

**Annual Report: July 1, 1937  
thru June 30, 1938**

UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF BIOLOGICAL SURVEY

ANNUAL REPORT

WAUBAY MIGRATORY WATERFOWL REFUGE

For the fiscal year July 1, 1937 to June 30, 1938 incl.

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Wildlife:

The migration of waterfowl during the fall of 1937 on this refuge was in direct contrast to the migration of the fall of 1936. In 1936, the numbers of water birds with the exception of Franklin gulls and coots, were small. Hunters were able to kill few ducks due not so much to the lack of birds as to the facts that few potholes contained water and grain fields had failed to produce. This lack of food and water caused water birds to concentrate on larger bodies of water where they were comparatively safe from the hunter.

In the fall of 1937 many ducks were shot in this country because potholes were filled and cornfields contained ample food. This abundance of food and water was conducive to the scattering of water birds over a wider area and also induced the birds to remain longer in this territory. In fact, many mallards remained on this refuge, feeding in cornfields until long after the hunting season had closed.

Aside from ducks, other birds showing a marked increase in the fall of 1937 over the fall of 1936 were Canada geese, avocets, lesser yellow-legs, marbled godwits, Franklin gulls, ring-billed gulls, black terns and Forster's terns.

The gadwal was the duck most often seen in hunters bags with pintail, shoveler, mallard, baldpate and green-winged teal occurring in the order named. Blue-winged teal for the most part had started their migration southward before the hunting season began here.

Thirty-odd Canada geese were donated to this refuge by Mr. Jack Rommel. These geese were placed in a pasture prepared for them and were useful during the migrations by attracting many Canada geese to our refuge. Snow and blue geese also visited the refuge this spring in large numbers. Often large numbers of geese were on the refuge. Accurate estimates were impossible due to the constant turnover, as some groups were leaving and others coming in. Most flocks remained for only one day but one flock of about five hundred snow and blue geese remained on the refuge for more than four weeks and became quite tame.

Large flocks of pintails and mallards stopped in this section

during spring migration for rest and food. Often corn fields were alive with them and competent observers maintained that we had larger numbers of ducks and geese in this country than had occurred since 1923.

Shortly after the opening of the hunting season, a concentration of ducks occurred on this refuge. The maximum number was estimated at one hundred thousand. This number was arrived at by counting the number of ducks on a given area of water and multiplying this number by the total number of units. This method is only an estimate but it is felt that the total estimate was conservative. In addition to large numbers of ducks, it was gratifying to see that redheads, canvasbacks and ruddies made up a large share of our increase over previous years.

The first ducks to arrive during spring migration were pintails with mallards a close second. Goldeneyes were third and their numbers observed, showed a very decided increase over last year. During the winter of 1936-37, twenty-one log nesting boxes were placed in trees for the goldeneyes. Three of these boxes were used by goldeneyes during 1937 and during the past spring, seven broods of these ducklings were hatched in these man made hollow trees. Many of these nest boxes were used by squirrels, screech owls and long-eared owls as brood boxes. Because of this appropriation by owls and squirrels an increase in the numbers of these boxes is planned for the coming nesting season. The goldeneye nests early and by July 1, most broods were well grown.

Conditions during the 1938 nesting season were excellent and with the exception of crow damage, very little nest predation occurred. Of the nesting ducks, pintails led the list with blue-wing teal, shovelers, mallards, gadwals, baldpates, ruddies, redheads, canvasbacks and goldeneyes nesting in the order named. Green-winged teal evidently nest north of this refuge.

During the spring migration two hundred odd whistling swans stopped on Spring and Hillebrand lakes. These birds were quite tame and remained for over three weeks. Their principal food while here appeared to be a small specie of snail and fresh water isopods.

The ring-necked pheasant is abundant on the refuge and has shown a remarkable "come back" after the severe losses during the spring of 1937. The 1937 nesting season was unfavorable for pheasants but conditions during 1938 were excellent. Pheasants nested early this past spring and most broods were large. Food and cover conditions for pheasants during the past winter were excellent. Vegetative growth was heavy and plenty of food was available. Ample precipitation this spring during April, May and June has resulted in ample growth of food and cover plants to care for our pheasants during the coming winter.

The population of European partridges on this refuge has shown a slight decrease over last year due perhaps to this birds dislike to excessive vegetative growth. Some European partridges migrated onto the refuge during the winter from surrounding pasture lands but in the spring most birds returned to the more open cover off the refuge.

The prairie chicken is not uncommon on our refuge but their numbers are not large but careful inquiry and observation reveals that these birds on the refuge are about the only remaining ones in this vicinity.

Sharp-tailed grouse are common on this refuge during the winter but with the coming of spring they migrate north and west.

The following list includes all birds observed on or near the refuge during the past year.

Snow Bunting	Oven-bird	Long-eared Owl
Chestnut-collared Longspur	Black-poll Warbler	Screech Owl
Lapland Longspur	Myrtle Warbler	Blue Jay
Dakota Song Sparrow	Yellow Warbler	Wood Pewee
Swamp Sparrow	Tennessee Warbler	Olive-sided Flycatcher
Lincoln's Sparrow	Black & White Warbler	Black-billed Cuckoo
White-throated Sparrow	Warbling Vireo	Mourning Dove
Gambel's Sparrow	Red-eyed Vireo	Black Tern
Harris's Sparrow	Starling	Forster's Tern
Field Sparrow	White-rumped Shrike	Franklin's Gull
Clay-colored Sparrow	Northern Shrike	Ring-billed Gull
Chipping Sparrow	American Pipit	Herring Gull
Tree Sparrow	Ruby-crowned Kinglet	Northern Phalarope
Slate-colored Junco	Bluebird	Wilson's Phalarope
Lark Sparrow	Willow Thrush	Avocet
Vesper Sparrow	Gray-checked Thrush	Hudsonian Godwit
Nelson's Sparrow	Olive-backed Thrush	Marbled Godwit
Grasshopper Sparrow	Hermit Thrush	Ruddy Turnstone
Savannah Sparrow	Robin	Semipalmated Sandpiper
Lark Bunting	Brown Trasher	Stilt Sandpiper
Arctic Towhee	Catbird	Dowitcher
Goldfinch	Short-billed Marsh Wren	Red-backed Sandpiper
Common Redpoll	Prairie Marsh Wren	Least Sandpiper
Dickcissel	House Wren	Baird's Sandpiper
Rose-breasted Gosbeak	Crow	White-rumped Sandpiper
Cowbird	Purple Martin	Pectoral Sandpiper
Bronzed Grackle	Cliff Swallow	Lesser Yellow-legs
Brewer's Blackbird	Barn Swallow	Western Willet
Rusty Blackbird	Bank Swallow	Spotted Sandpiper
Baltimore Oriole	Tree Swallow	Upland Plover
Orchard Oriole	Horned Lark	Killdeer
Redwing Blackbird	Least Flycatcher	Semipalmated Plover
Yellow-headed Blackbird	Alder Flycatcher	American Coot
Western Meadowlark	Arkansas Kingbird	Sora Rail
Bobolink	Eastern Kingbird	Virginia Rail
English Sparrow	Red-headed Woodpecker	Sandhill Crane
American Redstart	Northern Flicker	Ring-necked Pheasant
Mourning Warbler	Sennett's Nighthawk	Hungarian Partridge
Yellow-breasted Chat	Short-eared Owl	Prairie Chicken
Northern Yellow-throat	Burrowing Owl	Sparrow Hawk
Grinnell's Water-Thrush	Horned Owl	Duck Hawk

Prairie Falcon	Canvasback	White-bronced Goose
Marsh Hawk	Ring-necked Duck	Hutchin's Goose
Golden Eagle	R <sup>d</sup> head	Canada Goose
Ferruginous Rough-leg	Wood Duck	Whistling Swan
American Rough-leg	Shoveller	American Bittern
Swainson's Hawk	Blue-winged Teal	B. C. Night Heron
Red-tailed Hawk	Green-winged Teal	Great Blue Heron
Sharp-shinned Hawk	Pintail	Cormorant
Cooper's Hawk	Baldpate	Loon
Hooded Merganser	Gadwall	White Pelican
Ruddy Duck	Black Duck	Pied-billed Grebe
Buffle-head	Mallard	Eared Grebe
Goldeneye	Blue Goose	Hobell's Grebe
Lesser Scaup Duck	Lesser Snow Goose	

The mammals on this refuge include ground squirrels (three species) fox squirrels, gray squirrels, white-footed mice (two sub-species), prairie jumping mice, meadow mice (two sub-species), pocket mice (two species), woodchuck, grasshopper mice, jackrabbits, cottontails, raccoons, coyotes, badgers, mink, weasels, skunks and white-tailed deer.

Fully ninety percent of the rabbits and meadow mice on this refuge died during the winter of 1936-37 but now cottontails and meadow mice are quite common and jackrabbits show a very great increase.

Badgers, skunks and raccoons are rare due in part to former extensive trapping. Weasels and mink are common but apparently confine most of their predation to rodents. Coyotes are common but evidently effect birds very little. Stomach examinations show that rabbits make up the major portion of their food.

Reptiles are rare on this refuge. Painted tortoises are common in our lakes but no snappers are found. The only snake seen on the refuge in almost two years observation is the common garter snake and their numbers are small. The only lizard found here is the skink.

Frogs and toads are quite common especially so this past spring. The tiger salamander is very abundant in our lakes and axolotal larvae of this salamander occurs in Spring Lake. Stickleback fish occur in Spring Lake and this fish, the salamander and frogs furnish much food for terns, pelicans, night herons and other water birds.

#### Use Made Of Refuge:

Seven of the twenty one nest boxes placed for goldeneye duck in trees near lakes were used by these ducks. Grey squirrels, fox squirrels, long-eared owls and screech owls also used these boxes for their broods.

Nesting islands in Spring Lake were used by a few common and Forster's terns. Spotted sandpipers and killdeer also nested on these islands. Many spotted sandpipers and killdeer nested on Spring Lake

Dikes No. 1 and 2. These birds laid their eggs in the spaces between the riprap.

Ring-necked pheasants used the shelters prepared for them to a great extent. Shocks of barley and corn fodder were placed in front of the shelters and plenty of gravel was placed under the shelter proper, thus combining in one spot food shelter and grit. It is interesting to note that at least one hen pheasant nested near each of our shelters. A few prairie chickens and sharp-tailed grouse took advantage of the food placed at shelters. Squirrels, rabbits and several species of song birds also used these shelters and food placed for them. With song birds this use of shelters was particularly noticeable during spring migration when storms occurred. Brush piled in the woods also served as shelters for birds during the winter and during spring storms.

Our recreational area was used extensively. Rarely a day passes without several groups picnicing there. One week ends this area is crowded often as high as one hundred cars are parked there. The public is very enthusiastic about our recreational area and about our refuge as a whole. An accurate estimate of the number of man days recreation furnished would be out of the question with the data which we have but a conservative estimate would place the number between ten and fifteen thousand.

#### Plantings:

Our corn, millet, barley and cane yielded very well in 1937 and ample grain was raised for seed and winter feeding of upland game. Much grain was fed to ducks and geese during the spring migration and since much barley and some corn was left unharvested, many ducks especially mallards and pintail fed in these fields.

Twenty acres of rye was planted in the fall of 1937. This grain has done very well but was little used this spring by waterfowl. Twenty acres of barley, thirty acres of millet, eighteen acres of corn and three acres of speltz were planted in the spring of 1938. These plantings have done very well but it is believed that grasshoppers will eat the heads from most small grain. The grain itself is rarely eaten by the hoppers and will remain as food for upland game and waterfowl.

Three hundred pounds of wild rice seed was properly planted in various bodies of water on this refuge but only a very little grew and that little gives no indication that it will seed. It seems quite evident that it is futile to plant wild rice here.

Approximately two thousand feet of double rows of round stem rush were planted experimentally. This planting is growing well and plantings should be enlarged since this rush is much used as nesting cover for certain ducks and waterbirds. This rush is also valuable for cover for coots, ruddies and many other birds.

Eighteen large evergreen trees and shrubs were planted in the

landscaping of refuge headquarters. Sixteen thousand five hundred hackberry and ash seedlings were planted in out-over areas on this refuge. The hackberry and ash seedlings were collected on the refuge. One hundred seven ornamental shrubs were collected on this refuge or donated by interested refuge neighbors and planted at refuge headquarters or in the recreational area.

Seven thousand pine, cedar and spruce trees secured from the Forest Service were planted in our small experimental nursery. These trees are doing fair.

#### Preditor Control:

Coyotes were often seen on the refuge during the summer of 1937 but none were killed until December because they were evidently doing little harm and at that time their pelts would have value. After the lakes were frozen it was a simple matter to drive the animals out on the ice where they were easily shot. Six coyotes were killed in this manner on the refuge.

Nine weasel, one mink and one skunk were trapped during the winter to keep these predators under control.

Early in May crows were observed eating duck eggs and were ruining many clutches of eggs. It was decided that the crows should be eliminated or they would greatly reduce our duck production. These birds were hunted and forty seven adults and forty seven nestlings were killed and fifty six eggs were broken. With the elimination of these crows, predation on ducks eggs was practically stopped since we have few skunks and very few, if any, bullsnakes. Even while our crow campaign was on these birds ate the eggs of three Canada geese nesting on the refuge. Farmers near the refuge also reported crows eating turkey eggs.

#### Refuge Improvements:

The spillway at Spring Lake Dike No. 2 was completed and the service trails over Dike No. 1 and No. 2 were finished. These dikes or dams are so constructed that little maintenance cost is expected. The control gate in Dike No. 2 has been strengthened and wings of concrete built to prevent trouble from ice jams.

All nesting islands built during 1937 have been reconditioned and adequately rip-rapped. Many small nesting islands of straw and weeds were constructed for the geese. The geese did not use them but they were used by black terns and black-crowned night herons.

An easement project diversion ditch into Hillebrand Lake was completed except fencing the ditch and removing some clay from the embankments. This ditch, under normal conditions will greatly raise the water level of Hillebrand Lake, increase the water area and be conducive

to the growth of the better aquatic duck food plants.

An irrigation or sprinkler system was completed for the refuge headquarters. Water is pumped from Spring Lake Dike No. 2. This system has proven very satisfactory and the water used for irrigation has been tested and found good.

The drive at headquarters and the two courts have been graveled and riprapped. The rip-rap has been criticised as excessive but under actual practice has proven satisfactory and greatly reduces maintenance costs.

The refuge office was completed. Also one file cabinet, one gun cabinet, one office desk and three office chairs were made from native oak.

The inside of the service building and the inside of the machine shed were painted. The cabin~~g~~ basement was painted and also the trim on cabin and service building.

Seven old farm buildings were torn down and the usable lumber salvaged.

The rail fence at the recreational area was completed and a combination stone and log shelter was built. Many picnic tables were made for our picnic area and for transfer to other refuges.

Two hundred rods of snow fences were constructed and those built last year, repaired.

Seven miles of fire and service trails were constructed and all existing fire lines conditioned by plowing and discing.

Approximately forty thousand fence posts were cut. Only dead timber was cut and this work as well as furnishing excellent oak posts has greatly improved our woods. Many logs were cut for manufacture of lumber, signs and picnic tables. Over fifty refuge signs were made for this and for other refuges.

As a whole refuge improvement has gone forward very well. Accomplishments were not hindered to a great extent by weather conditions.

#### Scientific Progress:

The study of the relationship between coyotes and upland game birds in winter, started in 1936 was continued during the past winter and findings were such that conclusions arrived at as a result of the 1936 work were strengthened. No absolute evidence that coyotes kill upland birds was uncovered although coyotes may do some harm by molesting and



flushing ring-necked pheasants during severe weather.

#### Law Enforcement:

No violations of our refuge occurred during the past year. Few game law violations occur in this country although located in the lake region. Excellent State game law enforcement as well as the help given by US Game Management Agent, Leo Childers, has reduced game law violations here to a minimum.

Public sentiment here also is very much in favor of our refuge and this fact was no doubt one of the factors in producing our lack of violations.

#### Water Conditions:

Water levels on all of the larger lakes in this section of South Dakota are above or equal those of this time last year. Frequent showers and many good rains have kept water levels practically constant and it is evident that reduction in wind velocity during this spring and summer has reduced the rate of evaporation.

On the refuge proper Hillebrand Lake on June 30 had three inches more water than it had one year ago. Spring Lake Dikes No. 1 and 2 have a water level maintained by spring flow. Spring Lake proper is slightly lower than it was last year but the difference is slight. Waubay Lake is now up to the high water mark of last year and Picherel Lake is almost ready to over flow. When this over flow occurs, Waubay Lake will receive, in addition to its own watershed, that of Pikerel Lake. If normal precipitation occurs during the next year all refuge lakes would have a decided raise in water levels.

Potholes contain less water than a year ago due no doubt, to the great decrease in run off from melting snow. During the winter of 1936-37, over seventy three inches of snow fell while less than half that amount was recorded during the winter of 1937-38. This lack of water in potholes has not and in this community, will not result in losses of young ducks due to late summer dry ups as very few young ducks are found on the smaller potholes and the larger ones contain plenty of water to last through the summer.

#### Other Information:

The Waubay Refuge has proven itself an excellent producer of ducks as well as furnishing food and rest for many thousands of migrating birds.

Early settlers and Indians say that this lake region of South Dakota formerly was teeming with waterfowl, even the word "Waubay" is said to mean in the Indian tongue, "where the ducks nest and rear their young".

That this region was a happy hunting ground for the redman is still quite evident. Burial mounds dot the landscape in the vicinity of the lakes and several such burial mounds are on our refuge. Artifacts, such as stone hammers and axes are often found here and in the woods surrounding a forest pothole, the site of an old Indian village is quite evident by mounds, holes in the ground and by the heaped up circles of earth where the lodges were located.

The site of Day County's first postoffice is also located on our refuge. It is felt that this site should be properly marked so that the information may not be lost.

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