FISH SPRINGS NWR - NARRATIVE REPORT
1968

NARRATIVE REPORT

Fish Springs National Wildlife Refuge
Dugway, Utah

January - December
1968

PERSONNEL

Robert G. Yoder	Refuge Manager (transferred 12/68)
Larry A. Dunkeson	Assistant Refuge Manager
Anthony Alderete	Summer Assistant
John Cesspooch	Summer Assistant
Robert Christensen	Summer Assistant
Bruce Larsen	Clerk-typist (EOD 5/68)
Jim Layland	Maintenanceman, intermittant
Gail Parker	Maintenanceman, intermittant
Kelly Parker	Maintenanceman, (terminated 2/68)
Katherine Parker	Clerk-typist (terminated 4/68)
Charles Timm	Farm Laborer, intermittant
Irl Timm	Farm Laborer, intermittant

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

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I. GENERAL

A. Weather Conditions

Less precipitation was recorded this year than last although the total, 7.51 inches, was still above normal (fig. 1). Total evaporation at the refuge weather station was 57.90 inches. Making the adjustment of .70 for the difference in evaporation in the pan and on the open marsh we see that 40.53 inches was actually lost.

Temperatures averaged lower in all months but May (table 1). Although the high temperature, 103 degrees, was two degrees higher than the high temperature last year. The year ended with above average snowfall and very cold temperatures made worse by wind. Wind is common here, 35,121 miles passed the weather station during 1968.

B. Habitat Conditions

1. Water: Water elevations in Avocet, Curlew, Mallard and Shoveler Pools remained at satisfactory levels all year. All other pools held some water the entire year. In Gadwall and Harrison Pools the water levels were quite low by the end of August. With the approach of hunting season, all available water was channeled into Harrison Pool to give the birds a little more water where the hunters wouldn't be lurking. By hunting season, the pool was in good shape, and by the end of November, it was full.

Spring production is measured once a month to show the flow of our three major springs and numerous small springs and seeps. This year, for the first time, spring production was not erratic but flowed more like one would expect (fig. 2). In 1967, May was the second wettest month we had, but notice it was the lowest month for water production. This year the highest amount of precipatation fell in August but peak water production was in June and from there it went down hill. No correlation has ever been found between precipitation and spring production which lends credence to the idea that our water originates some distance away.

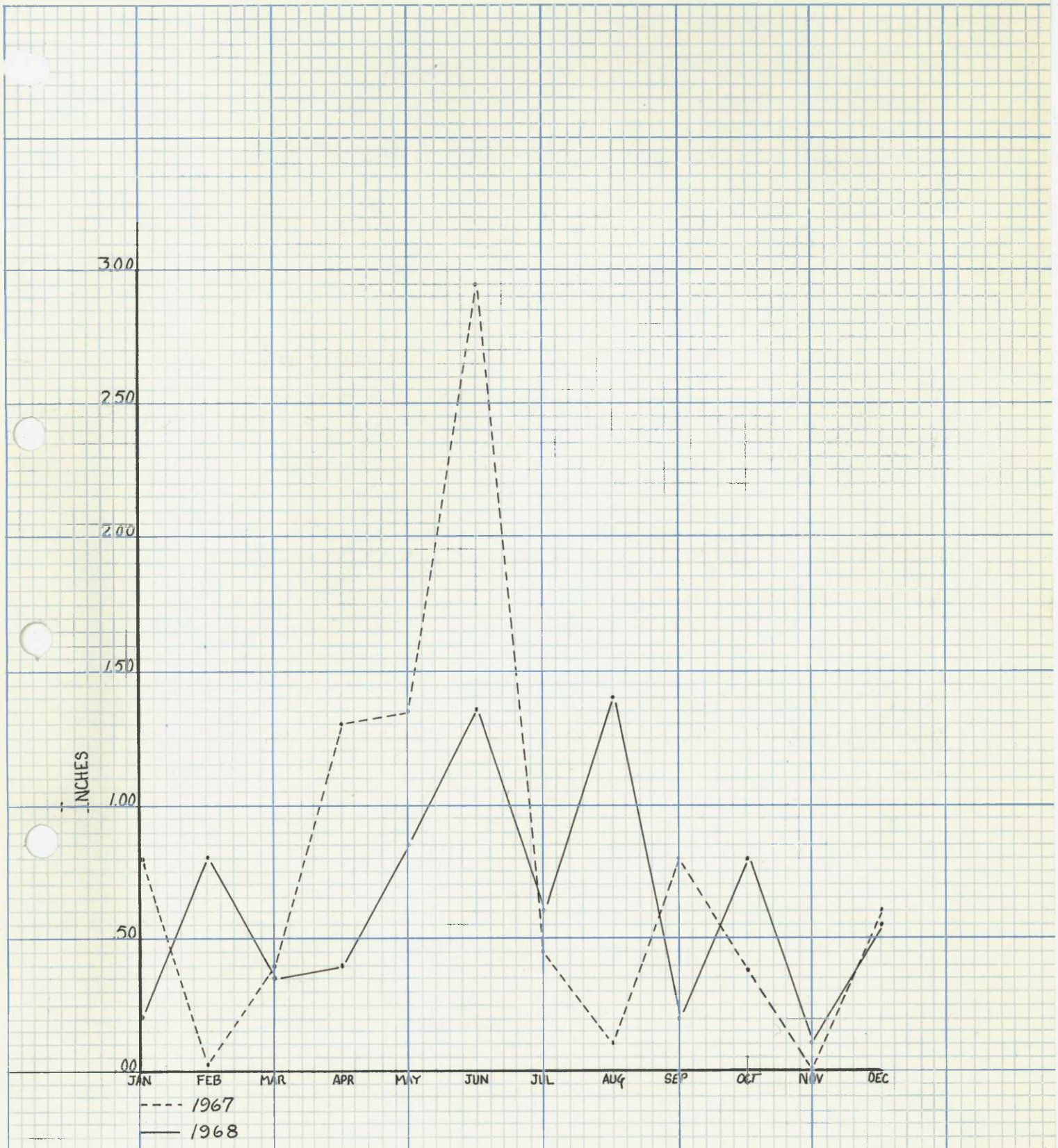


FIG 1 PRECIPITATION IN 1967 AND 1968

Month	Precipitation		Temperatures				Evaporation IN Inches
			Averages		Extremes		
	Ppt.	*Norm.	Max.	Min.	Max.	Min.	
Jan	0.21	0.53	35.9	13.0	48	-5	
Feb	0.78	0.52	50.3	30.6	63	20	
Mar	0.37	0.58	56.4	33.0	78	23	
Apr	0.38	0.72	57.6	35.5	76	24	5.10
May	0.85	0.70	72.1	46.6	91	29	5.71
Jun	1.36	0.54	82.6	59.9	103	40	9.95
Jul	0.58	0.36	94.3	65.6	102	47	13.68
Aug	1.42	0.53	85.5	56.9	97	42	9.36
Sep	0.18	0.44	78,0	50.3	93	31	9.12
Oct	0.78	0.41	66.1	38.5	77	21	4.98
Nov	0.07	0.53	54.0	28.3	69	18	
Dec	0.53	0.61	37.7	15.0	58	-2	
Totals	7.51	6.47					57.90

* The normal is from a sixteen year record kept by the Dugway Proving Ground metorological section. Precipitation at Dugway is generally higher than at Fish Springs.

Table 1. Precipitation, Temperature and Evaporation in 1968

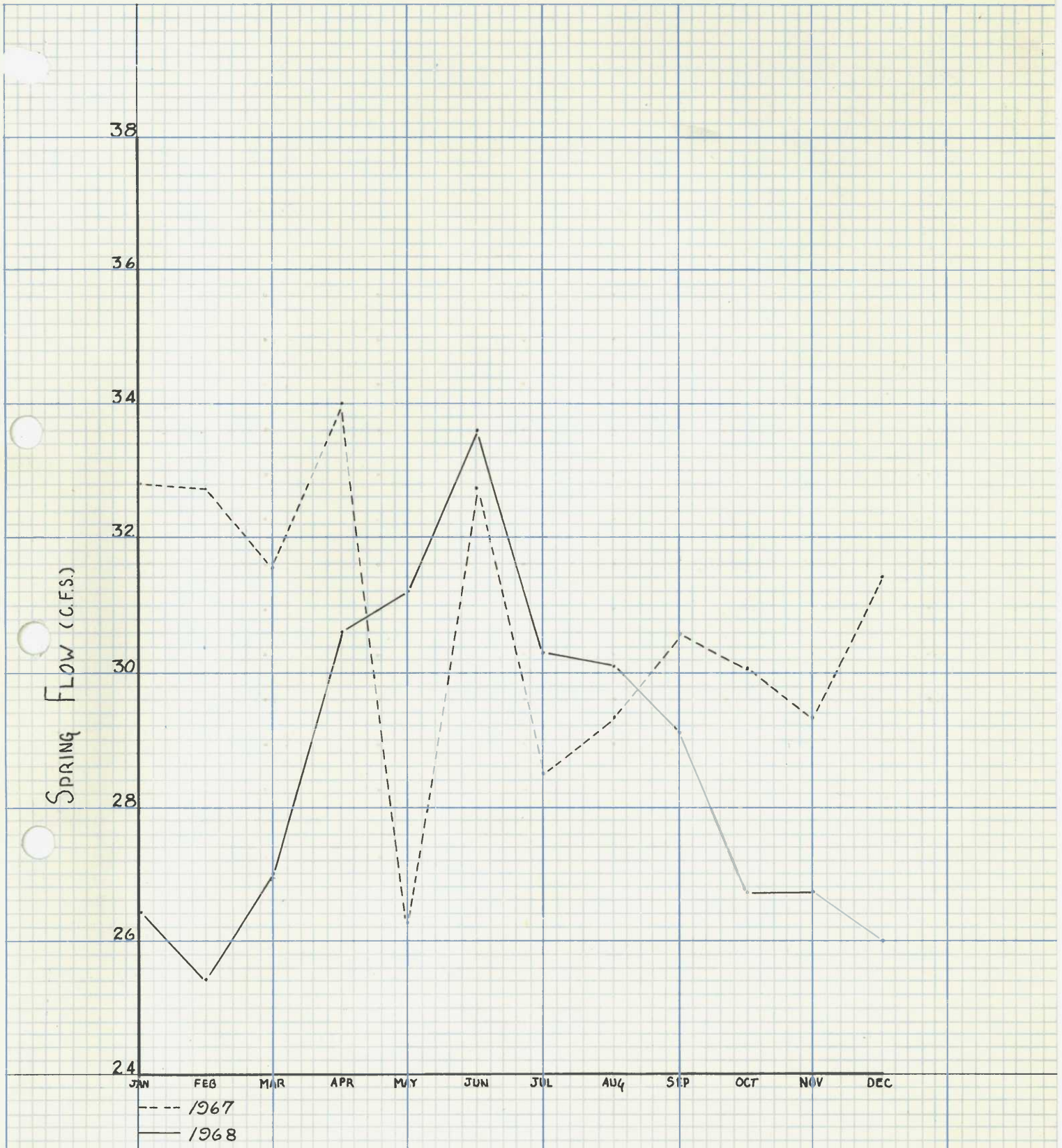


FIG 2 SPRING PRODUCTION IN 1967 AND 1968

Parshall flumes were installed at Percy, House, North, Mirror and Walter Springs. We are now able to get a more accurate spring production measurement than we could previously. In the past we were taking measurements at water control structures sometimes as far as one half mile from the springs.

2. Food and Cover

a) General. Ice covered the impoundments until February, although several ditches and sloughs stayed open as did the spring heads. All pools carried good water levels until July when the northernmost pools, which are farthest from the springs, began receeding. Consequently, adequate food and cover was available during the nesting and brooding period. During August and September pool levels dropped drastically. With the lowering of evaporation and transpiration in October pool levels began recovering. By mid December, ice covered all nine impoundments.

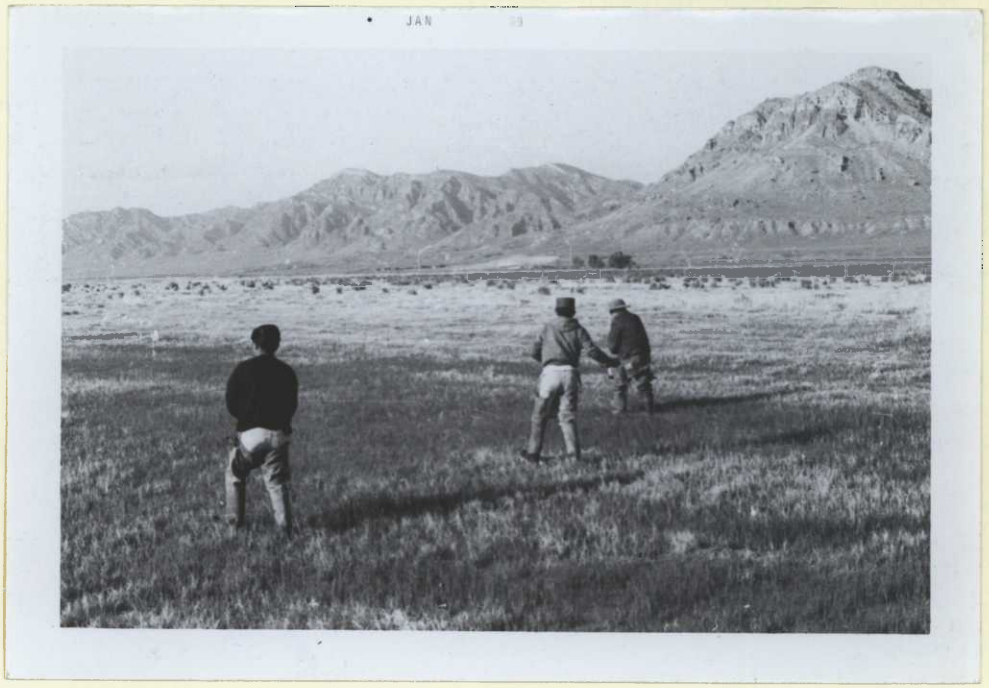
b) Widgeongrass. Widgeongrass is present in all nine pools as well as ditches and spring heads. The largest concentrations are found in water one to three feet deep with little or no current. Dehydration and excessive salinity in late summer definitly retard widgeongrass, although regrowth in spring and summer is good. This period thirty-five bushels of widgeongrass were collected and dispersed in Gadwall Pool in hopes that it would take root and begin growing there in larger beds.

c) Muskgrass. (Chara sp.) is usually found with Widgeongrass but is also dominated by it. Shoveler and Avocet pools contain the largest beds of this vegetation. Muskgrass, as well as Spiny Najad (Najas marina) is heavily used by coots during the late fall and early winter.

d) Bulrush. Alkali Bulrush (Scirpus paludosus) a native to the Fish Springs marsh, is spreading throughout the impoundments. Some dense, lush stands are developing along pool edges. During this period 1,040 bushels of Alkali Bulrush (Scirpus robusta) purchased in California, was hand broadcast on mudflat areas throughout the marsh (photos p. 6). The two species are very similar and will volunteer readily under the right conditions.

Olney's Bulrush (Scirpus olneyi) is present in several large areas on the marsh. One stand, in the southeast corner of Avocet Pool, is used extensively as nesting cover by Black-crowned Night Herons and Snowy Egrets (photos p. 7). The greatest part of the refuge muskrat population is also centered in this area.

Hardstem Bulrush (Scirpus acutus) is relatively scarce on the marsh. The only large stand is located in Ibis Pool. This period, approximately one mile of dike was planted with cuttings from the hardstem stand (photos p. 8). Previously planted areas in Avocet Pool have done very well and are providing excellent water and wind erosion control (photo p. 9).



Hand broadcasting Alkali Bulrush on shallow water areas.

Black-crowns are even uglier as young than adults. They don't smell much better either!

Snowy Egrets, although unsightly as young, become one of the most beautiful birds on the marsh.

Summer students planting Hardstem Bulrush cuttings along dike in Curlew Pool.

Hardstem Bulrush planted in 1964

e) Other plants. Other notable aquatic plants in most pools include: Juncos sp, Phragmites sp, Ceratophyllum sp, and Eleocharis sp. A few small stands of Typha sp can be found in Avocet Pool. This pool also has traces of Potamogeton sp, which has invaded this area from the collection and distribution ditches.

II. WILDLIFE

A. Migratory Birds

1. Swans: Only one swan was recorded on the refuge this year. This swan was first seen in January and is still here at this writing. When first seen it was assumed to be a Whistler. In July, during the swans molt, we captured it and to our surprise, it was a female Trumpeter (photos p. 11). We banded and released her and are keeping a close watch on her. This is the first Trumpeter recorded in Utah according to John Nagle, chief biologist with the Utah Fish & Game Department.

2. Geese: Total use days for Geese were up this year from 68,507 to 78,754. Only one White-front was seen after sighting five last year. Thirty-three Canada Goose broods were counted totaling 156 young. This is 86 more young than were seen last year.

3. Ducks:

a) General.

January - April. Total use days during this period amounted to 342,766. This is a decrease of 11,442 from 1967. The largest loss was in Mallard numbers which fell by 28,362 use days reflecting the need for the smaller bag limit this season. During this same period Pintails increased their use days to 31,539.

May - August. Use days were nearly double this year what they were in 1967. Then 366,900 use days were tallied compared with 688,428 in 1968. Thirty two more broods were seen this year totaling 202, but only 2,307 young were counted as compared to 2,520 last year.

September - December. As in previous years the peak population figures were recorded during this period. The high number recorded this year was 14,346, 1,036 more than the high for 1967. Use days, however, were down to 890,612. This is a decrease of 332,310 from 1967. In early December two snowstorms and a very hard freeze resulted in a drastic drop in waterfowl numbers (fig 4).

Female Trumpeter Swan captured during her molt. This bird has been on the refuge for over a year now.

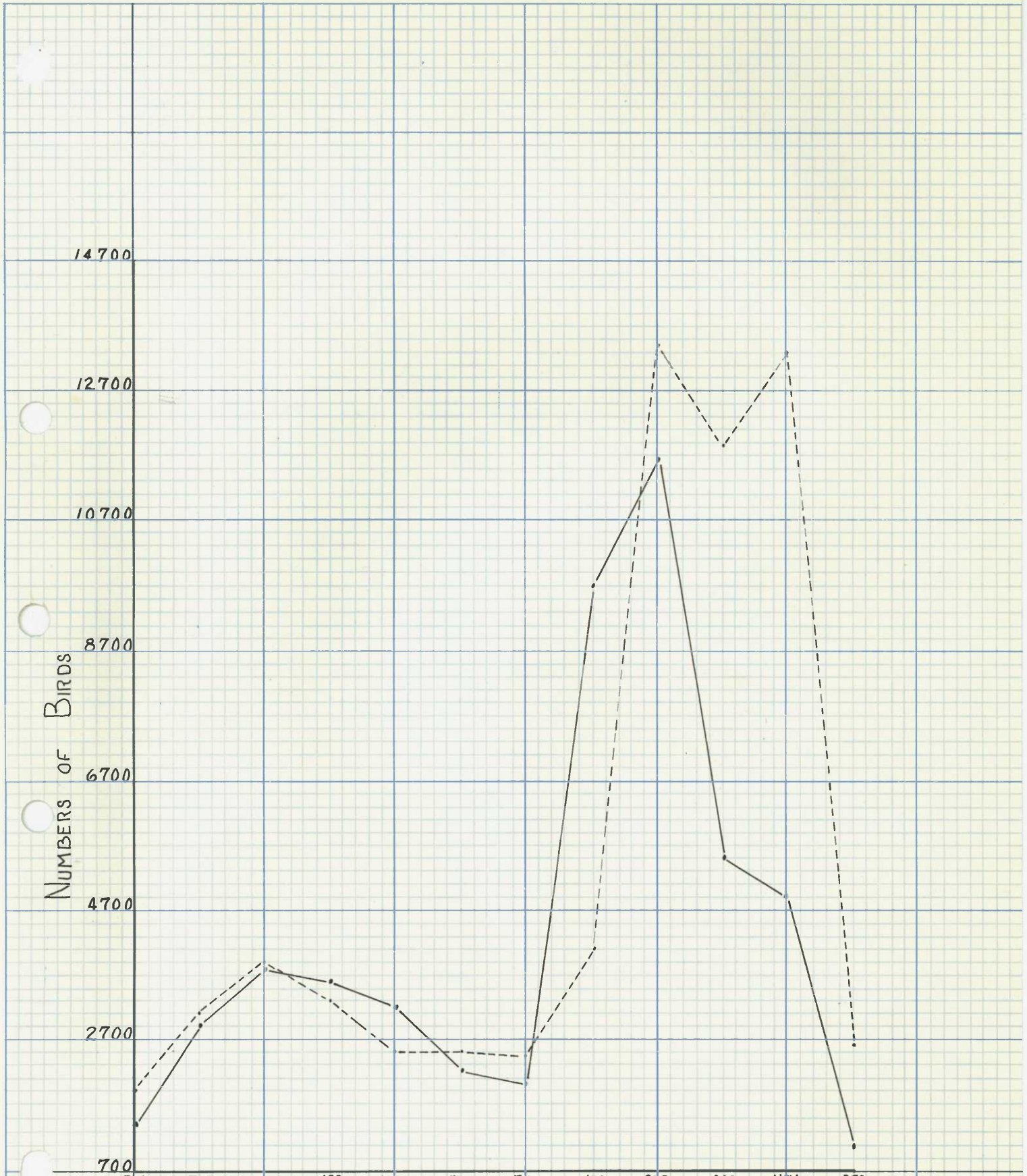


FIG. 4 DUCK POPULATIONS IN 1967 AND 1968

b) Individual Species

Mallard. Total use days this year were down to 186,745. This is a drop of 200,945 from 1967. Production was also down drastically, from 780 young last year to 150 this year.

Pintail. Use days for the Sprig increased this year by nearly 29,000 days to 609,536. Production increased by 85%.

American Widgeon. The Baldpate also showed an increase in use-days. They recorded 63,379, an ehormous increase of 368 days. You could say that one extra bird spent the year here!

Redhead. Use days for this species decreased only slightly this year, to 189,077. Production was very good with 1,250 young being sighted.

Teal. Green-wings accumulated 304,193 use days in 1968, a decrease of 50,000 from 1967. Cinnamon Teal increased their total by 53% to 355,704. Blue-winged Teal also increased their use days substantially. A 77% increase this year brought their total to 2,106.

Other Ducks. Total use days for Gadwall amounted to 96,298, an increase of 19,944 over 1967. Shoveler use days decreased from 40,510 in 1967 to 25,288 this year. Ruddys also decreased their use days, but by a much smaller number. Last year the Butterball totaled 51,452 use days, while in 1968 their total was 49,515. Use days for other species totaled 38,959 as compared to 23,760 in 1967.

In conclusion, the total use days for all ducks during the entire year was 1,921,806, a decrease of 22,224 from 1967.

American Coot. The Ivory-billed Teal managed to increase its use days by 197,149 this year to an all time high of 1,845,006. The high single count of these birds was 13,182. Compare this to the number of ducks that same day: 5,576!

4. Other Water Birds: Peak numbers of water and marsh birds were recorded, as could be expected, in midsummer. The most abundant species during the May to September period, in descending order of use days were: Snowy Egrets, Eared Grebes, Black-crowned Night Herons, Pied-billed Grebes, Great Blue Herons, White Pelicans, American Bitterns, Western Grebes, and the Common Loon. Nesting was observed in all species but the Pelicans, Loons and Great Blues. An estimated 250 Snowy Egrets and seventy-five Black-crowned Night Herons were raised on the refuge (photos p. 7).

5. Shorebirds, Gulls & Terns. These birds were also most numerous during the summer. The Black-necked Stilt, Wilson's Phalarope, California Gull and Foresters Tern posted the highest number of use days. The Long-billed Curlew, Snowy Plover and Common Snipe were observed less frequently. One lonesome, shivering Killdeer was seen in late December trying to wade in the solidified water.

Gulls increased their use days by 3000 this year. No nest predation was noted, however, this has become a problem in Northern Utah and bears watching here.

6. Doves and Pigeons. Only a few Mourning Doves were seen on the refuge this year and none were banded. One Band-tailed Pigeon was seen in October, along with several Domestic Pigeons in August and September.

B. Upland Game Birds

Our pheasant population seems to be doing well. Many of them can be seen near the grain bins in the early morning as well as on other parts of the refuge. From what we have seen it looks like our population is top heavy with cocks.

No other upland game birds were seen on the refuge.

C. Big Game Animals

Only three deer were seen on the refuge this year, but that is still more than last year! Two of these were observed several times eating the leaves off our Russian Olive trees. After they had eaten the leaves, they broke down the trees by rubbing their velvet on the branches.

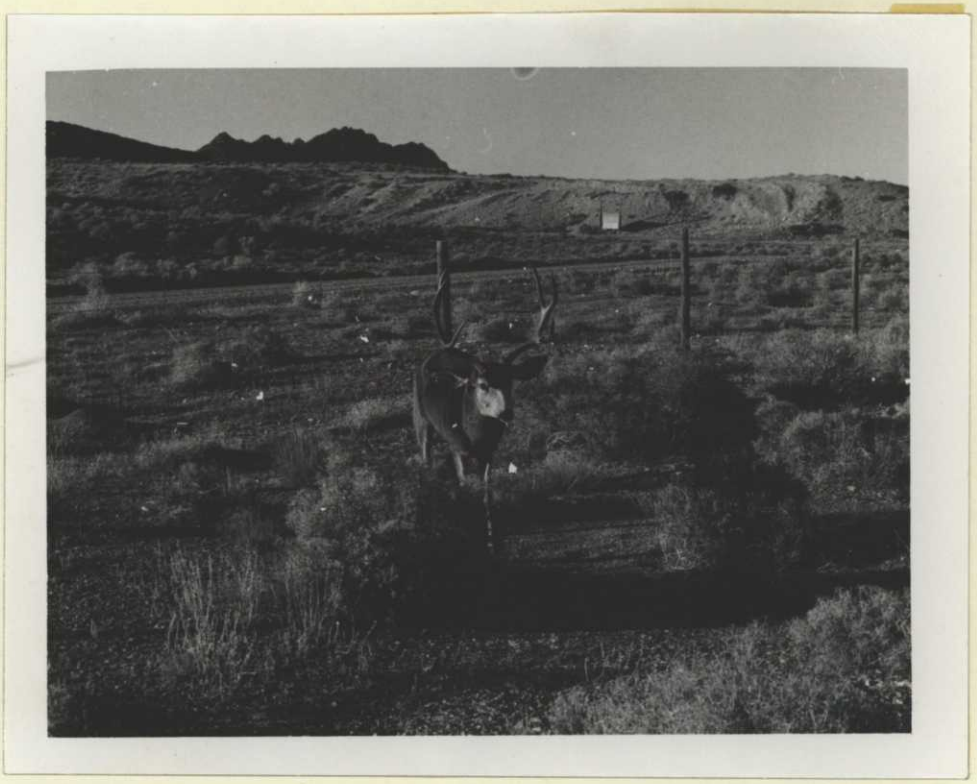
The third deer, a three point buck, was first seen early in the morning in the assistants back yard. Later that day, after being notified that the deer was down, we were able to approach to within fifteen feet of the animal and take pictures (p. 15). It was then we noticed he was frothing at the mouth. We "disposed of" the deer, took a blood sample, the brain, pieces from the heart, lung, liver, kidney, bladder, gut and hind-quarter muscle (photos p. 16). All of this was sent to Dugway to be checked for rabies, parasites and whatever else they could think of. As of this writing, no results have been received.

One antelope was also recorded, the first to be seen within the boundary for several years.

D. Fur Animals, Predators, Rodents and Other Mammals

Muskrats are plentiful and are seen frequently on the marsh. The present population is estimated to be around 7,000 animals. Each year a few new feeding houses are constructed and old ones are enlarged.

A number of coyotes were seen this year but their population is not thought to be high enough to pose a threat to the waterfowl. However, the jackrabbit numbers have risen markedly in the past year so a larger number of coyotes is possible in the future. Several Badgers, Spotted Skunks and numerous other small rodents have also been observed.



After seeing this nice buck fall several times, and noting the foam around his mouth, refuge personnel disposed of him. Notice the conspicuous rib cage suggesting malnutrition.

Assistant Manager Dunkeson took tissue samples from several of the internal organs.

Dugway Ecology and Epidemiology personnel taking blood sample.

E. Hawks, Eagles, Owls and Crows

Marsh Hawks are commonly seen all year. Two nests were found while walking transects this year (cover photo). Occasionally Rough-legged Hawks and Prarie and Peregrine Falcons are also recorded.

Golden Eagles are seen at times during the summer but are more common in the fall and winter.

One Short-eared Owl was found on a dike this year (photo p. 18). It passed on to the land of many mice shortly after being picked up.

Ravens are observed occasionally all year.

F. Other Birds

Nothing to report other than birds already listed.

G. Reptiles and Amphibians

During May, while searching an island for waterfowl nests, the manager and his wife (one of our best hands!) found a nest which had been robbed, but could find no signs of predatores. They then came face-to-face with a large Gopher Snake. Perhaps he was the culprit.

Some remnants of the frog farm colony are still seen around the spring heads and sloughs. One turtle, a Pond Slider (Pseudemys scripta) was found by the summer assistants. This is the first turtle ever found here and is also a variety commonly sold in pet stores. This leads us to believe that someone thought Fish Springs would make a good home and released him here.

H. Fish

The Desert Chub and Mosquito Fish are common in most inundated portions of the marsh. These fish are a primary source of food for the herons, egrets and mergansers.

I. Disease

None

LONG SEE

This ~~Short~~-eared Owl was found near death on a dike. No visible injuries were apparent.

III. Refuge Development & Maintenance

A. Physical Development

Approximately one mile of spoil bank along the main distribution ditch, and on the west side of Gadwall Pool was leveled for use as a secondary access road for ditch maintenance. A one-quarter mile section of spoil bank along a stub ditch into Harrison Pool was leveled and graveled. This road is now being used as an observation point during the waterfowl census and will also provide easier access for ditch maintenance. Four hundred yards of gravel fill was spread on refuge roads which were then bladed. Fifty yards of gravel had to be spread on roadsides and dikes where waves from high winds caused excessive erosion. Eight hundred yards of gravel fill was moved into the equipment storage yard and leveled. This provides out-of-sight parking and storage for our heavy equipment.

A Byer's Dragline, obtained through surplus, was refitted with cable and other assorted small parts (photo p. 20) and put to work cleaning our main collection ditch (photo p. 21). This machine has proven to be an invaluable addition to our refuge equipment. Because it has tracks, instead of rubber tires, it can be operated in boggy areas without getting stuck, (usually).

During the summer, when evapo-transpiration is at it's highest, our pool levels drop drastically. This is especially true in the four northernmost pools. With this in mind we decided to try pumping Middle Spring to see: (1) how hard could we pump the spring and still maintain maximum flow, (2) would pumping increase the flow, (3) what would the recovery rate be after pumping ceased, and (4) would pumping one spring affect the flow in other springs?

After draining off the head on the spring (photos p. 22) we attempted to build a jetty upon which a 10" and an 8" pump could be placed. Due to a soft bottom and underground seeps, our first efforts didn't produce the results we had hoped for (photos p. 23). However, with gnashing teeth and no little amount of grumbling, success was finally achieved and the pumps were set in place. As luck would have it, the contractor doing the pumping was plagued with equipment troubles and could only pump for a few hours at a time. We did find, however, that by keeping the head off of the spring we increased the flow by about two second feet without affecting the flow in any other springs.

At North Spring a 4' concrete culvert, around which we built a concrete and metal headgate, was installed, replacing a 10 inch culvert which had been there for several years. By placing this larger culvert at North Spring we gained two second feet of flow and the ability to regulate this water where we could not before. A Parshall Flume was then installed near the downstream end of the culvert.

Refitting Byers Dragline with new cable and other assorted small parts. The wide tracks on this machine are a great help in our marshy areas.

Our Byer's Dragline in operation. This machine is a great aid in ditch and canal maintenance.

Above: Middle spring before removing the head. Below: After lowering the water level. Two second feet were gained by removing the pressure exerted on the spring by several feet of water.

Above: Dirt is pushed against wooden structure to build a jetty on which to place pumps. Now if it will just hold .....

..... together!

Parshall Flumes were also installed at Percy, House and Mirror Springs. Crater Spring was ditched and is now producing more water.

Work was begun on cleaning the main collection ditch of silt and submergent vegetation which is choking off the flow of water. With the silt, a dike is being built along the west side of the ditch which will be leveled off and also used as a maintenance road. Water from South and Percy Springs will be impounded behind the dike forming a shallow pool which should stay open all winter and provide excellent habitat for wintering dabblers. Roughly one-half mile of ditch has been cleaned thus far and the impoundment, to be called Crescent Lake, is already being used by Mallards, Pintails and the ever present Ivory-billed Teal (Fulica americana).

Retaining walls of 2 x 12 rough lumber were constructed on most of the water control structures where vehicular traffic was knocking gravel onto the roof of the structures. Many times people driving around the refuge stop at these structures to look at the fish congregated there. Fearing that someone, for instance the refuge manager, would slip on the gravel and fall into the water these walls were constructed. As a final precaution, aluminum alloy safety strut was installed on several of the structures replacing the wood plank walkways. Metal, enameled numerals were then placed on posts at each structure matching the number in our record books.

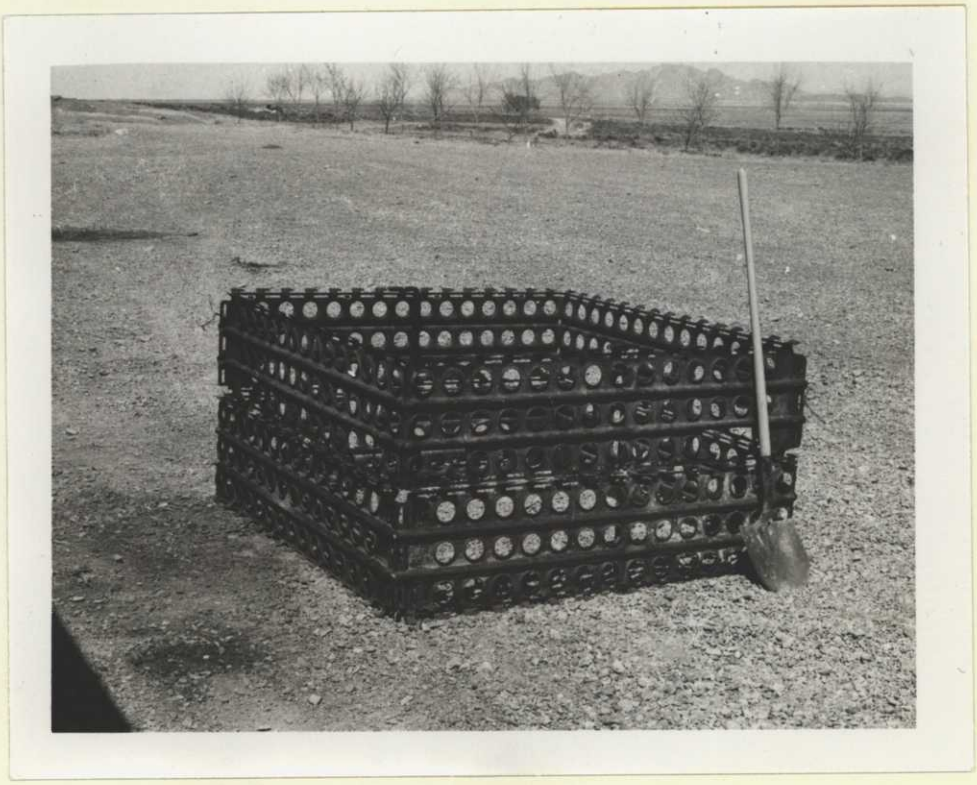
Four nesting islands were built from surplus perforated steel planking. With the willing help of the Dugway Boy Scouts (photos p. 25) these were placed in Curlew Pool, filled with baled hay and sodded with Salt Grass (Distichlis stricta). The islands were not out in time for nesting this year so no evaluation of their use can be made. A second niche we hope the islands fill is breaking up wave action against the dikes.

The captive goose pen, which was used to begin our present population of geese, was dismantled by the summer assistants. This structure had become an eye-sore since the captive flock was released, and yet we salvaged several rolls of wire, fence posts and gates which can be put to good use elsewhere.

Another dismantling job undertaken was the razing of a "home" which was built shortly after World War One (photo p. 26). This abode was the castle of Mr. James Harrison, one of the first pioneers in the Fish Springs Valley. Jim's wife and family lived here for many years while they tried their hand at farming and cattle ranching. He says that he can remember his children putting young Sandhill Cranes in the chicken coop just to see the chickens run!

Along with dismantling old structures we also excavated one. Fish Springs was once a stop on the Pony Express and Overland Stage Trails. Unfortunately the building which served as the local restaurant and inn was torn down and its walls used in dikes in other parts of the marsh. However the foundation is still intact, and has been unearthed and will serve as a point of interest on our self-guided auto tour (photo p. 27). Several old bottles, somehow overlooked by previous glasshounds, were found along the foundation.

Dugway Boy Scouts earned credit toward merit badges while helping construct artificial islands. Below: Perforated steel planking shaped into "L's" and fastened together to form the frame for the islands. This frame is filled with baled hay and sodded with salt grass.



This lovely structure once housed one of the first pioneers in the Fish Springs Valley. Because it was becoming an attractive nuisance it was removed.

This foundation is all that remains of a Pony Express Station once located near our present recreation area.

A cement floor was poured in the old hangar and a large sliding door was fabricated and installed. With the installation of a fuel oil furnace we now have a fine heavy equipment repair shop.

The refuge residences and other buildings received a much needed exterior painting during the summer. Our excess property storage area, or dump as it is called, was rearranged and cleaned up. Automatic oil feed valves were installed on the two new generators.

Maintenance of equipment included the following: road grader, scraper, D-6 and D-7 cats, and the front-end loaders. Vehicle work included routine and preventative maintenance as well as major repairs to the Bombardier Tractor and Jeeps.

B. Plantings.

1. Aquatic and Marsh Plants:

Eighteen hundred pounds of Alkali Bulrush (Scirpus robusta) was hand broadcast over mudflats and other shallow water areas in all nine pools (photo p. 6). Results of these plantings won't be seen until next spring but hopefully we will get good germination and growth as this is an excellent food plant, and one which will grow in our alkaline soil and water.

2. Trees and Shrubs

None

3. Upland Herbaceous Plants

In an effort to find a waterfowl food plant, besides Alkali Bulrush, which could be grown in our saline soil, an area on the western edge of Avocet Pool was leveled, tilled, divided into panels and planted with the following seed: Alfalfa, Perennial Rye, Barley, Reeds Canary Grass, Yellow-blossomed Sweet Clover, CB 5982 Clover, Crested Wheat Grass, Tall Wheat Grass, Alta Fescue, Pasture Grass Mix and Russian Wild Rye. The salt grass did very well. The clovers all came up but really didn't show much promise. Perhaps now that the soil has been leached for a growing season, tilling and planting again next season will produce better results. We will never get the ground any less saline that the spring water we irregate with (1420 micromhos/cm) however we can probably leach the soil for some time to come before we reach this point. In the soil lies the crux of our agricultural problems.

C. Collections and Receipts.

1. Seed and Other Propagules

Howard Johnson and the Mallard Express made two visits to Fish Springs during 1968. The first was in January when he delivered 42,000 lbs. of corn to be spread on the dikes while other waterfowl food lay under several inches of ice. His second trip was in November when he brought 742 bushels of milo.

2. Specimens

A word of commendation should be given to our clerk, Bruce Larsen. We didn't know when we hired him as a clerk that we were getting an accomplished taxidermist too. Bruce has put up several birds for the refuge as well as beginning a waterfowl wing collection. We all hope he keeps up the good work.

One new specimen, a Band-tailed Pigeon, was added to the refuge bird list this year.

D. Control of Vegetation

Salt Cedar (Tamarix pentandra) control was continued this year. After several years of control, mostly done by hand, this pest is a minor problem. Our summer assistants pulled or cut and treated 373 plants this year bringing the total number of plants destroyed since the refuge was begun to 20,199. We were given a word of warning by Jim Harrison though: "If you keep pullin them plants up them ducks ain't gonna have no shade and they're gonna get blisters on their backs".

E. Planned Burning

1. General

A twenty five acre area of Alkali Bulrush in Pintail Pool was opened up by burning. This stand of Bulrush has volunteered for several years but grows so thick that the birds work only along the perimeter unless areas are opened up (photos p. 30). Immediately after this area was opened up the ducks began using it much more extensively. This vegetation is growing in a very marshy area where it is impossible to run a mower of any kind. We are hoping however, that this water will freeze solid enough in the future to allow a rotory mower to cut the vegetation above the ice.

Seventeen miles of roadside and ditch banks were burned to control Smother weed (Bassis hyssopifolia). This weed grows in very dense stands along roads and ditches, a single plant sometimes being as large as four feet across and three feet high. After it dries out it blows into ditches, clogging them and adjacent water control structures.

F. Fires

One small accidental fire occured during the year. We aren't sure whether it was caused by a cigarette or a hot jeep manifold. It was in an area where dead salt grass was very heavily matted. All things considered, it probably did more good than harm.

Bulrush in Pintail Pool before being burned.

Same area during burning.
Some of the Bulrush was not destroyed and birds began using it immediately.

IV. RESOURCE MANAGEMENT

A. Grazing

No grazing permits are issued on the refuge. In the past, before the refuge was established, cattle ranching was tried on the marsh. This proved to be financially unwise because of the number of cattle lost to "Fish Springs muck" in the sloughs. Now and then an occasional sheep strays onto the refuge, but despite their adequate fertilizing of residence lawns they are soon back on the trail.

B. Haying

None

C. Fur Harvest

Again this year, muskrat pelts failed to pay their own way. Mr. James P. Harrison held the trapping permit for the 1968 season. Old Jim could be seen treading through the marsh nearly every day checking, setting and resetting his traps. For all of this work the 1352 pelts he trapped and sold earned $644.00, or $.48 per pelt.

We are curious to see what response we will get when the trapping permit is given out on a lottery basis. The low prices for pelts, distance to the refuge, poorly maintained roads, and absence of living accomodations are sure to affect response to the lottery.

D. Timber Removal

None

E. Commercial Fishing

None

F. Other Uses

Once again the courts have ruled against Mr. Joseph A. Shriber and the Domesticated Frog Farms Inc. The latest decision, a denial of Mr Shribers appeal, was handed down on July 12, 1968. He has since been given until January 15, 1969 to claim and remove the material he wishes. As of January 15 Mr. Shriber had not been seen on the refuge.

Mr. Stanley R. Mahoney, holder of the peat moss lease, visited the refuge only once during 1968. Absolutely no interest was shown in mining the peat during the year. On his single visit Mr. Mahoney removed his front-end loader which had been stored in our equipment yard. His statement that he would return in a month and go to work now seems to amount to what we see rising from our springs on a winter morning: hot air.

On December 5, 1967, two metaliferous mineral leases were awarded to Mr. John F. Powers of Salt Lake City on two sections of land within our boundaries. The state holds mineral rights on the refuge. Supposedly, Mr. Powers was to do some core drilling in hopes of finding rare earth metals such as lithium and strontium. Now, a year later, Mr. Powers is yet to make his first visit to the refuge.

V. FIELD INVESTIGATIONS AND APPLIED RESEARCH

A. Banding

The highlight of this years banding program was the capture of the previously mentioned Trumpeter Swan. She was captured with the use of the refuge airboat and a large, long-handled net (photos p. 11). Another exciting part of the banding program was the initiation of a neck collaring study on Canada Geese. We found that it is easier to capture these birds in the office than in the field!

We have always assumed that our Canada Goose flock stayed on the marsh year-round. Our census figures do not bear this out. During territory selection, nesting and brood rearing, goose numbers decreased (figure 3). Part of this is undoubtedly due to the birds hiding their nests during this time. However, we also feel that the immature and unpaired geese are possibly leaving the refuge. Perhaps this is due to harrassment by other birds defending their territory. The object of our study then is to find where these birds are going, if they are actually leaving the refuge.

Flightless birds of the year and moulting adults were captured during the day either by chasing them on foot or with the airboat and net. This proved to be a very slow method.

Adults were collard with a plain bright orange collar 2½ inches wide. Immature birds of the year were collared with the same collar including a ½ inch black horizontal stripe. In all, nineteen birds were collared.

All ducks were captured at night by using the airboat and equipping it with a small generator and lights. Most of the birds captured were flightless young. Bad weather and engine problems with the airboat hindered operations constantly. See table 2 for species breakdown.

Species	Number	Species	Number
Canvasback	4	Pintail	17
Cinn. Teal	4	Redhead	40
Gadwall	29	Ruddy	6
G.W. Teal	1	Shoveler	1
Mallard	13		

Table 2, Waterfowl Banded in 1968

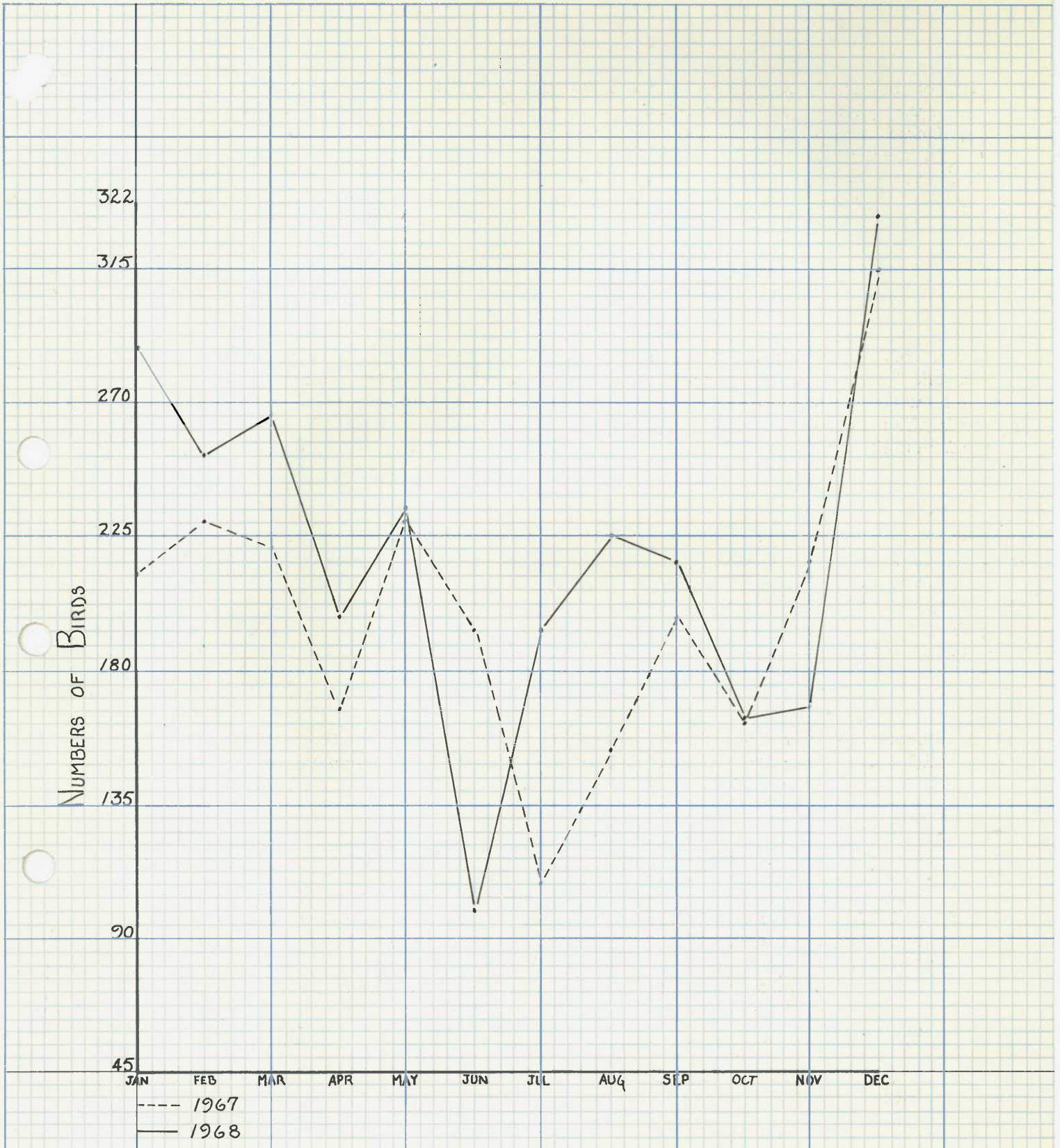


FIG 3 CANADA GOOSE POPULATIONS IN 1967 AND 1968

B. Studies

Mr. Donald McKnight, a graduate research assistant at Utah State University, completed his field work at Fish Springs on his Doctorate Degree. His project is titled "Factors Limiting Waterfowl Production on the Spring-fed Salt Marshes West of the Great Salt Lake, Utah." Two of the major objectives of his study are: (1) To assess the waterfowl productivity of a spring-fed salt water marsh and (2) To make ecological, chemical and physical measurements of possible factors limiting waterfowl production on spring-fed marshes.

Don is presently writing his thesis and compiling results so no final report can be given here. However his progress report for 1968 gave the following information: Mallards made up 27% of the breeding population, Redheads 27.5% and Cinnamon/Blue-wing Teal 26%. Breeding pair densities averaged 128 pairs per square mile while nesting density on his sample plots was 1.21 nests per acre. Sixty-three percent of 312 duck nests located during his study were successful. Duckling mortality for all species totaled only 16%. Don has promised us a copy of his thesis as soon as it is printed. The final results of his study will be given in next years narrative.

Last spring the University of Utah placed a sentinel flock of twenty-five chickens on the refuge. They were to be bled periodically and their blood tested for viruses which they may have been infected with by the local hoards of mosquitoes. Thus far they have been bled only three times and no results have yet been sent to us. Due to the construction of the pen, which allows the chickens in and out, the local hawks are eating well.

Another study from which we have results is carried on by Dugway's Ecology and Epizoology branch. Their work involves trapping mosquitoes, small mammals and reptiles on the refuge. The mosquitoes are tested for viruses, especially encephalitis. The mammals and reptiles are trapped and bled in hopes of finding, among other things, how these viruses are carried through the winter. The results sent to us recently show a 12% incidence of California Equine Encephalitis in one species of mosquito, Aedes dorsalis.

VI. PUBLIC RELATIONS

A. Recreational Uses

A total of 837 recreational and 71 official and economic visits were recorded during 1968. Hunters accounted for 364 of the recreational visits.

Three Boy Scout Troops totaling 85 scouts were given the grand tour during the year (photos p. 37). One school group also visited the refuge.

In addition to these activities numerous people stopped in to ask about the shortest way back to civilization. This years award for the most comical question must go to the little old man and woman (no tennis shoes) who stopped one afternoon and asked "Where is the nearest restaurant?"

B. Refuge Visitors

January		
3	Bob Tasker & Dean Spakman, Utah Fish and Game	official
February		
21	Lowell Decker, B.L.M.	official
March		
1	Fred Pomel Wildlife Services	official
April		
19	Bob Tasker & Kendall Nelson Utah Fish & Game	official
19	Ron Klogsdale, B.L.M.	official
23	Ecology & Epizoology Team	official
June		
19	Ecology & Epizoology Team	official
19	Col. Watts, Dugway Commandant Col. Bolt, Post Chaplin	courtesy
27	R. Cox, Utah Highway Dept.	courtesy

August			
12	Kendal Nelson Utah Game and Fish	official
22	Henry Edgar, Regional Hydrologist, Albuquerque	official
30	Lt. Harper, Lt. Hauser Ecology and Epizoology	official
September			
18	W.M. Nelson, Corps of Engineers	official
24	Harold Chase, U.S.G.S.	official
October			
6	Charles Dewitt, Dugway Radio Shop	official
25	Fred Pomel Wildlife Services	official
28	Ecology and Epizoology Team	official
November			
18	Howard Johnson and the "Mallard Express"	official
20	Dave Kimbrell, Division of Realty, Albuquerque	official
December			
14	Major Charles James & Family Major Richard Goring & Family Dugway	courtesy
15	Mr. & Mrs. Dennis Pack KUED TV, Salt Lake City	official

C. Refuge Participation

In January and October the refuge staff presented slide-talks to the Dugway Rod and Gun Club. During February we journeyed to Callao, Utah, and showed movies. In August we returned to Callao where we entered a display in the annual West Desert Fair.

Three Boy Scout Troops took advantage of the refuge campgrounds this year. While here they were given help with merit badge requirements by refuge personnel. Above: Refuge Manager Yoder is shown making final plans with the scoutmaster.

D. Hunting

Hunter success was up this year. The 364 wildfowlers who came out took home an average of 2.03 birds each trip. However for various reasons they each lost .37 birds. Mallards provided 31% of the bag and Pintails 35%. It is also interesting to note that Redheads and Gadwalls made up 71% of the young hatched, but only 10% of the total bag.

Many of our hunters return several times each season. And, not surprisingly, the bulk of them are from Dugway Proving Grounds. This year Dugway provided 44% of the shooters. Salt Lake City, 140 miles north of the refuge, accounted for another 26%.

E. Violations

None reported

F. Safety

Safety meetings were held several times during the year. No lost time accidents occurred, and the number of consecutive man days without an accident stood at 7,004 on December 31, 1968.

VII. OTHER ITEMS

A. Items of Interest

Bob Yoder, manager at Fish Springs since 1964, left for a more populated area in early December. He and his wife Joyce moved to Princeton, Minnesota, where Bob took the reins at Sherburne National Wildlife Refuge.

Bob is responsible for a goose who thinks he is a people. During an evening drive on the refuge Bob and Joyce stopped to yield the right-of-way to a family of Canadas. Noticing that one of the goslings was having a hard time swimming away from the dike Bob braved the ire of a protective gander and made a daring rescue at sea. And so Esoog (Goose backwards!), who was hatched with a malformed neck, became a family pet (photos p. 39). Esoog is now residing at Bear River....in shallow water we hope!

B. Photographs

A selection of photographs taken during the year is scattered throughout the narrative to increase interest.

C. N.R. Forms

Appended

Esoog even had his own private pool although it was quite shallow. Because of the down-turn of his neck he had a hard time keeping his face dry while swimming.

Speaking of pictures! The primaries sticking out from Esoog's right wing were evidently used for balance.

This nestfull of young "cans" was a pleasant surprise. We have seen Canvasback broods in the past but this is the first nest found.

This year, for the first time, Fish Springs attracted some pre-season dog trainers.

Meet Bruce, the office mascot. One day, while chasing his lunch, he crawled into the radio transformer, turned on and dropped out!

Prepared By Terry A. Nusbaum
Assistant Refuge Manager

Submitted By Donald L. Perry
Refuge Manager

February 28, 1969

Reviewed By JW Schmidt 3-15-69

JB

K

3-175[illegible]
Form [illegible]
(Rev. March 1953)

WATERFOWL

REFUGE Fish Springs N.W.R. MONTHS OF Jan TO May, 19 68

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	1	1	1	1	1	1	1	1	1	1
Trumpeter										
Geese:										
Canada	294	287	282	273	264	255	245	250	255	260
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other coot	1352	1040	726	665	604	543	482	867	1252	1637
Ducks:										
Mallard	708	528	347	446	545	646	745	762	779	796
Black										
Gadwall	126	138	150	125	100	75	50	46	40	36
Baldpate	19	10	0	10	21	32	43	52	61	70
Pintail	449	205	76	236	396	556	716	920	1124	1328
Green-winged teal	61	38	15	343	671	999	1327	1114	901	688
Blue-winged teal	6	5	4	8	11	13	17	91	165	239
Cinnamon teal	23	12	1	4	7	10	13	12	11	10
Shoveler										
Wood										
Redhead	1	2	3	3	4	4	5	92	179	266
Ring-necked	4	5	6					7	14	21
Canvasback				1	2	4	6	11	16	21
Scaup	15	9	5	5	6	6	7	17	27	37
Goldeneye				1	3	4	5	7	8	10
Bufflehead	7	9	12	10	8	6	4	27	50	73
Ruddy	67	55	43	34	25	16	7	10	13	15
Other c. merg				3	4	5	6	9	12	15

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

WATERFOWL
(Continuation Sheet)

REFUGE Fish Springs N.W.R. MONTHS OF Jan TO May, 19 68

(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
Swans:											
Whistling	1	1	1	1	1	1	1	1	121		
Trumpeter											
Geese:											
Canada	266	252	238	224	210	193	203	213	30,008	4	21
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other coot	2024	2268	2512	2756	3000	3244	3230	3216	209,814		
Ducks:											
Mallard	814	777	740	703	666	627	637	645	80,102	3	27
Black	32	60	88	116	144	172	169	166	12,342		
Gadwall											
Baldpate	80	95	110	125	140	154	131	108	8,954		
Pintail	1533	1296	1059	822	585	346	342	338	82,159		
Green-winged teal	465	409	353	297	241	183	143	103	56,144		
Blue-winged teal							6	12	126		
Cinnamon teal	313	369	425	481	537	594	569	544	29,524		
Shoveler	8	57	106	155	204	233	228	223	8,712		
Wood											
Redhead	353	401	449	497	545	594	623	652	31,339		
Ring-necked	29	33	36	40	43	47	44	41	2,744		
Canvasback	26	25	24	23	22	21	20	18	1,616		
Scaup	47	69	91	113	135	156	133	110	6,665		
Goldeneye	11	9	8	7	5	4	4	3	588		
Bufflehead	97	98	100	103	104	105	80	55	6,292		
Ruddy c. merg.	18	79	140	201	262	325	328	331	12,221		
Other	19	16	13	10	7	4	24	45	1,313		
r.b. merg.		12	24	36	48	60	46	32	1,935		
~~Coot~~:											

(over)

	Total Days Use	Peak Number	Total Production
Swans	121	1	none
Geese	30,008	294	21
Ducks	342,766	3,845	27
Coots	209,814	3,244	none

SUMMARY

Principal feeding areas **Open water, sloughs and flooded salt flats**

Principal nesting areas

Reported by **Larry A. Dunkeson**

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

3-17!
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Fish Springs N.W.R. MONTHS OF May TO Sept, 19 68

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter	1	1	1	1	1	1	1	1	1	1
Geese:										
Canada	219	225	232	198	164	130	87	120	143	166
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other coot	3086	2956	2827	2465	2103	1741	1378	1645	1912	2179
Ducks:										
Mallard	653	661	670	591	512	433	351	340	329	318
Black										
Gadwall	164	162	160	165	171	176	181	186	192	197
Baldpate	92	76	61	48	35	22	7	5	3	1
Pintail	336	333	331	302	273	244	215	267	119	72
Green-winged teal	76	49	22	17	12	6	3	3	4	4
Blue-winged teal	16	20	25	30	34	39	43	34	25	15
Cinnamon teal	527	510	492	487	482	478	474	471	469	466
Shoveler	219	215	210	187	163	139	116	106	95	87
Wood										
Redhead	672	692	712	710	709	707	705	703	701	700
Ring-necked	39	36	34	26	18	10	3	3	2	1
~~Canvasback~~ Scaup	94	78	62	46	30	14	0			
~~Scaup~~ Canvasback	17	16	15	18	20	23	26	30	33	37
Goldeneye	3	2	1	1	0					
Bufflehead	39	23	6	6	5	5	4	3	2	1
Ruddy	333	335	336	269	202	135	66	92	118	144
Other R.B. Merg.	0	0	4	4	3	3	2	0		
Com. Merg.			15	12	6	4	0			

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

WATERFOWL
(Continuation Sheet)

REFUGE Fish Springs N.W.R. MONTHS OF May TO Sept, 19 68

(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
Swans:											
Whistling											
Trumpeter	1	1	1	1	1	1	1	1	123		
Geese:											
Canada	190	197	204	211	218	226	234	242	23370	29	135
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other Coot	2447	2459	2471	2483	2495	2507	2519	2531	288312		
Ducks:											
Mallard	306	447	588	729	870	1011	1152	1293	76875	19	150
Black											
Gadwall	200	235	270	305	340	373	406	439	29520	46	400
Baldpate	0								2345		
Pintail	22	692	1366	2040	2714	3394	4074	4754	136493	4	35
Green-winged teal	5	169	333	497	661	823	985	1147	32841		
Blue-winged teal	9	7	5	3	1	0			1980		
Cinnamon teal	465	915	1365	1815	2265	2712	3162	3612	244684	15	60
Shoveler	78	69	60	51	42	34	26	16	13038	10	80
Wood											
Redhead	609	793	887	981	1075	1167	1261	1355	104058	62	1250
Ring-necked	0				1	1			1134		
Canvasback	40	34	28	22	16	9	5	3	7056	7	40
Scaup									2056		
Goldeneye									50		
Bufflehead	0								603		
Ruddy	171	183	195	207	219	229	240	249	25338	36	265
Other R.B. Merg.	0				1	1			105		
Com. Merg.									252		
Coot:											
									688 928	202	2307

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	123	1	
Geese	23370	232	135
Ducks	~~288035~~ 688428	9753	2280
Coots	288312	2507	700

SUMMARY

Principal feeding areas Open water, sloughs and flooded salt flats.

Principal nesting areas Meadow marsh and peripheral salt flats.

Reported by

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

6242

3-175'
Form ...-1A
(Aug. 1952)

MIGRATORY BIR...
(Other than Waterfowl)

Refuge Fish Springs N.W.R. Months of Jan to May, 1968

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Eared Grebe	24	4-15	24	4-15	Pres.					2904
*Pied-billed Grebe	32	1-16	30	2-16	"					3751
*American Bittern	2	1-16	5	4-15	"					484
*Great Blue Heron	16	1-16	16	1-16	"					1936
*B.C. Night Heron	50	1-16	53	2-16	"					6292
*resident										
II. Shorebirds, Gulls and Terns:										
Ring-billed Gull	54	3-15	101	4-15	Pres.					9438
Foresters Tern	8	4-15	8	4-15	"					968
Virginia Rail	1	1-16	?		1	1-16				121
Avocet	1	3-22	16	4-15	Pres.					1089
Black-necked Stilt	4	4-08	36	4-15	"					2420
Wilson's Snipe	2	4-01	7	4-15	7	4-15				968
L.B. Dowitcher	6	4-01	15	4-15	15	4-15				2178
Marbled Godwits	14	4-15	14	4-15	14	4-15				1694
Greater Yellowlegs	1	1-16	20	2-16	6	4-15				1694
Willit	3	4-15	3	4-15	Pres.					363
Killdeer	1	2-16	31	4-15	"					1936
Longbilled Carlew	2	4-08	4	4-15	"					363

(over)

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove	1	4-15	10	4-15	Pres.		605
White-winged dove							
IV. Predaceous Birds:							
Golden eagle	1	4-08	1	4-08	Pres.		121
Duck hawk							
Horned owl							
Magpie							
Raven							
Crow							

Reported by _____

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

(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 migration record for the species for the reporting period.

(3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.

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

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

(6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Fish Springs N.W.R. Months of May to Sept, 1968

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Western Grebe	4	5-13	4	5-13	4	5-13				4
Eared Grebe	721	5-13	721	5-13	Present		nesting observed			23316
Pied-billed Grebe	11	5-13	50	7-10	Present		young observed			2900
White Pelican9	1	5-23	113	5-24	24	6-11				588
Amer. Bittern	6	5-13	6	5-13	Present					464
G. Blue Heron	3	5-13	18	7-10	Present					1428
B.C. Night Heron	65	5-13	212	7-10	Present		1	25	75	14990
Common Loon	1	6-1	1	6-1	1	6-1				3
Snowy Egret	152	5-13	393	8-12	Present		1	100	250	30135
II. Shorebirds, Gulls and Terns:										
Calif. Gull	106	5-13	135	8-12	Present					8262
Caspian Tern	1	7-2	16	7-10	7	8-12				693
Foresters Tern	151	5-13	151	5-13	25	7-10				6426
Black Tern	21	5-13	25	8-12	Present					1056
W. Faced Ibis	4	5-13	10	7-10	Present					861
Wilsons Phalarope	266	5-13	289	8-12	Present					15744
Avocet	46	5-13	65	7-10	Present		Young observed			6273
B. Necked Stilt	106	5-13	519	8-12	Present		Young observed			33948
Common Snipe	1	6-11	1	6-11	1	6-11				35
L-Billed Dowitcher	67	5-13	67	5-13	1	6-11				1794
Yellowlegs	12	7-18	26	8-12	Present					1274
Willet	4	5-13	8	7-10	Present					612
L-Billed Curlew	7	5-13	7	7-10	7	7-10	Nests obxerved			510
Killdeer	22	5-13	68	6-11	Present		Young observed			5043
Snowy Plover	6	6-11	6	6-11	6	6-11				147

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove					
White-winged dove					
IV. Predaceous Birds:					
Golden eagle	seen occasionally all year				
Duck hawk					
Horned owl					
Magpie					
Raven	seen occasionally all year				
Crow					

Reported by_____

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

(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 migration record for the species for the reporting period.

(3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.

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

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

(6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

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

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

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge **Fish Springs N.W.R.** For 12-month period ending August 31, 1968

Reported by **Larry Dunkeson** Title **Ass't. Refuge Manager**

(1) Area or Unit Designation	(2) Habitat Type	Acreage		(3) Use-days	(4) Breeding Population	(5) Production
	Crops	0	Ducks	688428	1654	1765*
	Upland	3061	Geese	23370	45	129
	Marsh	2275	Swans	123	0	0
	Water	2955	Coots	288312	450	1400
	Total		Total			
	Crops		Ducks			
	Upland	9701	Geese	other misc. upland on refuge		
	Marsh		Swans			
	Water		Coots			
	Total	17992	Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over) ***total production taken from brood counts**

INSTRUCTIONS

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

(1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.

(5) Production: Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Fish Springs N.W.R. Months of January to May, 1968

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	6,000 acres of upland greasewood, shadscale type, 1,000 acres upland marsh	70	3	10	20% male 80% feml				100	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

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

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

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

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

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

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

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

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Fish Springs N.W.R. Months of May to Sept, 1968

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	6,000 acres of upland greasewood, shadscale type, 1,000 acres of upland marsh	70			20% male 80 % female				100	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

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

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

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Fish Springs N.W.R. Year ending April 30, 1968

(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	
Deer Mouse							53							
Harvest Mouse							28							
Long-tailed Pocket Mouse							5							
House Mouse							1							
Canyon Mouse							6							
Piñon Mouse							1							
Ord's Kangaroo Rat							7							
Great Basin Kangaroo Rat							1							
White-tailed Antelope gd. Squirrel							19							

* List removals by Predator Animal Hunter

REMARKS: Taken by Dugway's Ecology & Epizoology Branch for disease research.

Reported by _____

INSTRUCTIONS

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

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

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

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

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Fish Springs N.W.R. Year ending April 30, 1968

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								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	Total Population
Muskrat	Bulrush, salt water marsh - 12,700 acres	1.8		1318				T-523 6	1318					7,000
Black-tailed jackrabbit	6,000 acres of upland greasewood - shadscale type	60			none				none					100
Audobons Cottontail	Found only around refuge buildings	-			none				none					25
Coyote	18,000 acres upland and marsh meadow type	1800			3**									10
Sagebrush voles							4							
Pocket Gopher							4							

* List removals by Predator Animal Hunter

REMARKS: **removed by refuge personnel
Taken by Dugway's Ecology & Epizoology Branch for disease research.

Reported by _____

INSTRUCTIONS

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

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

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(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.

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3-1 a
Cont. F 1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Fish Springs N.W.R. MONTHS OF Sep 1 TO Dec 31, 1968

(1) Species	(2) Weeks of reporting period: * 11	* 12	13	14	* 15	* 16	17	3 days 18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter	1	1	1	1	1	1			112		
Geese:											
Canada	171	226	222	218	214	329	272	215	25,376		
Cackling											
Brant											
White-fronted									7		
Snow											
Blue											
Other coot	9785	13182	9738	6294	2851	2371	2226	2081	1,346,880		
Ducks:											
Mallard	341	282	372	462	552	284	311	338	29,768		
Black											
Gadwall	45	16	15	14	13	11	13	15	54,436		
Baldpate	950	597	464	331	198	65	45	25	52,080		
Pintail	1184	1410	1127	844	562	173	188	203	380,884		
Green-winged teal	2093	3030	2033	1036	38	400	372	344	215,208		
Blue-winged teal											
Cinnamon teal									81,496		
Shoveler	3	4	3	3	2	2	2	3	3,538		
Wood											
Redhead	163	25	19	13	8				53,680		
Ring-necked		1	21	42	62	2	1	1	1,586		
Canvasback	1	16	11	6					854		
Scaup		15	21	26	31	3	5	7	1,830		
Goldeneye		1	1	1	1	10			366		
Bufflehead	24	15	15	16	16	12	9	5	2,440		
Ruddy	43	161	124	87	50	45	31	20	11,956		
Other C. Merg.	17	3	2	1	0	4	5	6	488		
Coot:											

(over)

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

WATERFOWL
(Continuation Sheet)

REFUGE Fish Springs N.W.R. MONTHS OF Sep 1 TO Dec 31, 1968

(1) Species	(2) Weeks of reporting period: * 11	* 12	13	14	* 15	* 16	17	3 days 18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter	1	1	1	1	1	1			112		
Geese:											
Canada	171	226	222	218	214	329	272	215	25,376		
Cackling											
Brant											
White-fronted									7		
Snow											
Blue											
Other coot	9785	13182	9738	6294	2851	2371	2226	2081	1,346,880		
Ducks:											
Mallard	341	282	372	462	552	284	311	338	29,768		
Black											
Gadwall	45	16	15	14	13	11	13	15	54,436		
Baldpate	950	597	464	331	198	65	45	25	52,080		
Pintail	1184	1410	1127	844	562	173	188	203	380,884		
Green-winged teal	2093	3030	2033	1036	38	400	372	344	215,208		
Blue-winged teal											
Cinnamon teal									81,496		
Shoveler	3	4	3	3	2	2	2	3	3,538		
Wood											
Redhead	163	25	19	13	8				53,680		
Ring-necked		1	21	42	62	2	1	1	1,586		
Canvasback	1	16	11	6					854		
Scaup		15	21	26	31	3	5	7	1,830		
Goldeneye		1	1	1	1	10			366		
Bufflehead	24	15	15	16	16	12	9	5	2,440		
Ruddy	43	161	124	87	50	45	31	20	11,956		
Other C. Merg.	17	3	2	1	0	4	5	6	488		
Coot:											

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	112	1	
Geese	25,383	329	
Ducks	890,610	12,635	
Coots	1,346,880	18,605	

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by

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

6242

3-175?
Form [illegible]1A
(Aug. [illegible]52)

MIGRATORY BIR[illegible]
ther than Water[illegible]1)

Refuge Fish Springs N.W.R. Months of September to December 31, 1968

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Eared Grebe	present		13	10/16	7	11/19				252
Western Grebe	1	10/16	2	11/19	2	11/19				35
Pied-billed Grebe	present		36	12/18	present					1008
Great Blue Heron	present		39	11/19	present					162
Snowy Egret	present		33	9/19	5	10/16				931
BC Night Heron	present		10	9/19	present					252
American Bittern	present		2	11/19	2	11/19				14
II. Shorebirds, Gulls and Terns:										
Killdeer	present		6	10/29	1	12/12				63
Lesser Yellowlegs	1	10/16	6	11/13	present					252
Avocet	present		25	9/19	6	11/06				847
B. Necked Stilt	present		1	9/19	1	9/19				21
Wilsons Phalarope	present		45	9/19	18	10/16				1519
Calif. Gull	present		18	11/06	1	12/12				840

(over)

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove							
White-winged dove							
IV. Predaceous Birds:							
Golden eagle	present		4	10/29	present		126
Duck hawk							
Horned owl							
Magpie							
Raven							
Crow							
Marsh Hawk	present		9	12/12	present		756
Rough-legged Hawk	1	12/12	3	12/18	present		56

Reported by_____

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

(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 migration record for the species for the reporting period.

(3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.

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

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

(6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

Form NR-1C
(Sept. 196C

WATERFOWL H ER KILL SURVEY

Refuge Fish Springs N.W.R. Ye. 1968

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/12 1st	109	682	Mallard 115, Pintail 85, Redhead 9, baldpate 43, GW Teal 12, Gadwall 51, Shov. 4	319	81	400		
10/13-19	16	68	Mallard 11, Pintail 3, Baldpate 3, Gad. 1	18	5	23		
10/20-26	13	26	Mallard 6, Pintail 2, Redhead 2, GW Teal 1 Gadwall 1, Coot 4	12	1	13		
10/27-11/2	11	38	Pintail 5, Mallard 2	7	1	8		
11/3-11/9	17	77	Mallard 21, Pintail 20, Baldpate 2, Shoveler 2, Redhead 1, Bufflehead	47	6	53		
11/10-16	38	274	Pintail 27, Mallard 13, Baldpate 6, Redhead 5, GW Teal 5, Bufflehead 2 Gad. 1	59	17	76	All hunters and bags checked; collumns 2 and 7 assumed 100% sample	
11/17-23	24	117	Pintail 17, Mallard 5, Baldpate 4, Scaup 2, Bufflehead 2, Ruddy 1	31	6	37		
11/24-30	32	130	Pintail 16, Mallard 10, GW Teal 5, Gadwall 3, Shoveler 2, Ruddy 1, Coot 1	38	3	41		
12/1-12/7	24	97	Pintail 9, Mallard 8, Redhead 1 Gadwall 2, Shoveler 1, Ruddy 2, Canvasback 1	24	4	28		
12/8-14	8	27	Pintail 15, Mallard 4, Baldpate 2 Ruddy 2	23	3	26		
12/15-21	28	135	Pintail 25, Mallard 21, Gadwall 6 GW Teal 6, Ruddy 3, Baldpate 2, Shov. 2, Coot 1	66	7	73		
12/22-28	20	104	Pintail 27, Ruddy 13, Mallard 6, GW Teal 4 Bufflehead 1, Redhead 1, Gadwall 1, Coot 73	53	1	54		
12/29-1/4	25	140	Mallard 12, GW Teal 12, Pintail 10, Gadwall 1, Baldpate 1, Shoveler 1, Coot 39	37	4	41		
1/5 last	6	34	Ruddy 3, Ring-neck 1, Pintail 1, GW Teal 1, Bufflehead 1, Coot 21	7	2	9		
	371	1949		741	141	882		

2.03 birds/hunter
.37 birds lost/hunter
5.25 hours/hunter visit

(over)

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Fish Springs N.W.R. Months of September to January, 1968

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	6,357 acres upland areas and marsh meadow	42			50% male 50% female				150	

3-1755
Form
60701

DISE

Refuge Fish Springs N.W.R. Year 1968

Botulism

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

-1757
orm NR-7
Rev. June 19

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS (1)

Refuge Fish Springs N.W.R. Year 19 68

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Los
lkali Bul	1000 lb	R	Summer	Seed Co	[illegible]	1040 bu.	Shorelines	20# acre	50 acres	20 lb	Sum 68	know nx yr	
lfalfa				"	S	200 lbs	W. Avocet	15# acre	.08 acres	3 lb	May 68	none	salinity
er rye				"		200 lbs	"	"	.16 acres	3 lb	"	"	"
arley				"		600 lbs	"	"	.24 acres	4 lb	"	"	"
anary Gs				"		25 lbs	"	"	.16 acres	3 lb	"	"	"
wt. Clo				"		100 lbs	"	"	.40 acres	6 lb	"	20%	"
982 Clo				"		10 lbs	"	"	.16 acres	3 lb	"	20%	"
lsike Clo				"		10 lbs	"	"	.16 acres	3 lb	"	none	"
res. Wht				"		100 lbs	"	"	.32 acres	5 lb	"	"	"
all wheat				"		100 lbs	"	"	.16 acres	3 lb	"	"	"
lta Fes.				"		100 lbs	"	"	.04 acres	1 lb	"	"	"
asture Mx				"		125 lbs	"	"	.04 acres	1 lb	"	"	"
tab. Clov				"		20 lbs	"	"	.04 acres	1 lb	"	20%	"
uss. rye				"		25 lbs	"	"	.04	1 lb	"	none	"
ap millet				"	✓	100 lbs	"	"	none				

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

Total acreage planted:

Marsh and aquatic	50 acres
Hedgerows, cover patches	0
Food strips, food patches	2 acres
Forest plantings	0

Remarks: _____

76148

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

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Fish Springs N.W.R. County Juab State Utah

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Alfalfa					.08		.08		
Perrennial Rye					.16		.16		
Barley					.24		.24		
Reeds Canary Gs					.16		.16		
Sweet Clover					.40		.40		
c.b. 5982 clover					.16		.16		
Alsike Clover					.16		.16	experimental plantings	
Crested Wheat Gs					.32		.32	on west side of Avocet	
Tall Wheatgrass					.16		.16	pool	
AltaFescue					.04		.04		
Pasture Grass Mix					.04		.04		
Strawberry Clover					.04		.04		
Russian Wild Rye					.04		.04	Fallow Ag. Land	130

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

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue
Hay - Wild			

GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
1. Cattle	0			
2. Other	0			
1. Total Refuge Acreage Under Cultivation				2.00
2. Acreage Cultivated as Service Operation				

3-1570
NR-58
(1/54)

REFUGE GRAIN REPORT

Refuge Fish Springs Months of Jan through Dec, 1968

(1) Variety*	(2) On Hand Beginning of Period Bushels	(3) Received During Period Bushels	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Wheat	670	0	670	0	0	329	329	341		341	
Corn		740	740	0	0	208	208	532		532	
Milo		740	740	0	0	90	90	650		650	
Alkali Bulrush	40 lb	1000 lb	1040 lb	0	1040	0	1040	0			

(8) Indicate shipping or collection points Fish Springs N.W.R.

(9) Grain is stored at Refuge Granery

(10) Remarks

*See instructions on back.