FISH SPRINGS NATIONAL WILDLIFE REFUGE

Dugway, Utah

ANNUAL NARRATIVE REPORT

Calendar Year 1989

U. S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

FISH SPRINGS NATIONAL WILDLIFE REFUGE

Dugway, Utah

ANNUAL NARRATIVE REPORT

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Refuge Manager Date

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Refuge Supervisor Review Date

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Regional Office Approval Date

INTRODUCTION

Fish Springs National Wildlife Refuge was established in 1959 at the southern end of the Great Salt Lake Desert in western Utah. It encompasses 17,992 acres between two small mountain ranges. Warm, saline springs flow from the base of the Fish Springs Mountains to supply water for a 10,000 acre marsh. It is located in Juab County, 78 miles northwest of Delta and 105 miles west and south of Tooele. Postal and commissary services are available at Dugway Proving Ground, a military base, 66 miles northeast of the Refuge.

There is evidence of continued Indian use of the area before the 19th century. Jedediah Smith visited the area in 1827. The Central Overland Stage, Pony Express, transcontinental telegraph, and Lincoln Highway followed within less than 100 years and left their marks within the present Refuge boundary.

The native Utah chub inhabits the warm springs and are apparently responsible for the name of the area. The small gambusia mosquito fish was apparently introduced just prior to acquisition. There are no other fish species present.

The Refuge was established for the primary purpose of providing a waterfowl nesting and resting area in the Pacific Flyway. Five major springs and several lesser ones flow from the base of the eastern front of the Fish Springs Range. The springs flow eastward into the marshlands and then east and northeast into the desert.

The development of nine shallow water impoundments was completed in 1964. The area contains approximately 8,905 acres of saline marsh, 7,084 acres of mud and alkali flats, and 2,003 acres of semi-desert uplands. The saline and alkaline soils support very little vegetation. Vegetation in the marsh is primarily Olney's three-square bulrush, spikerushes, and saltgrass. Widgeongrass, muskgrass, and coontail are common in the springs and ditches. The upland areas support saltgrass, greasewood and shadscale.

INTRODUCTION

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A. HIGHLIGHTS

Drought conditions prevailed throughout year. This was the fourth driest year since 1960 (Section B).

Two maintenance helper positions filled (Section E-1).

Lost time safety record comes to an end (Section E-6).

Marsh drawdown cycle in full swing (Section F-2).

Canada goose nesting worst on record (Section G-3).

Waterfowl nesting study initiated (Section G-3).

Electronic Battlefield apparently "dead" (Section J-3).

B. CLIMATIC CONDITIONS

Weather conditions in 1989 were highlighted by record low temperatures and the continued drought. Temperatures ranged from 104 F on July 21 to -18 F on February 6-8. The year began with unusually cold temperatures in January and February, averaging 8 F below normal. April was slightly warmer than usual, while the remaining months moderated around the 21-year average.

Table 1. 1989 Weather Conditions

	Temperature (F)				Precipitation	
Month	High	Low	Avg	Depart*	Total	Depart*
January	44	0	20	-7.3	.17	-.24
February	65	-18	26	-9.0	.27	-.21
March	80	15	47	4.2	.33	-.46
April	86	32	57	6.5	.10	-.77
May	90	36	61	0.2	1.63	.58
June	102	42	69	-2.6	.34	-.33
July	104	55	82	3.3	.11	-.46
August	102	46	77	-0.1	.49	-.14
September	96	38	66	-0.3	.52	-.25
October	84	22	54	1.6	.57	-.26
November	75	11	39	-0.5	.32	-.26
December	49	9	29	-0.7	.17	-.25
Avg/Total	81	24	52	-4.7	5.02	-3.05

* Departures from 21-year average for temperature and the 29-year average for precipitation.

Drought conditions prevailed throughout the year. Precipitation was below normal during all months, except May. Total precipitation in 1989 was 38% below the 29-year average of 8.07". Snowfall (7.85") was recorded on four days in January and February. This was the fourth driest year since Refuge records were started in 1960.

C. LAND ACQUISITION

2. Easements

An easement proposal was submitted to the Regional Office to protect 4.75 acres of wetland and floodplain riparian habitat. Both easements were on one FmHA farm in Beaver County, Utah. Two other farms were evaluated but did not contain wetlands.

Eighteen Conservation Reserve Program (CRP) farms were also evaluated for wetlands. None qualified.

D. PLANNING

2. Management Plan

The Marsh Management Plan was reviewed and rewritten. Much technical data needs to be collected before a final can be prepared. Important items include: conductivity measurements, soil samples, cover maps and individual unit prescriptions. This information will be collected as soon as possible. A final plan will be prepared by April 1990.

E. ADMINISTRATION

1. Personnel

Bret Layland entered on duty as an Intermittent Laborer WG-3502-2 on April 9.

Assistant Manager Joe Engler was promoted from GS-485-7 to GS-485-9.

Two WG-5 Maintenance Helper positions were filled in December. Both people will not report until 1990.

2 5
1 4 3

Personnel

1.	Jim Savery	Refuge Manager, GS-11 PFT
2.	Joseph D. Engler	Assistant Refuge Manager, GS-9 PFT (Promotion 8/13/89)
3.	Leah L. Layland	Refuge Assistant, GS-5 PPT
4.	Vernon R. Velasquez	Maintenance Worker, WG-8 PFT
5.	Bret J. Layland	Laborer, WG-2 T-Intermittent (4/10/89-12/30/89)

Table 2. Staffing at Fish Springs Refuge 1985-89.

	Permanent Full-time	Permanent Part-time	Temporary	Total FTE
FY 89	3	1	1	4.6
FY 88	3	1	2	5.1
FY 87	3	1	1	4.6
FY 86	3	1	1	4.6
FY 85	3	1	4	6.3

4. Volunteer Program

David Chaney and Barbara Savery served as volunteers during 1989. David was a Biotech during 1988, but because of budget restraints, he had to be terminated. He stayed on over two months as a volunteer in January, February and part of March. His help doing bird surveys and reading all of the water in the marsh units helped a lot. Barbara Savery picked up and delivered mail to Dugway which is 61 miles away. Since Barbara now teaches school at Dugway, we get the mail every day instead of once a week.

The Refuge applied for two Student Conservation Association (SCA) volunteers. However, due to severe budget constraints, we had to cancel the program.

5. Funding

Total funding for FY 89 was $170,988 (Table 3). In 1988, the budget just barely maintained the status quo. We were able to pay salaries and operate our physical facilities. In 1989, due to personnel moves and the purchase of ATV's for the nesting study, several cut-backs had to occur. The Biological Technician had to be terminated, the two Student Conservation Association Volunteers were cancelled, the Intermittent Laborer was "laid-off" for an extra two months, the new pick-up was cancelled and all training was cancelled. Along with this, the Assistant Manager was off the Refuge for training and banding assignments for almost five months. There is also no adequate office space (with heat) for the Assistant Manager or the new computer systems. If this "maintenance" level of funding continues for very many years, the physical facilities will be in a condition that will seriously hamper management of the Refuge.

Table 3. Funding at Fish Springs NWR, 1985-1989.

Subactivity	FY85	FY86	FY87	FY88	FY89
1260	168,000	177,600	216,000	163,000	163,000
8610	8,000	5,042	10,839	15,200	7,988
Total	176,000	182,642	226,839	178,200	170,988

6. Safety

Safety meetings were held quarterly. Films viewed and topics discussed included FWS Employee Orientation, ATV Safety, and Hearing Protection. Fire extinguishers and smoke alarms were checked quarterly. There were no major safety deficiencies noted.

One lost-time accident occurred in December. Maintenance worker Valesquez received minor burns to his arm from a radiator boil over. Previous to this, there had been no lost-time accidents for 1,990 days or about 5.5 years.

8. Other Items

Several days were spent cleaning and preparing the Refuge for the Administrative and Operations Review. Elliot Sutta, ARD Budget and Administration and Bob Nagel, Assistant Zone I Supervisor, Refuges and Wildlife were on station August 14-17 for the inspection. This was a very good review and should enable us to improve several programs. Everything went very well.

F. HABITAT MANAGEMENT

1. General

The Refuge can be divided into five major ecological zones:

mud and alkali flats	7084 acres	(39%)
marsh meadow	4611 acres	(26%)
marsh	4294 acres	(24%)
greasewood uplands	1184 acres	(7%)
phragmites/greasewood	819 acres	(4%)
	17992 acres	

Marsh meadow vegetation is characterized by saltgrass (Distichlis spicata), marsh cane (Phragmites australis), and scattered stands of alkali sacaton (Sporobolus airoides). Marsh emergents are primarily Olney's three-square bulrush (Scirpus americanus) and wire rush (Juncus arcticus). Narrowleaf cattail (Typha domingensis), alkali bulrush and hardstem bulrush (Scirpus maritimus and S. acutus) are also present. The principle submergents are widgeongrass (Ruppia maritima), muskgrass (Chara spp.), spiny naiad (Najas marina) and coontail (Ceratophyllum demersum). Vegetation common to the high mountain deserts characterize the uplands. This includes fourwing saltbrush (Atriplex canescens), shadscale saltbrush (Atriplex confertifolia) and greasewood (Sarcobatus vermiculatus). High lava peaks and cliffs of the Fish Springs Mountain Range encompass a small area in the northwest corner of the Refuge. Soils are generally sandy-clay in the marshes with peat deposits occurring near the springs. Upland soils are very alkaline, thus limiting plant diversity.

2. Wetlands

The Refuge water source emanates from a series of five major springs and several lesser seeps located along the eastern base of the Fish Springs Range. The springs are thermal with year round temperatures ranging from 70 to 80 F. and are high in dissolved minerals. Total output averages 35 cubic feet per second (cfs). Water generally flows eastward into a series of distribution canals, then northward and eastward into the nine impoundments. Spring flows are not sufficient to counteract the high summer evaporation rate, thus impoundment levels can drop considerably during the hot dry summers. Generally, all water is retained on the Refuge but excess spring runoffs can be diverted into the desert.

Current management plans involve rotational drawdowns of the impoundments. Each unit will remain dry for at least one full growing season (February-November) to promote the invertebrate populations and establish vegetation.

Kochia response to drawdown on Shoveler Unit
89FS-JDE

Pintail and Shoveler Units were drained in the summer of 1988. They remained dry until November 1989. The vegetative response in both units was poor. Shoveler had a 75% stand of kochia and Pintail was almost barren. However, at the old waterline around islands and sloughs, a prolific crop of salt cedar invaded. These were mostly pulled by hand and ATV. During the dry

period, salts percolate to the surface and prevent almost all vegetation from growing. The limited water supply from the springs also prevents moist soil type management in all but three units. However, invertebrate populations do respond quite well to the drawdowns. When the units are reflooded they are flushed first to eliminate some salts. Conductivity measurements have been initiated to monitor Sodium Chloride levels. Soil samples taken in the units yielded the following results: ph - 8.1 to 8.3, salinity - 46 to 55 mmhos/cm. These show a high accumulation of salt and sodium that is toxic to many plants.

7. Grazing

Prior to establishment of the Refuge two ranchers utilized the area for grazing cattle and sheep. There were approximately 350 cattle and several hundred sheep. In 1959, when the area became a Refuge, that grazing was stopped. However, deed restrictions were included in the Public Land Order 1942 which withdrew 14,097.42 acres of land to be used by Fish and Wildlife Service. Item number 2 in this withdrawal states ..."The withdrawal made by this order shall not interfere with the continued use of the lands for stock driveway purposes, including livestock use of the lands along the road which crosses sections 29, 30 and 31, T.11S, R13W, and Section 36, T11S R14W for trailing purposes while they are being moved from range to range, nor stock use of accustomed resting, and watering places, including the W1/2SE1/4, Section 3 T11S, R14W and no improvements shall be constructed on the lands as will interfere with such continued use". This area totals 2740 acres outside the fenced area of the marsh. It is part of the Bureau of Land Management East Fish Springs Allotment. Most of this land is uplands with greasewood and shadscale. However, cattle use 20 acres of wetland on the south end of the Refuge on a regular basis. The FWS received no payment for this grazing use.

In 1982, a Memorandum of Understanding was signed between BLM and FWS, number 14-16-0006-82-953(R), to compensate FWS for grazing use. The MOU established a grazing season from April 15 to November 30 each year. BLM figures the price and collects money from the permittee (after the fact).

The Fish and Wildlife Service receives payment for 10% of the actual grazing use not to exceed 110 AUMs.

9. Fire Management

Three prescribed burns totalling 410 acres were conducted in October and November. Prescribed burning at Fish Springs imposes several challenges. Irregular burning regimes in past years and localized lush annual growth have created areas with thick duff layers of saltgrass and wire rush or impenetrable stands of emergents. Firebreaks, such as roads and sloughs are often the only means of controlling the burns, short of dozing

roads in the marsh. However, sloughs are often emergent choked and offer minimal control. Peat deposits are considered an important natural resource scattered throughout the Refuge, particularly along the spring outflows and large sloughs. These areas can smolder for months, then re-ignite. Current practices attempt to minimize peat burns when possible. Manipulating water tables and/or winter burning in sensitive areas will be explored in 1990. Shoveler and Pintail Units were burned in conjunction with the drawdown management scheme to rejuvenate production in the impoundments.

Shoveler Unit is primarily a maze of saltgrass islands and sloughs. The thick, matted saltgrass burned well and should promote increased upland duck nesting in the unit. Kochia was the principle plant responding to the drawdown cycle and invaded most of the open flats and sloughs. Despite being dead and dry, the kochia did not burn.

Prescribed burning of phragmites and wire rush on Avocet Unit

89FS-JDE

Pintail Unit is primarily utilized by nesting Canada geese. Saltgrass is the principle vegetation with the major sloughs containing dense bulrush. The burn is expected to revitalize goose grazing areas and promote nesting of redheads in the emergent-lined sloughs. Several small peat fires continued through the end of the year, when impoundment refilling finally extinguished them.

A 30-acre prescribed burn was conducted along the shoreline and main pool of Avocet Unit. The main burn area consisted of dense saltgrass and wire rush, with an 8-11" duff layer. Despite the thick duff and damp conditions, the vegetation was nearly all consumed in the fire. Hardstem bulrush along the shoreline, as well as part of the colonial bird rookery was also burned.

10. Pest Control

Due to the Services anti-chemical program, there was again no chemical spraying on the Refuge this year. Phragmites (Phragmites australis) is a serious problem and can be found throughout the Refuge. The Refuge-constructed dikes and impoundments have artificially raised the water table allowing phragmites to become established in desert upland areas. Alternate means of large scale control, such as mechanical or flooding, are not possible at this time. Mechanical equipment for discing or ripping is unavailable and would be unsuitable in many areas. Low water output and locations of established water control structures are not effective for quick flooding of most phragmites stands. Flooding was attempted in a small spring area in 1989, through the construction of a temporary dike. Water levels, however, rose slowly and had minimal impact on the new growth. The possible presence of threatened species around

Salt cedar response after drawdown cycle on Shoveler Unit

89FS-JDE

several springs has dictated a no management-no pest control policy. Unfortunately, the spring areas are heavily infested with phragmites and they are "seeding" the adjacent desert uplands.

Salt cedar (Tamarix spp.) made a dramatic rebound in 1989. Two units, Shoveler and Pintail, were drawn down and dried since the summer of 1988, as part of the Marsh Management Plan. This allowed latent roots and seeds to sprout in the dry slough. Several thousand salt cedars, 6" to 5' high, were hand-pulled, dug, or wrenched out by ATV's. This time-consuming, non-chemical method unfortunately does not eliminate all roots. Recurring growth is expected in future years when water is low. Shoveler Unit was heavily infested, while Pintail Unit contained scattered pockets of salt cedars.

11. Water Rights

The Refuge controls all water rights to the spring outflows. The Certificate of Water Appropriation is for 43.88 cubic feet per second (cfs). However, the measured amount that goes through the flumes averages 35 cfs. An Amendatory Change Application for Water Rights was filed in November, 1988. This change was necessary because of an error in spring location described on an earlier Certificate of Water Appropriation. Certificate No. 13087 issued by the Utah State Engineer for Water Right No. 18-215 was filed in Juab County on October 11, 1989.

G. WILDLIFE

2. Endangered and/or Threatened Species

Bald eagles are observed on the Refuge from November through March. One to three individuals usually comprise the wintering population. One eagle was observed during January and February. One bird returned in November, with two eagles sighted almost daily during December. Generally, sightings tend to be intermittent as bald eagles move about the area. The Refuge eagles prey on sick and injured waterfowl or scavenge food from other Refuge raptors. They have been observed throughout the West Desert scavenging sheep carcasses and road kills.

Peregrine falcons were not observed on the Refuge in 1989, though one possible sighting was reported. Two subspecies are reported to migrate through Utah. The American peregrine falcon (Falco peregrinus anatum) supposedly nested in the Fish Springs Mountain Range, historically. It is one of the objectives of the Refuge to reintroduce this falcon to the area within the decade.

Several species are being considered for state listing as endangered or threatened. Ferruginous and Swainson's hawks occasionally utilize the Refuge. Three ferruginous and one Swainson's hawk were observed this year. Both species breed in the Great Basin region. Long-billed curlews are common migrants and a small population nests on the Refuge. The size of the breeding population is unknown, but probably numbered less than 10 pairs in 1989.

White-faced ibis and western snowy plover nest on the Refuge. The Refuge conducted preliminary studies on these species in 1989, which will be discussed in Sections 4 and 5.

The Bonneville Southern pocket gopher (Thomomys umbrinus bonnevillei) is known to exist only on the Refuge. Little is known about this species or its status. The Utah Bubble Snail (Physella utahensis) is present on the the Refuge and occurs in only two other locations in the state. Its status is also unknown. Unfortunately, there are no immediate plans to study either of these species.

3. Waterfowl

The tundra swan population averaged 35 birds from January to March, and all birds were gone by April. Typically, the wintering population is 50-75 birds. The reduced number was probably due to the extremely cold weather, which froze most of the open water areas. Tundra swans returned at the end of October and peaked at 91 on November 21. About 60 birds remained throughout December.

Four neck-collared trumpeter swans were observed on Christmas morning. These birds were initially banded at Red Rocks Lake NWR, Montana and relocated to Grays Lake NWR, Idaho in 1989. Three unbanded trumpeter swans arrived on December 30. A trumpeter swan was shot by a hunter on December 29, about 70 miles northeast of the Refuge. It may have been a member of the group that arrived at Fish Springs the next day.

It is generally thought that trumpeter swans may join migrating tundra swan flocks when searching for alternate wintering grounds. The Refuge tundra swan population did not change with the arrival of the trumpeters, thus indicating that these two flocks may have 'struck out' on their own. Trumpeter swans have been recorded at Fish Springs during eleven winters since 1968, although few records exist for the rest of Utah. It appears that Fish Springs is a regular, but little known wintering area for trumpeter swans. If deemed feasible, the Refuge may establish a breeding flock here in the future.

A Refuge Christmas present - these trumpeter swans from Grays Lake NWR arrived on December 25

89FS-JDE

These trumpeters arrived just prior to the NEW YEAR

89FS-JDE

The Great Basin Canada goose (Branta canadensis moffitti) is the common migrant and nesting subspecies at Fish Springs. Lesser, Richardson's and rarely cackling geese winter or migrate through the Refuge. The wintering population dropped to less than 100 individuals during February and March due to the extreme cold.

The breeding season was the worst on record with less than 18 pairs nesting and only 12 nests hatching. Recent years data indicates an average of 75 nesting pairs. In 1987, Fish Springs was opened for the first time to (very successful) goose hunting. The subsequent breeding season saw nearly a 65% decline in nesting pairs. The 1988 hunting season was again successful, and resulted in the current breeding population. The hunting season was closed in 1989. An intensive nesting and brood rearing study was initiated during the 1989 season.

Historically, gosling survival at Fish Springs is well below the norm for other Great Basin breeding populations. This year, survival was 30%. Twelve nests hatched producing 63 young, of which only 22 goslings were known to reach fledging age. Observations show that many key foraging areas are outside of diked impoundments and are isolated from open water. In these areas goslings appear easy targets for predators, especially coyotes. Chronic low recruitment, predation, habitat degradation, and hunting mortality/harassment appear to impact the goose population. The severe winter cold may have disrupted breeding this year as nesting was nearly two weeks later than normal. A vigorous management program is needed to re-vitalize the population. Despite the woes of the breeding goose population, migrant numbers peaked at over 1200 birds in mid-December with about 900 wintering.

One of the few - goose brood on Avocet Unit
89FS-JDE

Snow geese gave a meager showing in 1989. One bird in March and a total of seven in November and December were the only records. This compared to over 130 birds in 1988. One Ross' goose lingered from November 16 to December 10.

Seventeen species of ducks utilize the Refuge, with nine regularly nesting. As with the geese and swans, early year populations plummeted to less than 1500 birds due to the severe cold. Spring migrants peaked in April at about 6000 birds, with 1300 pairs remaining to nest. Peak fall flights were slightly below 1988 levels and over a 50% decline from the long-term average (Table 4). The December population totaled about 6000 birds.

Pintail, green-winged teal, mallard and wigeon are the common wintering species. Redhead, cinnamon teal and gadwall were the most abundant nesters. The breeding mallard and pintail populations declined in 1989. Green-wings, wigeon and pintail comprise the majority of the fall population with mallards peaking in December.

Table 4. Peak Population and Fall Flights

Year	Peak Flight	Date	Average Fall Population
1976	36,100	Early Nov.	18,400
1977	26,600	Late Oct.	20,000
1978	38,500	Early Sept.	18,900
1979	15,300	Late Sept.	11,200
1980	35,100	Mid-Sept.	22,300
1981	17,000	Mid-Aug.	9,900
1982	18,000	Mid-Sept.	10,700
1983	35,700	Late Aug.	12,300
1984	30,100	Late Aug.	11,100
1985	28,200	Early Sept.	8,300
1986	23,100	Late Aug.	9,600
1987	18,000	Mid-Sept.	10,900
1988	10,800	Mid-Nov.	8,000
1989	10,566	Early Oct.	9,700
Average:	24,505		

Fish Springs joined the waterfowler's mainstream in 1989 by initiating a mechanized nest-dragging program. The purchase of two ATV's in late 1988 greatly expanded our nest searching potential. Nest searches in previous years were confined to hand dragging ropes through suitable areas. The high interspersion of water throughout the Refuge limits ATV use in many areas, so the "old ways" were not forgotten.

The Mayfield Exposure method was used to estimate nest success. This was applied to pair counts and brood counts (survival estimates) to estimate production. Where adequate species data

was unavailable, survival estimates were based on a diver or dabbler grouping. The Refuge consists of a myriad of ponds, sloughs, canals, islands and vegetative types. Therefore, production estimates extrapolated across the Refuge are impractical, particularly since updated aerial photos of the Refuge are not available.

Nest search operations consisted of ATV-chain dragging, island searches, and the beat-out method on bulrush stands. Searching began on May 2 and ended on June 13. Budget restrictions, visa ve no seasonal employees, forced us to abandon the operation as the backlog of other duties/projects grew. At that point, 60 nests had been located by dragging and incidental observations of which 46 met requirements for use in the Mayfield formula.

Despite our new found sophistication, duck production was the poorest on record (Table 5). Pintail, redhead, and canvasback production declined sharply. Although the Mayfield method supposedly gives the best production estimates, the good old SWAG method looks better on paper.

Table 5. Waterfowl Production at Fish Springs NWR 1982-1989

	1982	1983	1984	1985	1986	1987	1988	1989
Mallard	356	800	570	400	350	400	70	59
Pintail	429	300	300	520	310	300	370	43
Shoveler	239	190	130	50	380	200	20	35
All Teal	90	70	420	450	280	40	120	123
Gadwall	620	600	320	230	270	300	110	146
Redhead	845	770	350	80	700	1400	350	153
Ruddy	55	120	40	40	150	300	40	24
Canvasback	10	60	40	80	290	250	50	5
Subtotal	2589	2910	2170	1850	2730	3550	1130	588
Canada Goose	55	140	130	80	90	70	75	22
American Coot	2000	120	260	390	500	700	300	678

Nesting success was calculated at 9% for the Mayfield Method, 15% for the shortcut method; apparent success was 33%. Ravens were responsible for at least 27 of the 31 destroyed nests. Ravens appeared to be keying on the nest dragging operations and/or nest markers. On one occasion, two of three newly flagged nests were destroyed while the crew was still dragging only a few hundred yards away. Nest marking methods will be modified in 1990 to reduce this problem. One pair of ravens was observed on a number of occasions carrying eggs back to their nest. Many more destroyed eggs were observed on roads, dikes

and hummocks. Three northern harrier nests were also found to be destroyed by ravens. Ravens apparently are efficient nest predators, with or without the help of our nest markers.

One of the fortunate - duck brood on Curlew Unit
89FS-JDE

4. Marsh and Water Birds

The Refuge provides nesting habitat for a variety of marsh birds. Pied-billed grebes are common nesters and year-round residents. Despite a few past breeding records, the Western and eared grebes have not established nesting populations. Virginia rail and sora are hard to find though common residents. Fish Springs provides one of the most reliable areas in Utah to find these two rail species during the winter.

American white pelican numbers peaked at 155 in late July but they do not breed here. The presence of breeding adults suggests that these birds may be making daily feeding trips to the Refuge from breeding islands on the Great Salt Lake, over 80 miles away. Double-crested cormorants occur in small numbers during the summer months. Three immatures were observed in June showing little to no propensity for flying. Breeding has not been documented for this species on the Refuge, so the origin of these young cormorants is unknown.

Single sandhill cranes were observed on three occasions between April 19 and May 1. This species, once the subject of a Refuge captive breeding program, has become a rare Refuge visitor.

Cranes have been recorded on the Refuge only twice since 1977.

One great egret was observed on the Refuge through April with one sighting in late May. Two birds were observed in September with one remaining the winter. This species is rare in Utah and was first recorded on the Refuge in 1977. At least one bird has wintered at Fish Springs for eight of those years. The Refuge represents the only known wintering location for the great egret in Utah.

Scattered sightings of cattle egrets occurred from spring through fall, peaking at eight in May. The nesting status of this fast expanding species is unknown. An unusual white egret with black head, neck and upper breast was observed with a cattle egret April 23 - May 13. The bird differed from the cattle egret in both physical characteristics, colorations and behavior. It's identity has not been determined though it is thought to be either a soot-covered cattle egret or a hybrid.

American bitterns are year-round residents. The Refuge is the only regular wintering area for this species in Utah. Little is known about the breeding status and population densities of bitterns at Fish Springs.

The Refuge has one major rookery (Avocet Unit) and several small rookeries (Mallard, Egret and Ibis Units) for nesting great blue herons, snowy egrets, white-faced ibis', and black-crowned night herons. These rookeries are located in hardstem bulrush (Scirpus acutus). The rookery survey was expanded this year to collect more detailed information on the colonial nesters. An initial 169 nests in Avocet Unit were flagged to obtain egg measurements, clutch size, hatching success and other pertinent data. Seventy percent of the nests were rechecked. The other 30% could not be found, probably due to flag loss such as destruction by nesting birds. Thirteen percent of the nests contained different species than on the first survey. This was due to flagging locations, observer experience in egg identification, and renesting on failed or hatched nest sites.

Nest searches were conducted from May 24 to July 10 during the cooler periods of the day. This was to avoid "baking" the eggs and chicks in the nest. These species appear extremely susceptible to heat stress, so limiting the period that parents were off the nests was essential. Minimal disturbance to hatched nests was also important. Chicks of all ages exhibit kamikaze tendencies by leaping from nests when approached. The large number of floating, dead chicks suggests that this may be a fatal practice, particularly for the youngest birds. This escape tactic made it difficult to assess hatching success and brood survival.

Main colonial bird rookery on Avocet Unit
89FS-JDE

"Home Sweet Home" - white-faced ibis & snowy egrets
89FS-JDE

Only three great blue heron nests were found in the rookery. Of ten eggs, only one chick survived to fledging size. The July population increased by 35-40%, indicating that this species successfully reproduced elsewhere on the Refuge. Production for snowy egrets, ibis and night herons was estimated by the apparent hatching success (young in and around nests) during the recheck surveys of the flagged nests. Unfortunately this does not fully account for brood age and survival, which was beyond the scope of this study. Table 6 shows a 10-year comparison of rookery production. Production data for 1989 is summarized in Table 7. The large jump in ibis production is attributed to the displacement of these birds when the Great Salt Lake flooded in the early to mid 1980's.

The three minor rookeries on Mallard Unit appear to be an overflow breeding area. Ninety-five nests were found here compared to 420 in the Avocet rookery. On June 21, 49% of egret and heron nests, and 39% of ibis nests were unhatched in the Avocet rookery. In the Mallard rookeries on June 29, 96% of egret nests, 64% of ibis nests and 89% of heron nests were unhatched. This indicates that late nesters were unable to find room in the main rookery, therefore utilizing marginal habitat in Mallard Unit. Birds apparently shunned the open marginal habitat in Avocet Unit, possibly because of its close proximity to dry land. Mallard rookeries contained thin, shorter stands of hardstem bulrush but were completely surrounded by open water. Water levels were optimal on both units so did not seem to affect late nesting site selection.

The wide breeding period for these species, disturbance related problems (heat stress, nest evacuations) and limited manpower effected the number and quality of searches that could be conducted this year. However, we hope to refine survey techniques in 1990.

Table 6. Rookery Production 1980-1989

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Snowy egret	348	462	368	165	48	593	500	300	200	445
Ibis	0	1	23	4	3	0	300	350	100	379
Night heron	78	49	151	108	12	244	250	100	10	99

Table 7. Rookery Data 1989

Flagged Nests	IBIS	EGRET	HERON
# Nests Flagged	99	37	30
# With Usable Data	32	14	13
Clutch Size	2.75	3.00	2.77
Hatching Success*	1.56	2.14	1.46
Avocet Unit			
Clutch Size (# Nests used w/eggs/young)	2.77(153)	2.84(101)	2.37(57)
Clutch Size (# Unhatched nests)	2.69(78)	2.78(78)	2.64(28)
Hatching Success (# Nests used)	1.45(109)	2.23(64)	1.96(25)
# Nests Found			
Avocet Unit	201	161	58
Mallard Unit	39	47	9
Egret Unit	3	0	1
Total Production (# Nests x hatching success)	379	445	99

* Hatching Success was defined as the number of chicks observed in or around the nest. This accounted for some of the early brood mortality.

6. Shorebirds, Gulls, Terns and Allied Species

Twenty-two species of shorebirds were observed on the Refuge in 1989. Killdeer, black-necked stilt, American avocet and Wilson's phalarope are the common nesters. Snowy plovers, long-billed curlews and willets also nest here in small numbers. Red-necked phalaropes were common throughout May, peaking at 594 on May 24. Long-billed dowitchers are common migrants, peaking at 384 in early May. Unusual sightings this year included solitary sandpiper, black-bellied plover, Baird's sandpiper, dunlin and sanderling.

American avocet grubbing for an afternoon snack
89FS-JDE

Snowy plovers were surveyed on June 3-8 in conjunction with the Utah Division of Wildlife Resources, as part of a four state survey. This species is proposed for listing as a threatened species in Utah. A peak of 174 plovers were tallied including one nest and four broods. Eleven broods were counted throughout the season. Timing was found to be crucial for observing peak numbers. Dawn and dusk surveys are critical as adults switch nest duties at this time. Males typically incubate at night, while the female pulls the dayshift. Most surveyed birds (>90%) were males indicating a substantial breeding population in the area. It is believed that plovers nesting off-refuge on the surrounding alkali flats utilize the Refuge shoreline for feeding, particularly when ephemeral pools have dried up.

Fish Springs snowy plovers represented 20% of the total Utah census and was the largest concentration outside the Great Salt Lake. Doubtlessly, many more snowy plovers exist in Utah particularly at the Great Salt Lake. Limited coverage and variable census techniques account for the disparity. Regardless, the Fish Springs area appears to be an important stronghold for this plover.

Ring-billed, California, Franklin's and Bonaparte's gulls were observed on the Refuge this year. All made impressive showings, considering the latter three have not been recorded every year.

California gulls were observed March through July peaking at 210 in early April. Three to 18 Bonaparte's gulls were observed mid-April to mid-May. This represents only the third recorded observation of this species in ten years and the sixth since 1970. Franklin's gulls peaked at 16 in early May.

Forster's, black and caspian terns peaked at 184, 146, and 30, respectively. Forster's tern is the common breeding tern on the Refuge. Despite summer long sightings, black terns are not known to be nesting on the Refuge. A caspian tern nest was located on Gadwall Unit this year. This is believed to be the first nesting attempt for this species on the Refuge. Unfortunately, after a month of diligent incubation the egg proved to be infertile.

6. Raptors

Sixteen species of raptors were recorded in 1989. Only northern harrier and short-eared owl nested on the Refuge this year. Golden eagles, red-tailed hawks, prairie falcons and great horned owls were observed throughout the year. Rough-legged hawks are common throughout the winter. Other species were sporadic though not unexpected including three sharp-shinned hawks, two Cooper's hawks, one Swainson's hawk, three ferruginous hawks, two osprey, three kestrels and three merlins.

Northern harrier nest - this bunch was lucky enough to escape the "Raven Patrols"

89FS-JDE

An immature red-shouldered hawk was observed September 5-8. This was a first Refuge record; this species is considered "accidental" in Utah. One turkey vulture was observed by Refuge Manager Savery around the same time for only the third Refuge record.

One bald eagle was observed January through March and 1-2 birds were present throughout December.

7. Other Migratory Birds

One hundred and eighty-two species of birds were recorded at Fish Springs in 1989. The Refuge waters serve as a magnet to migrating birds. Most migrant stopovers are very brief, often less than a day depending on the weather. This makes detection of many stopovers difficult, and probably accounts for the sporadic sightings of many species. The scarcity of trees concentrates smaller passerines around the headquarters, residences and picnic areas. Most of the mentioned bird sightings were recorded by ARM Engler during the bird censuses or through incidental observations.

Bird records for the past 30 years were compiled in 1988 and 1989. A total of 224 bird species have been recorded since the Refuge was developed. Compiling the 30 years of bi-weekly census' was quite a task considering monthly or yearly summaries were lacking for many years. It is hoped that all species records were accounted for and received proper recognition.

In 1988 and 1989, 23 and 35 species respectively were observed that are not included in the Refuge bird pamphlet. This prompted the 30 year compilation effort as well as an ongoing revision of the Refuge bird list. A tentative revision is included in the back panel and contains all recorded sightings.

Bird feeders, bird baths and the residence's shade trees lured an unexpected number of rarities into view this year. Assistant Refuge Manager Engler's backyard produced first Refuge records of lesser goldfinch, mountain chickadee, Nashville and Virginia's warblers, yellow-breasted chat and northern waterthrush. The latter is rarely sighted in Utah.

Other unusual birds observed around the residences included second Refuge records for: Cassin's finch (1), orange-crowned warbler (1), solitary vireo (3), ruby-crowned kinglet (3), varied thrush (2) and Harris' sparrows (2). The latter two species are rare in Utah.

Other rare Refuge sightings included calliope hummingbird (3rd record), Lewis' woodpecker, scrub and pinyon jays, brown thrasher, Wilson's and MacGillvray's warblers, green-tailed towhee, common grackle, evening grosbeak, Brewer's sparrow and Lincoln's sparrow.

A late May storm system produced a fallout of flycatchers. Twenty-five or more western wood peewees dominated the group, which included the first Refuge record for willow flycatcher and second records for olive-sided and Hammond's flycatchers.

Two northern shrikes were observed this year. This species has been recorded in only three previous years since 1970. The 1988 and 1989 records indicate that this species may migrate through in only a couple of weeks in late November and early December. This species may have been going unnoticed or simply misidentified as the more common loggerhead shrike.

Rock wrens were recorded on the Refuge once prior to 1988. In 1989, Assistant Refuge Manager Engler observed three pairs around the rocky cliffs in the NW corner of the Refuge. A later survey revealed a newly fledged family of wrens, for the first Refuge breeding record.

An extremely hardy and tame common poorwill was observed from November 4-10 around the residences. Two suspected sightings occurred during the summer. Although the poorwill is relatively common throughout Utah, this is apparently the first Refuge record for this species.

Longspurs were observed again on the Refuge in 1989. Lapland longspurs are rare transients through Utah. This year's bird represented the fourth year it has been recorded on the Refuge. Three chestnut-collared longspurs were observed for the second Refuge record. This species has been documented less than five times in Utah, so the three Refuge birds were quite a windfall. Last year's McCown's longspur was only the third documented state record. The Refuge is the only site in Utah where all 3 species of longspurs have been observed.

Two Christmas Bird Counts were conducted in CY 1989 by ARM Engler. The 1988 count was held on January 2 with 5 observers participating. The 1989 count was conducted with 7 participants on December 30. Listed, in Table 8, is a summary of species observed on the two counts.

Table 8. Summary of Species Observed on Christmas Bird Counts

SPECIES	1988	1989	SPECIES	1988	1989
Pied-billed Grebe	13	14	Ring-neck Pheasant	18	1
American Bittern	3	6	Virginia Rail	14	17
Great Blue Heron	10	19	Sora	1	
Great Egret	1	1	American Coot	445	1061
Bl.-cr Night-Heron	5	31	Killdeer	1	5
White-faced Ibis		1	Greater Yellowlegs	11	23
Tundra Swan	57	63	Common Snipe	4	1
Trumpeter Swan		7	Great Horned Owl		2
Canada Goose	217	883	Short-eared Owl	3	
Green-winged Teal	527	3080	Horned Lark	260	308
Mallard	370	1382	Pinyon Jay	15	
Northern Pintail	1000	1319	Scrub Jay		1
Northern Shoveler	73	37	Common Raven	12	4
Gadwall	63	552	Marsh Wren	10	25
American Wigeon	49	418	American Pipit	5	4
Redhead	20		Loggerhead Shrike	3	1
Ring-necked Duck	60	97	European Starling		2
Lesser Scaup		1	Am. Tree Sparrow	7	10
Common Goldeneye	4	3	Sage Sparrow	1	15
Common Merganser	CW	16	Song Sparrow	27	42
Ruddy Duck	CW	1	White-crown Sparrow	2	1
Bald Eagle		CW	Red-winged Blackbird		14
Northern Harrier	10	9	House Finch	1	
Rough-legged Hawk	4	7	Pine Siskin	1	
Golden Eagle	3	2	American Goldfinch	20	13
Prairie Falcon	3	1			
			TOTALS	3353	9500

8. Game Mammals

Fish Springs NWR does not allow hunting of game mammals. Mule deer inhabit the Fish Springs Mountain Range. These deer utilize the Refuge mostly during the summer months, particularly for watering. Some deer also feed on the Refuge for extended periods. Mulies were observed mid-April to late October. Three does with fawns were frequently sighted in June and July.

Pronghorn were observed infrequently in the foothills along the west side of the Refuge. Most sightings occurred in April and May.

Coyotes are commonly observed on the Refuge. The total population is unknown, though a healthy number of coyotes seem to exist.

Blacktail jackrabbits and desert cottontails are often observed, particularly along the western edge of the Refuge. Their numbers seemed low this year, possibly a result of the record cold temperatures earlier in the year.

Frequent sightings of badgers occurred in 1989
89FS-JDE

10. Other Resident Wildlife

There are over thirty mammal species recorded on the Refuge of which eleven are small rodents. Mice and voles were easily observed during prescribed burns but were seldom seen the rest of the year. Antelope squirrels, kangaroo rats, and muskrats are most frequently observed. Kit fox and long-tailed weasels are occasionally seen. Badgers seemed unusually cooperative this year with frequent sightings throughout the year.

Bats are sometimes observed at dusk. Several hundred western pipestrels were observed on a few occasions as they hawked insects around the springs and main canal.

Ringtail cats, bobcats, striped and spotted skunks were not observed this year. Skunks have not been observed since 1987, apparently the victim of diligent trapping. Raccoon tracks were observed during the winter months. This critter has not yet been observed and has eluded trap efforts. Its current status and whereabouts are unknown. This is apparently the second raccoon known to exist on the Refuge. It may have been intentionally released.

Seven species of lizards have been recorded on the Refuge. Great Basin sagebrush lizards and Desert side-blotched lizards are often observed around headquarters.

Five snake species occur on the Refuge. Striped whipsnakes, wandering garter snakes, and blue racers were occasionally observed. Great Basin gopher snakes are commonly seen on roads and in the marsh units. Great Basin rattlesnakes were unusually common this year with several sightings around the residences. Assistant Refuge Manager Engler encountered one at his backyard bird bath and another on his back porch. Several visitors reported rattlesnakes at the picnic area. All rattlesnakes are captured and relocated to less conspicuous areas.

Bullfrogs are common and leopard frogs are less frequently observed in the spring units, canals, and in some impoundments. Bullfrogs were introduced to the area for "farming" prior to establishment of the Refuge. The predatory or displacement impact of bullfrogs on the native leopard frog is unknown. Habitat alteration, increased salinities and bullfrog impacts have probably reduced the population of leopard frogs.

This rattlesnake was not happy about being evicted from its back porch haunt

89FS-JDE

11. Fisheries Resources

Native Utah chub and the introduced mosquito fish are abundant in the springs and canals. Speckled dace and least chub are native to Great Basin springs but they are not known to occur on the Refuge. Pre-refuge game fish stocking apparently occurred but was unsuccessful. No other fish species are known to inhabit Fish Springs other than the Utah chub and mosquito fish.

The Refuge springs have been proposed as a nursery for other threatened and endangered fish species. The suitability of this project has not yet been determined.

14. Scientific Collections

Wesley (Skip) Skidmore, Assistant Director of the Brigham Young University Monte L. Bean Life Science Museum, collected several specimens from the Refuge during June. The specimens are to be used in museum displays. The species collected included: two rattlesnakes, one gopher snake, one pied-billed grebe, one Wilson's phalarope, one coot, one nighthawk and one meadowlark.

Stephanie McKown, from Scientific Application International Corporation, Las Vegas, spent several days in May, June and August collecting moths. Stephanie and her crew were working on an EIS concerning the Electronic Battlefield that the military has proposed for the West Desert of Utah.

15. Animal Control

Ravens and coyotes are the principle waterfowl nest and brood predators. Gopher snakes prey on duck nests but their impact is unknown.

There was no active removal efforts of coyotes this year. Three ravens were eliminated in June in response to the high duck nest predation.

Snake traps were set up along the Avocet Unit dike and the Pintail Unit perimeter fence. Three gopher snakes, two racers, and one rattlesnake were captured. An additional 48 gopher snakes were hand captured along roads and in marsh units. All gopher snakes were released off-Refuge. Since the predation impact and population status of gopher snakes is unknown, lethal eradication is unacceptable at this time.

16. Marking and Banding

One hundred sixty-seven Canada geese were banded on June 16 in the Gadwall and Ibis Units. An additional 68 recaptures were tallied. The banded geese were molting subadults and non-breeders. No local or known breeding adults were captured. This was an improvement over 1988 when only 67 geese were banded. A total of 133 geese in 1987 and 258 in 1986 were banded. Only 25 local geese were banded, all in 1986. The majority of molting geese originate from other areas of Utah and unfortunately do not represent potential Refuge breeders.

Banding operations were conducted by Refuge personnel and twelve biologists and assistants from the Utah Department of Wildlife Resources. Four airboats were used to herd the flightless geese into shallow water, where they were then picked up for banding.

Refuge personnel spent six days between June 27 and July 7 banding goslings. Broods were spotted, then watched as the remainder of the crew arrived and unloaded the airboat. Brood locations were then radioed to the airboat crew. Geese were extremely wary and disappeared at the sight and sound of the airboat. Fifteen of the 22 remaining goslings were banded. An additional six adults were captured, at least three were breeders. Airboat malfunctions curtailed several attempts and hampered our efficiency in capturing goslings.

Table 9 summarizes band return data from Canada geese banded by the Refuge. Table 10 contains band return data from Canada geese banded at the Refuge by the Utah Division of Wildlife Resources.

Table 9. Canada Goose Band Returns from Fish Springs Refuge

Date Banded	Band Number	Age/ Sex	Recovery Location	Recovery Date	Years After Banded
08/06/62	528 98955	L/M	Fish Springs Refuge	07/12/77	15.0
08/06/62	528 98956	L/F	Fish Springs Refuge	08/02/72	10.0
08/06/62	528 98979	L/M	Niland, CA	12/15/71	9.0
08/06/62	528 98986	L/F	Sunrise Ranch Inglewood, CA	HS* /69	7.0
07/23/63	558 92592	L/M	Fish Springs Refuge	07/11/77	14.0
07/27/64	558 98505	L/F	Fish Springs Refuge	07/11/77	13.0
07/07/65	558 92510	L/F	Socoro, NM	HS* /72	7.5
07/07/65	558 92513	L/F	Fish Springs Refuge	07/11/77	12.0
07/07/65	558 92520	L/M	Blythe, CA	01/08/71	5.5
07/07/65	558 92619	L/F	Stillwater, NV	12/16/72	6.5
07/01/68	558 92628	A/F	Garrison, UT	01/05/86	18.5
07/01/68	558 92630	L/M	Niland, CA	12/26/70	2.5
07/07/69	558 92638	A/F	Promontory Point, UT	10/15/71	3.0
07/07/69	558 92643	A/F	Corinne, UT	10/13/73	4.0
07/07/69	558 92654	L/F	Locomotive Sprgs, UT	12/12/84	15.5
07/07/69	558 92655	L/M	Fish Springs Refuge	07/02/76	7.0
07/07/69	558 92665	L/F	Locomotive Sprgs, UT	11/07/70	1.5
07/07/69	558 92676	L/M	Buffalo Lake,Alberta	09/11/72	3.0
07/07/69	558 92678	L/F	Fish Springs Refuge	07/11/74	5.0
07/07/69	558 92679	L/M	Corinne, UT	10/23/71	2.0
07/07/69	558 92683	A/F	Lima Reservoir, MT	06/20/78	9.0
07/13/70	558 92685	A/M	Overton, NV	01/07/73	2.5
07/13/70	558 92688	L/M	Chino, CA	12/20/72	2.5
07/13/70	558 92690	A/F	Lancaster, CA	01/16/72	1.5
06/30/71	528 28703	A/F	Rosamond, CA	12/17/72	1.5
07/02/71	528 28709	L/F	Pocatello, ID	10/07/72	1.0
07/02/71	528 28711	L/M	Deer Flat NWR, ID	HS* /73	2.5
07/02/71	528 28716	L/F	Brawley, CA	01/07/73	1.5
07/13/71	528 28722	L/F	Rosamond, CA	12/17/71	0.5
07/13/71	528 28723	L/F	Lakeview, CA	01/09/82	10.5
07/11/74	528 28726	L/F	Millerton Lake, CA	01/08/77	2.5

07/16/74	528	28728	L/M	Fish Springs Refuge	01/17/75	0.5
06/29/76	528	28737	L/F	Declo, ID	11/04/82	6.5
06/29/76	528	28747	A/F	Centenial, AZ	12/29/76	0.5
06/30/76	528	28760	L/F	Monida, CA	10/26/80	4.0
07/02/76	528	28761	L/M	Elberta, UT	10/11/86	10.0
07/06/76	528	28764	A/M	Locomotive Sprgs, UT	10/11/80	4.0
07/11/77	528	28769	A/F	Redmond, UT	10/14/78	1.0
07/11/77	528	28772	L/F	Twin Falls, CO	HS* /78	1.5
07/11/77	528	28777	L/F	Fish Springs Refuge	12/19/87	10.5
07/11/77	528	28778	A/M	Howard Slough WMA,UT	10/18/79	2.0
07/11/77	528	28784	L/M	Aberdeen, ID	12/07/78	1.5
07/12/77	528	28786	L/F	Malad, ID	10/14/78	1.0
07/07/78	528	28798	L/M	Overton, NV	01/15/79	0.5
06/26/80	558	92540	L/M	Overton, NV	01/11/82	1.5
06/30/80	558	92548	A/M	El Cajon (Lake Henshaw, CA)	01/ /85	4.5
06/26/81	558	92571	A/F	Garrison, UT	12/19/81	0.5
06/26/81	558	92570	A/M	Stillwater, NV	HS* /83	2.5
06/26/81	558	92574	L/M	Wister Refuge LA, CA	01/02/85	3.5
06/26/81	558	92572	A/F	Fish Springs Refuge	11/19/87	6.0
06/26/81	558	92566	L/M	Fish Springs Refuge	12/19/87	5.5
06/26/81	558	92576	A/M	Garrison, UT	10/25/86	5.5

*HS = Hunting season
Age: A = After Hatching Year, L= Local
Sex: M = Male, F = Female

Table 10. UDWR Banding Data for Canada Geese from Fish Springs

Date Banded	Age/Sex	Recovery Location	Recovery Date	Band Number
1976	L	Utah	1986-1987	
1981	ASY	Utah	1986-1987	
06/86	SY	Lund, Utah	09/86	
06/86	SY	Mexico	02/87	
06/86	ASY	Utah	1986-1987	
06/86	ASY	Utah	1986-1987	
06/86	ASY	Utah	1986-1987	
1977	L	Fish Springs NWR	1987-1988	
1981	ASY	Fish Springs NWR	1987-1988	
06/86	L	Fish Springs NWR	1987-1988	
06/86	L	Utah	1987-1988	
06/86	SY	Fish Springs NWR	1987-1988	
06/86	SY	Fish Springs NWR	1987-1988	
06/86	SY	Fish Springs NWR	1987-1988	
06/86	SY	Utah	1987-1988	
06/86	SY	Utah	1987-1988	
06/86	SY	Utah	1987-1988	

06/86	SY	Utah	1987-1988	
06/86	SY	Utah	1987-1988	
06/86	ASY	Fish Springs NWR	1987-1988	
06/86	ASY	Fish Springs NWR	1987-1988	
06/86	ASY	Utah	1987-1988	
06/86	ASY	Utah	1987-1988	
06/86	ASY	Utah	1987-1988	
06/87	SY	Utah	1987-1988	
06/87	SY	Utah	1987-1988	
06/87	SY	Utah	1987-1988	
06/87	SY	Fish Springs NWR	1987-1988	
06/87	SY	Fish Springs NWR	1987-1988	
06/87	SY	Fish Springs NWR	1987-1988	
06/87	SY	Fish Springs NWR	1987-1988	
06/87	SY	Fish Springs NWR	1987-1988	
06/87	SY	Fish Springs NWR	1987-1988	
06/87	ASY	Fish Springs NWR	1987-1988	
06/87	ASY	Fish Springs NWR	1987-1988	
06/87	ASY	Utah	1987-1988	
06/87	ASY	Utah	1987-1988	
06/86	ASY/F	Utah	10/21/88	748-36575
06/86	ASY/M	Arizona	01/20/89	748-36512
06/86	ASY/F	Utah	12/18/88	748-36730
06/86	ASY/M	Fish Springs NWR	12/31/88	748-36739
06/87	SY/F	Fish Springs NWR	12/17/88	768-09223
06/87	SY/F	Idaho	12/11/88	768-09247
06/87	SY/F	Fish Springs NWR	12/23/88	768-09018
06/87	ASY/M	Fish Springs NWR	12/23/88	768-09042
06/87	SY/M	Fish Springs NWR	01/01/89	768-09052
06/87	SY/M	Alberta, Canada	10/27/88	768-09033
06/87	SY/F	Fish Springs NWR	10/22/88	768-09258
06/88	SY/F	Nevada	12/18/88	798-06317

Age: ASY = After Second Year, SY = Second Year, L = Local
Sex: M = Male, F = Female

H. PUBLIC USE

1. General

Public use of the Refuge progressively increased from 1985 to 1987 then decreased (Table 11). Most of the decrease can be attributed to the lower hunter numbers. Over 57% of the public use occurred in the four month period of March-June. Apparently the mild temperatures prompt many people to get out of Salt Lake City and go to the desert.

The Utah Department of Wildlife Resources crew swarmed in for a day of goose banding in June
89FS-JS

Manager Savery with one of the survivors
89FS-JDE

Table 11. Public Use at Fish Springs NWR 1985-1989.

	1985	1986	1987	1988	1989	5-year Average
Visits	2,442	2,673	3,426	2,347	2,318	2,641
A/H	5,534	7,451	12,176	7,033	5,961	7,631
A/H/Visit	2.2	2.7	3.2	3.0	2.6	2.9

5. Interpretive Tour Routes

The 11-mile, self-guided auto tour is open daily. Starting at the visitor contact station, visitors pass through a variety of habitat types including desert shrublands, salt grass flats and marshlands.

This year there were 11 formal tours conducted. These ranged in size from small boy scout groups to large groups in greyhound buses.

Visitors at Fish Springs sometimes flock in by the busloads
89FS-JS

The Dugway Outdoor Recreational Facility conducted their annual desert tour in June. Two bus loads totaling 50 people stopped at the Refuge for a guided tour.

The Utah Historical Society also visited the Refuge to learn more about the old Pony Express and Overland Stage routes.

The Fish Springs area offers more than just a wildlife refuge, history and geology abound - The Utah Historical Society
89FS-JS

7. Other Interpretive Programs

In December a film crew from KTVX, Channel 4 Television (ABC) Salt Lake City, interviewed Manager Savery concerning the remoteness of the Refuge and filmed swans and Canada geese. The tape was shown on New Years Eve and again on New Years Day.

Manager Savery was also interviewed by KTKK Radio Station in Salt Lake City. Apparently the news people had seen our advertisement for bids on the muskrat trapping program and wanted to discuss the subject on their call-in talk show. Other than the host trying to "sensationalize" fur trapping, everything went quite well.

8. Hunting

Hunting for ducks and coots was the only form of hunting allowed on the Refuge this year. The two-year goose hunting season was closed due to the crash of the Refuge breeding population. Hunting activity dropped markedly due to decreased duck numbers and the goose season closure.

Hunting visits and activity hours declined 73% from the previous 5-year average. Hunting represented only 14% of all visits to the Refuge, compared to 41% in 1988. Table 12 shows hunting activity from 1985 to 1989.

Table 12. Hunting at Fish Springs NWR 1985-1989.

	1985	1986	1987	1988	1989	5-year Average
Visits	706	1066	1687	968	290	943
Activity Hours	3228	5011	9463	5247	1473	4884
A-H/Visit	4.5	4.7	5.9	5.4	5.1	5.1
Ducks Taken	953	1077	1315	551	296	838
Geese Taken	--	--	344	129	--	237
Coots Taken	95	189	302	114	147	169
Ducks/Hunter	1.3	1.0	0.7	1.8	1.0	1.2

There were 296 ducks and 147 coots reported shot in 1989. Total duck harvest consisted of 37% mallards, 19% green-winged teal, 11% gadwall and 11% pintail. Seven other species were harvested in low numbers. December hunting was limited to the last weekend of the month as Utah used a split-season this year. Mallards and teal comprised 93% of the December harvest.

Coots represented 33% of the total birds taken, compared to the 5-year average of 14%. Low duck numbers probably contributed to increased coot hunting. The reported crippling rate for ducks was 15% of the total harvest. Fifteen ducks and 17 coots were found wasted during the season.

10. Trapping

Muskrats are the only furbearers commercially trapped on the Refuge. This program has been conducted on an intermittent basis since 1980. Harvest quotas are usually set at 75% of the lowest density estimates. These estimates are obtained from fall airboat surveys of active bank dens and houses. Public notice was served in several newspapers. The Refuge was again divided into two trapping units, similar to previous years. Two parties successfully bid on each unit. Special permits were issued for trapping 1200 muskrats on Unit 1 and 800 on Unit 2. Table 13 shows muskrat trapping data since 1985. The trapping year in the table reflects the winter season (usually January-March) when the majority of trapping was conducted.

Table 13. Muskrat Trapping at Fish Springs NWR 1985-1989

Year	Quotas Established Unit 1	Quotas Established Unit 2	Muskrats Harvested Unit 1	Muskrats Harvested Unit 2	Total
1985	1660	450	1653	465	2118
1986	600	500	600	459	1059
1987	1400	600	1396	582	1978
1988	1200	800	Not Recorded		2036
1989	1200	800	1218	821	2039

Unit 1, 1986 & 1987 Avocet and Curlew Units
Unit 2, 1986 & 1987 Harrison, Mallard, Shoveler & Spring Units

Unit 1, 1988 & 1989 Avocet and Spring Units
Unit 2, 1988 & 1989 Harrison, Mallard, Shoveler & Curlew Units

17. Law Enforcement

The relatively low numbers of visitors restricts most LE work to the waterfowl hunting season. Non-hunting visitors are generally given warnings for violations of the Refuge Administration Act, depending on the seriousness of the violation. Persons entering closed areas constitute most of the warnings, particularly along the Refuge perimeter and Spring Units. Apparently the general public thinks the "closed area" signs pertain only to hunters.

Assistant Refuge Manager Engler encountered a variety of LE situations during his first year with LE authority. Seven pink slips were submitted for ten violations and are summarized in the Table 14.

Table 14. Law Enforcement Activities at Fish Springs NWR 1989

	Violation 50CFR	Description	Disposition
1)	20.71	Taking migratory birds in violation of Federal Law	$100 fine
2)	20.71	Taking migratory birds in violation of Federal Law - by juvenile	probation
3)	26.21(a)	Trespass on a National Wildlife Refuge	$100 fine
4)	20.25	Wanton waste - coots	$100 fine
5)	20.25	Wanton Waste - coots	DP
6)	27.31(d)	Exceeding posted speed limit	DP
7)	27.61	Removal of public property	DP
	27.94(a)	Simple littering	DP
	25.21	Enter closed portion of a NWR	DP
	27.31	Travel on other than designated route	DP

DP - District attorney declined to prosecute case

A local sheep rancher attempted to pump water off the Refuge because a BLM well was inoperable. Assistant Refuge Manager Engler had the Peruvian ranch hand remove the pumping equipment and tanker truck before any water could be pumped. He later explained to the disgruntled ranch owner that water pumping was not a provision of the Sheep Driveway Mandate.

Assistant Refuge Manager Engler encountered two mud-covered women on the east side of the Refuge on an early December morning. The two had been "4-wheeling" in their brand new truck and became stuck in the mud on Friday night (See Photo). They spent a cold night in the desert but were fortunately well provisioned with beer, pop and cigarettes. The women were taken to the Refuge office to phone for assistance. After investigating the area, a variety of garbage was found dumped at the site as well as the disappearance of a Refuge boundary sign and post. The driver was cited for the four violations in Table 14 (50 CFR 27.61, 27.94, 27.31 25.21). The district attorney apparently thought that spending a night in the desert was enough punishment and declined to prosecute the case.

"Four-wheeling" has its pitfalls in a wet desert
89FS-JDE

I. EQUIPMENT AND FACILITIES

1. New Construction

A new septic drain field was installed behind the shop. The septic tank was installed in 1988. This septic system services the new bathroom in the shop.

Six new boat launching ramps (one each) were installed in Harrison, Avocet, Shoveler, Pintail, Gadwall and Egret Units. Previously, it was very difficult to launch the airboat across mudflats during the summer months when the pool elevations were low.

A new public water outlet was installed at the headquarters area. The piping had to be brought from the east end of the building. Fish Springs has the only potable water supply for 25 miles to the west and 60 miles to the east and south.

A portion of the cement block wall at residence 39 and a portion of the foundation were all repaired. These were cracked and in poor condition.

2. Rehabilitation

In October a 50-foot long crack was discovered on the dike between Pintail and Shoveler Units. It was only 4-5 inches wide but measured over six feet deep in some areas. Engineering thought it was due to shrinkage in the dike. The units on each side of the dike have been dry for 1.5 years. The crack was dug out with the backhoe, tamped and back filled.

The main entrance sign was sanded and repainted. Four "No Camping" signs were also installed at North Spring and on the southwest corner of the Refuge.

The hot water heater was replaced in residence #39. The saline water that was utilized prior to the reverse osmosis system deteriorated equipment rapidly. The water heater in residence #40 was hooked up and prepared for operation.

Four cable gates were installed on the three closed marsh units. These units are closed during hunting season. Identification signs were also routed and installed on these units.

A portion of the cement block wall at residence #39 and a portion of the foundation were all repaired. These were cracked and in poor condition.

This 50' long X 6' deep crack resulted from the 1.5 years that the two adjacent units were dry

89FS-JS

Corrective measures included refilling and packing the dike

89FS-JS

Over 200 feet of new electric cable was installed for the entrance visitor kiosk. The wire had to be run in PVC pipe to protect it from the alkali soil conditions. The old wire had deteriorated badly. The new lights make it a lot easier to check waterfowl hunters out.

3. Major Maintenance

Six new corregated metal pipes were assembled and installed in Avocet, Shoveler, Pintail and Gadwall Units. These structures ranged from 12 inches to 18 inches in size and included a six-foot wide cmp wing wall welded to the stop-log structure. The saline water condition causes most cmp structures to deteriorate rapidly. At least fifteen more half-round stop-log structures have been identified as needing replacement. Some are as large as 24 inches in diameter.

This culvert was installed in Gadwall Unit to replace the non-functional concrete stop log structure

89FS-JDE

Two 8-feet by 36-inch concrete culverts were installed in the entrance ditch to west Gadwall slough. The old 36-inch cmp had completely disintegrated

Seven concrete water control structures were completely rehabilitated. Repairing severe spalling and cracking is a continuous project. The ice and saline water conditions are hard on concrete. Each structure usually requires approximately two days to repair.

The roads to Thomas Spring and the measuring flume were not passable during portions of the year. Over 180 cubic yards of gravel were hauled and spread. The turn around areas were also enlarged.

4. Equipment Utilization and Replacement

In December, it was discovered that the JD 750 dozer had a "knock" in the engine. After the machine was "torn" down it was found to have a cracked crank shaft, two spun bearings, and two bent valves. New parts cost approximately $2600. All work was done by maintenance staff Velasquez and Layland. The John Deere heavy equipment dealer wanted $7500 to come out with their lowboy, haul the machine to town and repair it.

All vehicles and heavy equipment were inspected for major deficiencies as part of the Maintenance Management System. The computer listing was updated with all repairs, but the 1982 International Dump Truck was the only one with over $1000 worth of repair.

On Saturday, May 13th, the FMC dragline arrived back on station. The machine had been out on loan to LaCreek Refuge. However, it didn't arrive without incident. The rig was over 85 feet long and had to be brought out the Pony Express Road and Dugway Pass. The driver said he could make the Pass with "no problems". However, half way up the pass, the tractor got stuck with the rear wheels of the trailer almost off the road. After unhooking, unloading and jacking the trailer up, we got the rig to the top. It sure is interesting to block the Pony Express route for three hours on a weekend.

The bombardier was rehabilitated in the following areas: two hydraulic hoses were replaced, a U-joint on the hydraulic drive shaft was replaced and the main 2-1/2" swivel bearing was replaced.

The carburetors on the 1978 and 1981 Dodge pickup and Chevrolet stake truck were completely rehabilitated. Severe dusty conditions cause many problems for vehicles.

6. Computer Systems

Fish Springs NWR eased further into the computer age in 1989. The system, a PC's Limited 286 computer, Mitsubishi monitor, Fujitsu DL2400 printer and modem, which sat relatively idle during 1988, received increased usage throughout the year. The monitor needed repair in December due to a faulty power switch. A Zenith Portable Super Port 286 computer was ordered in December.

DBase and Word Perfect are the most utilized software packages at this time. Most of the Refuge plans, reports, proposals, field forms, and the 1988 narrative were "computerized" in 1989. A variety of projects and data files were incorporated into the DBase system. These include the Budget Tracking System, 30 year summary of weather data, bi-monthly bird censuses, 30 year seasonal summary of bird censuses, bi-monthly water flow data, waterfowl and colonial bird nesting data.

J. OTHER ITEMS

3. Items of Interest

In January, the U.S. Air Force proposed a new electronic battlefield for the Utah West Desert. The project may be constructed south and west of the Refuge headquarters and consists of new roads, at least ten radar sites, and several target grids. If the project is built, the Refuge will be surrounded by military land on two sides and subject to endless sonic booms. Science Applications International Corporation (SAIC) was the Environmental Consultant for the Air Force. The group conducted field work with FWE, Salt Lake City during the summer months. As of this writing, the project is "dead" due to military budget cut backs.

4. Credits

Joe Engler - Drafted sections B; E-6, F-9, 10; G; H-8, 10, 17; I-6; edited.

Jim Savery - Drafted sections A; C-2; D-2; E-1, 4, 5, 8; F-1, 2, 7, 11; H-1, 5, 7; I-1, 2, 3, 4; J-3, 4; edited.

Leah Layland - Conducted all word processing and assembly.

For additional information write:
Refuge Manager
Fish Springs National
Wildlife Refuge
Dugway, Utah 84022

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

RF6-65531-2 GPO 857-622 September 1988

Birds of the Fish Springs

National Wildlife Refuge

Dugway, Utah

Fish Springs is truly an oasis in the desert. It is located on the south edge of the Great Salt Lake Desert and is extremely isolated. This oasis attracts a myriad of birds. The species present vary with the seasons: in the fall we have thousands of ducks, geese, swans and coots. In the spring and summer we have fewer numbers of birds but a greater variety of species: waterfowl, marsh birds, shore birds and passerines. Young birds begin hatching in early summer—duck and goose broods are easily viewed from the dike roads.

Also present on the refuge is a variety of mammals, reptiles and amphibians. Mammal species include: mule deer, coyote, bobcat, kit fox, badger, striped skunk, spotted skunk, long-tailed weasel, antelope, ground squirrel, kangaroo rat, wood rat, muskrat, black-tailed jackrabbit, desert cottontail and a variety of mice. Eleven species of reptiles and two species of amphibians are present—collared lizard, leopard lizard, desert horned lizard, Great Basin sagebrush lizard, western fence lizard, desert side-blotched lizard, Great Basin whiptail lizard, striped whipsnake, wandering garter snake, Great Basin rattlesnake, Great Basin gopher snake, leopard frog and bullfrog. Three species of fish are present: Utah chub, mosquito fish and speckled dace.

EXPLANATION OF SYMBOLS:

Seasons:

S —Spring (March-May)
S —Summer (June-August)
F —Fall (September-November)
W—Winter (December-February)

Seasonal abundance:

a—abundant	certain to be seen, very numerous
c—common	should be seen in suitable habitat
u—uncommon	might be seen in suitable habitat
o—occasional	seen only a few times during a season
r—rare	seen at intervals of 2 to 5 years

Birds nesting on the refuge are preceded by a •.

The following bird list is in accordance with the 6th A.O.U. Checklist as amended.

	S	S	F	W
LOONS				
__ Common Loon	o	o		
GREBES				
__ • Pied-billed Grebe	a	a	a	a
__ Horned Grebe				r
__ Eared Grebe	a	u	u	u
__ • Western Grebe	u	u	u	
PELICANS, CORMORANTS				
__ American White Pelican	c	o	o	r
__ Double-crested Cormorant	c	u		
HERONS, BITTERNS, IBISES				
__ • American Bittern	u	u	u	u
__ • Great Blue Heron	c	c	c	c
__ Great Egret		o	o	o
__ • Snowy Egret	a	a	o	r
__ Cattle Egret	r	o		
__ • Black-crowned Night Heron	a	a	c	c
__ • White-faced Ibis	o	a	o	o
SWANS, GEESE, DUCKS				
__ Tundra Swan			c	c
__ Trumpeter Swan				u
__ Snow Goose			u	
__ • Canada Goose	a	a	a	a
__ Green-winged Teal	o		a	a
__ • Mallard	a	a	a	a
__ • Northern Pintail	a	a	a	a
__ • Blue-winged Teal	o	o	o	o
__ • Cinnamon Teal	a	a	u	o
__ • Northern Shoveler	a	c	a	a
__ • Gadwall	a	a	a	a
__ American Wigeon	o	o	a	a
__ • Canvasback	u	u	u	o
__ • Redhead	a	a	a	c
__ Ring-necked Duck	u	u	c	c
__ Lesser Scaup	u	o	c	c
__ Common Goldeneye				o
__ Bufflehead	o		o	u
__ Hooded Merganser			r	r
__ Common Merganser	o	o	u	o
__ Red-breasted Merganser	o	u	u	
__ • Ruddy Duck	a	a	a	c
HAWKS, EAGLES, FALCONS				
__ Osprey	r		u	
__ Bald Eagle			u	u
__ • Northern Harrier	c	c	c	c
__ Sharp-shinned Hawk			o	
__ Cooper's Hawk			o	
__ • Red-tailed Hawk	o	o	o	o
__ Ferruginous Hawk	r			
__ Rough-legged Hawk	o		u	u
__ • Golden Eagle	u	u	u	u
__ American Kestrel		o	o	
__ Merlin			r	r
__ Peregrine Falcon			o	o
__ Prairie Falcon	o		u	u
PHEASANTS, PARTRIDGES				
__ • Chukar	o	o		
__ • Ring-necked Pheasant	c	c	c	c
RAILS, COOTS				
__ • Virginia Rail	u	u	u	u
__ • Sora	u	u	u	u
__ • American Coot	a	a	a	a
SHOREBIRDS, GULLS, TERNS				
__ Black-bellied Plover	r	r		
__ • Snowy Plover		u		
__ • Killdeer	c	a	c	o
__ • Black-necked Stilt	a	a		
__ • American Avocet	a	a	o	
__ Greater Yellowlegs	c	o	a	u
__ Lesser Yellowlegs		u		u
__ Solitary Sandpiper		r		
__ • Willet	c	c		
__ Spotted Sandpiper	u	u		
__ • Long-billed Curlew	u	u		
__ Marbled Godwit	o	r		
__ Western Sandpiper	o	o	r	
__ Least Sandpiper		o		
__ Baird's Sandpiper		r		
__ Pectoral Sandpiper	r	r		
__ Long-billed Dowitcher	u	o	u	
__ Common Snipe	o		u	u
__ • Wilson's Phalarope	o	a	o	
__ Ring-necked Phalarope		r		
__ Franklin's Gull	r	r		
__ Ring-billed Gull	a	a	c	o
__ California Gull	r	o		
__ Caspian Tern	c	u		
__ • Forster's Tern	a	a	o	
__ Black Tern	r	o		
DOVES				
__ Rock Dove	o	o		
__ • Mourning Dove	c	c	u	
OWLS				
__ Common Barn Owl		r		
__ Great Horned Owl	o	o	o	o
__ Burrowing Owl			r	
__ • Short-eared Owl	u	u	u	u
GOATSUCKERS, SWIFTS, HUMMINGBIRDS				
__ Common Nighthawk		u		
__ White-throated Swift	r			
__ • Broad-tailed Hummingbird	o	u		
__ Rufous Hummingbird		r		
KINGFISHERS, WOODPECKERS				
__ Belted Kingfisher	o		o	
__ Lewis' Woodpecker			r	
__ Yellow-bellied Sapsucker			u	
__ Downy Woodpecker			u	
__ Northern Flicker	r		u	u
FLYCATCHERS				
__ Western Wood Pewee	u	u		
__ • Say's Phoebe	u	u	u	
__ • Western Kingbird	u	u		
__ • Eastern Kingbird	o	o		
LARKS, SWALLOWS				
__ • Horned Lark	a	a	a	a
__ Tree Swallow	c			
__ Violet-green Swallow	r			
__ Northern Rough-winged Swallow	c			
__ Cliff Swallow	r			
__ • Barn Swallow	a	a		
JAYS, MAGPIES, CROWS				
__ Pinyon Jay	r			
__ Clark's Nutcracker		r		
__ Black-billed Magpie				r
__ American Crow			r	
__ Common Raven	c	c	c	c
NUTHATCHES				
__ Red-breasted Nuthatch			r	
WRENS, THRUSHES				
__ Rock Wren		r	r	
__ House Wren			r	

	S	S	F	W
__ Marsh Wren	c	c	c	c
__ Ruby-crowned Kinglet			r	
__ Western Bluebird	o	o		
__ Mountain Bluebird		o	o	u
__ • Townsend's Solitaire	u	u	u	
__ Hermit Thrush			r	
__ • American Robin	o	u	c	o
THRASHERS				
__ • Northern Mockingbird	u	o	o	
__ Sage Thrasher		o	o	
__ Brown Thrasher		r	r	
PIPITS, WAXWINGS, SHRIKES, STARLINGS				
__ Water Pipit	r			o
__ Bohemian Waxwing			r	r
__ Cedar Waxwing			o	
__ Loggerhead Shrike	o	u	u	u
__ • European Starling	c	o	c	
WOOD WARBLERS				
__ • Yellow Warbler	c	u	u	
__ Yellow-rumped Warbler	c	u	u	
__ Townsend's Warbler			r	
__ • Common Yellowthroat	o	o		
__ Wilson's Warbler			r	
TANAGERS, GROSBEAKS				
__ Western Tanager	u	u		
__ Rose-breasted Grosbeak	r			
__ Lazuli Bunting	o			
__ Evening Grosbeak			r	
SPARROWS				
__ Green-tailed Towhee	r			
__ American Tree Sparrow	o			o
__ Chipping Sparrow	o		o	o
__ Lark Sparrow	u	c	o	
__ Black-throated Sparrow	o	a	o	
__ Sage Sparrow				o
__ • Savannah Sparrow	a	a	a	o
__ Song Sparrow	c		c	c
__ White-crowned Sparrow	c		u	
__ Dark-eyed Junco			a	u
BLACKBIRDS, MEADOWLARKS, FINCHES				
__ Bobolink	r			
__ • Red-winged Blackbird	a	c	a	c
__ • Western Meadowlark	c	a	a	o
__ • Yellow-headed Blackbird	a	c	u	
__ • Brewer's Blackbird	a	a	a	
__ • Northern Oriole	o	o		
__ • House Finch	u	u		
__ Pine Siskin	o			
__ American Goldfinch	o			r
__ House Sparrow	o			

NOTES

Fish Springs National Wildlife Refuge is one of a system of over 400 refuges administered by the U.S. Fish and Wildlife Service and dedicated to the preservation and conservation of wildlife. The financial base for this system was firmly established in 1934 through the passage of the Migratory Bird Hunting Stamp Act or "duck stamp act." Funds collected from duck stamp sales have been used to purchase refuge lands that provide habitats necessary to sustain a variety of wildlife for both hunters and nonhunters to enjoy.

REGULATIONS

☐ All plants and animals are protected. Molesting, disturbing, injuring, destroying, or removing any plant or animal are prohibited, (except legally taken waterfowl).

☐ Wildlife observation, photography and hiking are permitted except where restricted by signs.

☐ Automobile touring is restricted to gravel roads. Closed roads are marked with signs.

☐ Parking: please do not obstruct roads and dikes.

☐ Picnicking is permitted only in the designated picnic area.

☐ Camping overnight is not permitted on the refuge. The BLM campground outside the refuge may be used.

☐ Swimming is not permitted. Springheads and pond bottoms contain deep mud, quicksand, and entangling aquatic vegetation.

☐ Hunting is prohibited, except during prescribed special seasons — ask for hunting regulations at refuge office.

☐ Firearms or other weapons are prohibited on the refuge, except as noted in the hunting regulations.

☐ Fires are permitted only in provided firegrates.

☐ Litter is ugly — please use provided trash barrels.

☐ **All other uses not expressly permitted are prohibited.**

When in doubt as to any regulation, contact a refuge officer.

DUCK STAMP

Fish Springs National Wildlife Refuge is one of a system of refuges administered by the U.S. Fish and Wildlife Service and is dedicated to the preservation and conservation of wildlife. The financial base for this system was established in 1934 through the passage of the Migratory Bird Hunting Stamp Act. This Act requires waterfowl hunters to purchase an annual migratory bird or "duck stamp". Funds collected from duck stamp sales have been used to purchase numerous waterfowl refuges that provide habitats necessary to sustain a variety of wildlife for both hunters and nonhunters to enjoy.

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

Where to Write

Refuge Manager
Fish Springs National Wildlife Refuge
Dugway, Utah 84022

RF6 — 65531-1

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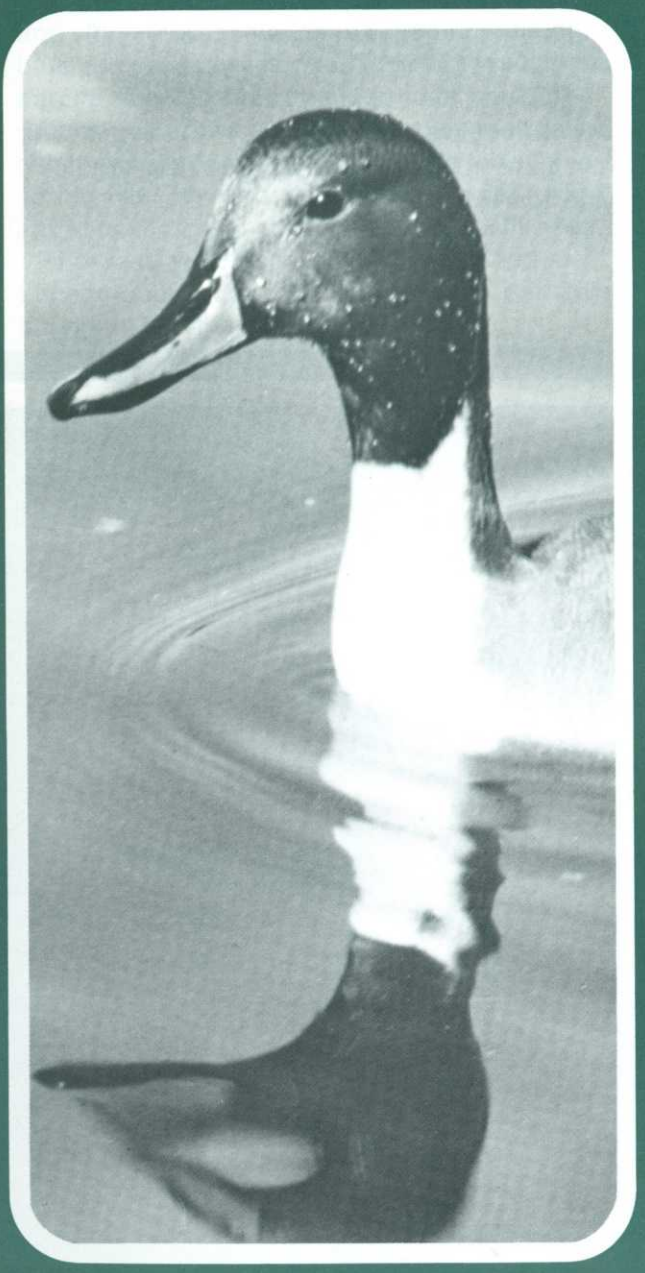
fishSprings
NATIONAL WILDLIFE REFUGE



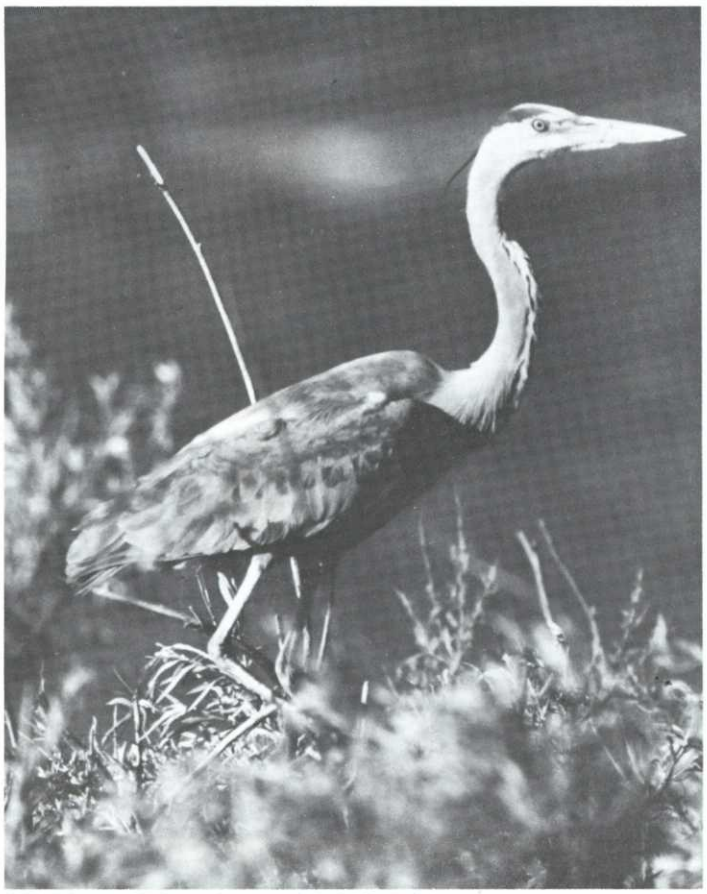
FISH SPRINGS NATIONAL WILDLIFE REFUGE

Fish Springs National Wildlife Refuge is located on the south edge of the Great Salt Lake Desert, 104 miles southwest of Tooele and 78 miles northwest of Delta, Utah. It is extremely isolated and can be reached only by gravel roads across uninhabited desert. Local inquiry into road conditions is advised.

No food, lodging, or gasoline is available in the Fish Springs area. It is 40 miles to the nearest gas station.

HISTORY

The Fish Springs area has a rich historical background which includes the use of the springs by Indians in pre-Columbian times. White men first entered the region in 1827 when famed explorer, Jedidiah Strong Smith, visited the springs during a trek from California to central Utah. The Overland Stage and the Pony Express maintained way-stations at Fish Springs. The first transcontinental telegraph, which replaced the Pony Express in 1861, crossed the Fish Springs marsh. Early in the 20th century the Nation's first transcontinental automobile road, the Lincoln Highway, came through what is now the refuge. Segments of the original road are still visible on the refuge.



GREAT BLUE HERON — Photo — USFWS / R. C. Twist

GOSLINGS —Photo USFWS / Ray C. Erickson

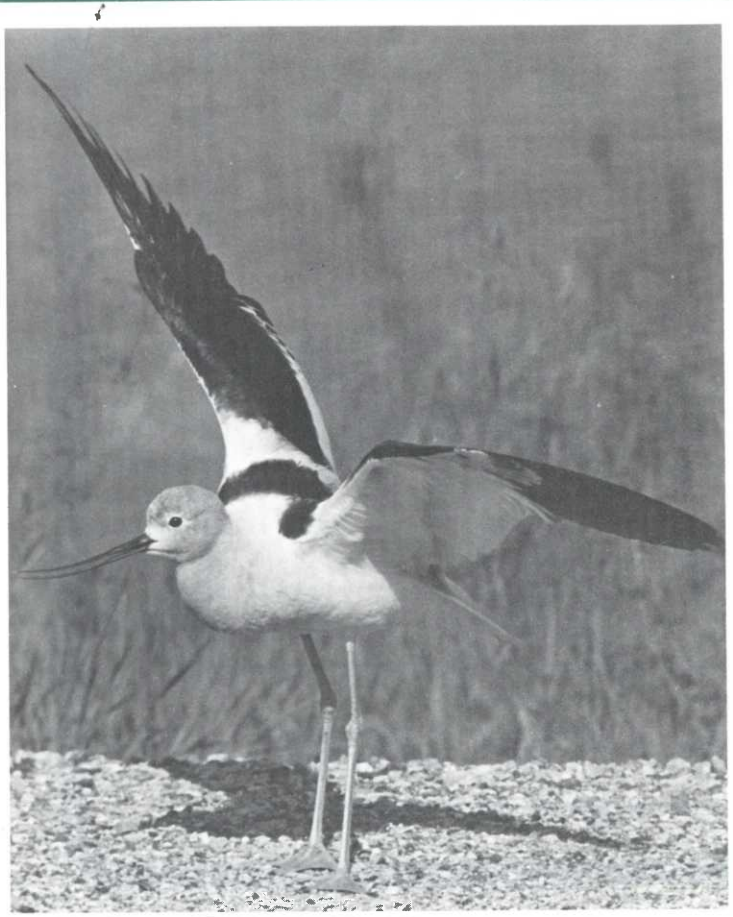
PINTAIL DUCKS — Photo USFWS / Frank Dufresne

THE MARSH

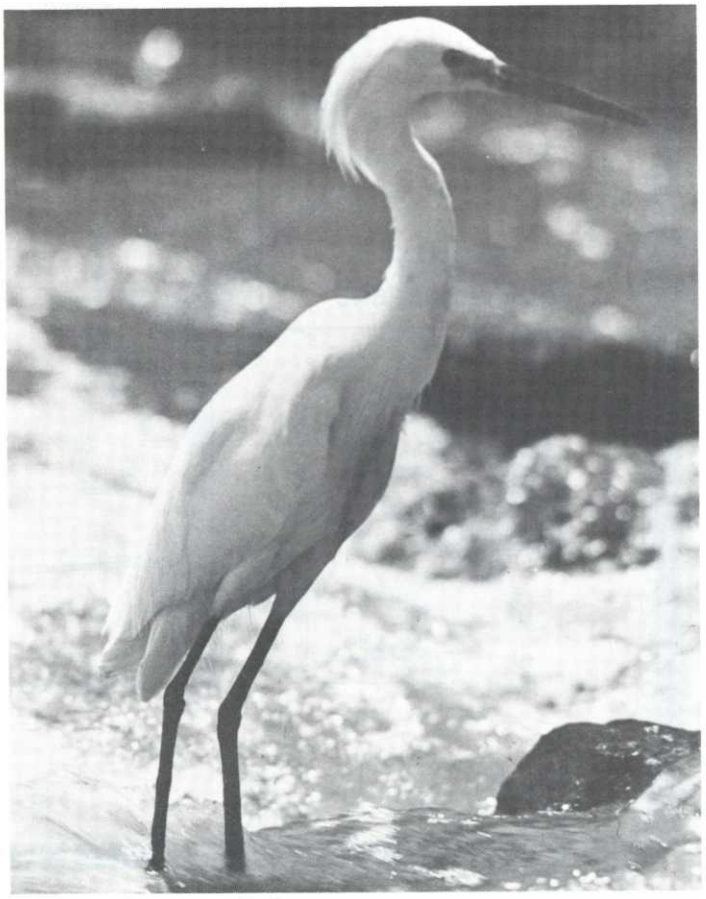
The refuge contains a 10,000-acre spring-fed marsh which has been developed to increase waterfowl utilization. The springs arise from a fault zone along the east edge of the Fish Springs Range and provide sufficient water for nine large impoundments and adjacent marshland. The 18,000-acre refuge was acquired in 1959 and development was completed in 1964.

WILDLIFE

Waterfowl species using the refuge include swans, Canada geese, mallards, green-winged and cinnamon teal, pintails, widgeons, gadwalls, redheads, canvasbacks, buffleheads, goldeneyes, ruddy ducks, and mergansers. A variety of shore and wading birds use the refuge, including great blue herons, snowy egrets, black-crowned night herons, avocets, black-necked stilts, and eared grebes. Waterfowl and marshbird concentrations can be observed best during the late fall and early spring. Nesting birds, common in late spring and early summer, are secretive and not easily seen. Visitors are welcome at Fish Springs and are encouraged to observe and study the Refuge's abundant bird life.

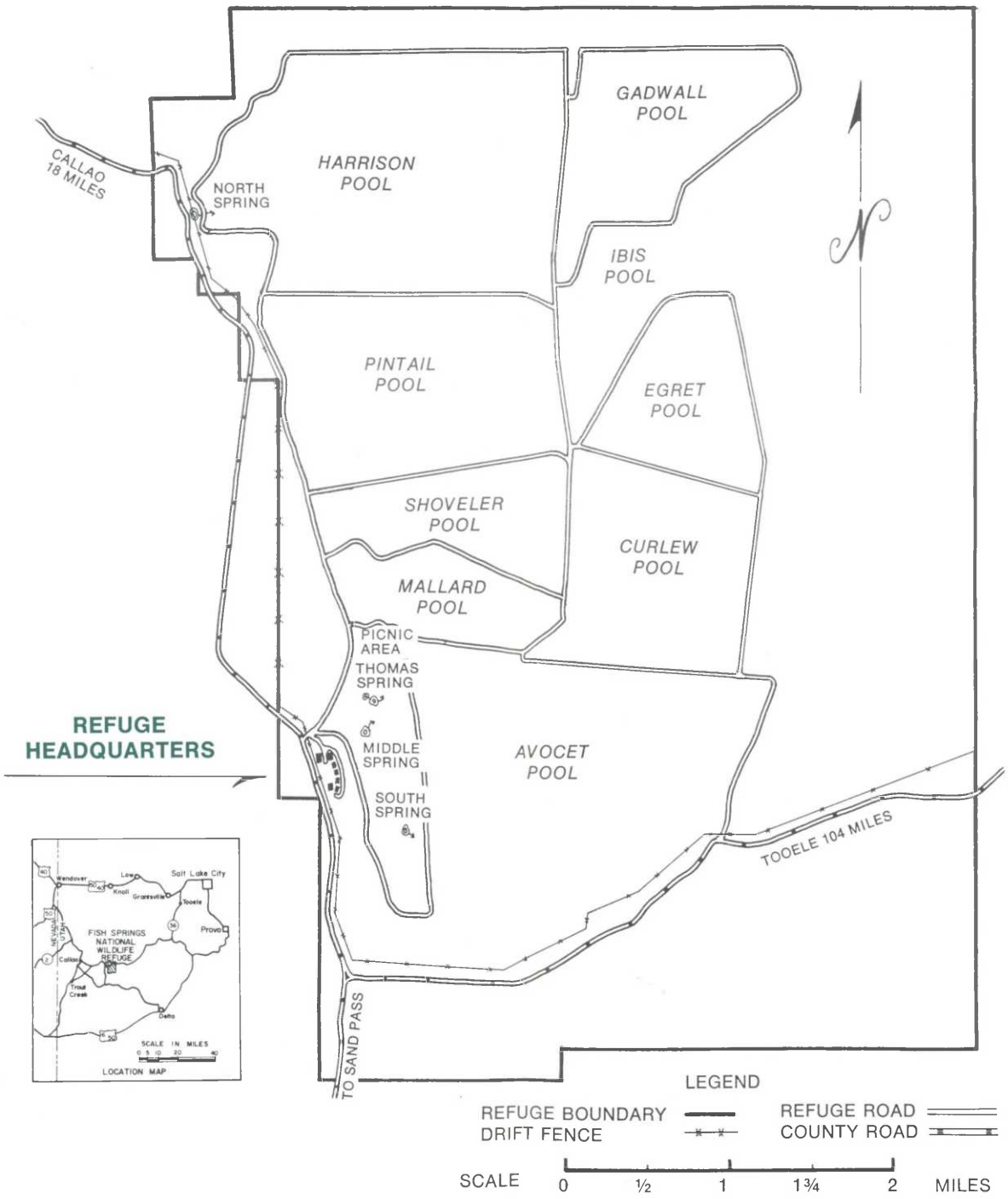


AVOCET — Photo — USFWS / John T. Lokemoen



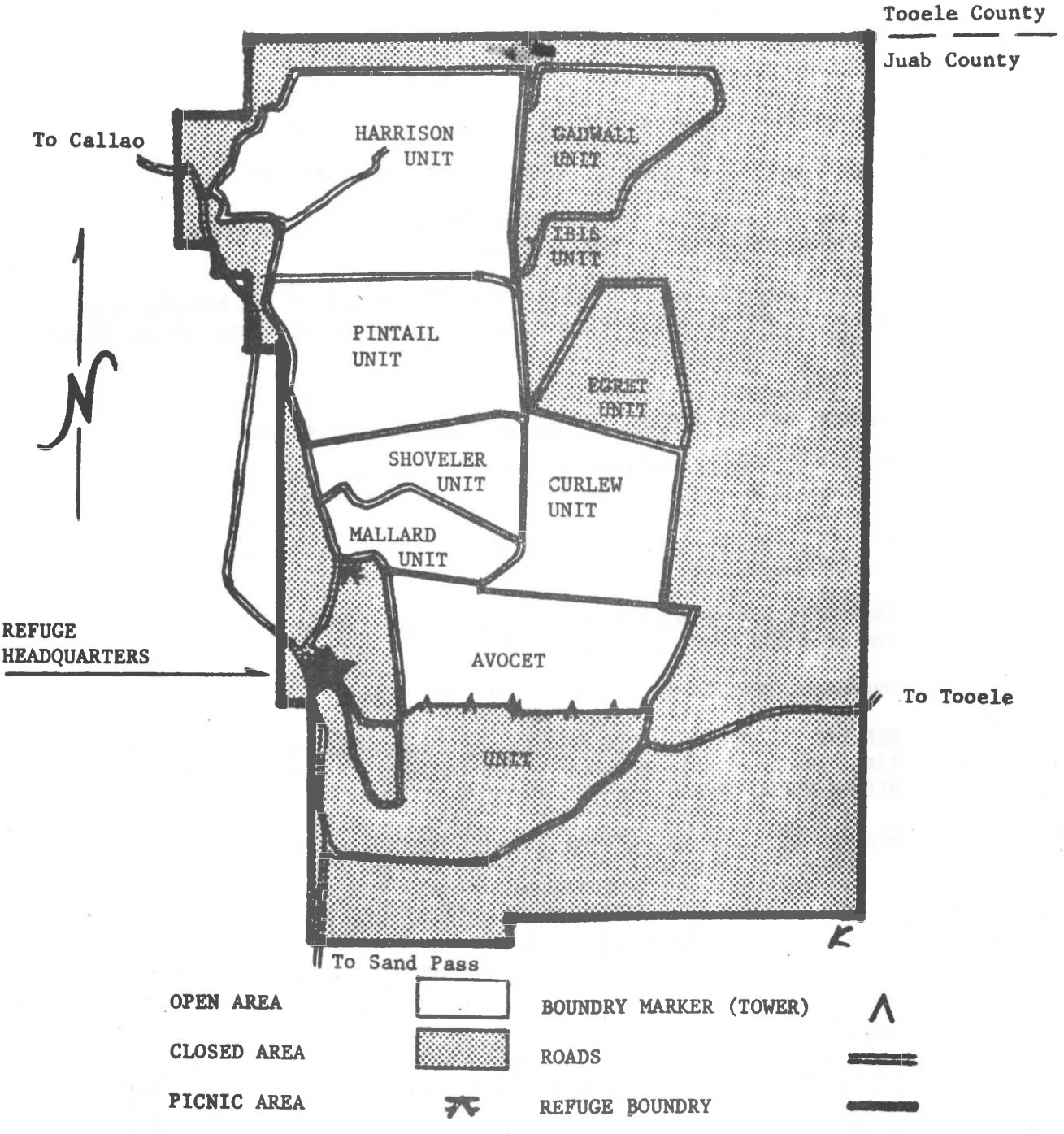
SNOWY EGRET — Photo USFWS

FISH SPRINGS NATIONAL WILDLIFE REFUGE



FISH SPRINGS NATIONAL WILDLIFE REFUGE
JUAB COUNTY, UTAH

HUNTING MAP



FISH SPRINGS NATIONAL WILDLIFE REFUGE

WATERFOWL HUNTING REGULATIONS

Hunting is permitted for [redacted], ducks, coots and mergansers in the designated public hunting area.

Observe all applicable State and Federal regulations.

Shooting upon or across DIKES or ROADS is prohibited.

Rifles and handguns are NOT PERMITTED on the refuge unless unloaded and cased or broken down.

Hunters may construct NON-PERMANENT blinds within the hunting area. All such blinds and materials must be removed when they are no longer used.

Use of small boats, canoes, etc., is permitted during the hunting season, but NO OUTBOARD MOTORS or AIRBOATS are allowed.

DOGS may be used for hunting, but must be kept under control at all times.

Parking spots are provided for your convenience. When parking, DO NOT OBSTRUCT dikes or roads.

CAMPFIRES are permitted only in fireplaces provided. Campstoves and portable heaters may be used.

Overnight CAMPING IS NOT PERMITTED on the refuge.

GENERAL INFORMATION regarding season dates, bag limits, and shooting times are available at the VISITOR INFORMATION STATION located at REFUGE HEADQUARTERS.

When in DOUBT as to any regulations, CONTACT a REFUGE OFFICER.

All Hunters Please Register
At Visitor Information Station
Prior To Hunting

FISH AND WILDLIFE SERVICE
U.S. DEPARTMENT OF INTERIOR

GPO 831-280

SEASONAL ABUNDANCE OF THE BIRDS OF FISH SPRINGS NWR

Seasons: S - Spring (March-May) S - Summer (June-August)
F - Fall (September-November)
W - Winter (December-February)

Abundance:

a - abundant	*	numerous, certain to be seen
c - common	*	should be seen in suitable habitat
u - uncommon	*	might be seen in suitable habitat
o - occasional	*	seen only a few times per season
r - rare	*	seen at intervals of 2-5 years
x - accidental	*	unexpected but within range
* - vagrant	*	out of normal range

Birds recorded nesting on the refuge are preceded by "."

	S	S	F	W
LOONS				
Common Loon	r	r	r	r
GREBES				
.Pied-billed Grebe	a	a	a	a
Horned Grebe	x			x
.Eared Grebe	c	u	u	u
.Western Grebe	u	u	u	x
Clark's Grebe	u	u	u	
PELICANS, CORMORANTS				
American White Pelican	c	o	o	r
Double-crested Cormorant	c	u	o	
HERONS, BITTERN, IBISES, CRANES				
.American Bittern	u	u	u	u
.Great Blue Heron	c	c	c	c
Great Egret	u	o	u	u
.Snowy Egret	a	a	o	r
Cattle Egret	o	o	o	
.Black-crowned Night Heron	a	a	c	c
Green-backed Heron	*	*		
.White-faced Ibis	c	a	u	r
Sandhill Crane	r	x	x	x
SWANS, GEESE, DUCKS				
Tundra Swan	u		c	c
Trumpeter Swan	u	x	x	u
Greater White-fronted Goose			*	
Snow Goose	o		o	r
Ross' Goose			r	r
.Canada Goose	a	a	a	a
Green-winged Teal	u	o	a	a
.Mallard	a	a	a	a
.Northern Pintail	a	a	a	a
.Blue-winged Teal	u	u	u	r
.Cinnamon Teal	a	a	u	o
.Northern Shoveler	a	c	a	a
.Gadwall	a	a	a	a
American Wigeon	o	o	a	a

	S	S	F	W
Wood Duck			x	
.Canvasback	u	u	u	o
.Redhead	a	a	a	c
Ring-necked Duck	u	u	c	c
Lesser Scaup	u	o	c	c
Oldsquaw	x			
Common Goldeneye	o		o	o
Bufflehead	o	r	o	u
Hooded Merganser			r	r
.Common Merganser	u	o	u	u
Red-breasted Merganser	o	u	u	r
.Ruddy Duck	a	a	a	c
HAWKS, EAGLES, FALCONS				
Turkey Vulture	x	x	x	
Osprey	r	r	u	
Bald Eagle	u		u	u
.Northern Harrier	c	c	c	c
Sharp-shinned Hawk	o	o	o	
Cooper's Hawk	o		o	
Goshawk		x		
Red-shouldered Hawk			*	
.Red-tailed Hawk	o	o	o	o
Swainson's Hawk	r	r	r	x
Ferruginous Hawk	r	o	r	r
Rough-legged Hawk	o		u	u
.Golden Eagle	u	u	u	u
American Kestrel	o	o	o	x
Merlin	x	x	r	r
Peregrine Falcon	r	r	r	r
Prairie Falcon	o	u	u	u
PHEASANTS, PARTRIDGES				
.Chukar	u	u	u	
.Ring-necked Pheasant	c	c	c	c
RAILS, COOTS				
.Virginia Rail	u	u	u	u
.Sora	u	u	u	u
Common Moorhen	*			
.American Coot	a	a	a	a
SHOREBIRDS, GULLS, TERNS				
Black-bellied Plover	o	r	o	
Lesser Golden Plover			*	
.Snowy Plover	u	u	o	
Semipalmated Plover	o	o	r	
.Killdeer	c	a	c	o
.Black-necked Stilt	a	a	u	
.American Avocet	a	a	o	
Greater Yellowlegs	c	o	a	u
Lesser Yellowlegs	u	o	u	o
Solitary Sandpiper	r	r	r	
.Willet	c	c	o	
Spotted Sandpiper	u	u	u	
.Long-billed Curlew	u	u	o	
Marbled Godwit	o	r	r	

	S	S	F	W
Western Sandpiper	o	o	o	
Least Sandpiper	o	o	o	o
Baird's Sandpiper	o	o	o	
Semipalmated Sandpiper			*	
Sanderling	r		r	
Pectoral Sandpiper	r	r	r	
Long-billed Dowitcher	u	o	u	x
Common Snipe	o	o	u	u
Dunlin			r	
.Wilson's Phalarope	u	a	u	x
Red-necked Phalarope	u	o	u	
Parasitic Jaeger	*		*	
Franklin's Gull	o	o		
Bonaparte's Gull	o		o	
Ring-billed Gull	a	a	c	o
Herring Gull	x			
California Gull	u	o		r
Black-legged Kittiwake	*			
.Caspian Tern	c	u	u	
.Forster's Tern	a	a	o	
Black Tern	o	o	o	
DOVES				
Rock Dove	o	o		
.Mourning Dove	c	c	u	
OWLS				
Common Barn-Owl	r	x	r	r
.Great Horned Owl	u	u	u	u
Long-eared Owl	x	x	x	
Burrowing Owl			r	r
.Short-eared Owl	u	u	u	u
GOATSUCKERS, SWIFTS, HUMMINGBIRDS				
Common Poorwill				r
Common Nighthawk	o	u	o	
White-throated Swift	o	o	o	
.Broad-tailed Hummingbird	o	u	o	
Rufous Hummingbird			r	r
Calliope Hummingbird				r
Black-chinned Hummingbird	o	r	r	
KINGFISHERS, WOODPECKERS				
Belted Kingfisher	u	o	u	x
Lewis' Woodpecker	r		r	
Red-naped Sapsucker			r	u
Williamson's Sapsucker				x
Downy Woodpecker				x
Northern Flicker	u		u	u
FLYCATCHERS				
Western Wood Pewee	u	u	u	
Eastern Phoebe	*			
.Say's Phoebe	u	u	u	
Vermilion Flycatcher	*			
Hammond's Flycatcher			r	r
Willow Flycatcher			x	
Olive-sided Flycatcher			x	

	S	S	F	W
Scissor-tailed Flycatcher		*		
.Western Kingbird	u	u	u	
.Eastern Kingbird	o	o		
LARKS, SWALLOWS				
.Horned Lark	a	a	a	a
Tree Swallow	c	u	o	r
Violet-green Swallow	o	o	o	
Bank Swallow	o	o	o	
Northern Rough-winged Swallow	c	r		
Cliff Swallow	u		o	
.Barn Swallow	a	a	u	
JAYS, MAGPIES, CROWS				
Gray Jay				x
Pinyon Jay	r	r	r	
Scrub Jay	r			
Clark's Nutcracker		x	x	
Black-billed Magpie			o	r
American Crow	r		r	
Common Raven	c	c	c	c
NUTHATCHES				
Red-breasted Nuthach			r	
Bushtit			x	
WRENS, THRUSHES				
.Rock Wren	u	u	o	
House Wren	r	r	r	
.Marsh Wren	c	c	c	c
Winter Wren	x		x	
Ruby-crowned Kinglet	r		r	
Golden-crowned Kinglet			r	
Western Bluebird	o	o		
Mountain Bluebird		o	o	u
.Townsend's Solitaire	u	u	u	
Hermit Thrush			x	
.American Robin	o	u	c	o
Varied Thrush			x	
THRASHERS				
.Northern Mockingbird	u	o	o	
Sage Thrasher	o	o	o	
Brown Thrasher		r	r	
PIPITS, WAXWINGS, SHRIKES, STARLINGS				
Water Pipit	o	r	o	o
Bohemian Waxwing			r	r
Cedar Waxwing	o	o	o	o
Loggerhead Shrike	o	u	u	u
Northern Shrike			o	r
.European Starling	c	o	c	c
WOOD WARBLERS, VIREOS				
Gray Vireo	x			
Solitary Vireo	x	x		
Orange-crowned Warbler			r	
Virginia's Warbler		x		
Black-throated Gray Warbler	x			
American Redstart	x	x	x	

	S	S	F	W
.Yellow Warbler	c	u	u	
Yellow-rumped Warbler	c	u	u	o
Townsend's Warbler			x	
Palm Warbler			x	
MacGillivray's Warbler	o	x	o	
.Common Yellowthroat	o	o	o	
Wilson's Warbler	o	x	o	
Northern Waterthrush	x			
TANAGERS, GROSBEAKS				
Western Tanager	u	u	o	
Rose-breasted Grosbeak	x			
Black-headed Grosbeak	o	o	o	
Lazuli Bunting	o	o	o	
Indigo Bunting		*		
SPARROWS				
Green-tailed Towhee	r	r	r	
Rufous-sided Towhee	x		x	
Vesper Sparrow	o		o	
American Tree Sparrow	o			o
Chipping Sparrow	o	x	o	x
Brewer's Sparrow	o		o	
Lark Sparrow	u	c	o	
.Black-throated Sparrow	u	a	o	
Sage Sparrow	o		o	o
.Savannah Sparrow	a	a	a	o
Fox Sparrow		x		
Song Sparrow	c		c	c
Harris' Sparrow			x	
White-crowned Sparrow	c	r	u	r
Lincoln's Sparrow	o		o	
Dark-eyed Junco	u		c	u
McCown's Longspur			x	
Lapland Longspur			o	
Chestnut-collared Longspur	x			
Lark Bunting	x	x		
BLACKBIRDS, MEADOWLARKS, FINCHES				
Bobolink	r			
.Red-winged Blackbird	a	c	a	c
.Western Meadowlark	c	a	a	o
.Yellow-headed Blackbird	a	c	u	
.Brewer's Blackbird	c	a	a	r
Rusty Blackbird				*
Brown-headed Cowbird	u	u	u	r
Common Grackle	r	r		
.Northern Oriole	o	o		
.House Finch	u	u		
Cassin's Finch	x			
Rosy Finch				x
Pine Siskin	o	x	o	o
American Goldfinch	u	o	o	o
Lesser Goldfinch	x			
Evening Grosbeak	o	o	o	o
House Sparrow	o			