RO

BEAR RIVER MIGRATORY BIRD REFUGE
Brigham City, Utah

ANNUAL NARRATIVE REPORT
Calendar Year 1976

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

5 3 4 6 7 1 2

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6.	Samuel A. Sage	Maintenance Worker	WG 08/5	PFT
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8.	Kim A. Forrest	Public Use Specialist/ Biological Aid	GS 04/1	Temp.
		EOD 05/09/76 - Term. EOB 09/30/76		
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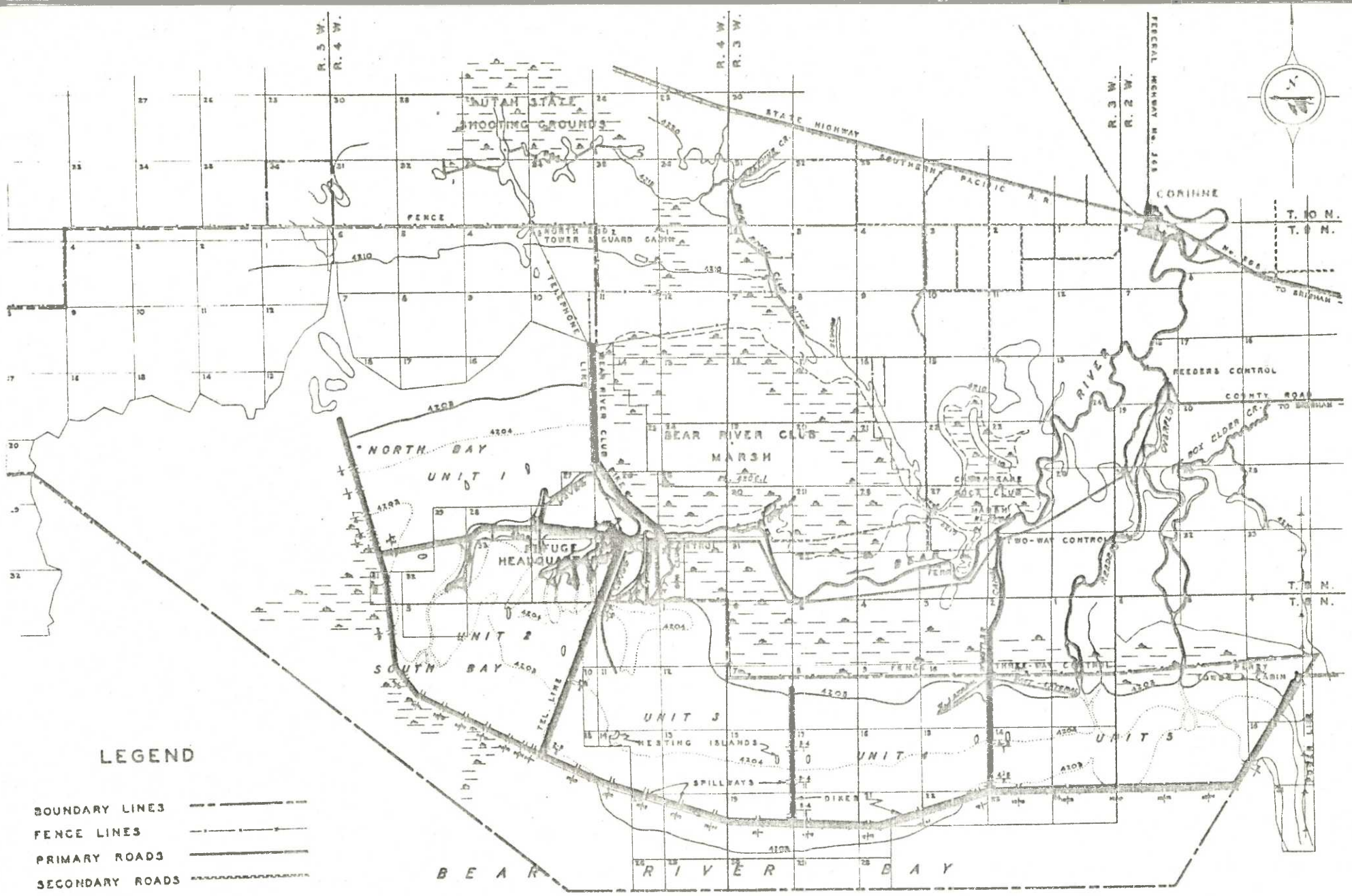
Review and Approvals

Ned I. Peabody 2/3/77
Submitted by Date

M. G. Sheldon 13 FEB 77
Area Office Date

Read River NWR
Refuge

Regional Office Date


R. 5 W.
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UTAH STATE SHOOTING GROUNDS
STATE HIGHWAY
SOUTHERN PACIFIC R. R.
FEDERAL HIGHWAY No. 165
CORINNE
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T. 9 N.
TO BRIGHAM
FENCE
NORTH TOWER & GUARD CABIN
TELEPHONE LINE
BEAR RIVER CLUB FENCE
BEAR RIVER CLUB MARSH
NORTH BAY
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FEEDERS CONTROL
COUNTY ROAD
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BOX ELDER CR.
TWO-WAY CONTROL
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TEL. LINE
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MIGRATORY BIRD REFUGE
BOX ELDER COUNTY
UTAH

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I. GENERAL

A. Introduction

Bear River Migratory Bird Refuge was established April 23, 1928 by a special act of Congress to provide a breeding and feeding area for migratory birds. The refuge contains 64,895 acres of shallow water impoundments, marsh, and saline mud flats at the mouth of the Bear River, and nearly spans the breadth of the valley between the Wasatch and Promontory mountain ranges. Refuge headquarters is located 15 miles west of Brigham City, Utah.

B. Climatic and Habitat Conditions

1. Weather

Weather patterns were normal during the first nine months of the year. October was milder and dryer than usual. Precipitation during November and December was the lowest recorded, with one exception, since the weather station was established in 1940.

1976 Weather Data

Month	Temperature		Precipitation			Evaporation	Wind
	High	Low	29 y.av.	1976	Snow		Miles
Jan.	49	2	1.09	.33	6.0		572
Feb.	54	1	.95	2.40	11.0		723
March	58	10	.95	.92	3.5		1,130
April	71	28	1.42	2.17		4.09	1,656
May	84	40	1.31	.94		8.68	1,468
June	94	42	1.37	1.20		8.65	1,035
July	98	52	.25	.58		10.33	603
August	92	43	.54	1.14		8.73	651
Sept.	91	41	.91	.96		5.72	496
Oct.	79	40	1.03	.84		2.76	519
Nov.	67	9	1.12	.04			511
Dec.	46	9	1.10	.09	1.0		320
Total			12.04	11.61	21.5	48.96	9,684
Extremes	98	1					

2. Water

Ice on the Bear River began to break up March 1 and flash boards were installed to begin filling the units on March 22. An excellent spring flow continued until June 4 when the river level dropped abruptly to a flow just adequate to maintain the refuge units. On June 23 the river level dropped again and all outlet structures were sealed. Unit levels dropped 6 to 8 tenths of a foot then stabilized until early in September when increased flow filled all units. Water levels outside the main dike were extremely high during spring but dropped 1 - 2 feet during the summer.

The river level fluctuated significantly again in October. Cutler Reservoir's water level was lowered so repair work could be completed. The refuge received a high flow of 3,900 cfs from October 7-10. The flow then stabilized near 1,000 cfs until October 22 when Utah Power and Light Company personnel started refilling Cutler. An extremely low flow was received until November 4 when the reservoir was filled. All units dropped 2 to 3 tenths of a foot during this low flow period and water levels in channels outside the main dike dropped substantially.

A cold wave moved through Utah on November 26 and 27 closing most water areas. During the first three days of December all units were drained and radial gates on all river structures were raised.

3. Habitat

The evaluation of habitat is expressed in general terms since the refuge has not established transects to measure production. Sago pondweed (Potamogeton sp.) production in Units 4 and 5 increased significantly. Large dense mats were visible compared to the small isolated patches of last year. Sago and Salicornia (Salicornia ruba) production south and west of the main dike was poor due to high water in spring and decreasing water levels during summer and fall. Salicornia production on other refuge areas was about normal.

About 75% of the 44 miles of dike produced an excellent crop of various forbs especially sweet clover (Melilotas sp.) annual sunflower (Helianthus annuus), milkweed (Aselepias sp.) and stinging nettle (Urtica dioica) . Saltgrass (Distichlis spicata) grew on most of the other dike area in monotypic stands and is spreading onto many of the mudflats.

C. Land Acquisition

1. Fee Title

The 14,500 acre Knudson's marsh has been proposed for acquisition under the habitat preservation advice for redhead and canvasback production areas. Knudson's marsh is adjacent to refuge Units 4 and 5 and historically has been an excellent redhead production area.

2. Easements

Not applicable.

3. Other

Nothing to report.

D. System Status

1. Objectives

a) Habitat Preservation (1100) Although no units of accomplishment or funding was programed under this activity, the Area Office transferred $510 to provide for employee attendance of a Pesticide Applicator's Workshop. Refuge personnel assisted with the collection of fish from the new Bear River site of the National Pesticide Monitoring Program. The Area Office was alerted to contacts and negotiations regarding the Bear River Compact and a proposed 35,000 acre evaporation impoundment to include considerable acreage in the northwest portion of the refuge.

b) Wildlife Resources (1200) This marked the fifth year of participation in the Service's steel shot program and the second year of exclusive use of steel shot. Phasing out the sale of steel shot on the refuge is not recommended until the use and sale of non-toxic shot is more prevalent in the area.

Rehabilitation of facilities included major renovation of two residences and the shop. Deterioration of migratory bird habitat continues due to inadequate funding for carp and vegetation control and maintenance of ditches and other water facilities. The following exerpt from the RPS reveals the expected outputs at the Current, NFIO and Objective levels.

Output Categories	Units	Current	NFIO	Objective
Threatened Species Maint.	UD	361,765	211,765	415,765
Waterfowl Maint.	UD	25,000,000	10,000,000	35,000,000
Other Mig. Bird Maint.	UD	17,016,500	7,514,500	20,020,000
Waterfowl Production	EA	18,000	5,000	28,800
Total Annual Benefits	RBU's	52,224,000	21,594,000	79,570,000

c) Interpretation and Recreation (1500) The NFIO level of management would necessitate elimination of guided and self-guided tours, the Visitor-Contact Station, fishing, camping and picnicking and over a 50 percent reduction in hunting and F&W Information outputs. This would directly conflict with objectives of maintaining current levels of recreational use opportunities and increasing the public's understanding and appreciation of the wildlife and wildlands resource.

Current refuge objectives are considered in conformance with national objectives, including camping and picnicking, as these activities are directly related to interpretation and wildlife oriented recreation. Utah has an active Hunter Safety Training Program required of all residents under the age of 21. This precludes the necessity for a refuge program which would be difficult to administer because of logistical and staffing problems.

The refuge is located within several hours driving time of one million people and has gained national recognition with bird watchers and photographers. The refuge was nominated by the Region for participation in an expanded interpretation program "Windows to Nature", but without funding the program remains paneless.

2. Funding

The current staffing pattern is composed of seven permanent positions as indicated on page 2, Personnel and Approval. The Assistant Manager (Trainee) position was lost in 1975 due to inadequate funds. Two temporary Biological Aid positions were filled this year compared to three in 1975. The NFIO level would necessitate reduction of the permanent staff from seven to three and no temporary personnel. The Objective level requires approximately two man-years of temporary positions, but only one additional permanent position of Public Use Specialist.

The following chart provides a synopsis of the fund targets allocated during the calendar year.

	FY 1976	T.Q.	FY 1977
1100	510		
1210	104,500(1)	30,000	107,200
1220	1,000	220	1,500
1500	29,000	6,650	30,500
Rehab	19,000(2)	3,600(3)	
Totals	154,010	40,470	139,200

(1) Including $4,500 pay act money.
(2) Rehab. of two residences and shop building by force account.
(3) Additional $2,400 force account for completion of building rehab. and $1,200 for canal cleaning. Original $8,000 rehab. for canal cleaning received too late in T.Q. to utilize either by contract or force account, reduced to $1,200 for force account.

Although the use of permanent employees for the special building rehab. project reduced the extent of maintenance on other facilities, the $19,000 provided for force account in F.Y. 1976 allowed for a viable refuge program and the employment of two temporary personnel. A slightly improved fund target during the Transition Quarter combined with an additional $3,600 for force account on rehab. projects permitted continuation of our normal shoestring operation. No vehicles or major equipment was purchased.

A review of the chart would indicate an approaching fiscal fiasco in FY 77, and such will be the case without relief. Salaries and benefits for permanent employees and fixed operating expenses total approximately $132,000 or 95 percent of the fund target. Our recommendation for elimination of one permanent maintenanceman position, endorsed by the Area Office, has not been accepted by the Regional Office.

Progression to the Objective Output level will require over one million dollars for new developments and major rehab, $175,000 for minor rehab., and an annual O&M allotment of $350,000. This latter figure appears ridiculous in light of current funding, but that's the difference between 21 million RBU's at the NFIO level and 80 million RBU's at the Objective level.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

Major rehabilitation of Quarters #1 and #3 was initiated in August, 1975. Engineers from the Regional Office inspected each residence and drew up specifications for window replacement, wiring, and plumbing contracts. Work on Quarters #1 began early in May when Mr. Delmar Zeigler was detailed from Alamosa Refuge to help stud the exterior walls. The window replacement contract and force account block work were completed in June. Contract plumbing and rewiring were finished early in September. Wall boarding, insulating, paneling, painting, and other finish work was completed by September 15. Carpet and linoleum were layed and a shower enclosure installed early in October completing most of the Quarter's #1 rehabilitation.

R76B5 RFK 7/15/76

Quarters #1 window replacement and block work reducing window size and heat loss.

The occupants of Quarters #3 moved on August 4 and by September 1 studding of the exterior walls was completed. During October, November and December contract rewiring was completed and the refuge crew installed wall board, panel, insulation, and painted the Quarters. Installation of linoleum and carpet was started before Christmas but was not completed before the year ended.

The shop roof was insulated, and finish work was completed on the cinder block oil storage house.

The refuge 14 foot aluminum airboat engine required a major overhaul during the winter. General repair and maintenance of all vehicles and equipment was accomplished during the winter. Two D-8 Cats, crawler crane with backhoe, and a front end loader were picked up surplus, repaired, and transported to Browns Park, Fish Springs and Ouray refuges.

R76B3 RFK 5/29/76

"Now what do I do?" "Old equipment taxes one's ingenuity"

The 1967 Dodge dump truck broke an axle 10 miles from the refuge headquarters. A grader blade hooked under the corner of the bed helped it home. A 3x8" crutch was rigged to get across the narrow bridge to the shop.

A new dirt and gravel airboat launch was constructed in September on Unit 5 for airboat hunters carrying lead shot and hunting off the refuge. However, opening weekend rain softened the ramp. Several vehicles were stuck opening day and use of the ramp was immediately discontinued.

A small fee collection building was picked up surplus from the Golden Spike National Monument. It was erected near the entrance to hunting Area "B" for a self-registration station.

R76B2 NIP 9/21/76

Installation of hunter self registration building for hunting area "B".

An estimated 700 ton of rock rip-rap was hauled to refuge dikes to repair eroded areas. An additional 1,666 tons of road gravel was purchased in September to help restore the deteriorating dike roads. About 700 tons of the gravel had been hauled in refuge dump trucks by December 31.

A regional office survey team located the southeast corner of the refuge near the Willard Reservoir dike. Monuments were set on the refuge and Willard Reservoir dike so the corner can be located by refuge personnel in the future.

B. Maintenance

The following steps were taken for improved safety on the refuge. Lights in the shop were rewired to meet (OSHA) safety standards. All fire extinguishers were checked and serviced as necessary and safety glasses were acquired for personnel requesting them.

Ten ton of Calcite rock was hauled from Lehi, Utah in and distributed to replenish that taken by visitors from around headquarters buildings. Many favorable comments were received from visitors on the headquarters area appearance.

Two days were spent cleaning silt from pools in the Bear River Research Station duck pens. In return the research maintenance man assisted in laying cinder blocks at Quarters #1.

R76B5 RFK 7/15/76

Maintenanceman Velasquez removing silt deposit from Bear River Research Station duck pen.

Temporary personnel painted and stained all public use signs on the auto tour route and around the headquarters area. They also assisted in lawn care and litter control.

R76B2 NIP 7/1/76

Biological Aid Kim Forrest painting the Station 1 sign on the auto tour route.

C. Wildfire

Nothing to report.

III. HABITAT MANAGEMENT

A. Croplands

Not applicable.

B. Grasslands

Prescribed burning was completed on a 1½ mile section of the main dike outside Unit 2. Burning removed the dense vegetation exposing gravel that had been graded off the road. The major benefit of the burn was the increase of desirable forbs, especially sunflowers and sweet clover, in monotypic stand of saltgrass.

C. Wetlands

Bear River Refuge is divided by a system of dikes into five major habitat units. There is an additional large area approximately one or two miles wide south and west of the units (See map).

The Bear River opened March 1 and all units were full of water by March 25. Units 1, 3 and 4 were held at 4204.70 feet during the year. Units 2 and 5 were held near 4205.00 feet until June, then lowered to 4204.70 feet, to encourage waterfowl to nest on higher ground. A majority of the river flow passes through Units 2 and 5 making it extremely difficult to hold the units level when the river fluctuates.

In October several hundred acres of mudflats north of Unit 1 were flooded by water from Salt Creek. Normally very small quantities of water enters the refuge from the adjacent State wildlife area which Salt Creek feeds.

The heavy silt concentration carried by the Bear River causes siltation in the slow moving channels which is a major problem. In September refuge personnel started cleaning the east lateral of Whistlers canal. Mechanical problems developed in the dragline after only 200 yards had been cleaned, and more urgent work necessitated postponing the project.

Another major wetland problem is the spread of salt cedar or tamarisk (Tamarix pentandra Pall.). Eight man-days were spent hand spraying spot infestations inside the units with Silvex, 2,4,5-TP, as a follow up to a major effort in 1975. An estimated 90 percent kill was achieved with hand spraying in 1975 as opposed to less than 10 percent with aerial application on 360 acres below Unit 2.

The establishment of desirable emergent vegetation on portions of the once barren saline flats below the main dike has been accomplished over the years by flooding or irrigation with water in excess of pool maintenance requirements. Contour furrowing and other development has facilitated the most efficient use of available water. The rising level of the Great Salt Lake, peaking at 4202.2 during the spring of 1976, has destroyed thousands of acres of State managed waterfowl habitat, and jepardizes the existence of this large attractive habitat unit. Spring and summer inspections revealed no loss of habitat from salt water intrusion, but the area remains highly vulnerable.

D. Forest Lands

Not applicable.

E. Other Habitat

A large area of barren mudflat and greasewood knolls is located in the northwest corner of the refuge. Water from the Blue Creek drainage normally runs through the area during spring and fall. Land owners adjacent to the north and west boundary recently secured water rights and built a series of dams stopping all flow.

F. Wilderness and Special Areas

The Greasewood Knolls Research Natural Area is located just inside the refuge's northern boundary. The 680 acre area is checked occassionally during aerial censuses but is relatively inaccessible from the ground.

The Great Salt Lake Commission has proposed a 35,000 acre evaporation pond to help reduce the rising water levels of the Great Salt Lake. This proposal would flood the Research Natural Area and a large portion of the northwest corner of the refuge.

G. Easements for Waterfowl Management

Not applicable.

IV. WILDLIFE

A. Endangered and/or Threatened Species

Peregrine and prairie falcons use the refuge during fall and winter months. Observations in 1975 were limited to single individuals, while two or three falcons were frequently seen at one time this year.

Western burrowing owls utilize the refuge area in very small numbers. One well known nest burrow was located on private land near the county road to the refuge, and had been used by owls for five years. The owls had provided thousands of refuge visitors with good opportunities for pictures and a close look. This spring the burrow was destroyed by a badger and the site was abandoned. A single owl was observed near the burrow site several times later in the spring and summer, and was last seen there on December 22 apparently checking up on the old home.

Ferruginous hawks are rare on the refuge and none were observed this year.

Western snowy plover (Charadrius alexandrinus nivosus) nest at the north end of the O-line and outside Unit 1. Approximately 6 to 8 pair were observed this spring compared to about 25 pair in these areas last year. There is no known reason for the decrease in use.

Approximately 6,000 white-faced ibis (Plegadis chihi) used the refuge during July. About 1800 nests were found and an estimated 3,000 young were produced. Most of the nests were outside Unit 2 just north of the airboat channel. A few ibis nested inside Unit 2 near rock island and others nested in small colonies outside Units 2 and 3. Mr. David Cappan, a graduate student at Utah State University collected eggs to check for shell thickness and pesticide residues.

Sixty-one species of plants have been proposed for threatened status in Utah. A more specific delineation of the range of these species, as well as identification of refuge plants is needed before the impact of this rule-making can be determined.

B. Migratory Birds

1. Waterfowl

a. Ducks: Duck production increased 107 percent from 1975. Many factors probably contributed to the increase in production, but perhaps the most significant was a decrease in predation. The results of many man-days spent on predator control could be readily observed on the nesting transects. In 1975 more than 38 percent of the duck nests located on the 16 nest transects were destroyed. In 1976 only 18 percent of the nests found while walking six of the 16 transects were destroyed. The six transects walked were representative of each refuge unit and included the transects with heaviest predation losses in 1975. A total of 240 active nests were located on the six transects compared to 208 on all 16 transects last year. Only six of the 16 transects were walked in 1976 due to a shortage of time and manpower.

Seven brood counts were made between July 1 and

August 5. Each count involved two vehicles with one driver and one observer in each vehicle. A predetermined route is driven and all broods within 100 yards were counted. The following table indicates production by species. The most significant difference is in gadwall and cinnamon teal production. Both nest on the dikes and are very accessible to predators.

Duck Production Data

	1976	1975	1974	1973	1972
Mallard	357	155	100	135	150
Gadwall	10246	4365	10000	13150	13742
Pintail	1053	439	50	160	363
Cinn. Teal	2467	1027	500	1150	1851
Am. Wid.	28				
Shoveler	264	123	50	125	152
Redhead	1162	1287	1000	1500	3100
Ruddy	854	559	250	330	939
Total	16431	7955	11950	16500	20297

The 1975 and 1976 production was estimated by multiplying the brood count total X 2.5 (brood habitat not observed) X the variation in the species observability quotient found in the Waterfowl Brood Survey Manual by M. C. Hammond revised June 1970. Ten percent of the production is subtracted to compensate for mortality.

Total duck use days decreased about 15% from last year (See table) primarily due to a delayed fall migration. Peak concentration of canvasback (Aythya valisineria) and pintails (Anas acuta) were 75% and 12% respectively, lower than 1975. Also large numbers of pintails migrated from the refuge earlier than last year. The green-winged teal (Anas carolinenis) peak population was about 30% larger than 1975 and supplied 37% of the ducks harvested during the hunting season. The following table indicates use-days and fall peak populations for five years.

Duck Use-days and Fall Peaks

Years	Use-days	Fall Peak
1972	14,271,000	145,445
1973	18,281,000	175,000
1974	21,476,000	333,000
1975	22,281,060	166,000
1976	19,003,170	170,000

Waterfowl censuses were conducted approximately once a month. During 1976 a pilot with super cub from the ADC unit in Salt Lake City flew refuge personnel on seven censuses. Three passes are normally made over each unit and one or two passes between the main dike and our south or west boundary. Flights are normally at an altitude of 300 to 400 feet and additional passes at lower altitude are sometimes necessary to identify species.

The first botulism was discovered on April 5. A sick pintail was picked up on the main dike outside Unit 4 and tests confirmed botulism. A few other sick birds were observed during April and May.

An estimated 900 ducks died of botulism during July, August and September. This was a minor die off with birds widely scattered in the refuge units. An additional 1,000 dead ducks were found south and west of the refuge boundary. A majority of the dead birds retrieved were green-winged teal and pintails.

Hunters utilizing Area "A" shot 4,697 ducks which included 1,748 green-winged teal and 679 pintails. More canvasback and lesser scaup were harvested while the bag of all other species decreased from last year.

Lead poisoning was confirmed as the cause of death of one mallard, and was suspect in three other duck mortalities. The refuge is not routinely checked for sick or dead birds other than occassional botulism surveillance in July, August, or September.

The following table summarizes the disposition of ducks donated to organizations during 1976.

Donated Ducks During 1976

Species	Number	Condition	Organization
Cinnamon teal	2	dead	Museum at Vernal, Utah
Canvasback	1	Live	Logan Zoo at Logan, Utah
Ruddy duck	10	"	" " " "
No. Shoveler	1	"	" " " "
Pintail	1	"	" " " "
Green-winged T.	3	"	" " " "
Hooded merganser	1	"	" " " "
Pintail	1	"	Tracy Aviary at Salt Lake City

b. Geese:

The spring migration of Canada geese began in late February and by April 1200 geese were using the refuge. By May 31 most young were hatched and several flocks of non-breeders were observed. The population remained stable through September then increased to 5,000 during October. The table below lists the use-days, fall peak, production, and date the first brood was observed for 5 years. The number of use-days in 1976 was higher, with one exception, than any other year since records have been kept.

Five Year Summary of Goose Data

Year	Use-days	Fall Peak	Production	Date First Brood Observed
1972	472,080	5,100	1,470	April 16
1973	470,000	5,000	1,000	April 22
1974	534,000	5,000	1,500	April 22
1975	693,750	6,000	1,200	April 19
1976	973,980	5,300	1,600	April 30

Three Canada goose brood counts were conducted between May 19 and June 14. The count on June 14 included an aerial count of all habitat not visable on the simultaneous ground count. Goose production was estimated by adding the largest ground count and the aerial count together. The number of young not observed in the census and renesting are believed to compensate for mortality from hatch to flight stage.

The few old artificial goose nesting structures on Bear River are used more by ravens than geese. However, a pair of Canadas were observed on a structure west of the short tower outside Unit 2. This is the second known nesting attempt on this refuge in artificial structures.

In 1976 there were 409 Canada geese checked at the refuge office during the hunting season, one goose less than the record set in 1967. This number includes geese shot by hunters using airboat access to off refuge areas and also geese shot in area "A". Hunters bagged 148 Canada geese on hunting area "A" and 40 on area "B" during the 72 day season.

A single snow goose was observed with a flock of Canada geese on August 25. An estimated 300 snows used the mudflats north of Unit 1 during November. During that period a large flock of approximately 2,000 snow geese were reported by a hunter near the refuge's northwest corner but the sighting was never confirmed. Use of Bear River Refuge by snow geese has decreased dramatically from 1933 when 363 snow geese were bagged during the hunting season. This year only 2 were bagged and last year none were bagged.

On June 24 refuge personnel and airboats assisted Utah Division of Wildlife personnel in banding 523 Canada geese on the refuge. Five airboats were used to herd the moulting birds into shallow water where they were caught by hand.

A Canada goose in very poor condition was picked up by hunters and turned over to the Bear River Research Station. The goose died and Dr. Wayne Jensen performed an autopsy confirming the cause of death as lead poisoning.

c. Swans:

The first whistling swan spring migrants arrived February 26. By March 25 at least 3,000 swans were using the refuge pools. They began moving out by the last of March and were last observed on April 8.

The fall migration of whistling swan began about October 16. In November 18,500 swans were using the refuge units. A majority of the swan migrated south when the units froze up at Thanksgiving and by December 31 only a dozen remained on Unit 1. The table below indicates the use and fall peak for the last five years.

Whistling Swan Use and Fall Population Peaks

Year	Use Days	Fall Peak
1972	410,640	7,800
1973	1,190,000	22,000
1974	600,450	17,000
1975	635,100	15,000
1976	604,770	18,500

Eight whistling swans in poor condition were found on the ice in January. They were captured and placed in the research station pens where seven eventually died. Autopsies were performed by Dr. Wayne Jensen confirming that five died from lead poisoning. It was believed the other two swans also died from lead poisoning but it was not confirmed.

A shortage of time and manpower prohibited refuge personnel from retrieving sick and wounded birds in the fall. Hawks and eagles removed most of the birds in poor condition before December 31.

Three wounded whistling swans were captured by Logan Zoo personnel early in December. Later attempts to capture birds in poor condition proved futile due to thin ice.

d. Coot:

American coots used the refuge 7,536,000 days in 1976. This is an increase of 1½ million use-days over 1975 but a million use-days less than in 1974. By the end of September coots reached a population peak of 81,000.

2. Marsh and Waterbirds

Fifteen species of marsh and waterbirds used the refuge 1,722,910 days during the year. Six greater sandhill cranes, an uncommon species on the refuge, were observed on April 10. Sandhill crane calls were heard and one pair was sighted occassionally into the last of April. Another unusual bird on the refuge, the common gallinule was observed on June 15.

On August 10 at least 7,000 white pelicans were using the refuge pools. This is an increase of 1,000 over the peak population observed last year. A wounded pelican caught in December was donated to the Logan, Utah Zoo but died soon thereafter.

An estimated 300 pair of western grebes normally nest on Bear River Refuge. In 1976 many colonies abandoned their nests due to declining water levels during July and August, especially below the main dike. The largest colony to experience a good hatch was a renesting attempt in Unit 5, but the mean hatch date was September 1. Two young western grebes, still unable to fly, were found frozen in the ice during the Thanksgiving freeze up.

The refuge double-crested cormorant population has been steadily increasing the last few years. (See table). There are 5-7 small cormorant colonies left in Utah. The refuge colony is considered the most stable and least threatened in the State.

Double-crested Cormorant Nesting Pairs

	1972	1973	1974	1975	1976
Number of Nesting Pairs	41	47	56	66	96

The 96 nesting pairs is the second largest nesting population recorded since 1940 when the records were started. In 1953 there were 106 nests counted on the two islands in Units 4 and 5 that the cormorants use.

3. Shorebirds, Gulls, Terns, and Allied Species

Approximately twenty-eight species of shorebirds, gulls, and terns inhabit refuge areas for 10,469,485 days. American avocet use makes up a third of the use-days.

Several large colonies of California gulls nest on the refuge. Surveys have been conducted for several consecutive years on the major gull nesting colonies and the following table shows the number of nests and eggs found on the surveys. The control that has been practiced during the last 12 years is also indicated.

California Gull Nesting and Control

Year	#Nests	#Eggs	#Eggs Sprayed	#Adults Killed
1965	9,573	15,334	No control	No control
1966	6,492	14,577	"	"
1967	5,411	12,145	12,145	"
1968	5,931	15,729	15,729	"
1969	4,998	9,792	9,792	"
1970	5,110	10,975	10,975	1,371
1971	3,117	8,058	8,058	500
1972	1,101	2,559	2,559	407
1973	516	1,281	225	50
1974	1,452	2,942	No control	775
1975	2,122	5,031	No control	763
1976	4,619	10,242	10,242	980

This table reveals what can be accomplished by spraying gull eggs with diesel fuel. The refuge objective is to lower the nesting population to 1,000 pairs. Research in the1930's found that very little predation took place with a population at this level.

The 1976 Caspian tern nest census recorded 59 nests with 108 eggs which is the largest number of nests ever recorded on the refuge. Caspian terns nest only on the east island in Unit 3. During a period between 1959 and 1973 nests were located only in four of the years. In 1974 ten nests were found and 52 nests were located in 1975.

4. Raptors

Thirteen species of raptors hunted the refuge for 26,590 days this year. Three endangered species discussed earlier were among those using refuge areas. One rather unusual specie observed in October was a Coopers hawk. The spring peak of 78 bald eagles and 10 golden eagles was observed March 20. The fall migration of eagles was larger than usual, with a total of 77 bald and golden eagles observed on December 1. Primary food in the spring is winter killed carp, while in the fall they feed on carp and wounded birds. Each fall and spring near the migration peak several counts are taken from the dikes using a spotting scope.

Rough-legged hawks are common winter residents, while marsh hawks are year-round inhabitants peaking in the fall. Rough-legged hawks peaked at 45 in early March and approximately 30 were present on December 1. In September the number of marsh hawks was lower than usual but had increased to 45 by October 15.

5. Other Migratory Birds

Mourning doves migrate through the refuge in August and September and a few nest on the refuge. The largest number observed on the refuge was 75 about September 1.

Water pipits are common winter visitors and approximately 1,000 were estimated to be on the refuge early in March.

C. Mammals and Non-migratory Birds and Others

1. Game Animals

A single or pair of mule deer were observed several times in Units 1 and 2 during February and March. Tracks were observed on the north side of Unit 5 on several occasions.

2. Other Mammals

A new species was tentatively added to the mammal list this summer. A least chipmunk (Eutamias minimus) was observed around the refuge office by the manager and assistant manager on September 24. It is possible or maybe probable that visitors brought the common mountain camp ground inhabitant to the refuge. The chipmunk was observed only on that one occasion.

Three other mammal species that are uncommon inhabitants on the refuge were sighted by refuge personnel and trappers. A yellowbelly marmot, a rare mammal on the refuge, was observed several times around the auto tour route in May. In October a porcupine was found wading through the shallow marshes several miles from the nearest tree. Bobcat tracks were reported a few times by muskrat trappers during February.

Red fox (Vulpes velox) numbers are increasing in the general area and tracks are commonly found on every refuge unit. One red fox was trapped by muskrat trappers during the season.

The spring muskrat trapping season ran from January 15 to March 31. The ice thawed very late in the spring and a good "run" never materialized. A total of 5,165 muskrats, 3 long-tailed weasels and several striped skunks were removed by the trappers.

A major trapping program for striped skunks and feral house cats was initiated because of the high observed predation rate on nests. Early in January leg hold traps baited with pieces of chicken were set on each bridge around the main dike. Traps were also placed in den openings that became obvious when the snow melted in late February. The traps were checked daily and the results were excellent. By April 14 when the trap line was pulled 161 skunks had been elinimated. Muskrat trappers contributed approximately 20 of the 161 taken. An additional eight skunks were shot during May and June. This is the largest number of skunks ever removed and is 75 more than in 1975. In addition, there were 17 feral house cats and two badgers removed.

3. Resident Birds

Ring-necked pheasants are commonly observed along the refuge dikes. The estimated pheasant population on January 1 was about 750. High winter mortality normally results from predation, exposure, lack of food and other causes. An excellent hatch brought the population up to an estimated 1,500 birds. Hunters removed 92 roosters during a 30 day season in November compared to 28 in 1975.

Chuckar partridge are common in the surrounding mountains and a few have been introduced on the Bear River Club adjacent to the refuge. A pair of relatively tame chuckars occassionally visit the refuge headquarters to accept hand-outs from the public.

Black-billed magpies and common ravens are common inhabitants during the year. Since they are predators some control of both species is useful in management. Three adult ravens and 11 subadults were eliminated from areas closed to the public. Only one adult magpie was shot but 70 eggs and 41 young were destroyed.

4. Other Animal Life

Carp remain a major problem in the refuge's shallow im-poundments. This summer the low water level dried up some channels outside Unit 2 and an estimated 80-100 ton of carp died.

CHRISTMAS BIRD COUNT
Rodney F. Krey

Brigham City, Utah: 41°28' N 112°16' W, center Bear River Migratory Bird Refuge, Headquarters, as described in 1969. West along canal roads, south and east over dikes to Unit 5, north and east along city and county roads to Brigham City, and west along county road to refuge headquarters, the starting point.
Habitat coverage: Marsh and ponds 60%, fields and farmland 20%, city 5%, open pasture land and river banks 15%.

December 20, 1976; 9:00 a.m. to 5:00 p.m. AM and PM clear, temperatures 15° to 39°F. Wind SW 0-10 m.p.h. Snow cover 0 to 0. Fresh water partly open, Salt water, open- partly open to frozen. Wild food crop good.
Nine observers in 2 parties. Total party-hours 16, 7 on foot, 9 by car; total party-miles 45, 6 on foot 39 by car.

Pied-billed Grebe	32
Great Blue Heron	49
Whistling swan	191
Canada Goose	953
Mallard	6,369
Gadwall	13
Pintail	107
Green-winged Teal	216
American Widgeon	5
N. Shoveler	19
Redhead	24
Ring-necked Duck	1
Canvasback	19
Lesser Scaup	6
Com. Goldeneye	61
Bufflehead	13
Ruddy Duck	13
Hooded Merganser	1
Com. Merganser	76
Red-breasted Merganser	8
Rough-legged Hawk	29
Buteo, sp.	11
Golden Eagle	1
Bald Eagle	34
Eagle, sp.	2
Marsh Hawk	39
Prairie Falcon	3
Ring-necked Pheasant	332
Am. Coot	34
Killdeer	15
Com. Snipe	4
Ring-billed Gull	11
Short-eared Owl	6
Com. (Red-sh.) Flicker	5
Black-billed Magpie	47
Com. Raven	36
Black-capped Chickadee	2
Long-billed Marsh Wren	14
Water Pipit	44
Bohemian Waxwing	2
N. Shrike	2
Starling	2,652
House Sparrow	194
W. Meadowlark	10
Red-winged Blackbird	67
Brewer's Blackbird	45
Am. Goldfinch	102
White-crowned Sparrow	19
Song Sparrow	84
Total Species	47
Total individuals	12,022

(In count area count week but not seen count day: Burrowing Owl.

Participants: Robert Clemans (Bridgerland Audubon Soc.) Clair Kofoed (Bridgerland Audubon Soc.) Rodney F. Krey, Alice Lindahl (B.A.Soc.) Rich Nunes (B.A.Soc) Ned Peabody, Buddy Smith (B.A.Soc.) Kim Smith (B.A.Soc.) Jan Young (B.A.Soc.)

Killdeer	15
Com. Snipe	4
Ring-billed Gull	11
Short-eared Owl	6
Com. (Red-sh.) Flicker	5
Black-billed Magpie	47
Com. Raven	36
Black-capped Chickadee	2

A company from Logan, Utah tried unsuccessfully to initiate a carp inland fisheries. The objecties of the group were to develop acceptable harvest techniques to sustain a viable commercial inland fisheries program and to determine what effect the program would have on basic productivity and related production of refuge waters. A Special Use Permit was issued to collect specimens for palatability tests, but the company was unable to find sufficient markets and the program folded in September.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On-Refuge

More than 68 percent of the 24,812 visitors to the refuge in 1976 drove around the 12 mile auto tour route. A visitor log is maintained at the refuge headquarters and all visitors are requested to stop and register, however, it is estimated that between 10 and 15% of the visitors do not register. Considering the implications of the Privacy Act, some revisions will be necessary in the visitor log before next year. Guided tours were given to registered school groups and other organizations with a total of 2,217 visitors; 250 fewer than in 1975 and the lowest total since 1967.

Personal film Krey 6/26/76
Visitors watching Bear River Salmon run the 1A spillway.

2. Off-Refuge

Twenty talks were given to off-refuge groups including boy scouts, school classes, the Great Salt Lake Interagency Technical Team, and the airboat association.

A small exhibit about the refuge and its fauna is permanently maintained at the Brigham City Community Center and is visited by several thousand people annually.

Manager Peabody helped staff F&WS booth at Career Days held in Salt Lake City. An estimated 25,000 elementary through high school students participated.

A new childrens checklist was developed and printed (60,000 copies) for identification of the common birds. The general refuge leaflet supply was depleted by April and an emergency order of 3,000 copies was received in May.

Ten news releases were written covering subjects from waterfowl production to hunting and trapping. Releases are normally sent to six newspapers in the Brigham City, Ogden and Salt Lake City area.

An instructor at a private junior high school in Salt Lake City is interested in starting environment education classes at the refuge this spring. The instructor visited the refuge in October to look over facilities.

Manager Peabody attended all regular meetings of the Bear River Technical Advisory Committee (BRTAC) and assistant manager Krey participated on the BRTAC Weed Control Task Force.

B. Recreation

1. Wildlife Oriented

a. Hunting

The 1978 waterfowl hunting season was open from October 2 to January 2. The daily bag limit was seven ducks not to exceed two redheads or two canvasback or two in aggregate. Goose season opened October 9 and closed December 19 with a daily bag limit of two dark and three white geese or five white geese. Bear River Refuge required exclusive use of steel shot on all areas.

A total of 2,920 hunter visits, including those using Area "A" and airboaters using refuge access to hunt State lands were registered at the refuge office. This was an increase of 24 percent over the previous season, but is 15 percent less than the number of registered hunters in 1974. A total of 1,902 hunter visits was recorded for hunting Area "A" and 420 for Area "B". The average bag for Area "A" was 2.11 birds per hunt compared to 2.80 in 1975. The 1,018 airboat hunters averaged 1.59 birds per hunt, but did exceptionally well on geese. The extended bluebird weather through the season resulted in a generally poor duck season, but an excellent goose season throughout this area.

A new self registration building was installed at the entrance to Area "B". It provided more accurate information than available in the past although approximately 15-20% of the hunters did not take time to register and another 15% did not fill out the form completely.

This was the second year that all refuge areas have been steel shot exclusively. There are still many complaints that the steel shot is too expensive, is available only in 12 gauge, and merely wounds birds rather than bringing them down. Several individuals, however, felt that the decreased hunting pressure caused by the steel shot regulation created an even higher quality hunting experience.

A 30 day pheasant season with a daily bag limit of two cocks opened November 6. Although many pheasants are bagged in conjunction with waterfowl hunting activities, an estimated 109 hunters concentrated mainly on pheasants. This was a large increase over estimated 40 hunters of 1975, and was attributed to the excellent pheasant population on the refuge. Hunters bagged a total of 92 pheasants in 1976 compared to a total bag of 28 in 1975.

b. Fishing

Refuge office personnel observe and record the number of fishermen using the refuge, which accounts for 10% of the visitor use. A total of 2,587 fisherman visits was recorded in 1976 which is the greatest use recorded. Fishing for channel catfish, and bullheads, and carp was very good in the spring. One fisherman interviewed

in July boasted that he had caught 26 channel cat, all over 8 pounds, since March. The "big ones" are normally caught with jumbo shrimp after dark. During the opening weekend of goose season, one lucky hunter caught a 14 pound channel cat on fresh goose liver.

c. Trapping

The annual public drawing for muskrat trapping permits was held January 9 at the Intermountain Indian School in Brigham City, necessitated by the gas well leak and county road closure. Sixty-two applications were received for the twelve units, and sixty people turned out for the drawing. The following table summarizes the season results.

Muskrat Trapping Data for 1976

Trapper	Unit	Fee	Harvest	*Est. Income
Floyd Martin	1-A	$226	411	$883.70
Jay Matthews	1-B	200	520	1,204.00
Lyle Schiess	2-A,3-A	210	199	327.30
Wendell Smith	2-B,C	214	207	344.90
Keith Jensen	2-D	355	472	919.40
Willard Jensen	2-E	309	782	1,802.40
Rees Richards	3-B	236	356	725.20
Barry Braithwaite	4-A,5-A	183	347	753.90
Tim Schiess	0-1,0-2	250	731	1,723.70
Michael Stone	0-3	200	743	1,806.10
Ken Pentz	0-4,0-5	200	367	790.90
Keith Jackson	1-5F	50	30	31.00
		$2,633	5,165	$11,312.50

*The estimated trapping income was figured by multipling the number harvested by $2.70 which is the average price received and then subtracted the fee.

Unit 1-5F was a new unit consisting of the shoreline inside the main dike from the large spillbox on Unit 5 to the sanitary landfill in Unit 1. The late spring thaw and movement of ice along the shoreline contributed to poor trapping success, and the area will be included in the other units next year.

Several new regulations were initiated this year. Only one trapping permit was allotted per household. An individual could not be entered on more than one application and any applicant who drew a State trapping area was disqualified from the refuge drawing. Also applicants were requested to name their assistant on the application.

d. Photography

Several professional and serious amateur photographers used the area in the spring. The number of professionals visiting the area was lower than usual in 1976, possibly due to changes in policy concerning areas open for their use. In past years they have had generally free range of the refuge. During 1975 and 1976 photographers have been limited to the general visitor tour route unless they were working on a specific publication and their subject was not available on the tour route. Special Use Permits were issued for use of the main dike below Unit 3 to those that qualified.

The refuge was discussed in both film and book this year. Mr. Charlie Craighead filmed footage for an educational film by Allied Film Artists of Jackson, Wyoming. A chapter about Bear River Refuge was included in George Harrison's book, Roger Tory Peterson's Dozen Birding Hotspots.

2. Non-Wildlife Oriented

The increase in picnicking and camping can be attributed to the increase in general visitation especially fishing. Many weekend fishermen brought families along to enjoy the area. New directives from Washington regard all picnicking and camping as non-wildlife oriented, but these activities on Bear River relate directly to the enjoyment of the wildlife/ wildlands resource and our interpretation program.

Some ice skating occurs along the main dike in Unit 5 during the time the Perry entrance gate is left open for hunter access. This activity is not encouraged or discouraged since it does not effect any other refuge activity or objective and no problems are expected.

C. Enforcement

The table below summarizes the number, type, and disposition of violations written during the year. The total number of cases in 1976 was lower than in 1975, as there was a significant decrease in the number of lead shot violations. This may indicate a growing acceptance of the steel shot program.

Summary of Violations in 1976

Number	Type of Violation	Disposition
3	Fishing without license	C.A. declined prosecution - Had bought license.
2	" " "	Fined $15.00
4	Illegal trespass	C.A. declined prosecution
2	" "	Fined $10.00
2	" "	Pending Jury trial
3	Lead shot possession	Fined $10.00
2	" " "	Fined $5.00
3	Lead shot possession	Pending Jury trial
2	No license, no stamp	Pending

One or more refuge employees patrol the refuge on most weekends. On opening weekend of goose and duck season four refuge employees are used for law enforcement. All fishing violations were written up by assistant manager Krey who routinely checked fishermen for licenses while working on weekends.

The southeast corner of the refuge is located in Willard Bay and ice action removes signs each winter. Five miles of boundary must be reposted each spring because fishing and hunting violations are common in the area. In September a survey crew from the Regional Office relocated the boundary corner and established reference stakes to facilitate accurate posting each year.

The problem of boundary shooting and illegal trespass retrieval was reviewed by Area Office, refuge, and enforcement personnel during a meeting February 20 in Salt Lake City. The regional solicitors opinion is that entry into a closed area constitutes a trespass violation and that birds shot which fall within the refuge boundary cannot be retrieved but must be counted in the daily bag limit. The U.S. Attorney has promised to take illegal trespass and boundary shooting cases through Federal Court if the Service is unable to receive convictions in State Courts.

The county sheriff's office investigated an incident of vandalism that occurred the night of August 8. Keys were stolen from several refuge vehicles and the headquarters restrooms were damaged slightly. The Bear River Research Station garage was opened by forced entry and their station wagon was driven into Unit 2 and abandoned in several feet of mud and water. Greater loss was probably forestalled because of the locked gates at all exits.

VI. OTHER ITEMS

A. Field Investigations

Mr. John Ratti provided the following summary of his study entitled "Reproductive separation and isolating mechanisms between dark and light phase western grebes."

Summary: The objectives were to determine the degree of reproductive separation between dark- and light-phase western grebes, identify and analyze isolating mechanisms, and clarify the systematic relationship between dark- and light-phase birds. Two major hypotheses were tested and field investigations included comparative study of clutch size, egg size, brood size, morphology, starch gel electrophoresis, reproductive separation, flock composition by color phase, nest initiation dates, nests and nesting habitat, and spatial distribution of nests by color phase. Study of captive birds included: development of techniques for maintenance of captive birds, growth curves, phenotypic development, and imprinting and/or conditioning to light- and dark-phase models. Analysis and final report of the data is expected in September of 1977.

Mr. Jack Mobely finished his masters thesis in September but due to problems with the printer we have not received a copy. His program was a Service funded study entitled "Wildlife Utilization of Contour Furrows on the Bear River Migratory Bird Refuge."

Mr. David Cappan finished a masters studying "The Ecology of White-faced Ibis in Northern Utah." This was not a Service funded study and the majority of data was collected on other areas. Mr. Cappan returned during the summer and collected additional information on nesting populations, nest density, and egg shell thickness for a follow-up of his thesis.

B. Cooperative Programs

Bear River Research Station located on the refuge has a staff of 4, researching botulism. Dr. Wayne I. Jensen has supervised the station for more than 20 years.

A Geological Survey crew conducts periodical monitoring of the salinity and volume flow of the Bear River.

A new fish collecting site was established on the Bear River for the National Pesticide Monitoring Program. Mr. Dale Robinson, fisheries management biologist from Vernal, Utah, unsuccessfully attempted to catch fish for the project in October.

Bear River Refuge was selected as a test site for the new Wetland Classification Inventory System. Personnel from Martel Laboratories of Baltimore, Maryland visited the refuge for 2 days testing the system.

Manager Peabody assisted BOR and NPS personnel in drafting a report for the Salt Lake City Urban Park Study. This was a unit of the Departmental Task Force on Urban Parks and Open Space Study.

Manager Peabody participated on a study team to define the wildlife management research needs of the Great Salt Lake.

Assistant Manager Krey participated in the Canadian duck banding program stationed in Medicine Hat, Alberta for six weeks. Mr. Krey and his assistant, Mr. Bob Meista (ES) of Olympia, Washington, banded 4,211 ducks using salt plains traps on four banding sites between Medicine Hat and Taber, Alberta, a distance of 105 miles. Mr. Richard Hoppes of the Colorado Division of Wildlife assisted the southern Alberta teams.

C. Items of Interest

Mr. Sam Sage transferred to Bear River in July of 1975. In December, 1975 Mr. Sage had worked with the Service for 20 years. He received his 20 year pin at the refuge staff meeting in 1976.

The following table summarizes the training refuge personnel received during 1976.

Training	Hours	Participants
Supervisory Training Part II	40	Krey
Gyroscope II	40	Krey
Law Enforcement Course	40	Peabody, Krey, Valcarce, Johnson, Velasquez
Law Enforcement Refresher Course	8	Peabody, Krey, Valcarce, Johnson, Velasquez, Sage
Pesticide Applicator Workshop	16	Peabody, Krey, Valcarce
Pesticide Applicator Workshop	8	Velasquez, Sage, Johnson
Privacy Act and FOIA	4	Peabody, Krey
Total hours	408	

Kim Forrest and Gary Moreau were temporary summer personnel. Ms. Forrest had a BS in Wildlife Management from Utah State University in Logan, Utah. Her primary duties included assisting with the public use and Biological programs.

Mr. Moreau had received a masters degree from Utah State. His principle duties included assisting with the biological and maintenance programs. Both were excellent employees and great assets to the station.

A methane gas well ruptured on November 20, 1975, at the Duckville Gun Club, located approximately one-quarter mile from refuge headquarters. The county road was immediately closed by order of the County Sheriff and fire marshall, and automobiles were prohibited from the well area due to the danger of an explosion and fire. Hunters, visitors, and refuge personnel were required to drive 17 miles on the refuge dikes to get to headquarters. Refuge and research station personnel were allowed access through the area after December 4, but the general public was restricted from the area until the well was sealed on February 16, 1976.

In February 1976, the Regional and Area Offices and refuge agreed to close the illegal and controversial breech in the Whistler canal, with advice to the landowner. The Canadian Goose Club cut the opening in the canal in 1965 to flood their mudflat. In subsequent years club members expected refuge employees to regulate the water in Whistler canal on their request. On September 27, following a directive from the Area Office and Regional Office refuge personnel closed the breech. On September 29, after the expected reverberations, a Special Use Permit was issued to Mr. Earl Knudson, the land owner, authorizing him to reopen the breech until January 1977. Hopefully, the conflict may be resolved in 1977.

Section ID of this report was written by Manager Peabody. All other sections were written by Assistant Manager Krey and edited by Manager Peabody. The report was typed and assembled by refuge clerk.

D. Safety

Safety meetings were held monthly. Movies from the MESA film library in Pennsylvania were reviewed and discussed at several of the meetings.

Three work related accidents occurred during the year. Biological Aid Moreau injured his knee while crawling under a dump truck to repair it. Maintenanceman Velasquez hurt his arm while removing flashboards frozen to the water control structure. Foreman Valcarce was struck in the left eye by a new water sprinkler head which blew apart as Mr. Valcarce leaned over to adjust the spray.