FISH SPRINGS NATIONAL WILDLIFE REFUGE

Dugway, Utah

ANNUAL NARRATIVE REPORT

Calendar Year 1985

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

REVIEW AND APPROVALS

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Dugway, Utah

ANNUAL NARRATIVE REPORT

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Refuge Manager Date Refuge Supervisor Review Date

Marvin L. Plenert 3-7-86

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, 52 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 the small fish is apparently responsible for the name of the area. The small gambusia mosquito fish was introduced just prior to acquisition. There are no other fish species present.

The refuge was established for the primary purpose to provide 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.

Nine shallow water impoundments were completed in 1964. The area contains approximately 10,000 acres of saline marsh, 2,000 acres of mud and alkali flats, and 6,000 acres of semi-desert uplands. The saline and alkaline soils support very little vegetation. Vegetation in the marsh is primarily three-square and Olney's bulrush, spikerushes, and saltgrass. Widgeongrass, muskgrass, and coontail are common in the springs and ditches. The upland areas support saltgrass, greasewood and shadscale.

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A. HIGHLIGHTS

Prescribed Burning in September (Section F.9)

Concrete water control structure repair (Section I.2)

B. CLIMATIC CONDITIONS

The year began rather mild but most of January and February were cold with periods of several foggy days. Temperatures were generally below normal through March, and spring was characterized by moderate to strong windy days and below average precipitation. Temperatures rose quickly in early summer and accompanying winds began to dry the units. Fall arrived tempestuously and early winter began freezing the ponds in November. Nearly all water areas were frozen by the end of the year.

Table 1. Temperatures and Precipitation, 1985.

Month	Max. High	Mini. Low	Snow	Total Prec.	25 Yr. Av. Prec.
January	46	0	2	.38	.37
February	52	-5	3	.28	.47
March	74	13	8	.64	.75
April	85	25		.06	.89
May	89	28		.73	1.06
June	103	42		.35	.75
July	106	51		1.02	.46
August	102	45		.01	.59
September	93	29		1.78	.74
October	83	24		.71	.82
November	71	1	8.5	1.26	.54
December	55	4	1	.95	.47
			22.5	8.17	7.91

E. ADMINISTRATION

1. Personnel

Jim Alfonso transferred from Fish Springs to Fort Peck Wildlife Station in early March. Patrick Gonzales, with wife Marlene, transferred from Cape Romain Refuge in late May to fill the vacancy.

Maintenance worker Irl Timm was seriously injured in a vehicle accident November 2. He has applied for disability retirement.

Renee' Warnek and Michael Johnson returned as Bio-techs from May to December. Mike finally landed a permanent position at Kulm Waterfowl Management Area at the end of the year after several years of temporary seasonal appointments.

Fig. 1. 8/20/85 Refuge Staff MG

8 7 6 9

3

1 4 2 5

Personnel (Fig. 1)

1. Charles R. Darling — Refuge Manager, GS-11 PFT
   James M. Alfonso — Assistant Refuge Manager, GS-9 PFT (Transferred 3/02/85)
2. Patrick D. Gonzales — Assistant Refuge Manager, GS-7 PFT (EOD 6/24/85)
3. Irl G. Timm — Maintenance Worker, WG-8 PFT
4. Leah L. Layland — Refuge Assistant, GS-5 PPT
5. Renee' E. Warnek — Biological Technician, GS-5 TFT (4/28 - 12/6/85)
6. Michael R. Johnson — Biological Technician, GS-5 TFT (EOD 5/06/85)
7. Raymond E. Timm — Laborer, WG-2 TFT (4/28 - 12/06/85)
8. Bret J. Layland — Laborer, WG-2 TFT (5/06 - 12/06/85)
9. Mark Holdorf — Student Conservation Association, Inc. Resource Assistant (Volunteer) (6/03/85 - 8/23/85)

Bret Layland and Raymond Timm were employed as temporary laborers for repairing concrete control structures (Fig. 1).

Table 2. Staffing at Fish Springs NWR, 1980-85.

	Permanent Full-time	Permanent Part-time	Temporary
FY85	3	1	4
FY84	3	1	2
FY83	3	1	4
FT82	2	2	4
FY81	2	2	4

4. Volunteer Program

Chris Alfonso, Peggy Darling, Marlene Gonzales and Judy Hassen served as volunteers for mail services and supply procurement (Fig. 2).

Mark Holdorf from Kiel, Wisconsin served as a twelve-week volunteer from the Student Conservation Association, Inc. Mark did a very good job working with the refuge staff on various surveys and minor maintenance projects.

Fig. 2. Refuge Volunteers. Left to right, Peggy Darling, Judy Hassen, Marlene Gonzales. Chris Alfonso was also a volunteer until March. CRD

5. Funding

Total refuge funding was $176,000 for FY85. The ARMMs project of repairing concrete control structures was done by force account with two temporary laborers rather than contracting as in FY84 (Table 3).

Table 3. Funding at Fish Springs NWR, 1981-85.

Subactivity	FY81	FY82	FY83	FY84	FY85
1210	107,000	100,000	120,000		
1220	200	3,000	5,000		
1240	5,000	4,000	5,000		
1260				155,000	168,000
8610	6,000	4,000	4,000	4,100	8,000
BLHP	50,000				

Several things were not procured or rehabilitated in FY85 because of an apparent lack of funds. It appeared that we might be short by the end of the year, but emerged with a slight overage.

6. Safety

There were no lost time injuries during the year. The manager was involved in a vehicular collision in Salt Lake City which required replacement of the right front fender and other repairs to the 1981 Ford pickup.

Periodic safety meetings were held and one film concerning the use of seat belts was used as part of defensive driver training.

F. HABITAT MANAGEMENT

1. General

The refuge is divided into five major ecological zones

mudflats	7,084 acres	(39%)
marsh meadow	4,612 acres	(26%)
marsh	4,294 acres	(24%)
greasewood upland	1,184 acres	(7%)
phragmites/greasewood	818 acres	(4%)
	17,992 acres	

2. Wetlands

The water source for the area comes from a series of small springs located along a fissure line on the west side of the refuge. The water temperature varies from 70-80°F and is constant for each spring. Water flows generally eastward through a series of ditches and canals by gravity, through impoundments, then in a northerly direction. Excess water is

released eastward and northward onto the southern end of the Great Salt Lake Desert. The spring flow is insufficient to maintain the units at capacity during the summer.

All units were full early in the year. Water elevations began receding a month earlier, in May, because of winds and low rainfall. Gadwall Unit held water longer this year because it was filled to capacity for the first time in many years after the dike was repaired the year before.

Avocet and Mallard Units began to refill slowly in September as evaporation rates declined; Shoveler and Curlew followed slowly through October and other units filled more rapidly after frost. Ibis, Gadwall and the east side of Harrison Units were still filling at the end of the year.

Open water areas were frozen most of November. There was a thaw in early December and then everything froze except the springs and warm water flowing in the main canals and entrance to Avocet and Mallard Units.

Fourteen goose nesting platforms were constructed from angle-iron with several bales of hay placed on top. They were distributed in Pintail, Harrison and Gadwall Units.

5. Grasslands

There are no grasslands present. A few fragile species survive on the upland desert areas. Saltgrass and phragmites are present throughout the marsh meadows.

7. Grazing

Incidental grazing occurs along the county roads at the south and southwest end of the refuge. This portion of the refuge is unfenced. Cattle wander onto these unfenced portions of the refuge from the adjacent BLM grazing allotment and 100 AUMs are utilized. Our agreement with the BLM results in about 10 per cent of the grazing fee being paid to the refuge.

The sheep driveway mandate continues which allows sheep to cross the refuge along the county road during spring and early winter.

9. Fire Management

Prescribed burning was limited to areas in Harrison and Pintail Units in September. Areas burned last fall revegetated very quickly during the spring (Fig. 3 and 4).

G. WILDLIFE

1. Wildlife Diversity

No formal work activities involving the intentional increase in wildlife diversity took place this year.

Fig. 3. 2002.005 10/10/84 Matted bulrush and wirebrush in Ibis Unit before burning. JMA

Fig. 4. 2002.037 5/3/85 Regrowth beginning to appear on October burn area in Ibis Unit. Burned areas green-up about a month earlier. CRD

Mark Holdorf, our SCA volunteer, built seven bluebird nesting boxes from wood materials he salvaged from the scrap pile. He assembled the boxes during his free time and mounted them on top of wood fence posts at various locations around the refuge. They will be monitored for any actiity during 1986.

2. Endangered and/or Threatened Species

Several sightings of endangered or threatened species occurred during the year. Seven bald eagles were seen on the refuge this year, compared with two reported for 1984. All were during the fall and winter months except for one during April. Three of the birds appeared to be subadults.

Prairie falcons were seen on the refuge throughout most of the year. Their numbers peaked December 6th when four were sighted.

White-faced ibis occur in small numbers on the refuge in the spring and summer months. Typically they will arrive during April and depart sometime in September. This species was not observed nesting on the refuge this year, but many of those present appeared to be immature.

Snowy plover numbers peaked at 18 on June 25th, compared to 20 for August of 1984. Three young are known to have been produced on the refuge this year.

3. Waterfowl

Waterfowl nesting on the refuge began late as it did last year. Duck nesting surveys were started in May, and the 61.5 mile transects were walked three times. Forty nests are required for the computer analysis to have validity. Last year the survey had 14 nests and this year it was down to eight nests. Therefore, it was necessary to rely on pair counts and brood counts to determine production. Estimates were based on an average nesting success rate of 60% with an average class IIc/III brood size of 5.5. Production estimates for 1985 totaled 2,311 ducklings. This figure represents a 20% increase over 1984 when 1,850 fledgling ducks were produced by the same method.

It was evident that defined trails had become established along the transects. These could be recognized by selecting waterfowl and predators and reduce nesting attempts and success. Sixty-two nests were found along the transects in 1981 and the number has declined each year; consequently the transects will be abandoned for a year or two.

Canada goose production declined 43% from the 131 produced in 1984. Only 75 goslings were estimated to have reached flight stage this year. Nesting conditions appeared favorable early in the year and it is not known why there was a sharp decline. There are 45 constructed nesting islands and 15 angle iron platforms available for goose nesting. Numbered placards were constructed and installed at each structure to facilitate future monitoring, and repairs were made to several islands that showed signs of erosion.

Table 4 summarizes the duck production from Fish Springs NWR for the past five years. While the production for each species may vary widely from year to year, the overall annual production shows much less fluctuation.

Table 4. Duck production at Fish Springs NWR 1981-85.

Year	Mal-lard*	Pin-tail*	Reds*	Cans*	Shov-elers	Gad-walls	Cinn Teal	Ruddy	Total Ducks Produced
1985	407	515	82	80	50	232	447	38	2,311
**1984	570	307	349	43	134	323	422	44	2,753
**1983	806	294	769	62	189	598	69	122	2,924
**1982	356	429	845	10	239	620	90	55	2,661
**1981	1,239	667	403	20	313	1,009	979	94	4,744
Total	3,378	2,212	2,448	215	925	2,782	2,007	353	15,393
Ave.	675	442	489	43	185	556	401	70	3,078

* National Species of Special Emphasis
** Numbers estimated by transect method

The peak fall duck population occurred in early September and totaled 28,200 birds. The principal species observed were green-winged teal, pintail, American wigeon, cinnamon teal, mallard and redhead. Table 5 illustrates the fall duck flights observed at Fish Springs for the past five years.

Table 5. Fall flights at Fish Springs NWR, 1981-85

Year	Peak Flight	Peak Date	Ave. Fall Pop.
1985	28,200	Early Sept.	8,300
1984	30,100	Late Aug.	11,100
1983	35,700	Late Aug.	12,300
1982	25,800	Early Nov.	10,700
1981	17,000	Mid Aug.	9,900
Average	27,360		10,460

Canada goose numbers peaked at 980 during early December. This was a 27% decrease from last year's November peak of 1,350. This year's average fall population (August-December) of 617 was well below the ten year average of 897 geese. Early freezing of the large open water areas and the decreased aquatic food production probably influenced the amount of time spent on the refuge.

Tundra swans were present on the refuge in low numbers during January, February and March. They arrived a month late in November. Their peak number

of 57 during December was a 20% decrease from last year.

Coot production was estimated at 385 birds this year. This figure was based on the observed average class IIc/III brood size and an estimated number of pairs. Their population peaked at 9,400 during September and averaged 5,600 during the fall months.

4. Marsh and Water Birds

Use days for birds in this category totaled 82,425, which was a 43% increase over last year's total. Eleven species were sighted this year. During the summer months the most common birds in descending order included snowy egrets, black-crowned night herons, various grebe species, great blue herons, and white-faced ibis. A few species such as the pied-billed grebes and herons, have proven to be hardy enough to brazen the winters at Fish Springs.

A single nesting colony of snowy egrets, black-crowned night herons, and American bitterns occurred in Avocet Unit this year compared with two colonies last year. However, this year's peak populations and nesting efforts intensified greatly as shown in Table 6.

Table 6. Peak populations for 1984-85.

	1985			1984		
	Peak Population	Nests	Young Produced	Peak Population	Nests	Young Produced
Snowy Egret:	680	142	593	125	16	48
Black-crowned night heron:	312	70	244	138	3	12
American bittern:	17	5	9	7	1	3

This year the white pelicans arrived at the refuge during March as usual. Their numbers were very low, however, as they peaked at only three during April, compared to 38 at the same time last year. A single pelican was seen regularly throughout the year. During the fall it was usually observed in the company of tundra swans.

5. Shorebirds, Gulls, Terns and Allied Species

Use days for this broad category totaled 100,135, which was a 7% decrease from last year. Black-necked stilts, American avocets, ring-billed gulls, Forster's terns, killdeer and various sandpipers were among the most commonly observed, and 14 species were present sometime during the year.

6. Raptors

Ten species belonging to this category were observed on the refuge this year. Refuge use increased last year from the previous years and the trend continued through 1985 as 8,365 use days were recorded. Northern harriers

proved to be the most abundant year-round species. They compete heavily with rough-legged hawks during the winter and moderately with golden eagles, red-tailed hawks, and prairie falcons during the rest of the year. American kestrels were seen off and on during the summer and fall. Significant increases were noted in bald eagle sightings, two osprey were seen during August and two marsh hawks were fledged from the refuge. Several species of owls were present on the refuge throughout the year, but their numbers were low. Great horned owls, short-eared owls, burrowing owls, and barn owls were frequently observed.

Table 7 illustrates the use days for the various bird categories that have occurred on the refuge for the past five years.

Table 7. Wildlife Use Days 1981-85.

Year	Marsh and Water Birds	Shorebirds	Raptors
1981	182,900	160,500	5,850
1982	257,675	195,491	6,744
1983	95,523	98,158	6,050
1984	46,940	107,664	6,690
1985	82,425	100,135	8,365

7. Other Migratory Birds

The refuge residence area was noticeably enhanced simply through the dispersed placement of hummingbird feeders, bird baths, and food stations. Response was very good as the residence area attracts many passerine bird species because it is practically the only area on the refuge where any trees occur.

8. Game Mammals

Desert cottontails and blacktail jackrabbits were the most abundant species that were seen this year.

Mule deer occasionally occur on the refuge but their numbers are few. Three bucks and a doe were frequently seen in Mallard and Spring Units during August and September.

Coyotes were present throughout the year and in stable numbers.

10. Other Resident Wildlife

Low numbers of badgers, longtail weasels, striped skunks, and kit foxes occur on the refuge. More numerous species include pocket gophers, wood rats, kangaroo rats, antelope squirrels, and a variety of mice.

On July 12th, it was reported that some unidentified bat was seen sitting beneath one of the refuge tractors. The small mammal appeared to be a

Mexican freetail bat, but when approached with a camera it flew away. During the spring and summer, many bats were seen roosting in the caves that are located on refuge property.

Gallinaceous birds that occur on the refuge in low numbers include the chukars and the ring-necked pheasants. Chukars normally won't venture out of the hills and onto refuge lands until late summer when they probably become stressed for water. The pheasants, however, are year-round residents whose population averages about 20 birds. Their habitat requirements are barely met at the refuge and is reflected in their low reproduction. However, a brood of 12 was spotted near the picnic area during August. Apparently some of the birds were females, because recently there has been a noticeable increase in the number of hen sightings on the refuge.

Mourning doves were present between April and September again this year. Their numbers peaked at 142 during September.

Muskrats can be found in just about every suitable wetland habitat present on the refuge. They serve as food for predators and inadvertantly assist the management in maintaining open water areas in the refuge impoundments. However, excessively high concentrations of muskrats can result in extensive annual damage to earthen dikes due to burrowing activities, reduction of certain plant species, and the general loss of wetlands habitat resulting in increased maintenance. Crowded conditions can promote aggressive behavior resulting in lowered pelt values and may threaten the general health condition of the refuge populations through the spread of disease such as tularemia.

Trapping is the primary management tool used to manipulate their populations. Commercial quotas are based annually on population estimates. A census method has been developed whereby muskrat den counts are conducted annually on existing waterfowl transect lines. The transects are either walked or traversed with an airboat and only active den sites or lodges are counted. Surveys are conducted in the best areas of Avocet, Spring, Mallard, Shoveler and Harrison Units and the data are analyzed using the computer program TRANSECT at Utah State University, Logan, Utah. This year's survey was conducted during November, and as Table 8 illustrates, large annual fluctuations can occur among units and on the entire refuge.

Table 8. Muskrat population estimates 1982-85.

Unit	1985	1984	1983	1982
Avocet	1141 ± 342	3162 ± 949	Not enough	Five rats
Mallard	154 ± 39	87 ± 37	present to	seen during
Shoveler	254 ± 60	126 ± 55	justify	entire year
Harrison	538 ± 135	833 ± 358	trapping.	since trapping season.

See section H.10 for information concerning the refuge trapping program.

Bullfrogs and leopard frogs were observed throughout most of the year and rattlesnakes were commonly seen on the refuge during the warmer months. A variety of lizards has been observed on the refuge. Tarantulas are also seen occasionally during the warmer months.

11. Fisheries Resources

Fish species that occur on the refuge are limited to the native Utah chub and the introduced mosquito fish.

14. Scientific Collections

Fish Springs NWR was selected for participation in the 1985-86 waterfowl lead poisoning monitoring program which was conducted on several refuges in Region 6. As part of the program, refuge volunteers and personnel collected 100 paired gizzard and liver tissue samples from hunter-killed waterfowl. Pintails were the index species originally chosen for testing. However, as the season progressed it became apparent that specimens from other dabbler species would be required if the 100 sample quota was to be met. Hunter response to the lead monitoring program was positive and many stated it was educational. The other portion of the program involves the collection of whole bird specimens. Birds exhibiting behavior indicative of lead poisoning were to be collected before, during and after the hunting season, and sent to the Madison Health Lab for analysis. As of this writing, no symptomatic birds had been observed; therefore no specimens had been collected.

Researchers for the Department of Army operating out of the Dugway Proving Ground installation (Environmental and Ecology Branch) were present on the refuge for two days during July while taking refuge mosquito population samples. The samples were taken at night and accomplished through the use of several lighted, CO_2 producing vacuum traps. The mosquitoes were being tested for arboviruses, primarily encephalitis, but none were detected in the samples taken.

15. Animal Control

Ravens and coyotes are the primary nest predators, and gopher snakes and skunks are a close second. Shooting is probably the easiest and most effective control tool employed by both refuge and ADC personnel. Although trapping efforts produced four striped skunks from the residence area during September, all other control efforts are basically opportunistic.

H. PUBLIC USE

1. General

Visits to the refuge have increased consecutively for the past five years. The total visits recorded for 1985 showed a 6% increase over 1984. However,

people spent less time on the refuge during 1985, as activity hours decreased 34% compared to 1984. Table 9 illustrates the public use data compiled for the past five years.

Table 9. Public use at Fish Springs NWR 1981-85.

	1981	1982	1983	1984	1985	5 Year Average
Visits	1463	1832	1995	2304	2442	2007
A-H	5310	7038	7232	8347	5534	6692
A-H/Visit	3.2	3.8	3.6	3.6	2.2	3.3

2. Interpretive Tour Routes

The refuge has developed a self-guided auto tour route for the public. It is open from sunrise to sunset daily, is 11 miles in length, and begins at the Visitor Contact Station. The route provides viewing pleasure as it traverses salt desert shrublands, salt grass flats and marshlands, with various floral and faunal species.

A few tour groups stopped by the refuge during the warmer months of the year. During May, a group of 29 people came through on horseback. They were sponsored by the Sons of the Utah Pioneers. Two bus tours came through during June; one contained 126 people and the other included 16 Girl Scouts. One other reported bus load of birding high school students came through in November. Other small groups consisted of weekend car caravans and mule riders (Fig. 5).

6. Interpretive Exhibits/Demonstrations

The visitor contact station serves as the primary source of information available to the public, especially after office hours or on weekends. It's usually the first place that visitors stop to stretch or relax momentarily and sign the guest register. Refuge leaflets and bird lists are available, and displays of historical pictures and memorabilia depict what events occurred in the area prior to refuge establishment. A USGS relief map of the West Desert and a mileage/service guide provide additional information. The refuge bird list was updated and reprinted this year.

During the waterfowl hunting season, weekly census results, shooting hours and refuge regulations are posted in the station with a separate mandatory hunter registration sheet. State hunting proclamations and maps with open/closed areas are also available.

8. Hunting

Despite the remote location, hunting remains the leading form of recreation. It accounted for 29% of the total refuge visits and 58% of the recorded activity hours. Hunter visits declined 25% this year compared to 1984,

Fig. 5. 6000.014 5/2/85 First came reenactment of the Pony Express riders. Then the mule riders were on their way to Nevada and California. CRD

Fig. 6. 6000.016 10/13/85 Hunter success was pretty good on opening day. PDG

along with a 32% decline in activity hours. Reasons for the declines are probably a result of the shortened season (79 days) and more restrictive harvest regulations. Ducks, coots and mergansers are the only species allowed for taking. During 1985 a total of 953 ducks and 95 coots were registered as harvested, and 133 birds were either crippled and/or lost with no species breakdown. Table 10 illustrates the hunting data compiled at the refuge for the past five years.

Table 10. Hunting at Fish Springs NWR 1981-85.

	1981	1982	1983	1984	1985	5 Year Average
Visits	645	679	646	936	706	722
A-H	3,726	3,639	3,726	4,768	3,228	3,817
A-H/Visit	5.8	5.4	5.8	5.1	4.5	5.3
Ducks Taken	1,905	690	1,313	1,629	953	1,298
Coots Taken	69	138	263	232	95	159
Ducks/Hunter	3.0	1.0	2.0	1.7	1.3	1.8

The primary species taken during 1985 in decreasing order of abundance were green-winged teal, mallards, American wigeon, pintail, gadwall and coots (Fig. 6).

9. Fishing

Sport fish do not occur in any refuge waters; therefore fishing is not allowed.

10. Trapping

Trapping is permitted only for muskrats when it is determined that an adequate population is present. Quotas are based on 75% of the lower population estimates as described in Section G.10. Four bids were received on two designated trapping areas. Special use permits were issued for trapping 450 muskrats for $613 and 1,660 muskrats for $2,112. One permittee was given a short extension to the six week trapping season and 2,118 muskrats were taken. It was the first season since 1982.

11. Wildlife Observation

Visits in this category totaled 793 which was a 4% decrease from 1984.

13. Camping

Camping is not allowed on the refuge, but is allowed on all surrounding BLM land.

14. Picnicking

Visitors to the refuge are provided with a pleasant picnic area which is located approximately .85 miles north of headquarters. Many years ago the site served as the Pony Express and Overland Stage station. Cottonwood and poplar trees were planted to provide shade for travelers. The trees have matured into large landmarks and tend to attract many bird species year-round. There is a small pond, and facilities include tables, outhouses, elevated metal barbeque grills and garbage cans.

15. Off-Road Vehicling

Off-road vehicling is not allowed at Fish Springs refuge.

17. Law Enforcement

Two of the refuge staff members possess law enforcement authority. Law enforcement activities on the refuge are generally during the waterfowl hunting season. Most persons visiting the refuge are from the Salt Lake City area, which means a seven hour round trip journey. A strong showing on opening weekend, followed up by frequent hunter contact and a highly visible patrol strategy during the rest of the season, resulted in good hunter behavior, and hopefully a higher quality experience for everyone involved. No violations were detected.

I. EQUIPMENT AND FACILITIES

2. Rehabilitation

FY84 contracts to replace copper water lines with polybutylene plastic pipe in four residences and the furnaces in the office and Quarters 39 were completed in January.

Six concrete water control structures were originally planned for rehabilitation in the ARMMs program similar to the previous year. Rather than going through the contracting procedure, it was determined to employ two temporary persons and do the work by force account. The structures were constructed in some of the earliest development programs in the early mid-1960's. Some of the concrete had spalled and deteriorated very badly. This may have been from freezing, using alkaline water, or just not enough cement in the concrete. Some of the repairs were much more extensive than originally programmed and would have been a hassle for contract amendments. The two laborers not only completed the original six structures planned at contracting costs, but finished an additional seven structures (Figs. 7-16).

3. Major Maintenance

Gravel is hauled to dikes and structures at various times of serious need and when other chores are not demanding. At least 1500 cu. yds. were hauled to the Avocet, Curlew, Harrison and Gadwall dikes.

Fig 7. 6/21/85 Structure #11, deteriorated concrete below ground surface. CRD

Fig. 8. 7/18/85 North wall (downstream) water control structure #11 after repair. CRD

Fig. 9. 1003.042 2/15/85 Deteriorated wing wall on WCS #12. Unmixed sand was evident in this section. CRD

Fig. 10. 8/13/85 Bret Layland begins to fill eroded portions of stoplog slots on WCS #12. CRD

Fig. 11. 9/29/85 WCS #12 after repairs with Thorite compound. CRD

Fig. 12. 1003.053 7/30/85 WCS C-1. Extensively rusted rebar was removed. Other exposed rebar was cleaned with acid before rebuilding the eroded sections. CRD

Fig. 13. 8/26/85 Bret Layland uses temporary forms on C-5 for deep fills. CRD

Fig. 14. 8/26/85 Raymond Timm works on other side of structure C-5. Thorite was applied in layers and required fast work in hot temperatures. CRD

Fig. 15. 9/20/85 WCS C-5 after rebuilding with Thorite. CRD

Fig. 16. 9/16/85 WCS F-5 and #12. The refurbished structures are visible for some distance down the dikes. CRD

An underground gasoline storage tank and the two old dispensing pumps were replaced (Fig. 17).

One hundred eighty feet of underground cable were replaced to eliminate a ground short in the water system remote control switches. The boundary fence was walked and repaired to exclude some stray sheep.

Quarters #40 was prepared for occupancy for the first time in many years.

The interior of Quarters #39 was repainted and the shower wall retiled between occupants and Quarters #4 and #39 were carpeted.

Most of the bogie wheels were replaced on the ATV Cushman Trackster before the summer season. It later developed an ignition problem which has eluded diagnosis. It has been a useful piece of equipment, but expensive to maintain.

One side of the east entrance sign was sinking in the soft terrain. It was raised enough to place a broad concrete pad underneath. The Service emblem was attached to entrance signs (Fig. 18).

Four CMP structures were repaired in Harrison and Pintail Units so that small flashboards could be used to raise water levels.

4. Equipment Utilization and Replacement

One of the 25 KW diesel generators was sent out for engine overhaul but has not been returned.

Our dragline was loaned to Alamosa-Monte Vista in early May. It hasn't returned either.

The microwave telephone system is still in operation through the Dugway switchboard under the cooperative agreement with Department of the Army, Dugway Proving Ground. It isn't perfect, but much better than the promises of a local independent system.

7. Energy Conservation

The new furnaces are rated for high efficiency, but have not been in service long enough to indicate appreciable difference.

J. OTHER ITEMS

1. Cooperative Programs

Refuge bunkhouse facilities were used several times by personnel from Dugway Proving Ground in performance of their biological collections, usually mosquitoes, in the monitoring program for equine encephalitis.

These facilities are also utilized by archeology, icthyology and other science professors and their classes from various state universities.

Fig. 17. 1/8/86 A leaky underground tank and two worn-out pumps were replaced. CRD

Fig. 18. 1/8/86 The Service emblem was attached to entrance signs. CRD

The sixth Audubon Christmas Bird Count was conducted December 28. Three people drove out from Salt Lake City to assist Pat and Marlene in making the count. Twenty-seven species and 1,085 birds were recorded on a cold, foggy day. It was the lowest Christmas count to date.

3. Items of Interest

Alfonso, Darling and Layland had 24 hours of ADP Orientation at Dugway in separate sessions.

Alfonso and Darling attended 40 hours of law enforcement training in Denver in February and Darling and Gonzales requalified for firearms at Arapaho Refuge during the Zone AWP meeting in August.

Gonzales had 40 hours of supervisory training in December.

A Refuge Revenue Sharing Act check in the amount of $2,099 was presented to Juab County in February.

3. Credits

Pat Gonzales prepared Sections G and H. Leah Layland arranged the photographs, refuge map, and typed the report.

Photo credits are identified by initials.

Early Day History

Coffey County, in which John Redmond Dam and Reservoir is located, shares the memorable past of a State over which the flags of France and Spain once flew; of great pioneer trails, earth-lodge Indian villages, and sod houses; and of turbulent times in our nation's history. Now in her second 100 years, present-day Kansas is a leader in agriculture, livestock, and mineral resources, a land of modern highways and abundant water, and a growing contender in industry and science. Coffey County ranks high among Kansas counties in wheat, corn, and many crops which make a prosperous diversified agriculture.

The John Redmond project was authorized as "Strawn Dam." The town of Strawn was relocated six miles eastward on higher ground when the dam was constructed. The old townsite is now under water.

In 1958, Congress renamed it John Redmond Dam and Reservoir for the Burlington Daily Republican's publisher, John Redmond, a beloved figure in Kansas newspaperdom who had received his training under the great William Allen White of the Emporia Gazette. One of the first to champion the causes of flood control and water conservation along the Neosho River, Mr. Redmond's work along these lines continued from the early 1920's until his death in 1953 at the age of 79. His dream of controlling floods in the upper Neosho had started to become a reality with the authorization of the four dams in 1950.

The fertile Neosho Valley was flooded 57 times in 34 years, with the worst flood coming in 1951, one year after Congress authorized the project. Floodwaters ran 30 feet deep at the damsite and one-third million acres were under water.

John Redmond Dam was pressed into flood control operation several weeks before final completion, protecting the Neosho River Valley for the first time from the damaging floods.

John Redmond

Dam & Reservoir

KANSAS

DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
"THE CORPS CARES!"

Visitors Welcome

John Redmond Reservoir lies in a broad flat valley with margins of the gently rolling Flint Hills — a bluestem grass region of natural scenic beauty. The 59-mile shoreline around the reservoir provides excellent camping areas and retreats for vacationists who like to get away from the beaten path. Located in the middle of the vast Central Flyway, the reservoir is on an important flight path for migratory ducks and geese. Large flocks of Canvasback Ducks as well as Snow and Blue Geese move through the Neosho River Valley in the spring and fall, and the Flint Hills contain the largest single concentration of greater prairie chickens in the United States.

Food, bait tackle, etc., are available near the lake. Facilities available at the public use areas are listed on the map side of this pamphlet.

Please keep the area beautiful for other visitors. Avoid damaging trees and plants. Extinguish all fires, and use trash cans to dispose of refuse.

Inquiries regarding the project and its use are welcomed by the Project Manager at the Project Office near the dam. Copies of regulations governing public use of this reservoir and other information may be obtained at the Project Office. Our mailing address is: Project Manager, John Redmond Project Office, U.S. Army Corps of Engineers, Route 1, Box 47, Burlington, Kansas 66839, Telephone: AC (316) 364-8614.

Project Data

LOCATION

John Redmond Dam is located on the Neosho River about 3 miles north and 1 mile west of Burlington, Kansas, just off U.S. Highway 75.

HISTORY AND DEVELOPMENT

Designed and built by the Tulsa District Corps of Engineers at a cost of $29,264,000, the project was started in 1959 and placed in flood control operation in 1964. The John Redmond project was authorized by Congress under the Flood Control Act of 1950.

OPERATION

John Redmond Reservoir is one of four Corps of Engineers' lakes in Kansas designed primarily for control of floods and low flow regulation in the upper Neosho River Valley. The other projects are Council Grove Lake on the Neosho River, completed in 1964; Marion Lake on the upper Cottonwood River, completed in 1968; and the authorized Cedar Point Lake on Cedar Creek, a tributary of the Cottonwood River. In addition to flood control, John Redmond Reservoir serves the purposes of water supply, recreation, and fish and wildlife.

John Redmond Reservoir, in order to accomplish its function, has three kinds of storage that are separated by zones from the top to the bottom of the lake: flood control, conservation, and inactive storage.

The top zone or "flood control storage" provides 562,500 acre-feet reserved to catch floodwaters and will remain empty except during times of flood control operation. An acre-foot is 325,850 gallons — enough water to cover one acre to a depth of one foot.

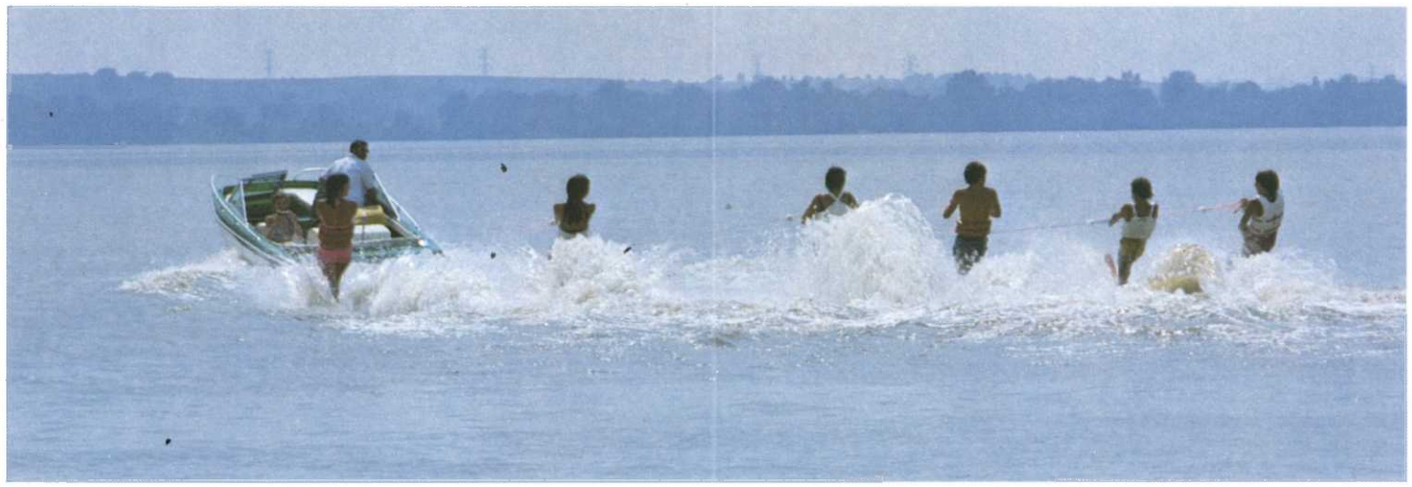
The middle zone or "conservation storage" provides 79,600 acre-feet of storage for water supply, water quality and space to contain sediment. The water supply portion of the storage will yield 24.5 million gallons a day.

The bottom zone or "inactive storage" provides 2,500 acre-feet of space to contain sediment.

Releases of water are made through the low flow pipes, over the spillway, or a combination of both. Releases are generally less than bankfull, however, during large flood periods they may range up to the bankfull flows of 12,000 cubic feet per second. The release rate depends on such factors as the inflow rate, amount of water in storage, river flows downstream, and weather conditions. A warning device is sounded at the dam prior to making a change in releases.

BENEFITS

John Redmond Dam and Reservoir benefits an area of 312,000 acres of agricultural land and urban areas in the Neosho River Basin above Pensacola Lake.



WATERSHED

Drainage area above the dam, square miles . . . 3,015

LAKE

Elevations, feet above mean sea level

- Top of flood control pool. 1,068.0
- Top of conservation pool (normal pool) . . 1,039.0
- Top of inactive pool 1,020.0

Surface area of lake, acres

- At top of flood control pool 31,700
- At top of conservation pool 9,400
- At top of inactive pool 610

Storage capacities, acre-feet

- Flood control pool. 562,500
- Conservation pool. 79,600
- Inactive pool 2,500
- Lake total 644,600

Shoreline length, miles

- At top of conservation pool. 59

DAM

Embankment

- Length of dam, feet. 20,740
- Maximum height of dam above streambed, feet 86

Spillway

- Type . . . . . Concrete, gated
- Length of Spillway, gross, feet 680
- Tainter gates (14), size, width and height, feet 40 by 35

Outlet Works

- Low flow pipes (2), diameter in inches 24
- Water supply pipe (1), diameter in inches . . . 30

Recreation

FISHING AND HUNTING

John Redmond Reservoir provides excellent opportunities for fishing and hunting. Principal species of fish in the lake include white crappie, walleye, white bass, channel catfish, flathead catfish, and various sunfish species.

The Kansas Forestry, Fish and Game Commission has a license to 1,472 acres of the project lands for wildlife management. The licensed area is known as the Otter Creek Game Management Area, and is managed primarily for bobwhite quail, mourning dove, greater prairie chicken, cottontail rabbit, squirrel, and deer.

The U.S. Fish and Wildlife Service has under cooperative agreement approximately 18,500 acres of project land and water areas for operation of the Flint Hills National Wildlife Refuge. The Refuge is managed as part of the national migratory waterfowl program and is open to public hunting during hunting season with the exception of the area north of the Neosho River which is closed to public access during the migratory waterfowl season. Detailed hunting information may be obtained from the Refuge Manager located in Hartford, Kansas.

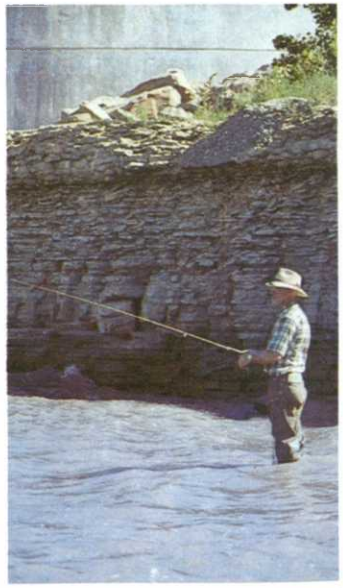
Hunting and fishing activities are regulated by Federal and State laws. Courtesy and safety should be practiced when utilizing public lands to insure a pleasant recreational experience.

CAMPING AND PICNICKING

John Redmond Reservoir has five recreation parks which provide camping and picnicking facilities. These facilities include individual camping units (table, cooker, lantern stand, and parking pad), potable water, and sanitation facilities. Also provided are group shelters, toilet facilities, swimming beaches, and boat launching ramps.

BOATING

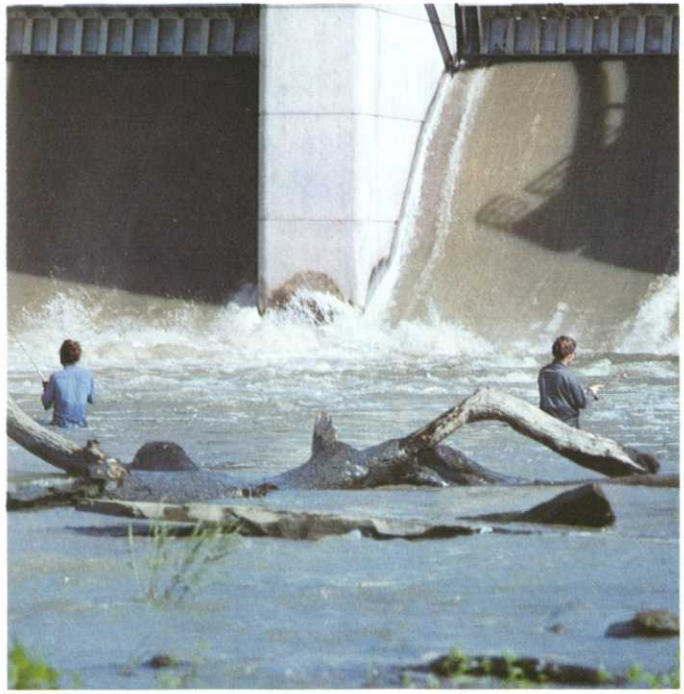
Boating on the lake is in accordance with the Kansas boating laws and Corps of Engineers' regulations. Operate your boat in a controlled, safe manner at all times.



SIGHTSEEING

John Redmond Reservoir is located in the broad Neosho River Valley. The rolling hills afford the visitor an opportunity to see many acres of agriculture and grassland. Fields of wheat, corn, and maize are abundant. Large areas of grasses including Big Bluestem, Little Bluestem, Indian Grass, Switch Grass, Brome Grass, and Sideoats Grama can be seen from the rolling hilltops. The lower areas consist of wooded cover of such species as elm, black walnut, hickory, ash, hackberry, cottonwood, and cedar.

Safety Suggestions



BOATING

Don't overload your boat.

Boats must not approach closer to the dam than indicated by warning signs or safety buoy lines.

If your boat upsets, stick to it and use it as a life perserver.

Standing in a boat can lead to disaster.

Help a boat in distress. Give help and if you need help, ask for it.

Each boat must have an approved flotation device for each passenger.

SWIMMING

Swim and wade only where you are familiar with the water depths and the bottom.

Don't swim alone. There's safety in numbers.

Be sure water is deep enough before diving.

Be careful of overestimating your swimming ability as water distances are deceiving.

Watch children and non-swimmers closely.

Swimmers should avoid regular boat channels, launching ramps, and docks.

FISHING

Keep clear of boat channels, ski and swimming areas.

Be careful when casting

If trolling, watch water ahead and traffic.

Be considerate of others.

SKIING

Always wear an approved personal flotation device.

Stay in open water. Watch for swimmers.

Have at least two people in the boat, one to run the boat, and one to watch the skier.

HUNTING

Know the correct way to carry your gun.

Treat every gun as if it were loaded.

Always point the gun muzzle in a safe direction.

Be sure of your target.

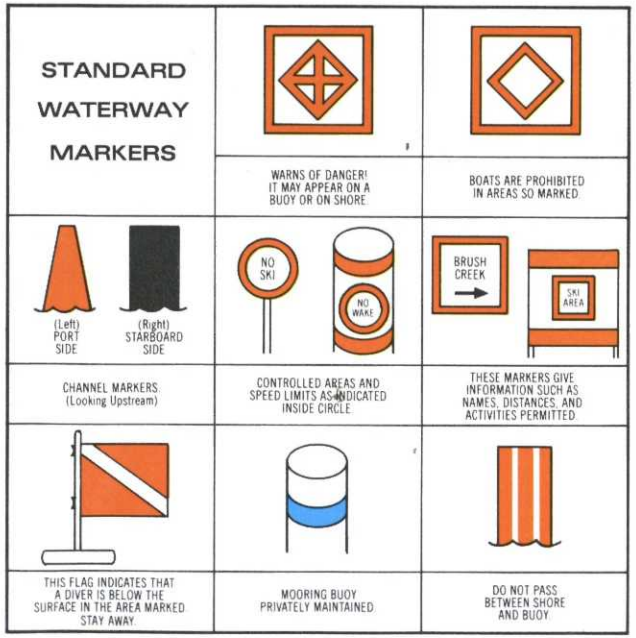
Keep the safety on or the chamber unloaded until ready to fire.

Never lay a loaded gun on bottom of boat.

Never shoot a rifle at the water.

HAZARDS

John Redmond Reservoir has numerous underwater hazards. Be especially watchful for submerged stumps, logs, fences, and other obstructions — particularly in shallow water and along the shoreline.

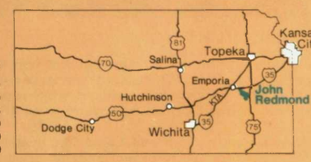


John Redmond Dam & Reservoir

DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
"THE CORPS CARES!"

ROAD MILES TO JOHN REDMOND

FROM	MILES
Kansas City	110
Wichita	120
Topeka	55
Tulsa	160
Joplin	160
Oklahoma City	250



LEGEND

- TOP OF FLOOD CONTROL POOL EL. 1,068
- TOP OF CONSERVATION POOL EL. 1,039
- PROJECT BOUNDARY
- STATE GAME MANAGEMENT AREA (IN SEASON HUNTING ONLY)
- PARK AREA
- OLD CHANNEL
- DIKE
- INTERSTATE HIGHWAY (35, 50, 75)
- U.S. HIGHWAY
- STATE HIGHWAY (130)
- PAVED ROAD
- GRAVEL ROAD
- PARK AREA PAVED ROAD
- RAILROAD
- COUNTY LINE
- MILEAGES
- SCALE OF MILES (1 3/4 1/2 1/4 0 1 1/2)

LOCATION	BOAT LAUNCHING RAMP	PICNIC AREA	DESIGNATED CAMPSITES	DRINKING WATER	GROUP SHELTER	RESTROOMS	SHOWERS	SWIMMING BEACH	CHANGEHOUSE	NATURE TRAIL	TRAILER DUMP STATION	MARINE DUMP STATION	ELECTRICAL OUTLETS	CONCESSION SERVICES	PLAYGROUND
J-7 DAM SITE AREA	●	●		●	●	●	●	●			●				●
D-5 HARTFORD RAMP	●	●	●	●		●									
I-6 HICKORY CREEK	●	●	●			●									
I-8 OTTER CREEK	●	●	●			●									
J-7 OVERLOOK				●		●									
J-7 REDMOND COVE		●	●	●	●	●									
J-8 RIVERSIDE EAST		●	●	●	●	●									
J-8 RIVERSIDE WEST		●	●	●		●	●								●
F-6 STRAWN RAMP	●					●									

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

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

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.

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

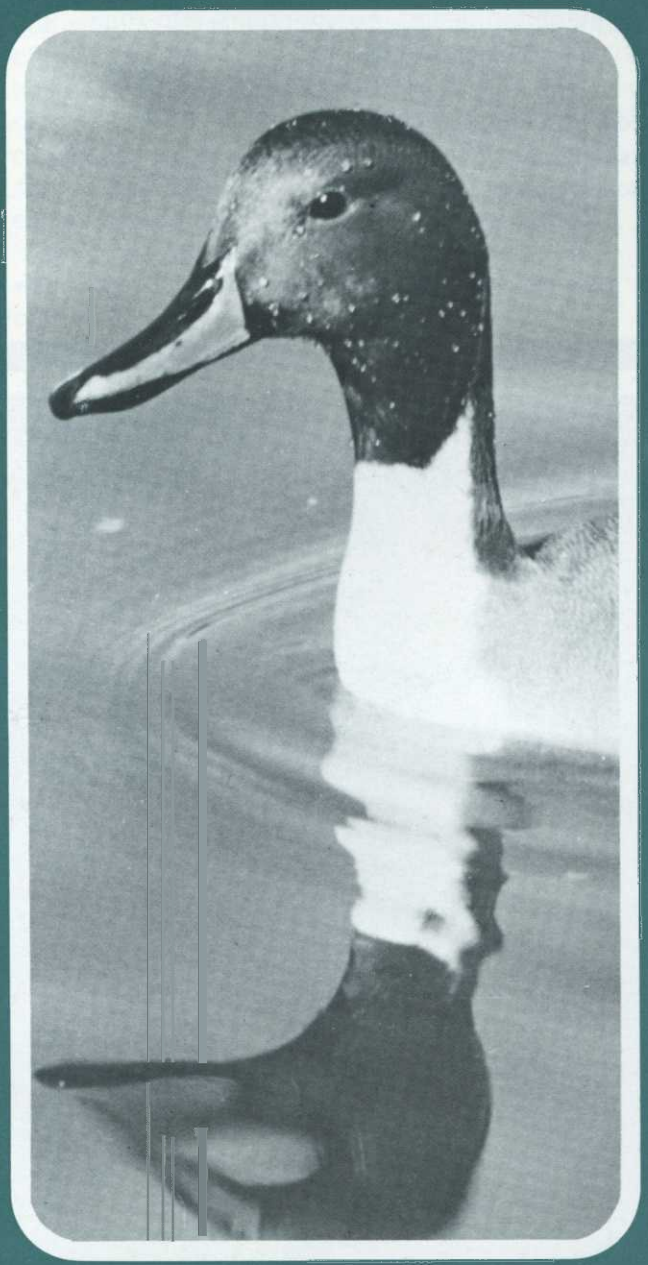
U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

RF6-65531-2

GPO 845-879

March 1985

fishSprings
NATIONAL WILDLIFE REFUGE



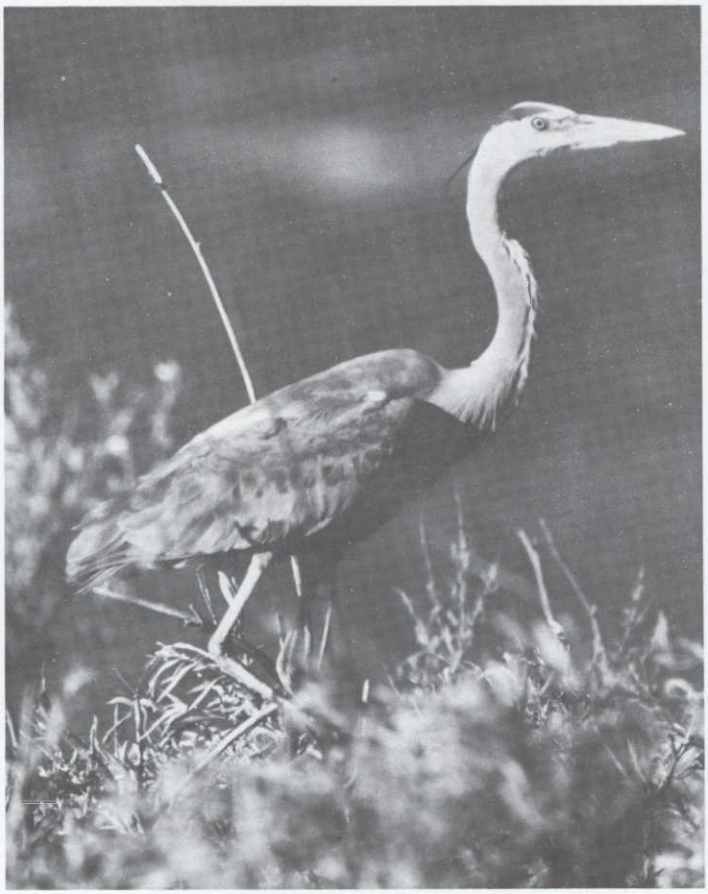
FISH SPRINGS NATIONAL WILDLIFE REFUGE

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.

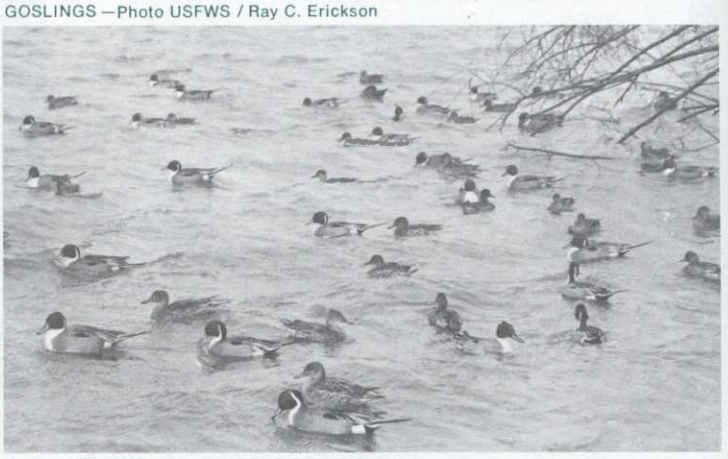
HISTORY

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



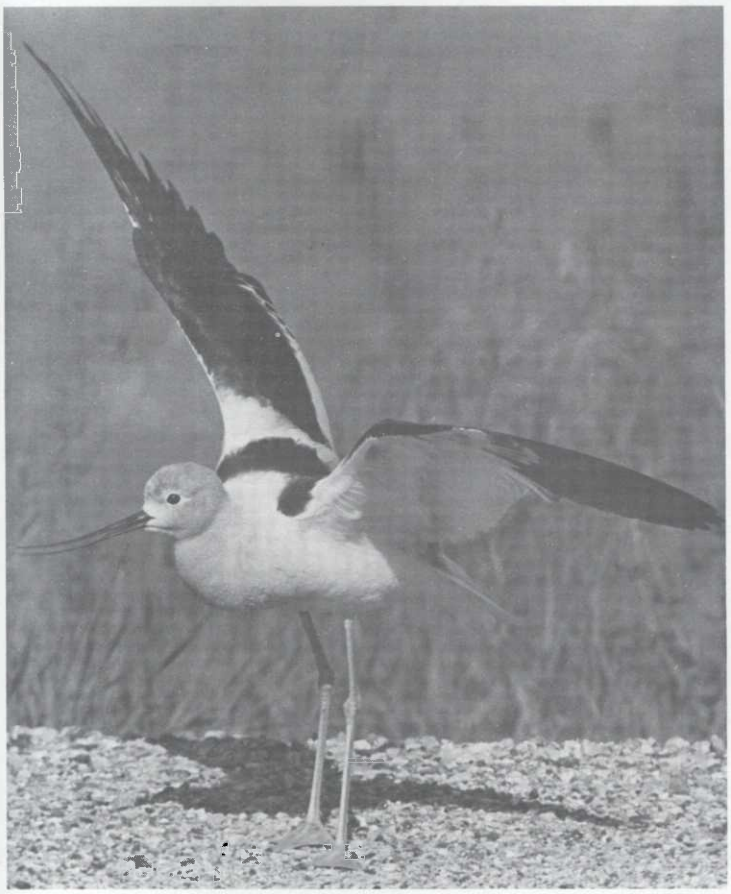
PINTAIL DUCKS — Photo USFWS / Frank Dufresne

THE MARSH

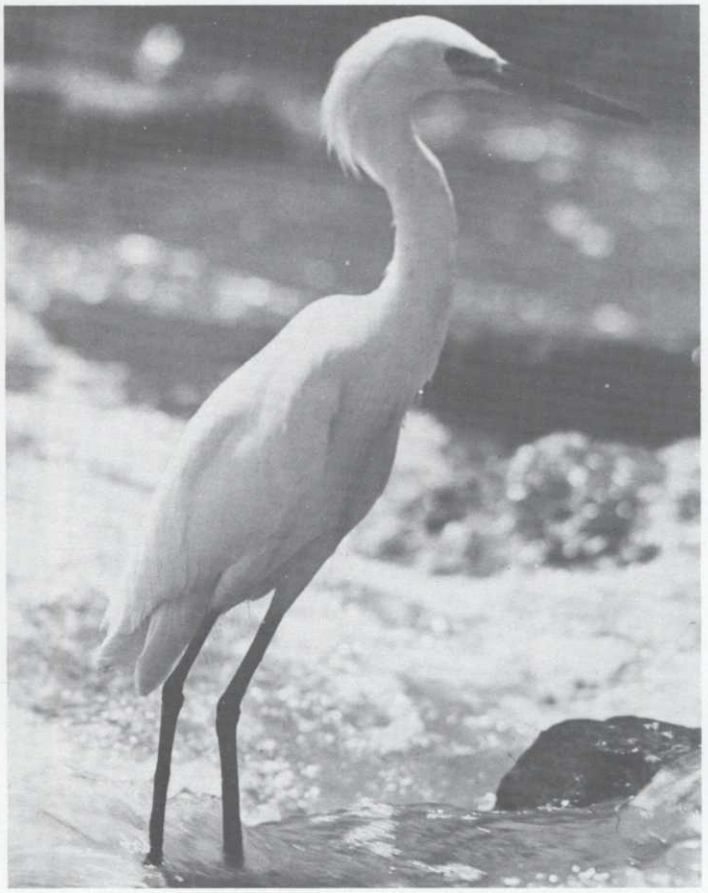
The refuge contains a 10,000-acre spring-fed marsh which has been developed to increase waterfowl utilization. The springs arise from a fault zone along the east edge of the Fish Springs Range and provide sufficient water for nine large impoundments and adjacent marshland. The 18,000-acre refuge was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

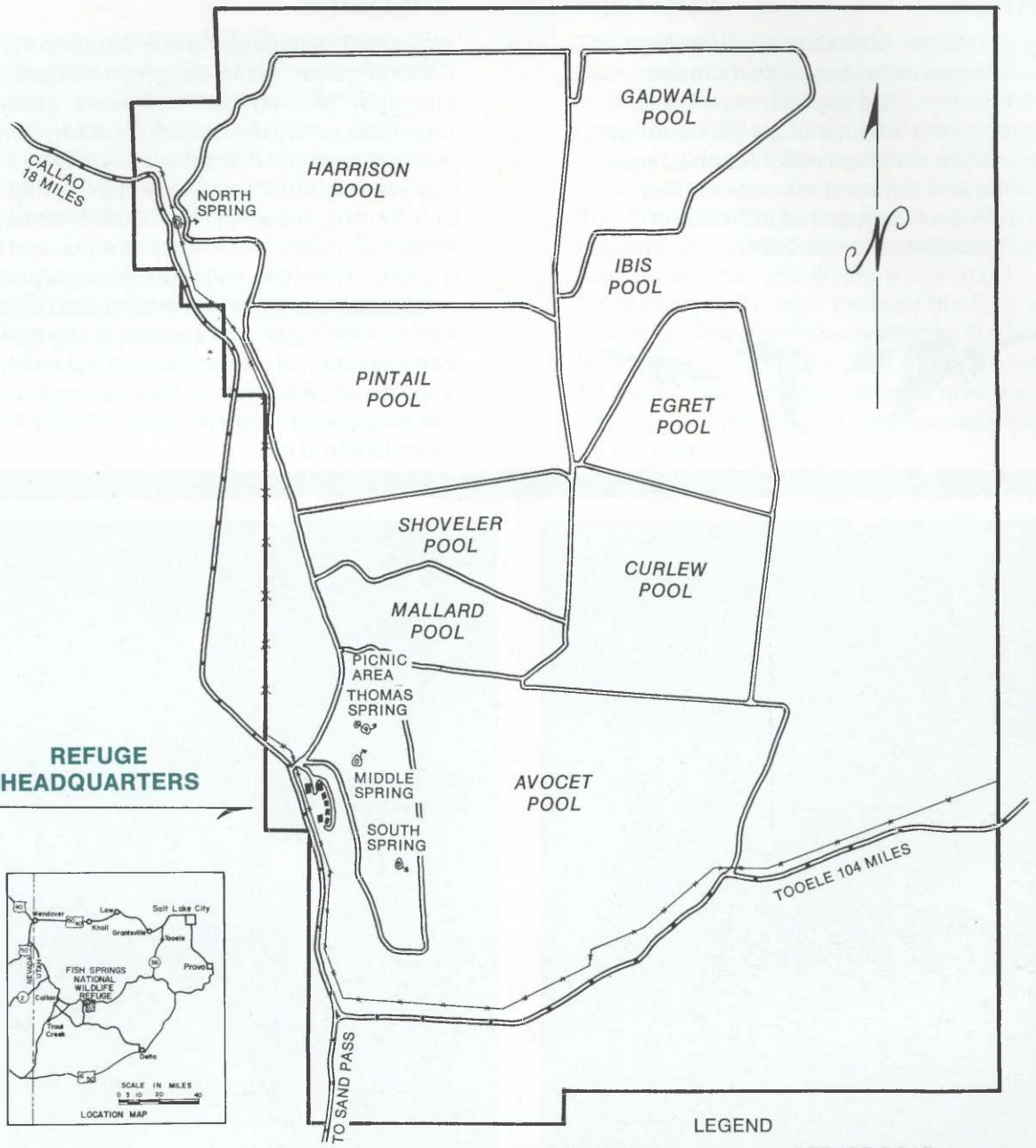


AVOCET — Photo — USFWS / John T. Lokemoen



SNOWY EGRET — Photo USFWS

FISH SPRINGS NATIONAL WILDLIFE REFUGE



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 May 1984

☆ U.S. GOVERNMENT PRINTING OFFICE: 1984—776 – 164.

Pony Express Trail

Western Utah

BUREAU OF LAND MANAGEMENT
SALT LAKE DISTRICT
2370 S. 2300 W.
Salt Lake City, Utah 84119

8/81

RELIVE THE OLD WEST

The Bureau of Land Management has interpreted the Pony Express trail at four locations in Western Utah. These locations are at Faust Junction, Simpson Springs, Boyd Station and Canyon Station. Research, reconstruction and interpretation of the trail was a part of BLM's Bicentennial program. This program was set up to give understanding of the American past that has made our present and will influence our future.

At Simpson Springs, the ruins of the Overland Mail and Pony Express station were reconstructed in 1974 by the Tooele Chapter of the Future Farmers of America. The size, nature and use of the old buildings were determined by archaeological investigation.

RIDE THE PONY EXPRESS TRAIL

By traveling graveled desert roads, you can follow the route of the Pony Express Trail as did riders of bygone days. Take Utah Highway 73 west from Lehi to the BLM signed turnoff which is five miles past the Stage Coach Inn State Park, or take Utah Highway 36 south from Tooele. Both routes lead to Faust Junction, the start of BLM's interpretive signing of the trail. West along the graveled road, BLM has placed concrete pillars to mark the trail.

BLM MARKER

The round trip from Salt Lake-Simpson Springs-Ibapah-Wendover is more than 300 miles and can be traveled best in two days. There is water at Simpson Springs from March thru October, but travelers should not expect to find gas, food or lodging along the route until Wendover. Travelers may also follow the Pony Express Trail through Nevada.

FAUST JUNCTION

As you travel west along the Pony Express Trail, this stop offers the first opportunity to view interpretive work completed in 1976 by BLM. There is also a marker at the site which was constructed in 1939 by the Civilian Conservation Corps as part of its project to mark the original Pony Express Trail. Named after station keeper "Doc" Faust, the station was a two-story stone structure some distance from the present marker. This station was where a change of riders took place and where the mail stage stopped for refreshments.

C C C MARKER

SIMPSON SPRINGS STATION

This station bears the name of explorer Captain J.H. Simpson who stopped here in 1858 while searching for an overland mail route between Salt Lake City and California. It is one of the most dependable watering points in this desert region. George Chorpenning established a mail station at this site in 1858, which was later used by the Pony Express and Overland Express.

A number of structures have been built and destroyed in the vicinity of Simpson Springs over the years. It is not known for sure which served as the station for both the mail route and the Pony Express. The restored structure is located on a building site which dates to the period (1860) and closely resembles the original. A BLM campground is located just east of the station with drinking water, toilets and 14 developed camping sites.

BOYD STATION

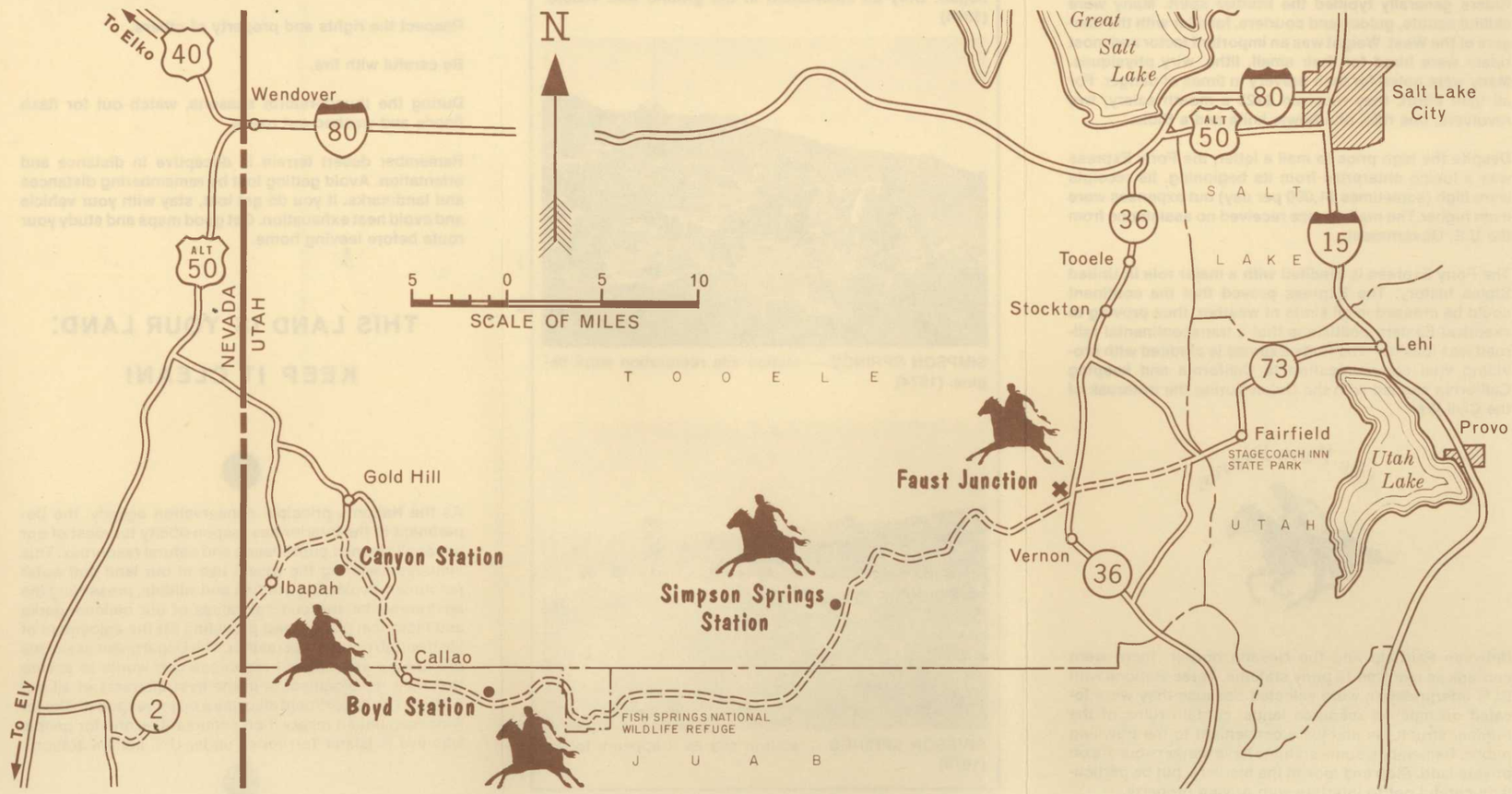
This relay station gets its present name from Bid Boyd, a station keeper who continued to live here into the early years of this century. In the days of the Pony Express, it was known as Butte or Desert Station. Only a portion of the rock walls that once provided protection from the elements now remains.

Living conditions were extremely crude. The partially dug out, rock walled, living quarters contained bunks which were built into the walls and furniture that consisted of boxes and benches. Life at the station was isolated and lonely. Activities of the station keeper, spare rider and blacksmith centered around caring for the horses and simple existence. The monotony was broken only by the arrival and almost immediate departure of two riders each day.

CANYON STATION

The Pony Express Station was located northwest of this site in Overland Canyon. Built in 1861, it consisted of a log house, a stable, and a dugout where meals were cooked and served. In July, 1863, Indians killed the Overland agent, four soldiers and burned the station. The Overland mail Station was built in 1863 at the presently marked site, which was a more defensible location. Stone outlines of the 1863 station are still visible.

There are remnants of a round fortification built just behind the station which served as a lookout and place of refuge. It probably never had a roof so defenders could speedily climb over the wall and begin firing through the rifle ports. The depression on the south side of the parking lot indicates where the corral and blacksmith shop were probably located.



HISTORY OF THE PONY EXPRESS

The legacy of the Pony Express has certainly long outlived the pony riders on the trail. The operation of the trail only lasted 18 months from April 1860 to October 1861. The Pony Express was made obsolete by the completion of the first transcontinental telegraph system. At the time, the Pony Express provided the fastest means of communication between St. Joseph, Missouri, and Sacramento, California. At a cost of $1.00 per ounce of mail and averaging no more than 20 pounds per trip, Pony Express riders could relay a mail pouch from St. Joseph to Sacramento in ten days.

To operate, the Pony Express required 500 horses, 190 stations and 80 experienced riders. Each rider rode an average of 33 miles each relay and normally used three horses to complete his portion of the route.

Riders generally typified the frontier spirit. Many were skillful scouts, guides and couriers, familiar with the dangers of the West. Weight was an important factor and most riders were hired for their small, lithe, wiry physiques. Many were noted for their bravery in times of danger. For all their effort, they received $125 a month salary, two revolvers, one rifle, one bowie knife and a Bible.

Despite the high price to mail a letter, the Pony Express was a losing enterprise from its beginning. Its receipts were high (sometimes $1,000 per day) but expenses were even higher.The mail service received no assistance from the U.S. Government.

The Pony Express is credited with a major role in United States history. The Express proved that the continent could be crossed in all kinds of weather, thus proving to skeptical Eastern politicians that a transcontinental railroad was feasible. The Pony Express is credited with providing vital communication to California and keeping California aligned with the Union during the outbreak of the Civil War.

Between Fairfield and the Nevada border, there were perhaps as many as 13 pony stations. Three stations with BLM interpretation were selected because they were located on national resource lands, contain ruins of the original structures and were convenient to the traveling public. Remember, some stations have markers but are on private land. Stop and look at the markers, but be particularly careful not to interfere with private property.

SIMPSON SPRINGS — station site before restoration work began. Only an indentation in the ground was visible. (1974)

SIMPSON SPRINGS — station site restoration work begins. (1974)

SIMPSON SPRINGS — station site as it appears today. (1976)

DESERT TRAVEL TIPS

Come prepared for desert travel, bring extra gas and water. No gas is available between Vernon and Wendover. Gas is sometimes available in Ibapah.

Keep vehicles on existing roads. Sand and mud often look deceptively solid in the desert when, in fact, they may not support a vehicle.

All Pony Express sites are protected under the Antiquities Act. This act prohibits excavation, injury or destruction of any historic or prehistoric ruin or monument on lands administered by the Federal government. Persons violating the law may be fined up to $500, imprisoned up to 90 days, or both.

This land is your land; keep it clean. Take all refuse home with you to dispose of properly.

Respect the rights and property of others.

Be careful with fire.

During the thunderstorm seasons, watch out for flash floods and washed-out roads.

Remember desert terrain is deceptive in distance and orientation. Avoid getting lost by remembering distances and landmarks. If you do get lost, stay with your vehicle and avoid heat exhaustion. Get good maps and study your route before leaving home.

THIS LAND IS YOUR LAND:

KEEP IT CLEAN!

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

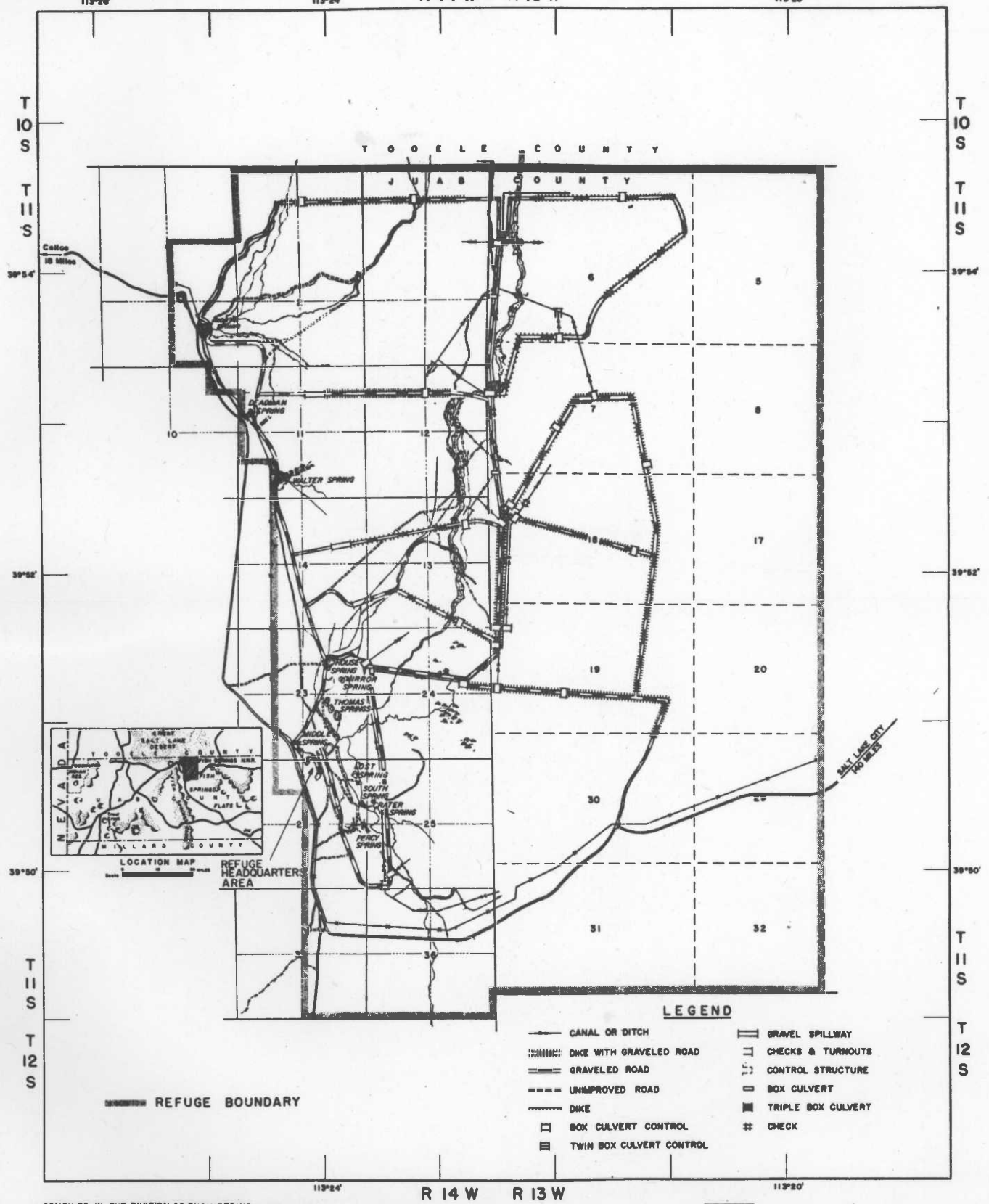
FISH SPRINGS NATIONAL WILDLIFE REFUGE

JUAB COUNTY, UTAH

R 14 W R 13 W

UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



COMPILED IN THE DIVISION OF ENGINEERING
FROM SURVEYS BY B.L.M., AERIAL PHOTOGRAPHS
AND U.S.F. & W.S. SURVEYS.
REVISED JANUARY 1964, AUG. 1968, OCT. 1968,
JULY 1972

ALBUQUERQUE, NEW MEXICO MAY, 1956

SALT LAKE MERIDIAN

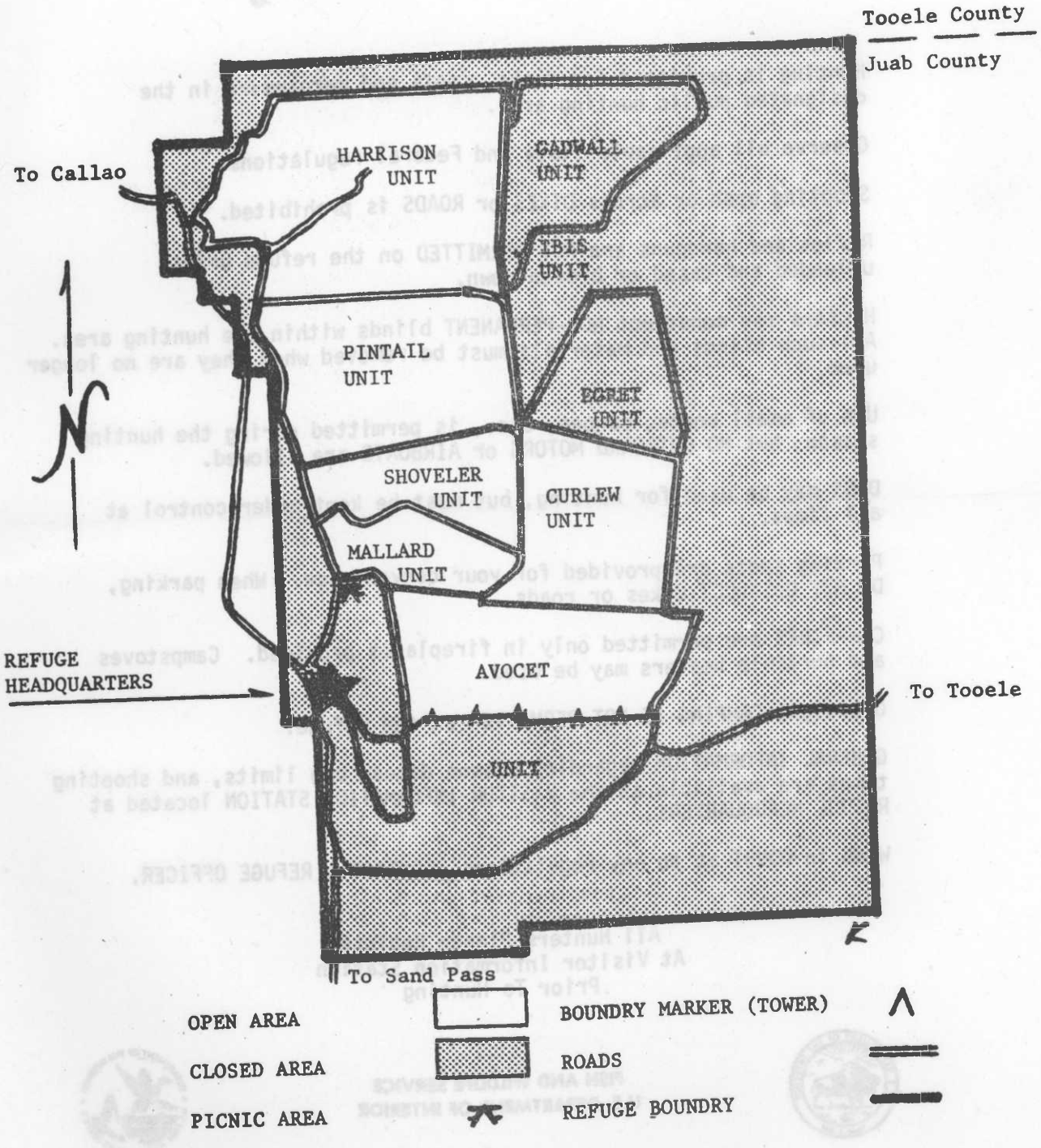
Scale 0 20 40 60 80 100 CHAINS
0 1/4 1/2 1 1 1/2 2 MILES

TOWNSHIP DIAGRAM

MEAN DECLINATION 1965

2R UTAH 522 413

FISH SPRINGS NATIONAL WILDLIFE REFUGE
JUAB COUNTY, UTAH
HUNTING MAP



FISH SPRINGS NATIONAL WILDLIFE REFUGE

WATERFOWL HUNTING REGULATIONS

Hunting is permitted for 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 831-250