

AnnualNarrative



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BEAR LAKE NATIONAL WILDLIFE REFUGE

Montpelier, Idaho

ANNUAL NARRATIVE REPORT

Calendar Year 1989

U.S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

INTRODUCTION

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Nothing to Report.

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A. HIGHLIGHTS

Tract number 22 totalling 120 acres was purchased in July (Section C.1.).

Refuge Manager Deutscher transferred to Stillwater NWR in February (Section E.1.).

Due to reduced funding, Manager's position left vacant, temporary employee terminated early, Sjoström arrived in September to take Manager's position (Section E.1.).

Carp control work in the Rainbow Unit during 1988 showed good biological response in 1989 (Section G.3.).

Received transferred excess dumptruck and truck/tractor from Stillwater Refuge (Section I.4.).

B. CLIMATIC CONDITIONS

Weather data is recorded at Utah Power and Light Company's (UP&L) Lifton Pumping Station which is located at the refuge's southern boundary. The high temperature of 94° F occurred on 26 June and the low of -18° F occurred on 3 February. The average annual precipitation at Lifton is approximately 10 inches. Table 1 summarizes weather and water levels.

Table 1. Weather data and water elevations for Bear Lake NWR during 1989.

Month	Temperatures (°F) ^a		Precipitation (inches)	Mud Lake Elev. (ft.) ^b	
	High	Low		High	Low
January	38(26.8)	-16(1.9)	.36	5920.69	5920.62
February	53(26)	-37(2)	1.16	5920.75	5920.57
March	59(42)	1(24)	1.52	5920.67	5920.50
April	72(57)	23(35)	.89	5921.55	5920.61
May	76(63)	20(39.3)	.21	5921.60	5921.42
June	84(70.5)	34(45.9)	.88	5921.58	5921.23
July	90(84.2)	48(54.2)	.12	5921.32	5920.94
August	91(79)	34(57)	.23	5921.07	5919.85
September	82(71)	31(39)	.38	5920.62	5919.75
October	72(58.8)	17(30.8)	.70	5920.63	5920.55
November	59(44.6)	7(22.5)	.51	5920.70	5920.58
December	42(31)	0(11)	.09	5920.66	5920.55
Total	(653.9)	(362.6)	7.05		
Average	(54.5)	(30.2)			
1988	(55.5)	(29.4)	4.36	(1987 precip ave. = 11.75)	

^aAverage monthly temperatures are in parenthesis

^bBased on UP&L elevation data

We again had another dry year, precipitation totals did exceed last year's meager amounts, but is still well below the 10-12 inch norm. The first few days of February saw the biggest snowfall for the year with 18 inches reported at Bern (5 inches at Lifton). We again had another low runoff year with peak flows in the Rainbow Canal reaching 360 cfs on March 29 and 484 CFS on April 24. Mud Lake was ice free on April 6 and refroze the next fall on November 21. Rainbow inlet flows dropped back to approximately 30 cfs during the irrigation season and late fall period. With inflows from the Bear River and Paris Creek via canals and ditches the refuge marsh fairs very well even in semi-drought situations. All marsh units received enough inflows to maintain the needed marsh habitats for good waterfowl and waterbird use and production.

Farming operations began in earnest in late April. Soil moisture was good and spring rains came at the right times to maintain good crops of barley. August was drier than in 1988, but rain showers in September and October improved the precipitation totals and eased the late summer fire danger in the county. Overall the late fall and early winter period was balmy and relatively dry, with minimal snow fall through December.

C. LAND ACQUISITION

1. Fee Title

Land appraisals were conducted on Tracts 10, 19, 22, 24 and 44 in 1988. During 1989 most of these fell through with exception of Tract 22 - Russell Payne's 120 acre piece along the west boundary adjacent to recently acquired Tract 43. Tract #22's deed was recorded on July 6. The purchase price was \$175 per acre. At this writing we have not received any paperwork on this tract showing refuge ownership. Evidently the Region realty people are still trying to get some minor property tax payments cleared up before clearing the title on this property. Mr. Payne has been paid. This property has excellent waterfowl values and most of the ground is deep wetland, locally known as Red Slough. We plan on installing new boundary fence in 1990 and resting most of the upland, with some farming a possibility.



Aerial view of newly purchased Tract 22 - Payne property looking southeast. This 120 acre piece includes two-thirds of the large wetland in foreground (center/left) locally called Red Slough. A nice addition to the refuge. GLD

Offers were made on Tracts 19 and 24, these were rejected as being too low. Tract 24 has since been sold to another party. Tract 44 had so many title and legal problems that its small size dropped it out of the process. We are not certain of Tract 10's status. This is an important one for the southeast side of the refuge and we will work with Realty on its possibilities in 1990.

2. Easements

The main "Farm Bill" properties for Bear Lake County involve two large wetland tracts that were turned back to FmHA three years ago. The Service has inspected these properties along with FmHA and Idaho Department of Fish and Game representatives on two occasions and did proposed conservation easements on large portions of each property. The most recent meeting with FmHA was in September and dealt with delineating out non-wetland areas not part of the easement proposal. The areas involved are the Feller property comprising 926 acres of wetlands along the Thomas Fork River by the Wyoming border and the Lazy CH or Rigby tract which has some 1,734 acres of riparian wetlands identified. FmHA has been slow to come to a decision on their disposal. Because of restrictive conservation easement requirements that make the lands undesirable to private buyers, FmHA is now considering turning these wetlands over to the Service in fee. Finally determination on these lands will probably be made in 1990. Bear Lake County is especially sensitive to this issue and with an eroding tax base and

depressed economy the local people do not want to see any increases in Federal ownership of lands that were traditionally used in livestock operations, wetlands included. FmHA is very aware of this feeling and is treading as lightly as it can on just how it will dispose of these acreages. These areas do have substantial riparian wildlife and waterfowl values and warrant whatever protection we can work out for them.

D. PLANNING

2. Management Plans

The fire management plan was revised and updated in November and is currently under review in the Region.

SIRC Biologist Bouffard reviewed and updated Bear Lake's Wildlife Inventory Plan, plugging in more current data on nest success, etc. to make the document more accurate.

A selective predator removal program was developed along with a nesting survey for implementation in 1990. This plan is currently being reviewed in the Region.

E. ADMINISTRATION

1. Personnel

Refuge Personnel



Kelsey, Sjostrom, Alexander

Staffing at Bear Lake NWR for past six years

	<u>PFT</u>	<u>Temporary</u>	<u>Total FTE</u>	<u>Other</u>
FY 89	2	2	3.08	0
FY 88	3	2	3.38	0
FY 87	3(1 CS)	3	3.63	0
FY 86	2	2	3.13	7 YCC
FY 85	2	2	2.90	2 YCC
FY 84	3(1 CS)	2	3.12	2 YCC

Probably one of the bigger items for 1989 was the promotion and transfer of Manager Gerry Deutscher in February to Stillwater NWR in Nevada. Gerry had been at Bear Lake since 1978 and was sort of an institution around these parts. Gerry moved the refuge forward in several important areas such as land acquisition, boundary fence placement, hay/grazing unit planning, marsh impoundment diking and roughfish control. We wish him well in Nevada. The manager's slot was left vacant through the summer months and was finally filled in mid September, when Dick Sjostrom transferred in from Ouray NWR, Vernal, UT where he had been the assistant for seven years.

Maintenance Worker Ken Alexander picked up most of the interim slack and did a fine job on running the day to day functions of the refuge (see Items of Interest Section). Temporary Maintenance Worker Larry Kelsey was another notable asset and was responsible for coordinating the farming and noxious weed efforts. Temporary Roscoe Caldwell worked the first part of the summer and unfortunately had to be laid off in mid August due to cutbacks in the Complex budget. He was another fine addition to our field crew.

5. Funding

The four refuges (Bear Lake, Camas, Grays Lake, and Minidoka) and the Headquarters of Southeast Idaho Refuge Complex are operated under a single fund target and FTE ceiling. There is flexibility to utilize funds and manpower where needs or benefits are greatest. Funding continues to be inadequate to meet documented Base Funding Needs. FTE ceilings are not a constraint because funds limit staffing. The situation was particularly acute in FY 89 when the Complex had to eat a \$14,000 increase in office space rental, \$16,000 of telephone charges when FTS service was eliminated, two permanent changes of station and \$32,000 of expenditures in support of Endangered Species Recovery Actions which Endangered Species did not fund. Adjustments were made by leaving three Refuge Manager positions vacant for most of the year and terminating all Temporaries in the middle of the peak work season.

Following is a funding summary for FY 89 and a comparison with FY 88.

	<u>FY 88</u>	<u>FY 89</u>
1261 Operations	\$390,700	\$454,200
1262 Maintenance	\$257,100	\$215,000
Total 1260 O&M	\$647,800	\$669,200
1113 SE Recovery Grays Lake Whooping Crane	\$32,000	0
1230	0	0
6860	\$3,000	\$3,000
Total Funds Available	\$682,800	\$672,200
FTE's	15.0	13.96
Quarters Receipts:		
FY 89 Carryover	\$13,408.44	\$14,697.79
FY 89 Collections	4,111.52	2,784.40
Withheld for Administration	781.19	529.04
FY 89 Expenditures	2,040.98	9,709.19
FY 90 Carryover	14,697.79	7,243.96

In addition the following Special Projects were funded in FY 89:

Waterproof Sealing of Camas Residence Basement	\$7,750.94
Asbestos Removal and Duct Replacement - Camas Residence Basement	\$16,161.00
Total	\$30,633.94

6. Safety

Safety meetings were held quarterly and informal safety discussions held at other times. One accident/incident was reported.

During late July Temporary Maintenance Worker Roscoe Caldwell hit a hole with his ATV while spraying weeds and was thrown sideways off the machine hitting himself on the handlebar. The blow caused a hernia problem and accident reports were sent in to the Safety Office and OWC. Roscoe visited a local physician, but other than this there was no lost time. The injury is not bothering him at present, but we are encouraging him to have the problem corrected because it is work related.

During October, Safety Manager Jim McNulty visited SIRC for a safety discussion with staff and attended an airboat prop safety discussion

with the entire SIRC crew at the Idaho State University aircraft repair shop. This meeting dealt with airboat propeller safety, bolt length and proper torquing of bolts.

On October 13, Mr. McNulty traveled to Bear Lake Refuge to inspect the facilities. No major problems were encountered and the refuge checked out very well. He inspected the Panther airboat and recommended one-half inch longer bolts. These were purchased and installed in December.

New fire extinguishers were purchased (several of the more effective Halon type) and installed on equipment; welding trailer, fuel trailer and newly transferred trucks.

A quick hitch attachment was purchased for use on our Case tractor and Grays Lake cultivator. This allows one-man hookup and eliminates hookup hazards using the standard manual hookup method with one person behind the tractor. A used quick hitch was purchased and adapted for use for \$173 (a new attachment would cost \$1,000+). Ken Alexander did a nice job locating and refurbishing the hitch, which resulted in a savings to the Government.

Other safety items include:

- Alexander and Kelsey - Boat Safety Course, May 10-11
- Refuge staff viewed helicopter safety video (30 min.)
- Refuge staff attended Idaho State Police Defensive Driving Course in Pocatello on November 16 and 2 hours of driver safety video prior to course.

Warning safety decals were placed on station ATV's and jumpstart warning stickers put on the John Deere tractor.

Additional safety/rescue gear was purchased for the refuge boats. Portable gunwale lights were purchased for possible use of boats at night. Portable rescue strobes and mirrors were placed in kits for each boat. A throw life preserver ring was installed on the airboat.

F. HABITAT MANAGEMENT

2. Wetlands

UP&L has control of the water level on the majority of the refuge. The refuge has water management capabilities on about 3600 acres and UP&L has control on over 13,000 acres. Since UP&L owns the water rights on the 13,000 acres and 2,000 of the 3,600 acres, most water management must be with the concurrence of UP&L. UP&L also coordinates their arrangement with the refuge manager, particularly the timing of water fluctuations. Cooperation has been very good.

Mud Lake Unit

All elevations are UP&L data which are 2.75 feet below actual mean sea level. January water levels at the Paris Dike averaged around 5920.65 and this level was held through March. Water levels were raised in April to assist with ice-out and maximize levels for the start of the summer season. Water levels peaked in mid May at 5921.61. The Rainbow Inlet Canal reached peak cfs flows of 360 on March 29 and 484 cfs on April 24. No later peak in late May - early June occurred from high elevation run-off. This is similar to 1988.



View of late summer discharge of Mud Lake's silty nutrient laden water into the main Bear Lake. Heavy agriculture use of the Bear River above the refuge causes this problems. RRS-10/89.

Rainbow Inlet flows dropped to the 30 cfs level during the summer period. Bear Lake below the refuge remains at a very low level (5913.42 level, December 1989), some 10 feet below the considered maximum water storage elevation of 5923.65. Lifton pumped out of Bear Lake all summer to satisfy downstream water obligations. Mud Lake levels dropped to a low of 5919.69 on September 9. UP&L began raising the level on September 14 to the target 5920.60 objective for stable fall and winter water. This elevation was reached September 21 and was held through December.

Salt Meadow Unit

Salt Meadow began the year in a nearly dry state after the fall, 1988 carp control effort. Water levels reached the gage on March 16 at elevation 5919.90 and steadily increased to a peak of 5921.56 in late June. August levels averaged around the 5920.70 mark, with a slow draw down which began in mid July. Water levels dropped to a low of 5920.10. For fall use this unit was slowly brought up to 5920.96 by late December.

The carp control work done in 1988 really improved water clarity and submerged aquatic plant growth. Observed duck pairs and broods, especially redheads increased significantly over the 1988 levels.

Dingle Unit

This unit was at a very low level early in the year and water was up to 1.75 on the gage by the end of February. Levels peaked in June at 3.94, one board was pulled to stabilize the level at around 3.75. Additional boards were pulled in July to begin a slow drawdown to the 0.85 level by late August. Water dropped away from the gage in late September. After hay season water levels were brought back up for fall migration and held at around 1.75 during the early winter period. The main inlet canal, the Black Otter, was cleaned in early October by contract excavator and this delayed fall water to the Dingle Unit for a few weeks.

This unit consists of a meandering channel that bisects the unit into wet meadow areas and small wetlands. Some carp are still present and we plan on drawing this unit down for roughfish control in 1990.



Fall flooded Alder unit, town of Paris in the background. RRS-10/89.

Alder Unit

The Alder Unit's overwinter level was at 2.00 feet. Water levels were brought up in March to 2.50 and in May, peaking at 3.70 feet May 16. Water levels gradually dropped in June to 3.16. Boards were pulled in late July starting at 2.66 and dropping to .90 by early September. After the hay areas were cleared of bales, boards were reset and elevations brought to 2.28 by September 30 and 3.18 by October. This level offered excellent flooded meadow habitat for fall migrants. Levels were dropped back to a stable 1.75 winter elevation.

Rainbow Unit

The Rainbow Unit had a January level of 5920.38. This unit was cleared of carp in 1988 and careful control of screened water into the unit was a high priority this year. Since structures #1 and #4 have high capacity rotary fish screens, these were the primary filling points. Water levels peaked at 5921.67 on June 28. Levels dropped to 5921.26 by late July. Summer evapo-transpiration brought water levels down to the 5920.02 marsh by mid September. As Mud Lake levels rose in the fall more water was available and levels reached 5920.61 by September 30 and 5920.86 by the end of October. We ended December at a healthy 5921.00 level.

The improved water quality and increased aquatic plant production was very noticeable over the summer. Divers responded especially well with increased use by redheads and improved production. Canvasback broods

were also more readily seen in this unit, overall refuge canvasback production increased 25 percent over 1988. Although very effective the fish screens do allow carp minnows through various gaps in our defenses. Rainbow will probably have to be drained every four years or so to control these pests and maintain a viable marsh.

4. Croplands

Barley and alfalfa are grown as supplemental food for waterfowl and sandhill cranes. We started refuge farming operations on April 19. Soil moisture was moderate to good and the entrance field was planted (6 acres) by April 24. Untreated Otis barley seed was planted in all fields at 60 lbs./acre. The airport field is 50 acres in size and is located one mile south of Hwy.89 along the airport road. This field received six strips of barley at 3.7 acres per strip (approximately 22 acres). The sandy soils are subject to wind erosion and the strips were placed to try to minimize this problem and an additional 5 acres was planted on the north end of this field for a total of 27 acres. Because of below normal summer rains this field had only fair production. Also, some two acres of Ladak alfalfa was broadcast seeded and harrowed. This effort was about 40 percent successful. The balance of the airport field was summer fallowed.

The Alder grain field contains 12 acres that is planted on a yearly basis. This field has loamy soils and holds water better than the entrance and airport fields. The field has not been summer fallowed every other year and has developed a serious wild oat problem. Production in 1989 was considered poor.

Unit 43 field, located north of Red Slough along the west side pole line road had 7 acres of barley planted and has been planted for only the last two years. This field has a 32 acre crop potential. Because of whitetop and Russian knapweed infestations, production has been limited. Spraying and summer fallowing young weeds when they reach 2 to 4 inches high has really helped control this problem and we hope to increase the planted acreage soon. Production was good this year.

Spring Creek grain field is 36 acres and is located along the southwest side of the refuge along the poleline road. Twenty acres were planted in 1989 with good production.

All farm fields were sprayed by refuge personnel using 2-4 D Amine.

Waterfowl and crane use was good on most fields with 80-90 percent of the mature barley utilized.

7. Grazing

Because certain areas of the refuge are too difficult to hay and still require some manipulation of wet meadow grasses and emergents for good waterfowl use, grazing is permitted in eight refuge units. Because of dense stands of emergents that extend right up to our boundary fence in

several areas, cattle are helpful in opening these areas up. During fall/winter storms, bedding by cattle in bulrush patches does work toward forming openings which in turn forms spring potholes for migrant and breeding waterfowl. In units with drier upland grasses and sagebrush, grazing is limited or prohibited. The 1989 grazing season ran from August 1, 1989 to February 28, 1990. A total of 470 AUMs under eight Special Use Permits were used.

8. Haying

The refuge has a large hay program. Some 2,500 acres of refuge are seasonally flooded shallow wetlands and wet meadows. Because of the tremendous growth and subsequent lodging problems of these wet grasses and small emergents, haying of these areas is an effective means to open up wetland areas and reduce litter accumulation. The resulting habitat is rolling shortgrass seasonally flooded meadows interspersed with taller emergent channels and potholes. Also, some drier upland sites are scattered through these meadows and they are left unmowed for waterfowl nesting. This type of habitat provides quality use areas for migrants and breeding pairs. Haying is allowed in August after the nesting season. Removal of this vegetation in low wet areas also reduces nest flooding since waterfowl will select the better sites on higher ground.

Some 23 areas are hayed each year. During 1989, 14 permittees harvested 1,084 tons of wild hay at the negotiated sale cost of \$3.28/ton. In addition, five refuge hay units were bid out with three permittees selected at bid prices ranging from \$5.26/ton to a surprising \$21.50/ton. Bid hay unit tonnage totalled 401 tons. Total revenue from haying was \$10,100. All refuge hay must be hauled off the refuge and fed solely to permittee cattle off-refuge. Although much of this wild hay is very coarse and of lower protein value because of the late cutting, it provides a good food source for cattle during the winter and this in turn encourages permittees to do a good job of cutting out the required areas.

9. Fire Management

No prescribed burns were conducted and there were no wildfires in 1989.

The maintenance crew constructed a tower and set a 500 gallon excess military water tank on it to provide emergency water filling for the refuge slip-on pumper. Water will be pumped into this tank early in the season and kept in reserve for spraying and wildfire use later in the summer. Safety Manager McNulty inspected the tank and declared it safe for use. There is no water or power available at the refuge field storage building.

The station Fire Management Plan and Fire Dispatch Plan was rewritten and updated to reflect current wildfire thinking and procedures.

10. Pest Control

All refuge barley fields were sprayed with 2,4-D Amine at the rate of 1/2 lb. AI per acre for annual weeds and 1.0 lbs. AI for perennial weeds.

Spraying was done for account this year using tractor mounted sprayers, a spray trailer or an ATV pulled sprayer. 2,4-D Amine mixed with Banvel was used to spot spray along portions of the refuge/county roadways, spoil banks and uplands. Areas such as the Salt Meadow tour route, the Rainbow Dike/road, Tract 43, the west access road, the Spring Creek field, the Lifton boundary area, the Alder Unit, north Rainbow uplands and the nearby ridge road were selectively spot sprayed. Russian knapweed, black henbane, Canada, musk and bull thistle, whitetop and some areas of quackgrass were the target noxious weed grass species. All spraying was done using protective gear and according to label recommendations.

With fallowing rotations and spraying we're getting a good handle on our farmfield weed problems. The noxious weeds along county/refuge road right-of-ways and various disturbed upland sites is a never ending battle.

G. WILDLIFE

2. Endangered and Threatened Species

No whooping crane observations were made at Bear Lake this year.

A midwinter bald eagle count was conducted on January 11 and a total of four bald eagles and five golden eagles were observed in the Bear Lake Valley and along the Thomas Fork River near the Wyoming line.

During the fall, the first bald eagle was spotted October 30 at Mud Lake. A total of three bald eagles were using the area at the close of the period. All were adults.

3. Waterfowl

The first tundra swans were observed in early November along the Rainbow Canal. Small groups of 2-10 swans were present until Mud Lake freeze-up on November 21.

Canada goose pair counts are unavailable this year. Based on the last few year's data, breeding geese averaged 800 pairs on the refuge for a total production of around 2,000 goslings (1988 = 2100, 1987 = 1710). Nest success on structures was around 85 percent with 60-70 percent of the structures used each year. Goose pairs on land surrounding the refuge (the Bear Lake Valley minus refuge land) was assumed to be similar as in 1988 and 1987, with an estimate 525 pairs of geese. Goose pair counts are flown with Idaho Department of Fish and Game toward the

end of April. This flight consists of one-half mile transects of the Bear Lake Valley and along the Bear River to Soda Springs and west to the Wyoming line. Although a flight was conducted this year by Idaho Department of Fish and Game, a recorder malfunction evidently eliminated the usefulness of the data. Refuge production is calculated by ground truthing the Rainbow Unit to obtain a visibility correction factor. Pair data is then expanded. Nest success data and average brood sizes from other surveys are used to estimate overall refuge production. Goose numbers for the refuge peaked at around 3,500 and dropped to only a few hundred by late September. A maximum of only 400 Canada geese used the refuge from October on. The late fall return flights that are the norm never materialized. This is similar to what happened in 1988. Possibly low water levels at some of the large reservoirs north of Bear Lake, such as Blackfoot Reservoir, are providing better habitat and are holding birds later until freeze-up.

Waterfowl numbers peaked during the summer months with resident pairs and broods totalling 9,000-10,000 birds. These numbers dropped somewhat in September and we entered the fall period with 6,000 ducks on the refuge. A late October aerial survey after partial freeze-up showed some 2,500 ducks and 400 geese on the refuge. Mallards made up the largest percentage. Lesser scaup numbered 200 and a large flock of 385 canvasbacks were spotted in the center of Mud Lake. Permanent freeze-up occurred on November 21 forcing most waterfowl out of the area.

Duck pair counts were conducted on 16 established transects from May 25-31. SIRC Biologist Bouffard and Manager Gladwin assisted the shorthanded Bear Lake staff in getting the surveys completed. Pair and production data is listed below. Hen success information was updated using current Mayfield data from Ron Tressler's 1987 duck nesting study at Bear Lake. These improvements were part of the revised Wildlife Inventory Plan - completed by Biologist Bouffard during November.

Year	<u>Dabbling Ducks</u>		<u>Diving Ducks</u>		<u>Total</u>	
	Pairs ^a	Prod ^b	Pairs ^a	Prod ^b	Pairs ^a	Prod ^b
1989	263	2380	268	2673	531	5053
1988	312	3135	145	1765	457	4900
1987	308	2905	174	2295	482	5200
1986	332	3065	271	3245	603	6310
1985	243	2715	206	2715	449	5430
1984	221	2775	148	2300	369	5075

^aThis is actual count and has not been expanded.

^bProduction is based on expanded pair count.

American coot production totalled 3,643 young produced from 1,012 pairs.

Diver production rebounded well from 1988's dip, increasing 52 percent. Dabbling production was down 24 percent. Overall refuge duck production was up 3 percent in 1989.



Aerial view of Mud Lake showing typical good quality diver and colonial bird habitat. Even during the late fall as this photo shows, water clarity is marginal in the main channel areas. Siltation from upstream uses and a large carp population reduces habitat quality in this part of the marsh. RRS-10/89.

Carp control was completed in the Rainbow Unit during September, 1988. This effort greatly improved the water quality and subsequent aquatic plant crops in this large diked unit. This project is probably responsible for this year's improvement in diver use. The drop in dabbling success may be the result of skunk infestations in some of our interior upland sites. A selective control effort to remove problem skunks in interior upland areas has been proposed to the Region for implementation in 1990. A nesting survey will be run in conjunction with this effort.

The management efforts during the 1980's to dike in certain marsh units and screen water inflows to minimize carp reinfestation is paying off. Periodic carp control of those units in 1983 and again in 1988, resulted in improvements in marsh water quality and waterfowl use. The proportion of divers to dabblers in our 1989 pair population (post carp control) was 51 percent divers to 49 percent dabblers. This contrasts with pre-control years data showing a split of 32 percent divers to 68

percent dabblers. We feel that improved diver habitat in some areas of the marsh has attracted more diver pairs and our pair data, brood counts and general waterfowl survey data bears this out. More specific surveys are planned for 1990 to more closely define these changes. Table 1 and Figure 1 display some of the pair data collected as it relates to the Rainbow Unit and carp control.

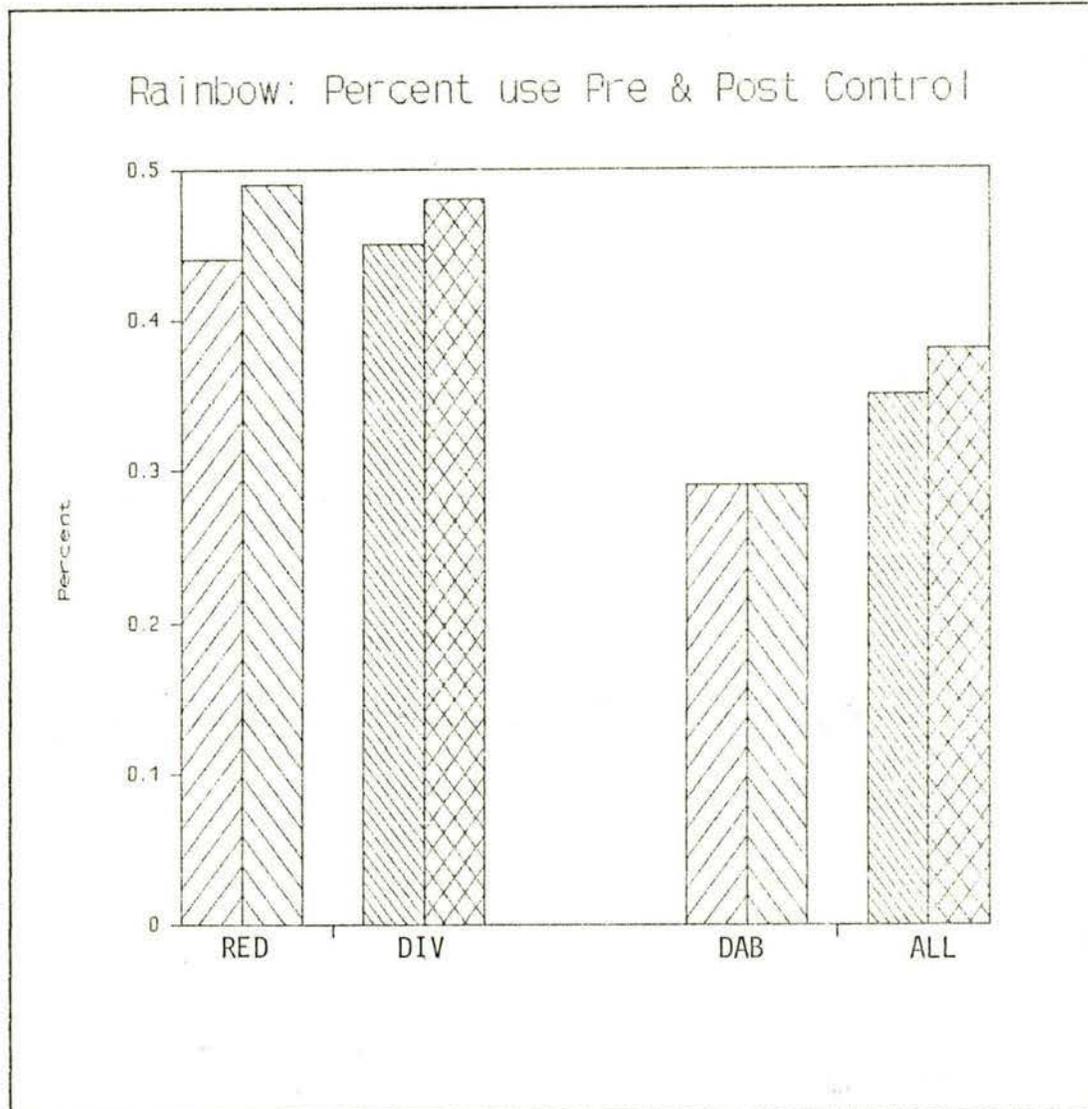


Figure 1. Percent of redheads, diving ducks, dabbling ducks and all ducks in the Rainbow Unit before treatment (first box of each pair) and after treatment (second box of each pair).

Table 1. Binomial parameters of duck pairs in pretreatment years (1982, 83, 88) and posttreatment years (1984, 85, 89) in the Rainbow unit and the entire Refuge at Bear Lake NWR.

		Rainbow (avg)	Refuge (n)	%Rainbow (p)
Redhead	pre	112	257	0.44
	post	210	425	0.49
Divers	pre	191	420	0.45
	post	303	635	0.48
Dabblers	pre	231	788	0.29
	post	210	729	0.29
All ducks	pre	422	1208	0.35
	post	512	1364	0.38

4. Marsh and Waterbirds

Sandhill cranes were observed in the valley on March 21. Some 15 to 20 pair use the refuge each year and approximately another 45 pair are scattered around the rest of the valley on private wetlands and meadows. No production estimate is available for 1989. Fall crane use was rather scattered, with the largest flock observed totalling ± 120 birds on October 4. Early to mid August crane use of refuge grain fields was light to moderate, with the following counts made. Alder grainfield: 12 sandhills, Unit #43: 11 sandhills, Spring Creek: 51 sandhills and a private field near the Airport field: 48 sandhills.



Sandhill crane colt hiding out along the edge of the marsh. GLD

Cormorant nesting islands, Rainbow 1 and 2 were checked on May 1. Rainbow 1 had 32 nests and Rainbow 2 had 15. This count was early, with few eggs observed in the nests. The nest count was conservative, with 28 cormorant nests and 22 California gull nests counted later in May on Rainbow 2. The Bunn Lake Colony #1 had 60 Forster's tern nests with scattered western grebe nests. This colony was inspected on June 28. Most of these nests were in the laying stage at this time. On June 22 the Mud Lake #1 colony had 500 white-faced ibis, 1000 Franklin's gulls and 50 snowy egrets using the area. Most of these birds were in the downy to partially feathered young stage.



Typical spring view of a white-faced ibis and Franklin's gull colony in Mud Lake. GLD

There are a total of 14 marsh and waterbird, gull and tern colonies on the Bear Lake marsh. An additional large great blue heron rookery (80-90 nests) in cottonwood trees exists along the Bear River approximately 3.5 miles northeast of the refuge. Because of a staff shortage this year not all colony sites were looked at.

5. Shorebirds, Gulls, Terns and Allied Species

Gulls and terns were discussed in Section 4 with the Marsh and Waterbirds.

6. Raptors

Northern harriers, great horned owls and kestrels were observed frequently during early fall. An occasional short-eared owl was seen along the Rainbow Dike. A ferruginous hawk was spotted on October 16 over the Salt Meadow Unit. The first rough-legs were seen on October 26. The January eagle count spotted some 6-8 rough-legs using the refuge. One dark phase was spotted along the north county road.

During November an injured golden eagle was picked up along the west boundary-Red Slough area and kept in the pen at Montpelier. The bird had a head injury, probably from a powerline strike, and continually got worse until it died.

We also picked up a great horned owl, which after a few days was strong enough to break out of its pen and fly off. A northern harrier we found was too badly injured, was euthanized and placed in our specimen freezer. We try to minimize our raptor rehab efforts and only work with birds having the best chance for recovery. No falcon observations were made in 1989.

8. Game Mammals

Due probably to the mild winter and lack of snow, very few deer were seen along the Merkley ridge wintering area in December.

15. Animal Control

Electric predator fences were again activated in late March for the third year. Two barriers across each end of the Rainbow dike were maintained until September. Water barriers and deep marsh along the dikes add to the barrier effect against skunk depredations. Late summer low water and over winter ice does allow for off season skunk access beyond these barriers. Also, raccoons (a new comer in the valley) were spotted on two occasions last fall. A limited skunk/raccoon removal program within the electrified barriers is needed each year to maximize the benefits for interior upland nesting ducks. A proposal toward this end is in the works for 1990.

The beneficial results from rough fish removal has been demonstrated many times. The increases in waterfowl use from the 1938 carp removal effort are discussed in the waterfowl section. Water clarity was excellent and the associated response from submerged aquatic very beneficial to divers in particular. The bottom line is that to reach optimum productivity for waterfowl (and divers in particular) the Bear Lake marsh needs additional large diked in units to control roughfish and siltation.

16. Marking and Banding

Maintenance Worker Ken Alexander assisted Idaho Department of Fish and Game on June 21 in the capture and banding of 57 Canada geese (47

juveniles and 10 older geese) on State land adjacent to the Outlet Canal. Of these, 52 geese were released near Grangeville, Idaho, in the Red River Meadows area. Regional Wildlife Manager Jim Hayden appreciated Ken's and Bear Lake's cooperation on this project and other projects of mutual interest.

H. PUBLIC USE

1. General

The Bear Lake Valley is a high public use area with several State parks around the edge of Bear Lake. The North Beach State Park lies just south of the refuge marsh along the north shoreline of Bear Lake. This area receives over 70,000 visitors each year. Approximately 10 percent of these visitors use the refuge for casual bird watching from the highway that divides this marsh to the north and Bear Lake to the south. A group of approximately 10 pelicans hung around in the Outlet Canal next to the Lifton Pumping Station most of the summer and provided the north beach visitors a good wildlife show. These birds on "live display" generated a lot of interest in the refuge and its bird life. The State Park employees handle most of the inquiries from the public, handing out refuge leaflets as needed.

2. Outdoor Classrooms - Students

During May, 150 elementary students and teachers from local schools participated in environmental field studies at the refuge for two days. Subjects such as bird life history, identification, marsh management and water samples were discussed and studied. This is the second year that local schools have conducted outdoor classrooms, with 80 students using the refuge in 1988. The Paris Dike area and Salt Meadow tour route were the areas used.

5. Interpretive Tour Routes

During October 65 elementary students from Soda Springs toured the refuge and received a talk on waterfowl from Manager Sjostrom. The tour continued on south with a visit to the Lifton Pumping Station.

6. Interpretive Exhibits/Demonstrations

Planning continued on developing an informational and interpretive display for the Idaho State Park kiosk located at North Beach. This has been in the works for the past few years and we hope to get completed materials for display in late FY 90. The location of the display is adjacent to the refuge marsh at North Beach State Park and is an excellent opportunity to inform park visitors about the refuge.

8. Hunting

The 1990 waterfowl season opened late this year with goose opening on October 14 and duck following the next weekend. The duck season was split, closing on November 26 and opening on December 26 through January 6. No hunter use was recorded after marsh freeze-up on November 21. Refuge hunter visits were estimated at 90 with 360 activity hours. Thirty-five hunters responded to a refuge questionnaire, yielding the following bag check information and estimates. A total of 198 waterfowl were harvested, 31 of these were Canada geese. Hunters averaged 4 hours per visit, 60 percent of the use was from the Cache Valley, Utah area. Hunters averaged 1.86 ducks and .34 geese per visit. Geese comprised 16 percent of the bag, mallard 35 percent, ringneck 12 percent, green-winged teal 12 percent, and pintail 9 percent. Crippling loss was 10-12 percent. Most local hunters concentrated on local big game hunts and balked at paying the \$25 for the required licenses and stamps. The Utah hunters felt the hunting was good despite the lack of pressure to move birds around. A peak of 5,000-6,000 ducks and geese were on the area during the late October period, including about 300 canvasbacks. Local hunters complained about the lack of birds, especially geese. One group of locals complained about the poor hunting, despite having a bag limit each of geese. Goose numbers were down from normal with under 600 birds in the area during the fall.

Overall waterfowl hunter numbers were down from 1988's 170 visits, but success for ducks improved from .40 birds/hunter to 1.86 this year. Duck Stamp sales continued to drop from a high of 355 in 1985 to around 150 sold this year in the valley. The higher costs, later more restrictive seasons and generally lower numbers of waterfowl the last few years have contributed to this decline.

The refuge also allows upland game hunting and while opportunities for gallinaceous birds are low, we do usually get some 30-40 hunter visits for cottontail rabbit late in the season.

9. Fishing

Quality fishing opportunities along the refuge's Public Fishing Area on the Bear River Outlet Canal are minimal. Carp are the primary species, with a few trout taken. Total visits are around 130 per year.

11. Wildlife Observation

Most refuge visitation (80 percent plus) deals with the opportunities to observe and watch the various species of water birds. The north access road and Salt Meadow tour road provide excellent viewing opportunities, especially during the goose hatch and brooding period in May and June.

Total visitation for the north access point was 2,071 visitors, up slightly from 1988's, 2014. The south end of the marsh receives some very casual visitation from North Beach users who observe marsh wildlife from the highway near Lifton. This use totals 10 percent of the total

park visitation or some 7,000 incidental users. Visitation in 1987 for the north access area totaled 1,742 people, current figures show a 15.7 percent increase over this level of use.

12. Other Wildlife Oriented Recreation

Boating use during the period when motors cannot be used is low, but we do usually get a few canoeists who want to explore the marsh. During September we had eight people in four canoes from out of state who spent a half day in the marsh. Other wildlife oriented visitors included a few mountain bikers on the dikes and cross-country skiers.

17. Law Enforcement

No hunting violation apprehensions were made. Overall waterfowl hunting pressure in the valley was very light this year. We did have an individual drive off the refuge entrance road and into the edge of the marsh last summer. He was apparently intoxicated. The county sheriff and a wrecker handled the situation. We had the usual vandalism this year. Our main entrance sign was hit by a shotgun blast toward the end of waterfowl season. Shooting up signs is a continual problem in this area.

Manager Sjostrom attended the Marana, AZ Law Enforcement Refresher Training during February 1989. He also requalified with pistol at Browns Park NWR, CO, in August and again at Pocatello in October after his move to Region I.

I. EQUIPMENT AND FACILITIES

1. New Construction

The refuge field shop and storage area has no water or electrical power. To improve our ability to fill sprayers and fire pumpers the refuge crew built a 500 gallon tank and tower adjacent to the building to gravity fill with. Water is periodically hauled from town using our pumper and stored in this tank for emergency or sprayer projects. This makes the overall sprayer operations much more efficient. The pipe tower stands 10 feet and the tank is an excess military water tank. Safety Manager McNulty inspected the tank setup in October and found no problems.

Additional turnouts were developed on the Rainbow Dike using fill dirt and gravel. Some of these still need to be riprapped.

2. Rehabilitation

During early October a contractor's excavator was working in the area adjacent to the refuge's east side Dingle Unit. This presented an opportunity for us to clean the large inlet ditch which feeds the Dingle Unit wetlands from the Black-Otter canal system further east. Approximately 2,000 feet of badly silted and overgrown ditch was cleaned

using a special ditch bucket. The excavator completed the project in seven hours, for a total cost of \$455 (\$65/hr). To complete this project, the refuge crew used our D-4 and ditcher plus the backhoe to clean a smaller feeder ditch which puts water into the Dingle Unit further south.

Thurston Construction out of Logan, Utah, returned in June to finish their contract work on the refuge entrance road. This involved widening the 4,000 foot road by two feet and surfacing it with 1 inch screened gravel from the J.B. Parson's pit. In addition, a new 8 x 14 foot cattleguard was installed at the road entrance. Total contract cost was \$37,724.50. Work began June 6 and was completed June 13. Maintenance Worker Larry Kelsey was the job inspector.



Excavator cleaning a badly overgrown inlet ditch from the Black Otter canal system. RRS-10/89

3. Major Maintenance

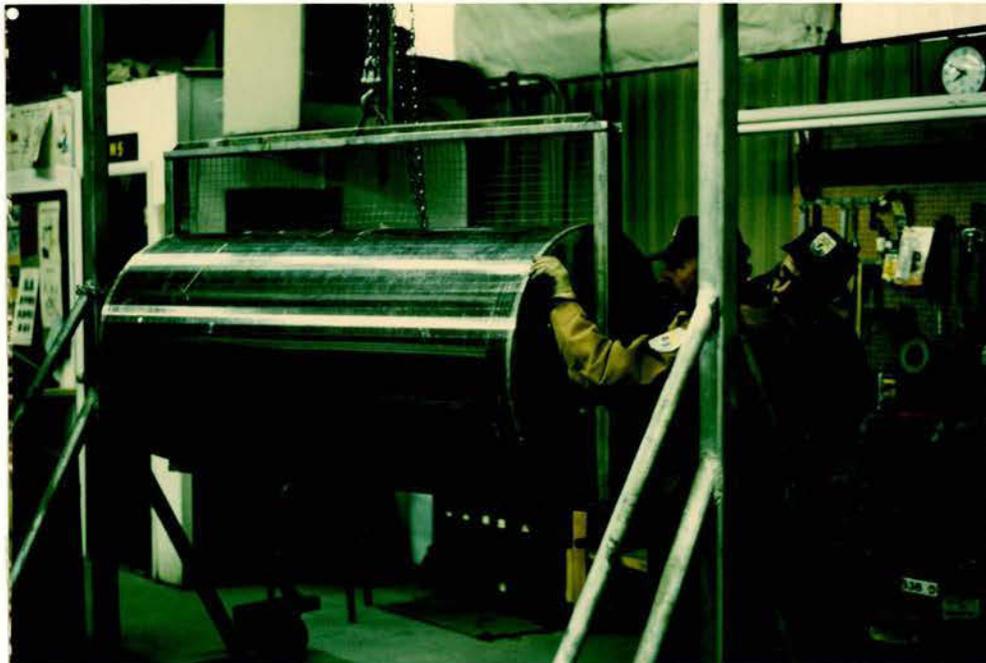
During January through March we checked the refuge's 88 goose nesting platforms. Additional hay bales were placed as needed and repairs made to the wooden structures.

Numbered signs were made and placed on the water control structures to help identify them as they relate to the water management plan.

Fence work this year was mainly maintenance of existing boundary fence, interior fencing and gate repairs. These projects including rebuilding

gates along the boundary adjacent to the Dunford property, resetting sagging corners along the southwest side and redoing gates and fence to improve water access by permittees along the Lifton units. In addition, old fence and trash piles were picked up and hauled to the county dump.

In December Ken and Larry hauled in the rotary carp screens from Rainbow structures #1 and #4 and replaced rusted bolts and the rubber seals along the frame which help keep the smaller carp out. These screens are really nice outfits, they work well and are pretty much self cleaning. Beaver however can still do a good plug job on them.



Larry and Ken making some minor repairs on one of two rotary carp screens used along the Rainbow Dike for water control. RRS-12/89

The turnout at Rainbow #4 structure was widened and graveled to make a safer truck turn around. Flashboard holders were placed at the Pugmire and Alder water control structures. These pipe frameworks are a nice addition since they allow us to stack our boards for easy storage and ease in location under snow. More are planned for our other structures.

Approximately 200 cu. yds. of material was hauled in December using the newly transferred Kaiser 6x6 dumptruck. Although old, this truck is in good shape. Its good to have a dumptruck around again. This material was used to enlarge Rainbow Dike turnouts and to fill an old spoil hole along the west access road.

The hunting area buoys that mark the closed area on the south end of Mud Lake were repaired during October and placed with the airboat. The buoys were pulled in early November as Mud Lake began to freeze over.

4. Equipment Utilization and Replacement

In mid October we transferred two excess trucks from Stillwater NWR in Nevada. Stillwater's truck/transport arrived October 17 with a 1969 6x6 Kaiser M-51A dumptruck. Stillwater's Equipment Operator Del Lee unloaded and headed back to Fallon with our Ken Alexander. Ken then drove back the other truck, a 1972 IHC truck tractor (12,000 actual miles). Both outfits are badly needed here. By the end of December both trucks had been serviced and minor repairs made to be fully operational. The 6x6 replaces our smaller Ford five-yard dump which burned up in October, 1988. The 6x6 can haul 12 yds. of material, has a heavy winch and is in good mechanical shape. The truck tractor is much needed at Bear Lake and in the SIRC Complex for hauling our heavier equipment to and from jobs. We're currently looking for an excess lowboy and may have one lined up out of Salton Sea Refuge.



Transferred 2 1/2 ton IHC truck/tractor and 6x6 Kaiser dumptruck from Stillwater Refuge. RRS-11/89

Our thanks to Stillwater Refuge Manager Ron Anglin and particularly former Bear Lake Manager Gerry Deutscher for helping us out with these transfers.

The burned out Ford dumptruck was surveyed and sold locally for scrap on a small lot sale in December. Hennings Salvage hauled the wreck off after paying a bid price of \$125.

The refuge Panther airboat had the heads rebuilt on its 455 cu. in. Buick engine. Considerable time was spent on identification of the engine due to modifications made by the airboat manufacturer. The work was finally completed (all force account) on September 21. Extra length bolts on the propeller, a new extinguisher, seat belts and additional life saving gear was also installed on the airboat.

The D-4 dozer received new cutting edges and end bits this year. The leaky hydraulics were rebuilt and rear remotes for hydraulic hookups for use with the ditcher and scraper were added.

We built a trailer for the refuge 4x4 ATV to be used for mounting our spray unit or as a flatbed for remote fencing locations. The lift ram on the 2440 John Deere tractor loader attachment was rebuilt and new load control shaft seals were also replaced.

Other shop projects included rebuilding the overhead hoist frame, repairing the cab to the old Wabco grader, and installing a five ton winch on the equipment trailer.

Overall most equipment at Bear Lake is rather outdated. The maintenance crew does a good job keeping the various pieces running and generally in very workable condition.

5. Communication Systems

IC&E was hired under contract in September to upgrade station vehicle radios to monitor and transmit on Idaho Department of Fish and Game frequencies. Some work was completed, but due to the loss of a key employee, they were not able to complete the upgrade. We are still trying to get the work completed. Evidently the problem lies with a rather tricky programming glitch in the radios. We currently have a FWS capability and can monitor Idaho Department of Fish and Game, but cannot talk to them. IC&E also repaired a hand set for us in November.

J. OTHER ITEMS

1. Cooperative Programs

The refuge works closely with Utah Power and Light (UP&L) on water level management in the Dingle (Bear Lake) marsh. UP&L is very responsive to our needs and does a good job raising or lowering the marsh to meet our needs. A water management agreement signed in October 1968, obligates

UP&L to maintain water levels within one-half foot of the 5920.5 elevation providing water is available. This agreement is suspended whenever the elevation of Bear Lake reaches or exceeds the 5920.00 elevations.

3. Items of Interest

Maintenance Worker Ken Alexander received a monetary Special Achievement Award for his continued high level of work and additional management responsibilities that shifted to him after Manager Deutscher left in March. Ken was essentially the man-in-charge at Bear Lake until the new manager arrived in mid September. Congratulations, Ken.



Complex Manager Peck congratulating Ken on a job well done. RRS-12/89

4. Credits

Manager Sjostrom wrote the report. Maintenance Workers Alexander and Kelsey provided work completion summaries for his use. Wendy Hall typed and organized the report and Complex Project Leader Chuck Peck did the final editing and review.