
Brant										
White-fronted										
Snow				10		10		200	300	50
Blue						20		300	700	50
Other										
Ducks:										
Mallard	1,060	1,455	2,350	1,180	1,325	5,520	6,400	5,350	6,600	2,900
Black	140	130	165	110	80	395	620	470	450	400
Gadwall				15	45	65	285	155	75	50
Baldpate	520	1,465	1,135	3,155	4,835	4,715	4,700	2,550	1,620	1,700
Pintail	15			100	40	145	500	500	500	470
Green-winged teal	205	425	315	915	440	1,280	540	500	300	90
Blue-winged teal	1,055	990	785	360	170	220	60	50	65	10
Cinnamon teal										
Shoveler				15		15	10	15	25	
Wood	135	65	435	240	300	120	40	40	65	50
Redhead							115	40	120	
Ring-necked	15	50	15	15	600	1,755	3,200	3,600	3,600	80
Canvasback							20	15	75	
Scaup			20		45	300	500	135	70	160
Goldeneye										
Bufflehead								40		
Ruddy						5	10			
Other Hooded Merganser				10	200		140	175	230	210
Coot:		75	455	2,800	4,650	5,950	3,800	5,505	4,700	270

Int. Dup. Sec., Wash., D.C. 37944

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Necedah Refuge MONTHS OF September 1 TO December 31, 19 70

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
	11/8-14	to 11/21	11/28	12/5	12/12	12/19	12/26	12/31			
Swans:											
Whistling	160	30							1,337		
Trumpeter											
Geese:											
Canada	2,500	1,500	9,000						395,015		
Cackling									2,405		
Brant											
White-fronted											
Snow	50								4,340		
Blue	50								7,840		
Other											
Ducks:											
Mallard	1,700	150							249,810		
Black	170	15							21,735		
Gadwall	15								4,935		
Baldpate	40								184,005		
Pintail									15,930		
Green-winged teal									34,660		
Blue-winged teal									24,245		
Cinnamon teal											
Shoveler									560		
Wood									10,160		
Redhead									1,925		
Ring-necked									90,480		
Canvasback									910		
Scaup									8,610		
Goldeneye											
Bufflehead									280		
Ruddy									105		
Other Hooded Merganser	230								8,375		
~~Coots~~ Common merganser	185	150							2,345		
COOT									197,435		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	1,337	160	
Geese	409,600	10,000	
Ducks	657,660	17,500	
Coots	197,435	5,950	

SUMMARY

Principal feeding areas Rynearson Pool No. 1; Rynearson Pool No. 2; Sprague Pool; flooded agricultural unit

Principal nesting areas

Reported by Grady E. Hocutt, 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).

Interior Duplicating Section, Washington, D. C.
1953

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Necedah Months of March to April 30 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Sandhill Crane	5	3/29	40	4/18	20	4/30				
Great Blue Heron	5	4/12	50	4/18	50	4/30				
Pied-billed Grebe	10	4/12	50	4/18	25	4/30				
Green Heron	1	4/20	5	4/30	5	4/30				
Am Bittern	1	4/30	1	4/30	1	4/30				
II. Shorebirds, Gulls and Terns:										
Killdeer	1	3/25	100	4/15	100	4/30				
Greater Yellolegs	5	3/30	50	4/15	20	4/30				
Lesser Yellowlegs	25	3/30	50	4/15	20	4/30				
Least Sandpiper	5	3/20	10	4/30	10	4/30				

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	25	3/15	150	4/15	150	4/30				
White-winged dove										
IV. Predaceous Birds:										
Golden eagle										
Duck hawk										
Horned owl	25	year -	around	resident						
Magpie										
Raven										
Crow	50	year -	around	resident						
Bald eagle	2	3/12	2	3/12	1	4/30				
Red tailed Hawk	2	2/10	20	3/15	20	4/30				
Marsh Hawk	10	2/30	20	3/15	20	4/30				
Sparrow Hawk	1	2/28	35	3/30	35	4/30				
Cooper's Hawk	1	3/15	5	3/30	5	4/30				
Screech Owl	30	year -	around	resident						
Barred Owl	5	year -	around	resident						

Reported by David J. Brown

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 Gruiiformes)
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 Necedah Months of May 1 to August 31 195 70

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Sandhill Crane	Summer	resident	125	late Aug	Still present				20	125
Great Blue Heron	"	"	120	"	"		1	30	55	140
Pied-billed Grebe	"	"	20-30	"	"				30	55
Green Heron	"	"	30-40	"	"				20	50
Common Loon	"	"	5							
American Bittern	1	5/27	20-25	"	"				10	35
Sora Rail		6/4	Undetermined	"	"					
Virginia Rail		6/4	"	"	"					
American Egret	21	Early Aug	49	"	17	late Aug				
Black-Crowned Night Heron	1	mid-Aug	3	"	Still present					
II. Shorebirds, Gulls and Terns:										
Killdeer	Summer	resident	Common	August	Still present					
Greater Yellowlegs	"	"	100-125	late Aug	"					
Lesser Yellowlegs	"	"	200-250	"	"					
Least Sandpiper	"	"	150+	mid-Aug	"					
Solitary Sandpiper	2	5/27	45-50	early June	"					
Spotted Sandpiper	4	5/27	45-50	"	"					
Pectoral Sandpiper	1	5/27	150-175	"	"					
Common Tern	8	5/27	occasional	August	"					
Black Tern	3	5/27	common	"	"					
Herring Gull	2	5/27	2	early June	2	6/27				
Upland Plover	3	5/28	common	August	Still present					

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	Summer	resident	400-500	August	Still	present		
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	1	7/12	1	7/12	1	7/12		
Duck hawk								
Horned owl	Summer	resident	Common		Still	present		
Magpie								
Raven								
Crow	Summer	resident	Common		Still	present		
Bald Eagle	1	8/21	3	8/28	"			
Osprey	1	7/9	2	7/24	2	7/24		
Goshawk	Summer	resident	Common		Still	present		
Red-tailed hawk	"		50-60	August	"			
Marsh Hawk	"		20-25	"	"			
Sparrow Hawk	"		30-40	"	"			
Broad-winged Hawk	"		occasional		"			
Barred Owl	"		occasional		"			

Reported by Grady E. Hocutt

Grady E. Hocutt, Ass't. Refuge Manager

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 Gruiiformes)
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 Necedah Months of Sept. 1 to December 31 195 x 70

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. **Water and Marsh Birds:**										
Sandhill Crane	Summer	Resident	400	10/18	5	11/21				
Great Blue Heron	"	"	120	mid-Aug	2	mid-Nov.				
American Egret	21	early Aug	90	mid-Sept	5	late-Sept				
Black-crowned Night Heron	1	mid-Aug	4	early Sept	4	early Sept				
Green Heron	Summer	Resident	Fairly common through September							
American Bittern	"	"	20-25	late Aug	1	late Oct.				
Common Loon	"	"	5	11/12	5	11/12				
Pied-billed Grebe	"	"	100	late Sept	3	late Oct				
Sora Rail	"	"	occasional in Sept		-	mid-Oct.				
Virginia Rail	"	"	"	"		" "				
Cattle Egret	1	11/1	1	11/1	1	11/1 (New addition to bird list of this refuge)				
II. **Shorebirds, Gulls and Terns:**										
Killdeer	Summer	Resident	Common into October							
Greater Yellowlegs	"	"	"	"						
Lesser Yellowlegs	"	"	"	"						
Least Sandpiper	"	"	"	"						
Pectoral Sandpiper	"	"	"	"						
Stilt Sandpiper	1	8/29	3	9/5						
Spotted Sandpiper	Summer	Resident	Common into October							
Solitary Sandpiper	"	"	"	September						
Common Tern	"	"	"	October						
Black Tern	"	"	"	"						
Herring Gull	1	mid-Oct	Undetermined							
Upland Plover	Summer	Resident	Common into September							

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	Summer Resident		600	late Aug	25	12/16		
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	Occasional		9	10/26	3	11/6		
Duck hawk								
Horned owl	year-round resident		common					
Magpie								
Raven								
Crow	year-round resident		common					
Bald Eagle	2	9/11	17	10/27	1	12/14		
Osprey	1	7/9	2	7/24	1	11/2		
Red-tailed Hawk	Summer	Resident	common		1	mid-Dec		
Rough-legged Hawk	2	mid-Oct	5	mid-Nov	1	"		
Marsh Hawk	Summer	Resident	30-40	mid-Oct	2	early-Dec		
Cooper's Hawk	"	"	2	late Oct				
Barred Owl	"	"	common					
Short-eared Owl	1	late Oct	4	early Nov				
Snowy Owl	1	11/10	2	12/14	Still present			

Reported by Grady E. Hocutt, Ass't. Refuge Mgr.

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 Gruiiformes)
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 Necedah For 12-month period ending August 31, 19 70

Reported by Grady E. Hocutt Title Assistant Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	Acreage		(3) Use-days	(4) Breeding Population	(5) Production
Unit I	Crops	130	Ducks	339,230	350	400
	Upland	8,805	Geese	90,022	20	30
	Marsh	1,500	Swans	42	0	0
	Water	1,000	Coots	93,345	5	15
	Total	11,435	Total	522,639	375	445
Unit II	Crops	292	Ducks	215,300	300	300
	Upland	7,488	Geese	336,120	10	10
	Marsh	1,000	Swans	0	0	0
	Water	700	Coots	26,290	0	0
	Total	9,480	Total	577,710	310	310
Unit III	Crops	0	Ducks	256,395	400	500
	Upland	4,540	Geese	115,034	20	30
	Marsh	2,000	Swans	0	0	0
	Water	3,000	Coots	57,205	5	10
	Total	9,540	Total	428,634	425	540
Unit IV	Crops	0	Ducks	104,171	290	140
	Upland	7,052	Geese	3,164	10	10
	Marsh	1,300	Swans	0	0	0
	Water	800	Coots	1,180	0	0
	Total	9,152	Total	108,515	300	150
TOTALS:	Crops	422	Ducks	915,096	1,340	1,340
	Upland	27,885	Geese	544,340	60	80
	Marsh	5,800	Swans	42	0	0
	Water	5,500	Coots	178,020	10	25
	Total	39,607	Total	1,637,498	1,410	1,445
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

INSTRUCTIONS

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

(1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should 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 ER-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.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Necedah Months of January 1 to April 30, 1970

(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.
Ruffed Grouse	23,000								1000	
Turkeys	35,500								60	Turkeys came through winter with little reduction in number. Courtship activity high this spring.
Sharp-tailed grouse	10,000								20	Population based on a few observations near the Blair field
Woodcock	12,000									
Snipe	5,000									

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 Necedah Months of May 1 to August 31, 19 70

(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.
Ruffed Grouse	30,000								2,000	
Sharp-tailed Grouse	10,000								Unknown*	
Bobwhite Quail	5,000								10	
Wild Turkey	30,000								150-200	
Woodcock	12,000								Unknown	
Snipe	5,000								Unknown	

*Last Sharp-tailed Grouse observed on dancing ground in Blair Field in April, 1969.

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 Necedah Months of September 1 to December 31, 1970

(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.
Ruffed Grouse	23,000								2,200	Production fair to good; some nesting mortality in low-lying areas.
Sharp-tailed Grouse	10,000								5 - 15	Three visual sightings; assume population decreasing
Wild Turkey	30,000								150 - 200	130 visual sightings. Populatic up due to easy winter.
Woodcock	12,000								Unknown	Flight this fall appeared small for this location.
Snipe	5,000								Unknown	Apparently up somewhat at this location. A few flocks of 20 - 50 and 5 caught in duck trap.
Bobwhite Quail	5,000								10 - 25	Remnant population; static

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

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

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Necedah Calendar Year 1970

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	35,000 acres of timber, brush, and marsh.	350	290									1300	900	

Remarks:

Reported by Grady E. Hocutt

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 <u>each species</u> 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 NR-4
(June 1945)

SMALL MAMMALS

Refuge Necedah Year ending April 30, 1970

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) Total Population
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
Mink				5				70-1	1	1				50
								9975	1	1				
Muskrat				628				70-1	78	78	78			300
								9974	135	135	135			
								9975	101	101	101			
Raccoon				18	110			70-1	12	0			110	100
								9975	6	0				
Skunk					2									50
Fox					3								3	15
Coyote					3								3	15
Beaver				72				70-1	4	0				50
								70-2	23	0				
								70-3	25	0				
								70-4	20	0				
Opossum														25
Otter														60

* List removals by Predator Animal Hunter

REMARKS:

Reported by David J. Brown

INSTRUCTIONS

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

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

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

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

32715

Form NR-5

DISEASE

1616

Refuge Necedah Year 194 70

Botulism Nothing to Report

Period of outbreak None

Period of heaviest losses

Losses:

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

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

Areas affected (location and approximate acreage)

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

Condition of vegetation and invertebrate life

Remarks

Lead Poisoning or other Disease

Kind of disease None

Species affected

Number Affected Species	Actual Count	Estimated

Number Recovered

Number lost

Source of infection

Water conditions

Food conditions

Remarks

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

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Necedah County Juneau 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
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Field Corn					43	3,000 bu	43	Rye	10
Buckwheat					51	800 bu	51	Alfalfa	52
								Grass mixture, bluegrass, red-top, timothy, legumes	120
								Fallow Ag. Land	0

No. of Permittees: Agricultural Operations 0 Haying Operations 2 Grazing Operations 1

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alfalfa	33.1	52	$82.70	1. Cattle	12	24	$5.00*	145
				2. Other	Apiary	20 hives	2.00	
				1. Total Refuge Acreage Under Cultivation				314
Hay - Wild	0			2. Acreage Cultivated as Service Operation				314

*Forfeiture of $5.00 down payment

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.

INT.-DUP. SEC., WASH., D.C.91767

3-1570
NR-8a
(4/54)

REFUGE GRAIN REPORT

Refuge Necedah Months of January through December, 1970

(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
Corn (shelled)	100	200	300			200	200	100		100	
Corn (seed)		10	10		10		10				
Wheat, spring	20		20					20		20	
Buckwheat	40		40		40		40				
Rye	55		55					55	55		
Millet, Proso	2		2		2		2				
Millet, Red	20		20		10	3	13	7	7		
Millet, Japanese	14		14		14		14				
Sorghum	3		3					3	3		
Oats	10		10					10	10		
Alfalfa, Vernal	2		2					2	2		
Bluegrass	1		1					1	1		
Timothy	3		3					3	3		
Red Clover	3		3					3	3		

(8) Indicate shipping or collection points New Lisbon, 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.

INT.-DEP. SEC., WASH., D.C. 17065

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge NECEDAH Year 19~~5~~ 1970

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
Becker Forest Prod.*	68-10	S. 25 20-2	350	15.00 750.00 50.00	3.00 .50 .50	Reported 1969 NR	Clear cut	jack pine oak aspen
R. Slovensky	69-10	S.20 19-3	24	243.88	6.30	1,536.44	Remove mature jack pine	jack pine
Becker Forest Prod.	69-14	S.30 19-2 S.19 19-3 S.18 19-3	420	1,775.00	6.30	Reported 1969 NR	" "	jack pine
Becker Forest Prod.	70-1	S. 8 19-3	127	1,360.00 110.00	6.30 1.00	Reported 1969 NR	Clear cut	jack pine aspen
R. Kubisiak	70-3	S.15 18-3	40	200.00	6.30	1,260.00	Remove mature jack pine	jack pine
Becker Forest Prod.	70-5	S.10 19-3	40	83.64	6.00	501.84	" "	jack pine
O. Baumgart	70-7	S.20 19-3	23	118.80	6.30	784.44	" "	jack pine
L. Nowicki	70-8	S. 7 19-3	40	78.46	6.30	494.30	Thin plantation	red pine
Becker Forest Prod.	70-9	S. 9 19-3	160	402.00 157.50	6.00 1.00	2,412.00 157.50	Remove mature " "	jack pine aspen
L. Nowicki	70-10	S. 7 19-3	30	521.39	6.76	3,524.60	Thin plantation	red pine
Becker Forest Prod.	70-11	S.36 20-2	160	546.00 45.50 136.50	6.30 1.00 1.00	3,439.80 45.50 136.50	Clear cut " "	Red-White pine Oak aspen
J. Bolcerek	70-12	S.20 19-3	23	198.00	6.30	1,247.40	Remove mature	jack pine
L. Nowicki	70-14	S. 1 19-2	30	160.00	5.00	800.00	Cut all merchantable jack pine	jack pine
Becker Forest Prod.	70-15	S. 3 18-3	40	200.00	6.30	1,260.00	" "	jack pine
Becker Forest Prod.	70-16	S.29 19-3	35	350.00	6.30	2,205.00	" "	jack pine
L. Nowicki	70-17	S. 7 19-3	36	353.01	6.30	2,223.96	Remove designated trees	Red & jack pine

*Permit not completed as of 12/31/70

CONTINUED ON NEXT PAGE

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

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

Cords.....

Ties.....

.....

INT.-DUP. SEC., WASH., D.C. 36103

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge NECEDAH Year 1970

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
O. Baumgart*	70-18	S.20 19-3	23	200.00	6.30		Remove mature jack pine	jack pine
D. Ziebell*	70-19	S.31 20-3	150	220.00	5.60	1,232.00	Clear cut	jack pine
				210.00	.50	105.00	" "	oak
				30.00	.50	15.00	" "	aspen
D. Ziebell*	70-20	S.31 20-3	130	60.00	7.00	420.00	" "	jack pine
				500.00	.65	325.00	" "	oak
				85.00	.50	42.50	" "	aspen
M. Bertotto*	70-22	S.36 20-2	175	400.00	7.28	2,912.00	" "	jack pine
				310.00	2.78	861.80	" "	oak
				410.00	2.05	820.50	" "	aspen
D. Nowicki*	71-1	S. 3 18-3	183	1,616.00	9.75		Remove mature jack pine	jack pine
Becker Forest Prod.	71-3	S. 1 19-2	30	120.00	1.00	120.00	Clear cut	oak
Becker Forest Prod.*	71-5	S.30 19-3	135	180.00	1.00	180.00	" "	oak
L. Bloczynski*	71-6	S.1&2 19-2	170	625.00	9.27		clear cut	jack pine
M. Bertotto*	71-7	S.21 19-3	25	125.00	9.25		Remove mature jack pine	jack pine

*Permits not completed as of 12/31/70

Total acreage cut over 2,599 Total income $28,889.58

No. of units removed B. F. Method of slash disposal lopped 18" - 24"
Cords 6,444.18
Ties

INT.-DUP. SEC., WASH., D.C. 36103

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Necedah

Proposal Number: 70-2

Reporting Year: 1970

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)
6-3-70	Quackgrass (Agropyron repens)	Canfield, Iron-top West Yellow agricultural fields	40	Atrazine 80%	120 lbs	3 lb/acre	Water 32 gal/ acre	Boom Sprayer

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

Good results and corn crop increased. Some problem with sedge coming in on corn ground. Plan to use only 2 lb/acre Atrazine and 1 gal/acre crop oil next year.

35500

Refuge permanent staff. Back row (l to r) Forester Al Johnson, Mechanic Bob Arrowsmith, Manager Jerry Updike; front row Maintenanceman Harry Carter, Clerk Vern Rudolph and Assistant Manager Gene Hocutt.
December 70-7-16 Updike

Temporary laborers Marv Jones and Larry Knickelbein worked most of the summer with chain-saws in areas being reverted to grassland. September 70-6-1 Updike

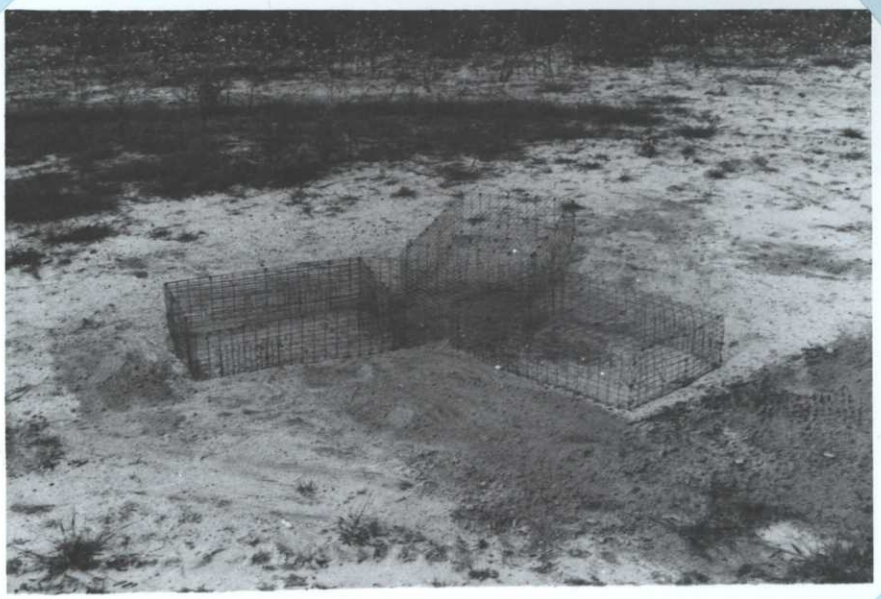
Visitor information shelter constructed near the observation tower. Auto and walking trails begin in this vicinity of Rynearson 1 Pool.
September 70-6-11 Updike

Manager Brown testing Ranger all-terrain-vehicle which has been helpful in summer and winter. Roll bars and seat belts have since been added.
February 70-1-21 Rudolph

Refuge trees "going through the mill" for lumber and spillway boards. Cost of the finished product, including local mill work, was $55 per 1,000 feet.
Above March 70-1-7 Brown
Below March 70-1-8 Brown

Over 6,400 cords of pulpwood were taken off the refuge to local paper mills. One of the larger operators is shown here loading up. March 70-1-4 Johnson

Assistant Manager Hocutt sacking some of the 208 mourning doves he caught and banded. Millet was the preferred bait. August 70-4-18 Updike



Small dove traps combined to make three-compartmented trap with central feeding area. Trap edges served as a lead, separate feeding area saved on bait and birds in holding compartments helped decoy others. August 70-4-20 Updike

Larger version of the previous trap. These three compartments caught and held over 350 wood ducks in one evening with corn still left in the feeding area. An even larger version of this trap may work for geese. September 70-4-9 Updike

Low dike constructed east end of Sprague Pool to isolate damaged water control structure 29. Dike will allow more diversity with water management in the Sprague Pool.
October 70-6-21 Updike

Wild fire area west of Rynearson 2 Pool. Only quick detection prevented a fire of major proportions. Burning peat took several days to extinguish.
August 70-3-21 Updike

Gravel hauling by contractor on three miles of refuge road east of Rynearson 1 Pool. Three miles of township roads within the refuge were also graveled by Kingston and Cutler Townships. June 70-2-12 Johnson

Tractor Operator Paul Woggon replacing worn-out planks on bridge just north of headquarters. September 70-4-2 Updike

Last known sharp-tailed grouse dancing ground at the Blair Unit. Little bluestem grass in foreground with photo-observation blind in center of photo.
October 70-5-3 Updike

Clerk Rudolph rotary mowing brush in Blair Unit. Opening of 160 acres will be maintained by prescribed burning. The John Deere 3020 tractor is new and protective guards were constructed here. October 70-5-8 Updike

D-7 with rolling chopper in action. Trees not taken by commercial operators are knocked down before the area is burned. December 70-7-0 Updike

Foreground is part of prairie restoration area which will be burned in August to remove slash and discourage resprouting. Periodic burns will be needed to maintain the 6,000 acres of reverted grassland. December 70-7-2 Updike

Personnel from the U. S. Forest Service Lake States Experiment Station inspect study area which was burned in April. Burning to improve wildlife habitat is being studied here. Fire encouraged aspen sprouting and increased grass vigor. October 70-4-12 Updike

Thinning in 35 year old red pine plantation. Dead, scarred and diseased, as well as some healthy trees, were removed to improve the tree stand and encourage forest floor vegetation. May 70-1-5 Johnson

Wild turkeys were a fairly common sight near farm fields. An excellent hatch was noted in 1970 but a hard 1970-71 winter may greatly reduce turkey numbers. Fall population was 200. October 70-5-14 Updike

Ruffed grouse were very common along refuge roads. Grouse numbers were the highest in several years in central Wisconsin. December 70-7-14 Updike

Burning to remove slash, control woody vegetation and encourage grasses. Forester Johnson checks backfire of Carpenter Unit burn northwest of Rynearson 2 Pool. Backfiring took all day. 8/20/70 Slide 1703 Wilbrecht

Fire whirls from Carpenter Unit burn on August 21. This burn turned into a near fire storm which sounded like a train and sent tornado funnels high into the air.
8/21/70 Slide 1708 Carter

Intense convection column rising from the burn. About ten of these hot fire whirls occurred. Approximately 200 cold ash dust devils moved from the fire edge into the woods. 8/21/70 Slide 1710 Carter

Aftermath of a hot burn. Grasses and forbs will show up next spring and future burns will consume remaining wood. 8/28/70 Slide 1715 Updike

Areas burned in August provide fall goose browse. Jack pine in background were killed by slow moving prescribed burn of August 14. 10/12/70 Slide 1716 Updike

The final product. Canada geese, greater sandhill cranes and snow geese utilizing a restored prairie area. Foreground was a forest a few years ago.
10/18/70 Slide 1717 Updike

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

WATERFOWL

REFUGE Necedah Refuge

MONTHS OF Sept. 1 TO Dec. 31, 19 70

(1) Species	Weeks of reporting period (2)									
	1	2	3	4	5	6	7	8	9	10
	9/1-5	9/6-12	9/13-19	9/20-26	9/27-10/3	10/4-10	10/11-17	10/18-24	10/25-31	11/1-7
Swans:										
Whistling							1			
Trumpeter										
Geese:										
Canada	265	325	500	950	5,760	7,010	7,900	8,350	9,000	4,475
Cackling					40		100	150		25
Brant										
White-fronted										
Snow				10		10		200	300	50
Blue						20		300	700	50
Other										
Ducks:										
Mallard	1,060	1,455	2,350	1,180	1,325	5,520	6,400	5,350	6,600	2,900
Black	140	130	165	110	80	395	620	470	450	400
Gadwall				15	45	65	285	155	75	50
Baldpate	520	1,465	1,135	3,155	4,835	4,715	4,700	2,550	1,620	1,700
Pintail	15			100	40	145	500	500	500	470
Green-winged teal	205	425	315	915	440	1,280	540	500	300	90
Blue-winged teal	1,055	990	785	360	170	220	60	50	65	10
Cinnamon teal										
Shoveler				15		15	10	15	25	
Wood	135	65	435	240	300	120	40	40	65	50
Redhead							115	40	120	
Ring-necked	15	50	15	15	600	1,755	3,200	3,600	3,600	80
Canvasback							20	15	75	
Scaup			20		45	300	500	135	70	160
Goldeneye										
Bufflehead								40		
Ruddy						5	10			
Other Hooded Merganser				10	200		140	175	230	210
		75	455	2,800	4,650	5,950	3,800	5,505	4,700	270

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Necedah Refuge MONTHS OF September 1 TO December 31, 19 70

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
	11/8-14	to 11/21	11/28	12/5	12/12	12/19	12/26	12/31			
Swans:											
Whistling	160	30							1,337		
Trumpeter											
Geese:											
Canada	2,500	1,500	9,000						395,015		
Cackling									2,405		
Brant											
White-fronted											
Snow	50								4,340		
Blue	50								7,840		
Other											
Ducks:											
Mallard	1,700	150							249,810		
Black	170	15							21,735		
Gadwall	15								4,935		
Baldpate	40								184,005		
Pintail									15,930		
Green-winged teal									34,660		
Blue-winged teal									24,245		
Cinnamon teal											
Shoveler									560		
Wood									10,160		
Redhead									1,925		
Ring-necked									90,480		
Canvasback									910		
Scaup									8,610		
Goldeneye											
Bufflehead									280		
Ruddy									105		
Other Hooded Merganser	230								8,375		
~~Coots~~ Common merganser	185	150							2,345		
COOT									197,435		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	1,337	160	
Geese	409,600	10,000	
Ducks	657,660	17,500	
Coots	197,435	5,950	

SUMMARY

Principal feeding areas Rynearson Pool No. 1; Rynearson Pool No. 2; Sprague Pool; flooded agricultural unit

Principal nesting areas

Reported by Grady E. Nocutt

Grady E. Nocutt, 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).

Interior Duplicating Section, Washington, D. C.
1953

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Necedah Months of Sept. 1 to December 31 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Sandhill Crane	Summer	Resident	400	10/18	5	11/21				
Great Blue Heron	"	"	120	mid-Aug	2	mid-Nov.				
American Egret	21	early Aug	90	mid-Sept	5	late-Sept				
Black-crowned Night Heron	1	mid-Aug	4	early Sept	4	early Sept				
Green Heron	Summer	Resident	Fairly common through September							
American Bittern	"	"	20-25	late Aug	1	late Oct.				
Common Loon	"	"	5	11/12	5	11/12				
Pied-billed Grebe	"	"	100	late Sept	3	late Oct				
Sora Rail	"	"	occasional in Sept		-	mid-Oct.				
Virginia Rail	"	"	"	"		"				
Cattle Egret	1	11/1	1	11/1	1	11/1 (New addition to bird list of this refuge)				
II. Shorebirds, Gulls and Terns:										
Killdeer	Summer	Resident	Common into October							
Greater Yellowlegs	"	"	"	"						
Lesser Yellowlegs	"	"	"	"						
Least Sandpiper	"	"	"	"						
Pectoral Sandpiper	"	"	"	"						
Stilt Sandpiper	1	8/29	3	9/5						
Spotted Sandpiper	Summer	Resident	Common into October							
Solitary Sandpiper	"	"	"	September						
Common Tern	"	"	"	October						
Black Tern	"	"	"	"						
Herring Gull	1	mid-Oct	Undetermined							
Upland Plover	Summer	Resident	Common into September							

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	Summer	Resident	600	late Aug	25	12/16				
White-winged dove										
IV. Predaceous Birds:										
Golden eagle	Occasional		9	10/26	3	11/6				
Duck hawk										
Horned owl	year-round resident		common							
Magpie										
Raven										
Crow	year-round resident		common							
Bald Eagle	2	9/11	17	10/27	1	12/14				
Osprey	1	7/9	2	7/24	1	11/2				
Red-tailed Hawk	Summer	Resident	common		1	mid-Dec				
Rough-legged Hawk	2	mid-Oct	5	mid-Nov	1	"				
Marsh Hawk	Summer	Resident	30-40	mid-Oct	2	early-Dec				
Cooper's Hawk	"	"	2	late Oct						
Barred Owl	"	"	common							
Short-eared Owl	1	late Oct	4	early Nov						
Snowy Owl	1	11/10	2	12/14	Still present					

Reported by Grady E. Hocutt

Grady E. Hocutt, Ass't. Refuge Mgr.

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 Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Necedah Months of September 1 to December 31, 1970

(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.
Ruffed Grouse	23,000								2,200	Production fair to good; some nesting mortality in low-lying areas.
Sharp-tailed Grouse	10,000								5 - 15	Three visual sightings; assume population decreasing
Wild Turkey	30,000								150 - 200	130 visual sightings. Populatic up due to easy winter.
Woodcock	12,000								Unknown	Flight this fall appeared small for this location.
Snipe	5,000								Unknown	Apparently up somewhat at this location. A few flocks of 20 - 50 and 5 caught in duck trap.
Bobwhite Quail	5,000								10 - 25	Remnant population; static

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

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

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Necedah Calendar Year 1970

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	35,000 acres of timber, brush, and marsh.	350	290									1300	900	

Remarks:

Reported by Grady E. Hocutt

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 <u>each species</u> 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.

Form NR-5 DISEASE 1616

Refuge Necedah Year 194 70

Botulism Nothing to Report

Period of outbreak None

Period of heaviest losses

Losses:

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

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

Areas affected (location and approximate acreage)

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

Condition of vegetation and invertebrate life

Remarks

Lead Poisoning or other Disease

Kind of disease None

Species affected

Number Affected

Species	Actual Count	Estimated

Number Recovered

Number lost

Source of infection

Water conditions

Food conditions

Remarks

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

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Necedah County Juneau 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
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Field Corn					43	3,000 bu	43	Rye	10
Buckwheat					51	800 bu	51	Alfalfa	52
								Grass mixture, bluegrass, red-top, timothy, legumes	120
								Fallow Ag. Land	0

No. of Permittees: Agricultural Operations 0 Haying Operations 2 Grazing Operations 1

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alfalfa	33.1	52	$82.70	1. Cattle	12	24	$5.00*	145
				2. Other	Apiary	20 hives	2.00	
				1. Total Refuge Acreage Under Cultivation				314
Hay - Wild	0			2. Acreage Cultivated as Service Operation				314

*Forfeiture of $5.00 down payment

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.

INT.-DUP. SEC., WASH., D.C.91767

3-1570
NR-8a
(4/54)

REFUGE GRAIN REPORT

Refuge Necedah Months of January through December, 1970

(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
Corn (shelled)	100	200	300			200	200	100		100	
Corn (seed)		10	10		10		10				
Wheat, spring	20		20					20		20	
Buckwheat	40		40		40		40				
Rye	55		55					55	55		
Millet, Proso	2		2		2		2				
Millet, Red	20		20		10	3	13	7	7		
Millet, Japanese	14		14		14		14				
Sorghum	3		3					3	3		
Oats	10		10					10	10		
Alfalfa, Vernal	2		2					2	2		
Bluegrass	1		1					1	1		
Timothy	3		3					3	3		
Red Clover	3		3					3	3		

(8) Indicate shipping or collection points New Lisbon, 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.

INT.-DEP. SEC., WASH., D.C. 17065

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge NECEDAH Year 19~~70~~ 1970

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
Becker Forest Prod.*	68-10	S. 25 20-2	350	15.00 750.00 50.00	3.00 .50 .50	Reported 1969 NR	Clear cut	jack pine oak aspen
R. Slovensky	69-10	S.20 19-3	24	243.88	6.30	1,536.44	Remove mature jack pine	jack pine
Becker Forest Prod.	69-14	S.30 19-2 S.19 19-3 S.18 19-3	420	1,775.00	6.30	Reported 1969 NR	" "	jack pine
Becker Forest Prod.	70-1	S. 8 19-3	127	1,360.00 110.00	6.30 1.00	Reported 1969 NR	Clear cut	jack pine aspen
R. Kubisiak	70-3	S.15 18-3	40	200.00	6.30	1,260.00	Remove mature jack pine	jack pine
Becker Forest Prod.	70-5	S.10 19-3	40	83.64	6.00	501.84	" "	jack pine
O. Baumgart	70-7	S.20 19-3	23	118.80	6.30	784.44	" "	jack pine
L. Nowicki	70-8	S. 7 19-3	40	78.46	6.30	494.30	Thin plantation	red pine
Becker Forest Prod.	70-9	S. 9 19-3	160	402.00 157.50	6.00 1.00	2,412.00 157.50	Remove mature " "	jack pine aspen
L. Nowicki	70-10	S. 7 19-3	30	521.39	6.76	3,524.60	Thin plantation	red pine
Becker Forest Prod.	70-11	S.36 20-2	160	546.00 45.50 136.50	6.30 1.00 1.00	3,439.80 45.50 136.50	Clear cut " "	Red-White pine Oak aspen
J. Bolcerek	70-12	S.20 19-3	23	198.00	6.30	1,247.40	Remove mature	jack pine
L. Nowicki	70-14	S. 1 19-2	30	160.00	5.00	800.00	Cut all merchantable jack pine	jack pine
Becker Forest Prod.	70-15	S. 3 18-3	40	200.00	6.30	1,260.00	" "	jack pine
Becker Forest Prod.	70-16	S.29 19-3	35	350.00	6.30	2,205.00	" "	jack pine
L. Nowicki	70-17	S. 7 19-3	36	353.01	6.30	2,223.96	Remove designated trees	Red & jack pine

*Permit not completed as of 12/31/70

CONTINUED ON NEXT PAGE

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

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

Cords.....

Ties.....

.....

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge NECEDAH Year 19~~6~~70

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
O. Baumgart*	70-18	S.20 19-3	23	200.00	6.30		Remove mature jack pine	jack pine
D. Ziebell*	70-19	S.31 20-3	150	220.00	5.60	1,232.00	Clear cut	jack pine
				210.00	.50	105.00	" "	oak
				30.00	.50	15.00	" "	aspen
D. Ziebell*	70-20	S.31 20-3	130	60.00	7.00	420.00	" "	jack pine
				500.00	.65	325.00	" "	oak
				85.00	.50	42.50	" "	aspen
M. Bertotto*	70-22	S.36 20-2	175	400.00	7.28	2,912.00	" "	jack pine
				310.00	2.78	861.80	" "	oak
				410.00	2.05	820.50	" "	aspen
D. Nowicki*	71-1	S. 3 18-3	183	1,616.00	9.75		Remove mature jack pine	jack pine
Becker Forest Prod.	71-3	S. 1 19-2	30	120.00	1.00	120.00	Clear cut	oak
Becker Forest Prod.*	71-5	S.30 19-3	135	180.00	1.00	180.00	" "	oak
L. Bloczynski*	71-6	S.1&2 19-2	170	625.00	9.27		clear cut	jack pine
M. Bertotto*	71-7	S.21 19-3	25	125.00	9.25		Remove mature jack pine	jack pine

*Permits not completed as of 12/31/70

Total acreage cut over 2,599 Total income $28,889.58

No. of units removed B. F. Method of slash disposal lopped 18" - 24"
Cords 6,444.18
Ties

INT.-DUP. SEC., WASH., D.C. 36103

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge	Proposal Number	Reporting Year
Necedah	70-2	1970

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)
6-3-70	Quackgrass (Agropyron repens)	Canfield, Iron-top West Yellow agricultural fields	40	Atrazine 80%	120 lbs	3 lb/acre	Water 32 gal/ acre	Boom Sprayer

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

Good results and corn crop increased. Some problem with sedge coming in on corn ground. Plan to use only 2 lb/acre Atrazine and 1 gal/acre crop oil next year.

35500