W.O.

RUBY LAKE NATIONAL WILDLIFE REFUGE
RUBY VALLEY, NEVADA

ANNUAL NARRATIVE REPORT - CALENDAR YEAR 1980

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

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2. David Johnson	Asst. Ref. Man. (CS)	GS-5/2	EOD	06-01-80
3. Steve Bouffard	Biologist	GS-9/3		
4. Thomas Bowser	Maint.-Mechanic (CS)	WG-9/4		
5. Monica McQueary	Clerk-Typist (PPT)	GS-5/3		
6. David Butler	YACC-Maintenance		EOD	10-27-80
7. Suzanne Duval	YACC-Clerk		Resigned Reappt.	10-10-80 12-30-80
8. Jim Klingensmith	YACC-Maintenance		Resigned	07-18-80
9. Jonny Lemback	Laborer (Temp)	WG-2/2	Resigned	10-03-80
10. Kirk Lauritsen	Bio-Tech (Temp)	GS-4/1	04-20-80	10-19-80
11. Barbara Piasecki	Bio-Tech (Temp)	GS-4/1	06-01-80	09-05-80

Review and Approvals

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Ruby Lake National Wildlife Refuge
Refuge

Regional Office Date

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I. GENERAL

A. Introduction

Ruby Lake National Wildlife Refuge lies in northeastern Nevada in a long narrow valley about 6,000 feet above sea level. High mountains rise east and west of the valley. About 135 springs supply the refuge with water. There is no outflow from the refuge or from Ruby Valley. Apparently, some subsurface outflow exists because the water in the marsh is fresh.

About 12,000 of the 37,000 acres on the refuge are wetlands. The high degree of interspersion of water, emergent vegetation, and islands attracts large numbers of nesting waterfowl, especially canvasbacks and redheads. In fact, the refuge is one of the major canvasback production areas in the country.

B. Climatic and Habitat Conditions

Table I can be used to compare 1980 with means for the 24 year period, 1951→1973 as published in Climate of Ruby Valley, Nevada by NOAA, April 1978.

Table I. Weather summary for Ruby Lake Refuge, 1980.

	Precipitation		Max.	Min.	Days 32°F or below		Days below 0°F	
	1980	Mean			1980	Mean	1980	Mean
Jan	3.92	1.29	53	-18	26	29	2	5
Feb	2.38	1.23	62	9	26	26	—	2
Mar	1.43	1.07	57	16	29	27	—	1
Apr	1.02	1.16	77	18	16	20	—	—
May	5.01	1.30	79	30	8	7	—	—
Jun	0.78	1.00	87	32	1	1	—	—
Jul	0.85	.54	95	46	—	—	—	—
Aug	0.17	.66	94	38	—	—	—	—
Sep	1.64	.48	88	31	3	5	—	—
Oct	0.20	.69	83	17	14	19	—	—
Nov	1.18	1.22	72	9	21	25	—	1
Dec	0.67	1.59	60	-2	26	29	1	4
	19.25	12.23			170	188	3	13

The first half of 1980 was very wet. Excellent ground moisture accumulations in the valley floor were supported by increased runoff from snowpack in the Ruby Mountains. The annual mean precipitation of 12.23 inches was exceeded before the end of May.

The increased moisture was welcomed, but unfortunately five inches of rain and snow fell during May, our major nesting period. The result was many nest desertions and failures, and a significant loss of the newly hatched young of several species including Canada geese, coots, and ducks. Precipitation totalled 19.25 inches by year's end. The last spring frost was 32° on 3 June. The first fall frost was 31° on 22 September, but temperatures did not dip below 30° until it reached 22° on 14 October.

All marsh units were at desired spring operating levels as the nesting season began. Because of high runoff, increased spring flows and high water tables, operating levels stayed high all summer, but finally receded to the desired fall operating levels by October. The North Sump began the season with more water than it has had for many years. The high water table kept water in the North Sump all year and wildlife really responded. Franklin Lake, a private marsh six miles north of the refuge, also had much more water than normal. Even the alkalai flat on the east side of Franklin Lake held water all year long. Both areas at Franklin Lake attracted and held many diverse wildlife species. Twenty-Year Spring, west of "Jog-In-The-Fence," flowed from April through September. Some of our low-laying grasslands produced good rank cover this year.

The marsh opened up early this year, in late February, and waterfowl responded by nesting earlier. The marsh froze about 15 November, a few days earlier than normal. It opened briefly about a week later and then refroze shortly after Thanksgiving for the rest of the year.

C. Land Acquisition

Nothing to report.

D. Systems Status

1. Objectives

Table II shows selected output categories for Ruby Lake NWR.

Table II. Outputs for selected categories at different funding levels at Ruby Lake NWR for Calendar Year 1980.

Output Category	Minimum Funding Level	Objective Level	1980 Output
Interpretation & Education (AH)	120	3,900	221
Wildlife Recreation (AH)	152,000	204,200	303,756
Waterfowl & Other Migratory Bird Maintenance (U/D)	4,500,000	8,000,000	4,413,800
Waterfowl Production (Including costs)	6,000	15,000	14,265
Refuge Receipts			
Grazing (1980 season)		(20,000)	$15,296.49
Furbearers (1979-80 season)		(5,000)	$3,240.19
TOTAL	$16,000	$25,000	$18,536.68

As mentioned last year, output levels need revision. Refuge receipts and Waterfowl and Other Migratory Bird Maintenance levels must be revised downward. Waterfowl Production levels are accurate, but Wildlife Recreation has gone through drastic changes. Activity hours for 1980 show a 66% increase over the 1979 figure. Fishing accounts for about 90% of the activity hours and that use is still unsettled since boating regulation changes of 1978. In the past two years many people have traded waterski boats for canoes, small boats and smaller motors. The changeover was reflected in the 1980 increase in activity hours. Use figures should settle again soon and then the objective level should be revised accordingly.

2. Funding

The following table shows funding received at Ruby Lake NWR in the last two years.

Table III. Comparison of two year's funding at Ruby Lake NWR.

Funding Source	FY-1980	FY-1981
O&M		
1210	101.4	100.6
1210 Onetime		15.0
1240	11.7	17.6
Cyclic Maintenance		
1210	10.0	3.3
1240	13.0	8.2
Pay Act	4.0	
O&M Deficit Covered	14.0	
TOTAL STATION FUNDS	154.1	144.7
Construction & Anadramous Fish (CAF)		
PDW-3 Hdqtrs. Rehab.	411,500 (Original)	
After change orders & add-ons	582,036 (Final)	
PDW-3 Bound. Fence		18,400
PDW-5 Silt Removal:		
Collection Ditch & Springheads		99,400
Manpower	CY-1980	CY-1981 (Projected)
Permanent	4(845MD)	3(676MD)
Career Seasonal	2(403MD)	2(500MD)
Temporary	2(272MD)	1(130MD)
YACC	3(385MD)	2(520MD)

Funding was inadequate for the needs of this station as shown by the deficit of $14,000 for 1980. Ruby Lake is still going through expensive maintenance pains for repair of substandard buildings, roads, water control structures, and equipment. Great advances were made during the year but it required additional money and temporary employees. Had it not been for deficit spending and additional YACC labor that does not involve station funds, the condition of most of the refuge property would have continued to deteriorate. Ongoing biological studies received high priority although they involve few expenditures other than salaries for the biologist and one 130-day temporary appointment. One additional 130-day temporary appointment was made for a bioaide to help assistant manager Johnson complete field work on a comprehensive grassland management plan and ultimately bring the grazing program into compliance with Service standards.

II. CONSTRUCTION AND MAINTEANCE

A. Construction

The major construction effort for 1980 was Headquarters Rehabilitation, a carryover of 1979 BLHP project description worksheet (PDW #3). The contract was awarded through Small Business Administration to Maldanado Construction, a minority contractor from Phoenix for $582,036. The contract was awarded 10 June and work began 19 June. It included construction of two new homes with full basements and one common garage, complete remodelling and new septic system for the office, addition of water, restroom, and septic system to the shop, replacement of roofs, siding and windows in Quarters 8 and 17 and installation of a fuel supply system with three 1,000 gallon buried, fiberglass tanks and new Wayne pumps. All necessary power hookups were buried.

The contractor was given 120 days for completion and then granted a 20 day extension because of some materials not arriving. All work was completed in 129 days. Construction went very well with a minimum of interference with refuge operations. Albert Maldanado did excellent work and was very concilliatory regarding our wishes and his work scheduling. His subcontractor, Bob Ulmer, is a local contractor accustomed to working in isolated sites. The fine quality of his work and his common sense approach to his work left us with a functional product that we can be proud of for many years to come. Inspector Harold St. Clair did not allow the contractor to stray from the intent of the plans. Because of his attention to detail in the plans, many mistakes were found and corrected prior to their becoming construction nightmares. These three people did not always see eye to eye, but the results were very respectable, a minimum of involvement by refuge staff was necessary, and interference with refuge operations was minimal considering the magnitude of reconstruction undertaken.

Force account construction included a cyclical maintenance project to replace old outhouses with new, larger ones capable of being used by handicapped persons. Eight were built during the winter, and six were put in place by years end. Two were installed at each of the following locations: Bressman Cabin, Brown Dike, and the Main Boat Landing. The Narciss Landing access road, parking area and launching area was regravelled and a pad was built up to set the two remaining outhouses on. Construction at Narciss will be completed in 1981.

Quarters #8 is occupied by assistant manager Johnson. Built in 1940, it had been the manager quarters through Papike, 1977. Since then, Manager Kline lived in Elko and Cameron occupied temporary state hatchery housing until completion of Quarters #100 in 1980. MDS 6/78

Quarters #8 and other refuge buildings were remodelled with red cedar siding and new roofs in earthtone colors. Several windows were also replaced with thermopane type. Interior was repainted by Johnson and Cameron in off work hours. FWC 9/80

Quarters # 17, built in 1941, houses maintenanceman Bowser's family and was afflicted with leaky window, deteriorating walls, and an inadequate porch. DNJ 8/80

Except for minor painting on trim, this was the appearance of Quarters #17 after BLHP construction. DNJ 8/80

In this 1978 photo, the 1941 office was still doubling as a shop. The entrance was at the left end of the building and office space was 14'x24' and included a restroom, office, reception and clerical area. Four garage bays made up the rest of the building. MDS 9/78

After 1980 construction, the entrance was in front with level, gravelled parking area, and a lawn area. Interior consists of seven rooms and a single garage stall. The new heating system and insulation seems to use no more energy to heat four times the space. FWC 10/80

A hill site immediately north of existing headquarters building was chosen for the two new homes and common garage. Here, with the aid of two weeks blasting, excavation for the basement in Quarters # 100 is complete. DNJ 7/80

After completion of the contract, Quarters #100,101, and garage had the appearance of being chisled out of rock. Soil was dumped around the Boise-Cascade structures. Lawns planned for spring 1981 will lessen dust bowl effect. FWC 10/80

Fuel service island was moved from immediately behind the office to a safer location above the shop. Facility consists of three 1,000 gallon fiberglass tanks, each with a new Wayne pump. Electrical service, upper right, was designed to eventually accomodate a new oil storage building. FWC 10/80

This overview to the northwest shows relative positions of office, Quarters #100, garage and Quarters # 101.

A water control structure to divert water from the Collection Ditch directly into the North Sump was installed in August. This will allow more flexibility in water management since flows need not be diverted through Unit 10 to go into the North Sump. The crumbling concrete structure from the Collection Ditch to Unit 10 was rebuilt. A corrugated metal pipe riser was inserted into the headwall of the existing structure and concrete was poured around it to join the old structure to the new half round riser.

Bowser begins cementing process to insert and seal a CMP riser into an old crumbling concrete headwall. DNJ 8/80

Severe erosion and siltation began in the Bressman Cabin area subsequent to the August 1979 fire along the west refuge boundary. A large wash developed from the base of the Ruby Mountains directly downhill through the driveway connecting the Nevada Department of Wildlife (NDOW) house to the county road. Bressman Cabin, an old log settlers cabin, was nearly levelled and the nearby Collection Ditch and hatchery rearing ponds of NDOW were heavily silted. With the aid of a TD-20 dozer from BLM-Elko, a diversion dam was built one-half mile west of Bressman Cabin, near the base of the Ruby's. It should divert heavy runoff to the north where gradual slopes make damage from washing less likely. Over 600 cubic yardsof fill material was used at the dam site in NW¼,NW¼, Sec. 13, T27N, R57E. Most work was done by Hank St. Clair, NDOW, whose driveway is affected by the erosion.

An old contour irrigation ditch 0.3 miles long in the flood area was cleaned out by Bowser with refuge equipment to intercept floodwater and spread it evenly over a large area. This is located in SW¼, Sec. 4, T27N, R58E. Hopefully, this will stop siltation and washout problems until reseeding efforts on the burn begin protecting the watershed.

Rubble, mud and debris was deposited up to four feet deep over roads at Bressman Cabin. Roads from the right and left of the photo once joined to form the one marsh access road in the upper center of the photo. DNJ 9/80

Most other force account construction was associated with the BLHP headquarters project. Because of our rocky terrain most utilities are overhead by choice of the utility companies. The telephone company did offer to provide and install buried cable to the two new homes and office if we did the trenching. We did, at the expense of one backhoe bucket.

Then because of the rocks, the cable being buried at 18" needed 6" of sand bedding above and below it. We did eliminate the need for three telephone poles and plan more such ventures when time and health of our backhoe permits.

The condition of the backhoe bucket attests to the solidity of the "soil" in an August trenching operation. FWC 8/80

Since the BLHP headquarters project called only for rough grading and backfill, the need for a dump truck was anticipated to haul topsoil, fine gravel, etc., for lawns and driveways. The old refuge dump truck, a 1951 IHC, has been defunct since 1978. We inherited another 1951 IHC, newly rebuilt, from Tweaukon NWR and borrowed a newer one from Fish Springs NWR, our nearest neighbor. Between the two beasts we managed to haul necessary topsoil, sand, and gravel before freezeup. With the addition of a few inches of manure this spring, lawns should abound on our rockpile by fall.

The new homes were equipped with eave troughs to eliminate the safety hazard of snow melting from the roof and forming ice on the sidewalks. Shelving, sheetrock, and some partitioning was added to the unfinished basements of the new homes to make them more liveable. All labor was volunteered.

The common garage between the new homes was rewired to provide more lights and outlets. It was then insulated and sheetrocked. A workbench and shelves were being added at years end. Again, most work was after hours.

B. Maintenance

The most extensive project was funded as cyclical maintenance of heavy equipment. Major repairs to three pieces of equipment were completed through the diesel mechanics class at Northern Nevada Community College (NNCC). Labor was free, but we paid for all parts.

The Austin-Western grader had the hydraulics, electrical charging systems, and a broken steering knuckle repaired at a cost of $1,071.48.

The biggest job we had was repairing steering clutches in the TD-18 dozer. The machine was taken apart in the early spring of 1980 by one NNCC class. A new instructor was hired and was scared to death of all the scattered parts that he inherited with his new job. All necessary parts were ordered by the first instructor, but because of the nationwide strike by International Harvester, no parts were received until late April and NNCC said they could not put the TD-18 together during that school year. Then the second instructor quit. So, all summer as I drove by the diesel shop all I could think about was a $7,000 parts bill and being the proud owner of a 30,000 pound anchor. In September, I met the next new instructor, Doc Howard, and asked if there was any hope for the critter. He did not seem nearly as nervous as I was about its future. Three weeks later his class was clearing the school parking lot with our dozer. Total cost for replacement of steering clutches, filters, lubricants, batteries, mufflers, hundreds of bolts, and adjustment of cable dozer was $8,968.97.

The TD-14A dozer had a cracked head and problems with the hydraulic pump. These were repaired in the spring 1980, but during the summer water was noticed in the oil pan. NNCC shop instructor, Doc Howard, was contacted. Mr. Howard brought his class 65 miles to the refuge in September 1980 to work on the TD-14 and found that the cylinder sleeves were cracked, possibly from being installed incorrectly by the previous class. The total bill for work on the head, sleeves, hydraulics, injectors, all new filters, batteries, and changing all lubricants was $1,785.67.

Class members from NNCC, Elko remove and replace cracked cylinder sleeves in the TD-14 dozer. FWC 10/80

So, for slightly less than $12,000 of cylical maintenance money we now have three pieces of heavy equipment that should last several more years.

A power generating system was added to a 9.8 HP outboard motor to aid in nightlighting efforts.

Work began on reworking contour irrigation ditches to better flood wet meadow areas. The meadows just north of headquarters, the one between headquarters and the hatchery, and the meadow south of the hatchery, were all completed using the Austin-Western grader. More attention was paid to irrigation improvements in the meadows since that responsibility was taken from the grazing permittee beginning in 1980.

Landscaping efforts continued as a row of juniper trees was transplanted to help shield the boneyard from public view. A lawn was planted and nursed to luxuriance at the YACC trailers. This and the crushed shale sidewalks that were also installed will help keep the mud outside the trailers where it belongs.

A hot water baseboard heater was installed in the bathroom of Quarters # 8, the assistant manager's home.

C. Wildfire

The 9,600 acre burn of August 1979 is well on its way to rehabilitation after reseeding in the fall of 1979. The reseeding project which was accomplished by cooperative effort between the U.S. Forest Service, BLM, NDOW, and the refuge, appears to be progressing very well. The above-average moisture received this spring contributed to the outstanding success of the project. A total of 8,000 acres were seeded with the following mixture at the rate of 11½ pounds per acre.

Table IV. Seed species and rates of application for August, 1979 Shantytown burn.

GRASSES	LBS/ACRE	SEED/FT^2
Crested Wheatgrass	2	8
Intermediate Wheatgrass	2	6
Bluebunch Wheatgrass	1/4	2/3
Western Wheatgrass	1/2	1-1/3
Subtotal	4-3/4	16
FORBS & BROWSE		
Bitterbrush	2-1/2	1-1/4
Ladak Alfalfa	1	2-1/4
Sainfoin	1	1/2
Small Burnett	1	1
Four-wing saltbrush	1/4	1/8
Sweet Clover	1	6
Subtotal	6-3/4	11-1/8
TOTAL	11-1/2	27

Table V. Seeding methods for August, 1979 Shantytown burn.

SEEDING METHOD	ACRES
Aerial Seeding	5,000
Rangeland Drill	2,000
Aerial Seeding w/chaining	1,000
Slopes too steep for seeding	1,600
TOTAL	9,600

Land ownership was distributed between BLM (550 acres), USFS (8,121 acres), private (286 acres), and refuge (643 acres).

In addition to seeding, the Forest Service contracted a project which involved planting 32,000 bitterbrush seedlings at 15 feet spacing, on fertile lowland soil types near Indian Creek road. It was completed in the spring of 1980 and should provide excellent mule deer winter habitat in the near future. All livestock grazing was eliminated on the area for the 1980 and 1981 seasons.

On 7 September, .85 inches of precipitation fell in less than an hour along the east front of the Ruby Mountains. The steep, unvegetated portions of the Shantytown burn offered little watershed protection and a serious flash flood occurred at Bressman Cabin. This resulted in extensive damage to the foundation and structure of the cabin, major silting to fish rearing ponds and the Collection Ditch, damage to the county road, destruction of the St. Clair driveway and erosion of the seeding and burn area.

On 7 September, 1980, heavy rains on the watershed of the 1979 Shantytown burn, see canyon in upper right, washed large boulders into the foundation of Bressman cabin. Rocks caused structural damage to the west (back) wall of the old settlers cabin. DNJ 9/8/80

Erosion from the burn area silted half a mile of the Collection Ditch, part of Unit 10, and the "North Canopy" hatchery rearing ponds. Damage also occurred to the county road, Bressman dike entrance, the boundary fence and cattleguard. DNJ 9/8/80

III. HABITAT MANAGEMENT

A. Croplands

None.

B. Grasslands

Four permittees harvested 5,083 AUM's on about 10,360 acres of grasslands. Approximately 2,340 acres of the east side of the refuge between the Brown Dike and CCC Dike were rested this year along with 10,000 acres on the north end which have not been grazed for eight years.

Approximately 25,000 acres were inventoried this summer in an effort to gather data for the grassland management plan to be completed in 1981.

Using aerial photographs, vegetation was delineated into site write-up areas and classified according to the dominant and subdominant species present, and the aspect of the site. A site analysis was done on 145 different site write-up areas and the following information was collected for each.

Site analysis: Photo, write-up number, date, examiner, pasture, moisture conditions, topography, plot size, exposure, type designation, location, plant species present, frequency, green weight/acre, dry weight/acre., species composition, desirable and intermediate produciton in pounds/acre (dry weight), physical description (narrative), overstory (trees), overstory (shrub), crown cover (herb), bare ground, pavement, vegetation, litter, density and average height of vegetation. Wildlife observations were made and recorded for each site to determine which species use each site and the degree of use. Also, included in the analysis was an estimate of utilization, range condition and apparent trend. See appendix A for actual forms used in inventory.

A literature search revealed that about 450 different plant species probably occur on the refuge and over 300 of those species were collected or observed during the inventory. A comprehensive list is now maintained in the refuge files. All obvious cultural or topographic features, and existing range improvements such as fences, windmills, roads, cattleguards, water structures, etc., were mapped on the aerial photos.

This field information is currently being mapped and analyzed and will be used to write and enact a new grassland management plan and to develop a comprehensive overlay system of maps for the refuge.

One of the most time consuming aspects of the range inventory was weight estimates. Here, Barbara Piasecki is measuring the production of *Juncus balticus*, a common plant on the refuge. KTL 8/80

Approximately 35 acres of grassland were control burned this year to promote new growth and remove excessive litter layer. The area located just east of the fish hatchery provides a feeding area for Canada geese and sandhill cranes in the spring (and with proper treatment should provide an upland nesting site for ducks). Photo plot No. 24 is located in this burn area.

Controlled burn of the "Horse Pasture" was completed in October. Collection Ditch and Gallagher Hatchery (NDOW), are shown in foreground. SHB 10/80

A controlled grazing study was conducted on the pasture just north of the hatchery. A temporary fence was constructed to divide the pasture in half. The south half was hayed and grazed and the north half was the control. Observations this spring should help determine how important this manipulation practice is in terms of providing feeding and nesting areas for wildlife species.

A temporary fence was constructed to divide this wet meadow in half. The south side (right) was hayed and grazed while the north side (left) was left untreated to allow for spring comparison. DNJ 12/80

In April 1980, thirteen Robel height-density transects were established on the refuge to monitor changes in vegetative cover. Visual obscurity is used to measure relative density of the vegetation. (See appendix B for map of transect locations). Photographs were taken of all transect sites and are maintained in the file.

Bouffard sets up Robel height-density plot to measure plant growth and density. This will allow for future monitoring of changes in the plant community. JAK 4/80

The photoplots established in April 1977 were continued again this year. These photographs show the seasonal changes and yearly changes in vegetative cover and composition of the photoplots. They also document the recovery rate in controlled burns and the changes in habitat which accompany this type of management. Photographs are taken bimonthly beginning in April and ending in November each year. (See appendix C for map of photoplot locations).

C. Wetlands

Control of water levels is our main management practice on wetlands. We follow the water management plan as much as possible. Water levels this year often exceeded specified levels, but being the lowest spot around there is no way to get rid of excess water.

We plan to begin a drawdown of Unit 10 in 1981. The drawdown was orginally scheduled for 1980, but was postponed to maintain good water levels in the North Sump. Cycling water through Unit 10 was the easiest way to do this. This summer a new water control structure was installed to take water from the Collection Ditch directly to the North Sump without passing through any other dike units. The general public dislikes having water put in the North

Bouffard, left, and Cameron discuss installation level of new control structure from the Collection Ditch directly to the North Sump. DNJ 8/80

Sump because it is "lost" to their recreational use; they want water in the South Sump where they can boat on it. Consequently, this new structure generated its share of outcries, congressional inquiries, etc.

The North Sump is a very productive unit, but is lowest on our water priority list so it usually does not produce near its potential. This year was wet enough to keep it full, and it produced many broods of dabbling ducks and was used by geese, swans, and cranes.

A brood of gadwalls and three divers choose typical North Sump habitat. RVP 8/76

We want to keep improving this habitat by keeping as much water in the unit as we can prior to drawing down the South Sump, possibly in 1983. At that time birds now nesting in the South Sump may use the North Sump as an alternative site thus minimizing waterfowl production losses during the drawdown phase of the South Sump, our most productive area.

We had problems in the Collection Ditch because of last summer's fire. Several thunder storms in the Ruby Mountains caused flash floods. These floods silted in about 1/2 mile of the ditch and part of Unit 10. The runoff also flushed lots of nutrients into the ditch causing a bloom of submergent aquatics. The vegetation was so thick that it nearly stopped the flow of water in the ditch. The upper end of the ditch was near overflowing but little water was flowing out the lower end of the ditch. Fortunately, we have a BLHP project scheduled for FY-81 to clean out the ditch.

We do not control any emergent vegetation. Judging from some narrative reports recently read by this staff, many managers have a private war against dense emergent cover. Since dabblers like dense cover it should be no surprise that divers also prefer dense cover for their overwater nesting. We have found that after removal of emergent cover by fire it took two years of growth to accumulate enough dead bulrush stems to attract nesting diving ducks. Control of dense emergents to increase interspersion of water is good, but in diving duck nest habitat, emergent cover should not be removed without careful considerations of the consequences.

We completed more preparations for the South Sump drawdown. Because of research obligations we will not drawdown the South Sump earlier than 1983. Preparations this year mainly involved visiting various groups and explaining why we wanted to drawdown the South Sump. Most people assumed that it was to kill off all the fish so we could eliminate boating entirely. After we explained marsh management, most people could see that our reasoning was biological and not sociopolitical, but many still did not favor the proposed drawdown.

D. Forestland

None.

E. Other Habitat

Nothing to report.

F. Wilderness and Special Areas

Nothing to report.

G. Easements for Waterfowl Production

None.

IV. WILDLIFE

A. Endangered Species

Several bald eagles were seen on the refuge in January, February, and December. No peregrine falcons have been seen on the refuge since 1976. There were several possible sightings this November, but the staff was unable to verify the sightings.

The relict dace (*Relictus solitarius*, Hubbs and Miller) will be covered under Section IV. C-4 after this year. After several surveys and status reviews, the USFWS decided not to list this species and the NDOW has offically removed the species from their "rare" designation. The species appears to be in no danger in spite of the fact that they were eliminated from the marsh by bass and trout. We have two large and one marginal populations left on the refuge. The species is also abundant in Franklin Lake and springs in four adjacent valleys.

B. Migratory Birds

1. Waterfowl

Ruby Lake NWR is primarily a waterfowl production area. The refuge is not on any major migration route and is a minor wintering area.

There were no disease outbreaks on the refuge in 1980.

a. American Coots

Coot production increased this year from last year's low. See figures one and two, pages 25—26. Clutch sizes (7-9 eggs) were also up from last year. We have no explanation for this trend.

b. Swans

Trumpeter swans were introduced to Ruby Lake NWR from Red Rock Lake NWR in the late 40's and early 50's. The population has stabilized between 40 and 50 birds.

At least seven pairs nested on the refuge and two or three additional pairs were present but made no breeding efforts. Perhaps they were subadult birds. Only two pairs and a group of nonbreeding birds were observed on Franklin Lake and no cygnets were seen during three aerial surveys of Franklin Lake. Last year three pairs on Franklin Lake

produced 11 of the 13 cygnets fledged in Ruby Valley. See Table VI.

This year was another excellent year for swan production. They were not affected by the bad weather in May. Fifteen cygnets were observed on 18 November. Estimates of cygnet production on the refuge was from 10-13. Apparently, swans may be breeding at sites out of Ruby Valley. We occassionally receive reports of swans on the Mary's River in northeastern Nevada. Survival of cygnets hatched on the refuge was excellent this year; last year most cygnets hatched on the refuge died from causes unknown, but probaby from disease or parasites.

The Christmas Bird Count indicated that this trumpeter swan population is over 50, an increase from last year. Because of the difficulty of covering all their habitat and the possibility of recounting the same individuals, it is hard to obtain an exact figure.

Last year we applied green neck collars on three cygnets. They were sighted six times since then, the last sighting being on 5 May.

In mid-December a snowstorm brought a wave of migrating whistling swans through the valley. Biologist Bouffard saw 300-400 at one time on Franklin Lake and flocks of 30-70 birds passed over all morning and early afternoon. About 50 of these birds stayed on the refuge for several weeks.

Table VI. Production and use days of Canada Geese and Trumpeter Swans at Ruby Lake NWR.

	1976	1977	1978	1979	1980
Canada Geese					
Production	175	80	220	185	425
Use Days	48,710	35,857	37,170	32,053	81,697
Trumpeter Swans					
Ruby Lake					
Production[a]	1	4	2	2	11
Use Days	5,938	7,866	5,153	6,402	8,207
Franklin Lake					
Production[a]	0	0	0	11	0
Total Production[b]	0	0	0	13	15

a. Birds to flight stage.

b. Production totals may exceed the sum of the production at Ruby Lake and Franklin Lake becasue of breeding outside Ruby Valley or breeding in the valley that was not observed an any aerial survey.

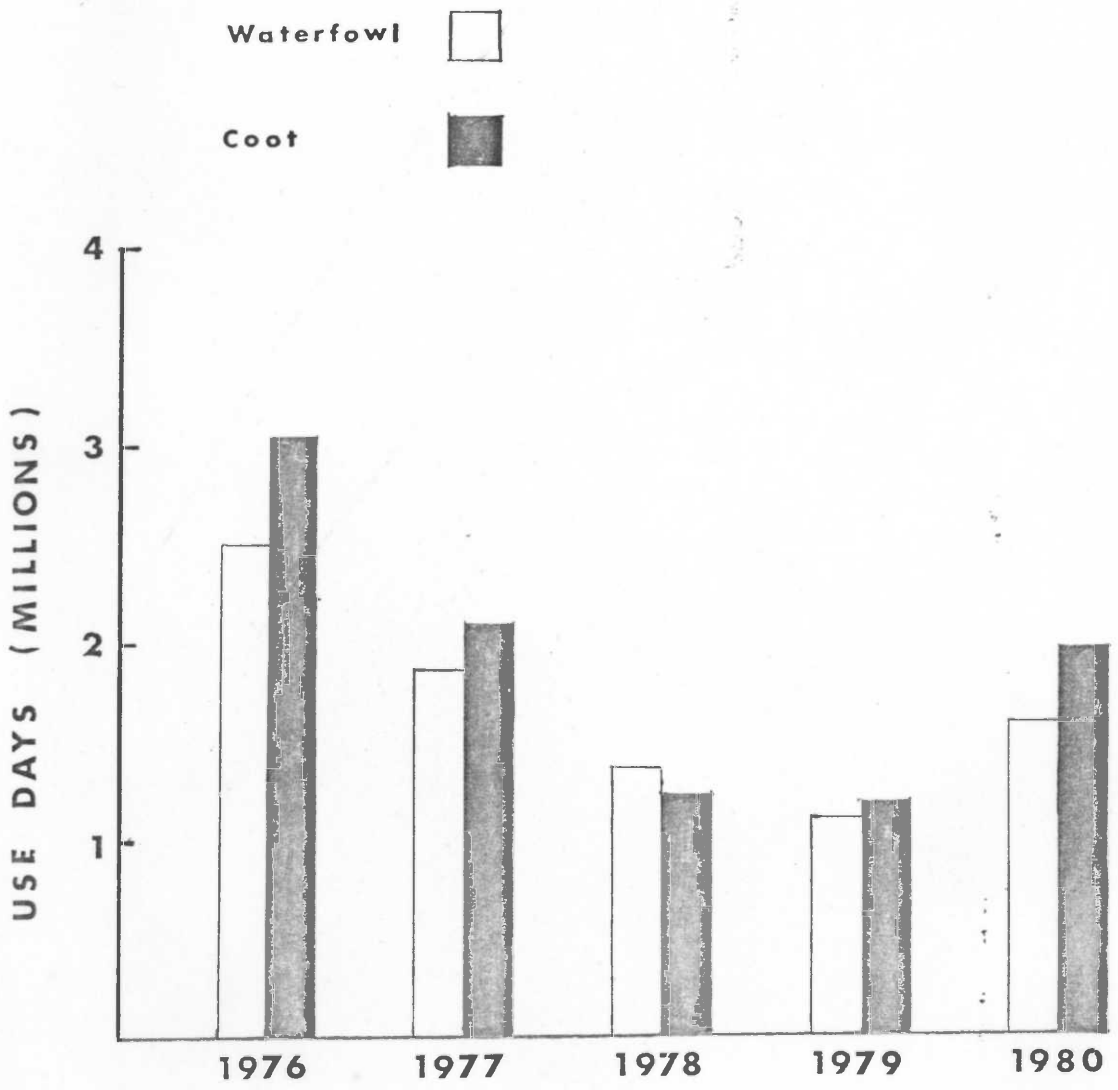


Figure 1. Estimated waterfowl use days at Ruby Lake National Wildlife Refuge.

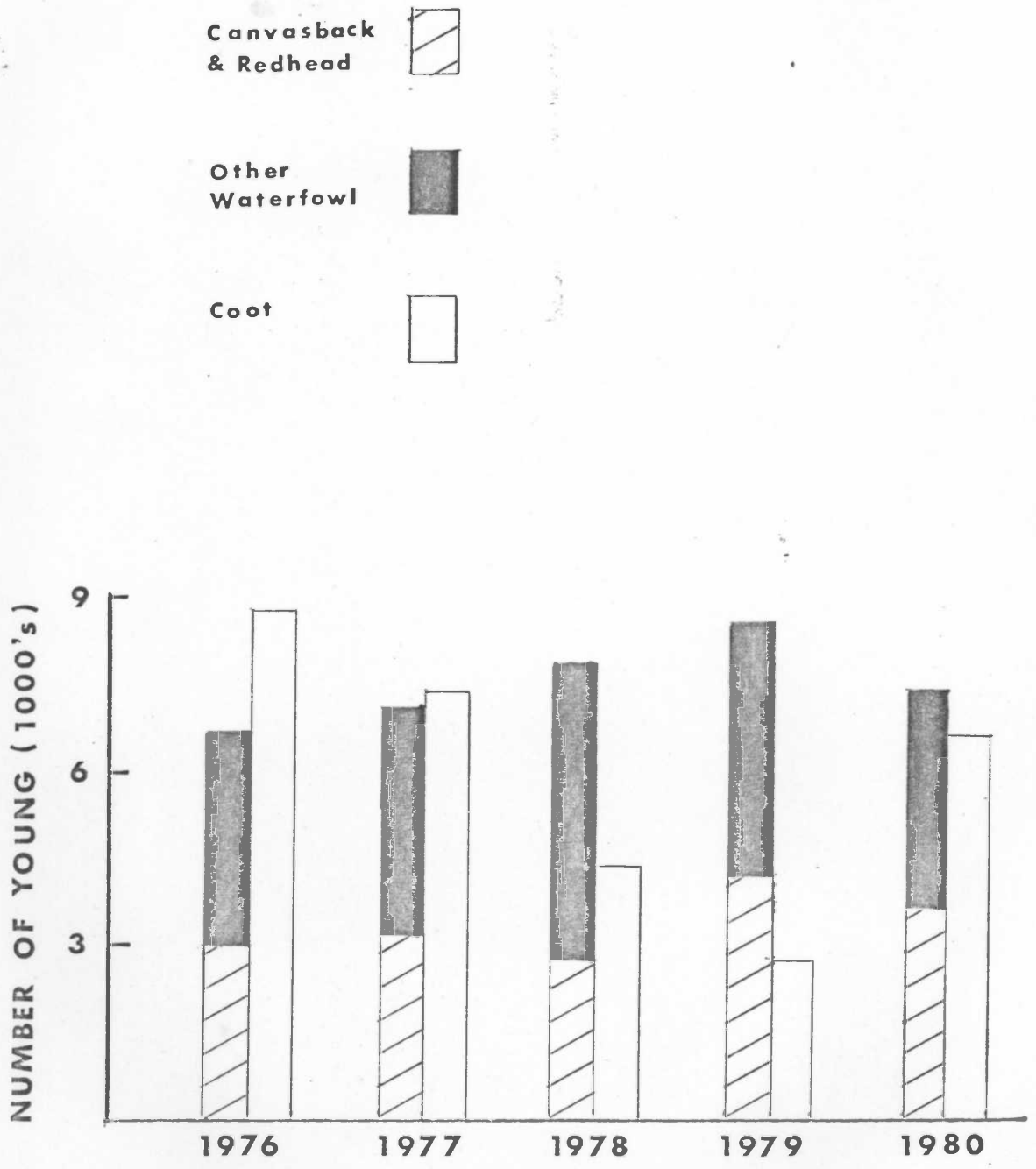


Figure 2. Estimated waterfowl production at Ruby Lake National Wildlife Refuge.

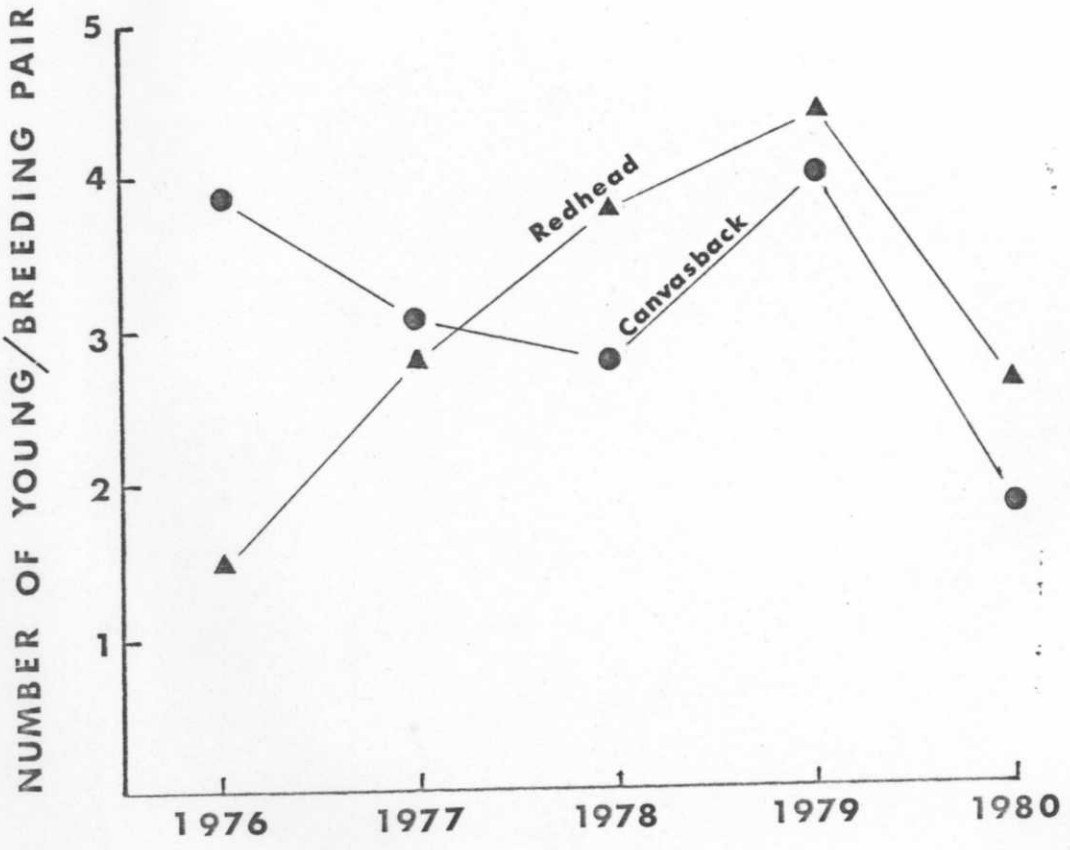


Figure 3. Estimated breeding success of canvasbacks and redheads at Ruby Lake National Wildlife Refuge.

c. Geese

It was an excellent year for Canada geese. We had twice as many breeding pairs (320) as last year (160) although about 50 of these pairs were nonbreeders. Nest success was high and 425 geese fledged, about twice as many as last year. Because the marsh opened early the geese nested early, many beginning in early March. Most had hatched by the end of April. The weather in March and April was mild while the weather in May was wet and cold. Most nests hatched before the bad weather. Several goslings were found dead after the first snowstorm, but most made it through the month of May in fine shape.

About 300 Canada geese was the largest group seen on the refuge this fall. Some were still here by year's end. Usually they are gone by mid-December and return in February. Only one snow goose was seen in Ruby Valley this year. It stayed on Franklin Lake until it froze and then moved to the refuge for a week or so before moving on.

d. Ducks

Things looked excellent for waterfowl production this year. Early spring weather was mild, the marsh opened early, water levels were excellent, and we had more breeding pairs of most species than the previous few years. The ducks started nesting in early and mid-April, one to two weeks earlier than normal. Peak nest initiation was in May. The cold, wet, weather in May wreaked havoc on nest success. We had measurable precipitation on 21 of 31 days with trace amounts on all other days. In the first two weeks of May, we had daily rain and snow squalls and hailstorms. The most damaging storm was a three day snowstorm on the 23-25th. Minimum temperatures were also below normal. Nest success of canvasbacks and redheads dropped to less than 30% from the normal of over 80%. The birds were deserting with little or no disturbance from our nest search efforts. We found that the eggs in some nests continued to develop normally after we had left the nest until a snowstorm hit and then the hen would desert. Two hens even deserted when we visited their nests as they were pipping. Normally, we are able to visit any nest with no danger of desertion with only one exception. Redheads are prone to desertion if their nests are visited for a long period of time (5 - 10 minutes) before they start incubating.

Dabblers are suspected of having the same problems with the weather as the diving ducks, but we did not monitor them as closely as the diving ducks. We did see lots of late broods and suspect that many hens renested. We documented one case of canvasback renesting.

2. Marsh and Water Birds

Table VII lists the known rookeries of colonial nesting species in Ruby Valley and Halleck, Nevada. All the nests at Ruby Lake NWR and the north colony at Franklin Lake are in hardstem bulrush. In the "Doughnut Colony" at Franklin Lake, most nests are in a ring of phragmites. At the Halleck rookery, all nests are in willows. The "Doughnut Colony" at Franklin Lake also contained 50 eared grebe and an undetermined number of yellow-headed blackbirds nests.

Table VII. Estimated number of breeding pairs of colonial nesting species on or near Ruby Lake NWR.

	1978	1979	1980
RUBY LAKE NWR			
Unit 14			
WFI	150	50	25
BCNH	35	15	25
SE	50	0	35
South Sump #1			
WFI	nd	150	10
BCNH	35	30	20
SE	nd	30	0
GBH	nd	4	0
South Sump #2			
GBH	18	35	35
FRANKLIN LAKE			
Doughnut Colony			
WFI	90	120	95
SE	nd	100	75
North Colonies			
BCNH	nd	nd	15
SE	nd	nd	12
HALLECK			
BCNH	nd	nd	125
SE	nd	nd	300
GBH	nd	nd	15
CE	nd	nd	2

WFI = White-faced ibis
BCNH = Black-crowned night heron
SE = Snowy Egret
GBH = Great Blue Heron
CE = Common Egret
nd = no data available

The number of white-faced ibis has been decreasing for the past few years. We have no explanation for this decrease.

Dr. Charles Henny of the Pacific Northwest Field Station, Patuxent Wildlife Research Center, has been studying the pesticide levels in the wading birds at Ruby Lake NWR and at other places in the west. He collected eggs from the black-crowned night herons again this year. Last year the eggs contained high DDE levels, showed severe eggshell thinning and were relatively nonviable. The pesticides are probably coming from the wintering grounds since the local fish and food samples taken from juvenile herons in 1979 contained no pesticides. Thus far we have not located the wintering grounds. We are trying to band as many local and nesting adults of this species as we can in hopes of getting some recoveries. This year we banded at Franklin Lake on the refuge, Halleck and at Gallagher Hatchery. We used a rocket net to capture flying birds attracted to the fingerling trout at the hatchery. In all, we banded 122 white-faced ibis, 85 snowy egrets and 67 black-crowned night herons in 1980.

This is part of our black-crowned night heron rocket netting team at work. We needed everyone we could get to catch the birds before they crawled under the net or drowned in the raceways. DNJ 6/80

Black-crowned night herons have had problems with drowning at the fish hatchery. Nearly 30 herons, both adults and juveniles, are known to have died there this year. Thirty birds is nearly our total annual production of black-crowned night herons. The raceways are covered with screens, but the herons often get under the screens and drown. Some herons also drowned

in open, uncovered, raceways. Several adults were emaciated and may have died of pesticide poisioning. All specimens were submitted for analysis in November 1980.

Other species in this group that nest on the refuge include pied-billed and eared grebes, American bittern, sora and Virginia rail, and about 15 pairs of greater sandhill cranes. The cranes hatched more young than last year, but the late May snowstorm killed most of the chicks. One pair just south of the fish hatchery had two newly hatched young the week before the storm but none after the storm. Several cattle egrets were observed this spring, but we could find no evidence of breeding.

3. Shorebirds, Gulls, Terns, and Allied Species

Willets, long-billed curlew, Wilson's phalarope, American avocet, black-necked stilt, spotted sandpiper, Forster's and black terns all nested on the refuge. Other shorebirds such as greater and lesser yellowlegs, several species of peeps, and long-billed dowitchers migrate through the refuge, but we did not see many this fall. Our water levels were high enough to keep most of the mudflats covered so fewer shorebirds were attracted. We had up to 50 ring-billed gulls, more than normal, stay on the refuge all summer, but we found no indication of nesting.

4. Raptors

Golden eagles, prairie falcons, marsh hawks, great-horned and long-eared owls, nest locally and used the refuge year-round. Of these, only marsh hawks and long-eared owls nested on the refuge. Red-tailed hawks, short-eared owls, and American kestrels nested locally but generally wintered elsewhere. During the winter, we normally see 20 or more rough-legged hawks and one or two bald eagles. We have one dark phase rough-legged hawk that winters between the refuge and fish hatchery. It is the only dark phase Bouffard has seen in this valley and he has seen it in the same place for the past four winters. Bob Howard, a former assistant manager, indicated that he had seen it prior to Bouffard's sightings. A screech owl was seen by Bouffard along Cave Creek in early December. This sighting is a new addition to the refuge bird list.

5. Other Migratory Birds

The riparian habitat along Cave Creek attracts many species of songbirds. We can usually find most local nesting species and most migrants there. Two unusual observations this year were a male American redstart and a band-tailed pigeon.

C. Mammals, Non-Migratory Birds and Others

1. Game Mammals

Mule deer were common during the year especially during the winter because the western edge of the refuge is part of their winter range. It is not uncommon to see 50 to 100 deer per mile in early morning during the winter.

Coyotes are abundant and bobcats are common in the area. Neither can be hunted or trapped on the refuge, but hunting and trapping pressure outside the refuge is quite high. Mountain lions use the area frequently; the Ruby Mountain population is one of the highest in the state. They are most common in the winter when they follow the deer to lower elevations.

We issued four permits for control of muskrat populations for the 1979-80 season. The quota for the season was 4,000 and 2,536 were taken. Three permits with a combined total of 3,000 were issued for the 1980-81 season. One nuisance beaver was removed from the Collection Ditch by a trapper with a special use permit. The beaver had been damming the Collection Ditch and excavating the dikes.

2. Other Mammals

The following mammals are present on the refuge: porcupine, mountain cottontail, pigmy rabbit, black-tailed jackrabbit, badger, spotted skunk, weasels, an occassional mink and many species of bats and rodents.

3. Resident Birds

There are several flocks of sage grouse on the refuge totalling 70-120 birds. We counted 24 cocks, down from 30 in 1979, on the strutting ground near the Indian Creek gravel pit. Sage grouse were less abundant than last year. Other upland birds showed increases from the past few years. Both chukar and gray partridge populations were up, possibly due to the wet spring and good grass production. Several coveys of each used the refuge regularly.

4. Other Animal Life

The most popular species in this group is the largemouth bass. It is the root of most of our recreation problems. The fish are small but abundant, easy to catch, and taste great. The creel limit on these fish is high, 20 fish per day and in possession. Rainbow, brown, and brook trout are not as popular with the fishermen even though they average two to three pounds. They are a little harder to catch and especially in the summer, have a strong, muddy flavor.

All impoundments at Ruby Lake contain fish populations. The Collection Ditch and springheads have brown, brook, and rainbow trout. The dike units and the South Sump have mostly largemouth bass, except that the South Sump has a good population of rainbow trout. Bass reproduce well although their growth is slow, but trout have not been shown to reproduce at all. Because of the voracious appetites of the resident bass, all trout stocking is with fish at least nine inches long. At that length they are more able to elude the hungry bass.

All stocking is done by NDOW and in 1980 the only species stocked was rainbow trout. Information for the following table showing data on all 1980 stocking was furnished by fisheries biologist Mike Green, NDOW.

Table VIII. Summary of Fish Stocking, 1980, Ruby Lake NWR.

Date	Species	Hatchery Source	Pounds	# Fish	Location
4/23/80	Rainbow	Lake Mead	2,500	4,750	Main Boat Land.
			500	950	South Springs
7/10/80	Rainbow	Washoe Sta.	400	1,400	Collection Ditch
7/31/80	Rainbow	Washoe Sta.	384	1,342	Collection Ditch
TOTAL			3,784	8,442	

Several species of snakes occur on the refuge. The gopher snake and great basin rattlesnake attract the most attention. One species of amphibian occurs on the refuge, the leopard frog. It is very uncommon because of predation by the bass. Once it was probably an important food source for cranes and wading birds.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On Refuge

A March tour of the refuge and nearby areas was given to Dr. Lee Eddleman and eight of his range students from the University of Montana. Involved in the tour were Cameron, Bouffard, and Johnson, who was then employed by BLM, Ely, Nevada. Jim French, Gallagher Hatchery also attended and explained hatchery operations. In August we hosted 17 members of Dr. Klebenow's wildlife class from the University of Nevada, Reno. Several other curious people from Elko, Ely, Ruby Valley, Carson City, and Oregon were invited to take part in refuge operations such as nest searching, nightlighting, checking colonial bird colonies,

cannon netting, and electroshocking for fish. It has become our policy to explain our management to anyone who is curious enough to ask what we are doing. With controversial changes in public use and water management occurring we have found this to be an excellent way to inform people. Visitors become more knowledgable even if they are not sold on our policy.

Cameron and Johnson were included in an hour long documentary on the Sagebrush Rebellion produced by KUED TV, Salt Lake City. Bouffard was filmed for a newscast feature story by KTVN TV, Reno. Cameron was questioned for a feature article on the Sagebrush Rebellion that appeared in the October issue of New West magazine.

2. Off Refuge

Manager Cameron and Biologist Bouffard attended several meetings in Elko and Ely concerning refuge operations, boating regulations, and drawing down the South Sump, where all boating and most fishing occurs.

Refuge staff members wrote a monthly column for the Ruby Valley News and prepared several articles for local newspapers.

Cameron met frequently with members of the County Game Board throughout the year to keep them informed.

In April, Cameron and Bouffard plus Drs. Horton and Jarvis from Oregon State University met with NDOW personnel and the Elko County Game Board to explain research goals and management implications for the five year study of food cycling in the South Sump. We met again in September to give a progress report after the first field season.

Cameron, Bouffard, and O'Halloran and Sweeney from the Sacramento Area Office attended an informational meeting with NDOW in early May.

In early June, contacts were made with Las Vegas and Reno newspapers with resulting articles intended to better inform the public about our fishing and boating regulations. Refuge public use leaflets were distributed to sporting goods dealers and state and federal conservation agencies statewide.

Cameron gave a presentation to White Pine County Sportsmen Club regarding refuge operation and water management. Bouffard and Johnson also attended. Several informational contacts were made with the club president, Jake Rajala.

Cameron and Bouffard were requested to present our water management and public use policies at the September meeting of the State Multiple Use Advisory Committee on Federal Lands in Reno.

Cameron gave a briefing to U.S. Representative Santini in October regarding management policy for Ruby Lake.

Beginning in late 1980 and at the request of NDOW, monthly meetings have been held between NDOW and the refuge staff. The purpose is for better interchange of information between our two agencies to avoid as many management conflicts as possible.

B. Recreation

1. Wildlife Oriented

Refuge visits made a dramatic increase over all previous years. The six traffic counters installed in mid 1979 recorded 64,401 visits for 1980. Fishing use amounted to 90% of the total, with wildlife observation accounting for another seven percent. The visits showed a 20% increase from our previous high of 53,377 visits in 1979 and we hope the trend does not continue. More

The 15 June opening for motorless boating rewarded these conoeists with a limit of 20 bass each and rainbows up to 3½ pounds. DNJ 6/15/80

people are taking advantage of off-season recreation, especially trout fishing in winter months. January, February, March, and April all set records for visitation. Then later in the year, excellent fall fishing for bass and large trout again set monthly use records for the months of October, November, and December as exceptionally warm weather and lack of precipitation allowed easy access to the refuge. The increased fall useage led to a four-fold increase in hunting visits. Waterfowl hunting on the refuge's south end was once only taken seriously by resident hatchery and refuge employees, but this year with more fall fishing

more sportsmen are also discovering the hunting opportunities that exist. Hunting increases have had their impact. With late season shooting limited to jump-shooting on springheads, it does not take many visits to educate the flushed birds to not return to open hunting areas.

Table IX. Number of visits to Ruby Lake National Wildlife Refuge from 1976 to 1980.

Year	Fishing	Boating & Waterskiing	Hunting	Wildlife Observation	All Other	Total
1976	45,295	3,300	550	650	220	50,015
1977	45,885	3,720	510	769	496	51,380
1978	41,515	180	377	966	472	43,510
1979	51,419	10	364	1,236	348	53,377
1980	57,698	0	1,590	4,772	341	64,401

2. Non Wildlife Oriented

With the prohibition of powerboating and waterskiing since 1978, no non wildlife recreation now occurs at Ruby Lake other than occassional unauthorized swimming and ice skating.

C. Enforcement

Minor hunting, boating and fishing violations were written and one theft-gross misdeameanor was prosecuted, but overall it was another quiet year.

A "4th of July Boat In" similar to the 1978 occurrance was again anticipated, and agents Branzell and Pearson were present for the occassion. Local boaters who advocate open defiance of our regulations seem to have lost their following and the cause is being forgotten. More people each year are equipping themselves with electric trolling motors and canoes. We had several comments in 1980 about how much nicer fishing is in the silence of a canoe or rowboat without the worry of being swamped by a powerboat. Two years ago, group pressure from waterski advocates would not have allowed such comments.

Regulations allow no boating until June 15. Then canoes or boats with electric motors can be used. Not until August 1 can outboards be used and they must not exceed 10 HP. People are changing their habits to abide by these regulations, mostly to take advantage of the excellent fishing opportunities that exist in early summer. People using the marsh then are relaxed and very cordial to our enforcement contacts. After August 1, we noted a drastic difference in attitudes. Many people now using small outboards are the same people who once used large motors and waterskis. Enforcement contacts after August 1 are much more likely to result in harsh words and

confrontation because a different group of people begin using the marsh on that date. Still, even some of the old hard-liners were becoming more sociable in 1980 and we look forward to an even better year in 1981.

We appreciate the enforcement efforts of agents Crawforth, Young, Green and French, NDOW, during the June opening of boating. Refuge agents Cameron and Johnson also patrolled on that weekend. During the August 1 opening for outboard motors Cameron and Johnson were aided by refuge agents Stanbrough and Zeller from Desert NWR.

An incident left unsolved this spring was the killing of these pelicans in Unit 10. Buckshot was used. The migrating flock was first seen one evening and the dead and wounded pelicans were discovered the next morning. SHB 4/80

One situation that bears watching is an increase in theft in this isolated area. Until this year, theft was almost never heard of in the Valley, but with increases in construction and mineral and petroleum exploration the area is hosting a more transient population. A high percentage of these people have criminal records and places like Ruby Valley probably seem like easy prey. An Idaho family had over $300 of fishing gear stolen in early June and one outboard motor was reported stolen from the Main Boat Landing in October. Mostly because of the efforts of Carl Young, NDOW warden, the fishing gear was recovered and prosecution was successful. Theft of the outboard was never resolved.

Table X. Below is a summary of citations issued for violations at Ruby Lake during 1980, all cases filed were successfully prosecuted. Information on citations issued by Nevada DOW is not available.

Citation	Number	Fine	Total	Comments
NRS 199.480 & NRS 205.220	1	$300	$300	Conspiracy to commit gross misdeameanor. Four mo. jail, suspended. 12-24 months probation.
50 CFR 20.24	1	50	50	Overlimit, redheads
50 CFR 26.21a	2	50	100	Camping
50 CFR 26.21b	1	25	25	Animal trespass, cattle
50 CFR 27.32	1	50	50	Boating regulations
TOTALS	6		$525	

VI. OTHER ITEMS

A. Field Investigations

In 1978 the South Sump Drawdown Advisory Committee recommended that the South Sump be drawn down, but only after baseline data was gathered so that the effects of the drawdown could be evaluated. Shortly after their report, personnel from the refuge and the Northern Prairie Wildlife Research Center (NPWRC), met and drafted a research proposal. This proposal was funded through NPWRC and work began in spring of 1980. The refuge staff conducted one portion of the research while other portions were contracted to the Cooperative Wildlife Research Unit at Oregon State University (OSU). The following research projects were conducted on the refuge in 1980.

1. Breeding Biology and Productivity of Diving Ducks at Ruby Lake NWR.

   This project was completed by the refuge staff. The objectives of this project were to monitor canvasback and redhead production and to identify factors affecting their productivity. The field work entailed nest locating and monitoring; weighing, candling and identifying all eggs; capturing, weighing and applying nasal saddles to the hens; capturing, weighing, webtagging and measuring the growth of ducklings and nightlighting, banding, and applying more nasal saddles in late summer. We produce a sizeable progress report each year which is available to anyone interested in the management or biology of diving duck production areas.

This female canvasback was captured, weighed and nasal saddled during refuge research projects. FWC 6/80

2. Feeding Ecology of Canvasback and Redheads at Ruby Lake NWR.

   This project was conducted by Jim Noyes, a M.S. student from OSU. The objective of this project was to determine the food habits of male, and more importantly, female diving ducks through their reproductive cycle and ducklings from hatching to flight stage. The field work involved collecting birds from spring through fall and analyzing the contents of their digestive tracts.

3. Feeding Ecology of Largemouth Bass and Trout at Ruby Lake NWR.

   This project was conducted by Richard Carmichael, a M.S. student from OSU. The objective of this study was to determine the food habits of the fish on the refuge year round. The field work involved catching fish by electro-shocker and angling and analyzing the contents of the digestive tracts. The bass were sampled with a stomach pump and were released alive. The trout had to be killed and dissected.

4. Growth and Breeding Biology of Largemouth Bass at Ruby Lake NWR.

   This five year project started in 1980 and is conducted by Mike Green, a fisheries biologist for the NDOW. The objectives of this study are to identify factors limiting bass production and growth and to develop an improved fisheries management

plan for Ruby Lake. The field work involves water chemistry nest surveys, creel census, fish marking, food studies and growth monitoring.

5. Reconstruction of Past Environments in the Ruby Mountains.

This project was conducted by Bob Thompson, a graduate student from the University of Arizona. The objective of this project is to reconstruct the past environments in the Ruby Mountains from the last ice age (appx. 20,000 years ago) until the present. The field work involves identifying and counting the pollen and other fossils in core samples taken from Ruby Lake and other areas in the Ruby Mountains.

B. Cooperative Programs

1. Young Adult Conservation Corps

A maximum of two enrollees were on board here during 1980. Jim Klingensmith was here from November 1979 through 18 July, 1980. Suzanne Duval began in December 1979 and worked until 10 October, when she resigned to plan her wedding. Klingensmith helped with maintenance and groundskeeping duties while Duval provided clerical assistance. David Butler was hired 27 October 1980 and is working on construction and maintenance tasks. Duval was rehired 30 December to complete her one year enrollee term.

Projects accomplished with YACC personpower were litter pickup, road and dike maintenance, raptor pen maintenance, lawn care, lawn and tree planting, clerical help, insulation and sheetrock installation, boneyard and facility cleanup, vehicle and equipment maintenance, topsoil and gravel hauling, and fish fin clipping for Gallagher Hatchery, NDOW. With clerical help limited to 24 hours per week and one maintenanceman on the staff, many projects would never have been done over the last few years without some good YACC help. Some enrollees are excellent people and do fine work. We are grateful for their support.

2. Other Cooperative Programs

The Gallagher Fish Hatchery, operated by the Nevada Department of Wildlife, is located on refuge grounds through a long term agreement. It is a trout brooding, hatching and rearing station.

Other cooperative programs include a weather station maintained in cooperation with the National Weather Service, the Colonial Bird Survey for the Migratory Bird and Habitat Research Labratory. We also submit regular reports to the magazine American Birds.

We also maintain a raptor rehabilitation center. This year we received 11 golden eagles, four were eventually released, four transferred to zoos or breeding facilities and three died.

Three golden eagles share the raptor pen. All had broken wings. Note the splint on the lowest bird. KTL 9/80

We received two great-horned owls, one was released, the other died. We released a juvenile hawk, probably a ferruginous, one kestrel died and a short-eared owl escaped. We currently have a juvenile red-tailed hawk on hand which we will release next spring. We also received an American bittern and common loon; both were successfully released.

We held our 3rd annual Christmas Bird Count on 20 December. It was the best count so far. We had 10 observers and found 60 species, 14 more than last year.

Table XI. Christmas Bird Count results for 1978, 1979, and December 20, 1980, held at Ruby Lake NWR.

SPECIES	1978	1979	1980
Eared Grebe			3
Pied=billed Grebe	1	2	1
Great Blue Heron	16	16	23
American Bittern		1	1
Whistling Swan	4	16	30
Trumpeter Swan	35	26	52
Canada Goose			171
Snow Goose			
Mallard	135	338	191
Gadwall	11	38	59
Pintail	42	51	66
Green-winged Teal	26	4	36
Cinnamon Teal	2	2	3
A. Wigeon	47	74	47
N. Shoveler	10	3	2
Wood Duck		a	
Redhead		19	6
Ring-necked Duck	7	30	10
Canvasback		10	2
Lesser Scaup	21	15	19
Common Goldeneye	17	19	49
Barrow's Goldeneye		2	
Bufflehead	85	27	17
Ruddy Duck	32	7	30
Hooded Merganser	1	2	1
Common Merganser	7	1	2
Goshawk	1		
Sharp-shinned Hawk	1		
Cooper's Hawk			1
Red-tailed Hawk			9[b]
Rough-legged Hawk	15[c]	9[d]	14[e]
Ferruginous Hawk			1
Buteo sp			
Golden Eagle	2[f]	5[g]	8[h]
Bald Eagle			a
Marsh Hawk	3	14	21
Prairie Falcon	2	1	
Falcon sp.	1		
Blue Grouse		9	3
Sage Grouse	20		
Chukar			16
Gray Partridge			
Virginia Rail			4
Am. Coot	7	71	257
Common Snipe	3	3	3
Mourning Dove		a	
Great Horned Owl	4	8	4
Long-eared owl	2		6
Poorwill		a	

SPECIES	1978	1979	1980
Com.(Rdsh.)Flicker	2	1	10
Lewis' Woodpecker	1		1
Downy Woodpecker	1		
Horned Lark	15	29	a
Scrub Jay	21	7	23
Bl.-billed Magpie	35	58	66
Common Raven	5	9	36
Common Crow			a
Piñon Jay	76	a	115
Clark's Nutcrack.	8	3	52
Mtn. Chickadee	19	4	39
Plain Titmouse		5	5
Bushtit	4	15	79
Dipper			3
House Wren			1
L.B. Marsh Wren			11
Cañon Wren	1		
Am. Robin			2
Mtn. Bluebird	1		19
Town. Solitaire	3	a	1
Cedar Waxwing		65	13
N. Shrike			
Logger. Shrike	3	1	1
Shrike sp.			3
Starling	2		11
Com. Yellowthroat		1	
W. Meadowlark			a
Yel.-head. Blackbird		2	
Red-winged blackbird	2		
House Finsh		3	
Sage Sparrow	1		
Dark-eyed Junco (Slate-Col.)	25	2	
Dark-eyed Junco (Oregon)	6	38	34
Tree Sparrow			2
White-Crwn. Sparrow			3
Song Sparrow		16	47
Sparrow sp.	4	6	11
Total Species	48	46	60
Total Individ.	790	1088	1760

[a] Seen during count week, not count day.
[b] 2 of 9, dark
[c] 1 of 15, dark
[d] 1 of 9, dark
[e] 1 of 14, dark
[f] Both adult
[g] 2 ad., 1 imm., 2 unk.
[h] 3 ad., 1 imm., 4 unk.

3. Visitors

Many of our friends and neighbors attended the open house on 19 December to show off our new office and homes. This was a BLHP project completed in October 1980. Nearly 50 people from the valley attended. It was a cordial and friendly gathering and everyone seemed to have a good time.

Visiting the refuge on business were Dick Mundinger and Bill Striplin of the Portland Regional Office, Dr. Charles Henny of the Pacific Northwest Field Station, and Drs. Howard Horton and Robert Jarvis of Oregon State University. Harry Swainston, Deputy Attorney General for Nevada, visited the refuge during the spring. He is responsible for bringing a lawsuit against the refuge. The state of Nevada is challenging FWS land purchasing procedures and water rights at Ruby Lake. The ultimate goal is state ownership of the refuge, or at least a stronger bargaining position for increased input into management policy, especially public use policy. This action is in keeping with the theme of the Sagebrush Rebellion which began in Nevada with passage of Assembly Bill 413 in 1979. The bill's authors and staunchest supporters are Assemblyman Dean Rhoads and Senator Norman Glaser, both from this county.

Also, visiting the refuge was Roger Johnson, manager of San Francisco Bay NWR and father of our assistant manager.

C. Items of Interest

1. Personnel Changes

Assistant Manager David Johnson transferred to Ruby Lake National Wildlife Refuge on 1 June 1980 from the Bureau of Land Management in Ely, Nevada. David has a Range and Wildlife degree from the University of Montana. David and his wife Kaye have two children.

2. Training

Refuge manager Forrest Cameron attended Federal Law Enforcement Training in Glynco, Georgia from 14 January through 8 February. Forrest also attended a five-day Supervisory Training session in Portland, 25-29 February. The course was primarily training in writing and understanding Performance Standards. David Johnson attended Federal Law Enforcement Training in Glynco, Georgia from 8 October through 12 December.

3. Refuge Receipts

Refuge revenue sharing checks were delivered to Elko and White Pine counties this year for use in the school district's general fund and the county road fund. Elko County received

a total of $5,013 from two checks and White Pine County received $2,765, also from two checks. The second check was under authority of a supplemental appropriation law that went into effect in 1980.

Table XII. Summary of refuge receipts for recent years at Ruby Lake NWR.

	79-80 Season	78-79 Season	77-78 Season
TRAPPING			
No. of Pelts	2,536	2,768	2,531
25% of rat sales	$3,240.19	$2,553.92	$2,767.61
	1980 Season	1979 Season	1978 Season
GRAZING			
AUM'S	5,083.31	5,249.59	4,670.91
Grazing fees	$15,296.49	$15,573.11	$14,031.23

D. Safety

Safety meetings were held as scheduled. Consecutive lost time accident free days increased to 9,131 days this year.

One accident relating to refuge operations but not involving refuge personnel or equipment was the rollover of this Humboldt Readymix truck. The truck, with less than 10,000 miles on it, was loaded with concrete for the headquarters BLHP project and missed the curve at the bottom of Harrison Pass. Only the truck was seriously injured.

DNJ 8/80

We had a good public safety record this year with no accidents being reported. However, we still received our share of visitors who insisted on staying out in the marsh until after sunset to get in the evening fishing. The USFWS Mayflower under the guidance of Chief navigator Steve Bouffard successfully rescued four parties of "Pilgrims" this year. One party was in the early stages of hypothermia.

A running total of pilgrims rescued is being kept on the USFWS Mayflower in an effort to deter late fishing in the marsh. DNJ 1/81

E. Credits

Forrest Cameron: I-B,C,D; II-A,B; IV-C, V-A,B,C; VI-B1.

David Johnson: II-C; III-A,B,D,E,F,G; VI-D.

Steve Bouffard: III-C; IV-A,B,C; VI-A, B2,B3.

Niki McQueary: I-A; VI-C,E. Typing, Assembling.

David Butler: Assembling

VII. APPENDIX A

SITE ANALYSIS

Range Analysis
Form A

Writeup no._____ Photo no._____

Date_____ Examiner_____ Pasture_____

Time in_____ out_____ Moisture_____ Topography_____

Transect no._____ Plot size_____ Plot interval_____ Exposure_____

Type designation_____ Location_____

	SPECIES	DRY WT	PLOTS 1	2	3	4	5	6	7	8	9	10	TOTAL	OMIT IF SUMMARY FORM IS USED *GREEN WT./AC	DRY WT./AC	* COMP	DESIRABILITY RATING D	I	L
GRASSES																			
FORBS																			
BROWSE																			
	TOTALS															XXXX			

%	OVERSTORY (TREES)											
%	OVERSTORY (SHRUB)											
%	CROWN COVER (HERB)											
%	BARE GROUND											
%	PAV. (< ½ DIAM.)											
%	ROCK & PAV. (½ >)											
%	VEGETATION											
%	LITTER											
	CHIPS											
	PELLET GROUPS											

100 %

CONDITION RATING

COMPOSITION RATING_____ _____

PRODUCTION RATING_____ _____

FORAGE CONDITION RATING_____

GROUND COVER INDEX_____

CURRENT EROSION INDEX_____

SOIL CONDITION RATING_____

APPARENT TREND VEG._____ SOIL_____

BROWSE CONDITION_____

APPARENT TREND_____

D&I PRODUCTION_____ LBS PER ACRE (DRY WT.)

EST. POTENTIAL PROD. FOR SITE_____ LBS PER ACRE (DRY WT.)-*

Physical Description

WILDLIFE OBSERVATION FORM

OBSERVER _____ WRITE UP # _____

DATE _____ HABITAT TYPE _____

Species	#Individuals	Sex	Age Class	Activities * Notes

Brief description of habitat type (i.e. veg., structure, cover)

Brief description of special features offered by type (i.e. creeks, cliffs, etc.)

*Note- When recording activities - if feeding, identify: feed if possible, when nesting describe nest and site if possible

USFWS
RUBY LAKE NATIONAL WILDLIFE REFUGE

Current Years
Range Utilization
(Key Forage Plant Method)

DATE _____ EXAMINER _____

PASTURE _____ CLASS OF STOCK _____

VEGETATION TYPE _____ REMARKS: _____

SEASON OF USE _____

TRANSECT LOCATION _____

Class		Key Species					
Interval	Interval Midpoint (X)	Species		Species		Species	
		Frequency	(F)x(X)	Frequency	(F)x(X)	Frequency	(F)x(X)
Slight (0-20)							
Light 21-40							
Moderate 41-60							
Heavy 61-80							
Severe 81-100							
Total							
Average Utilization	Σ FY / Σ F						

APPARENT TREND

Write up #
Type

Examiner

Date

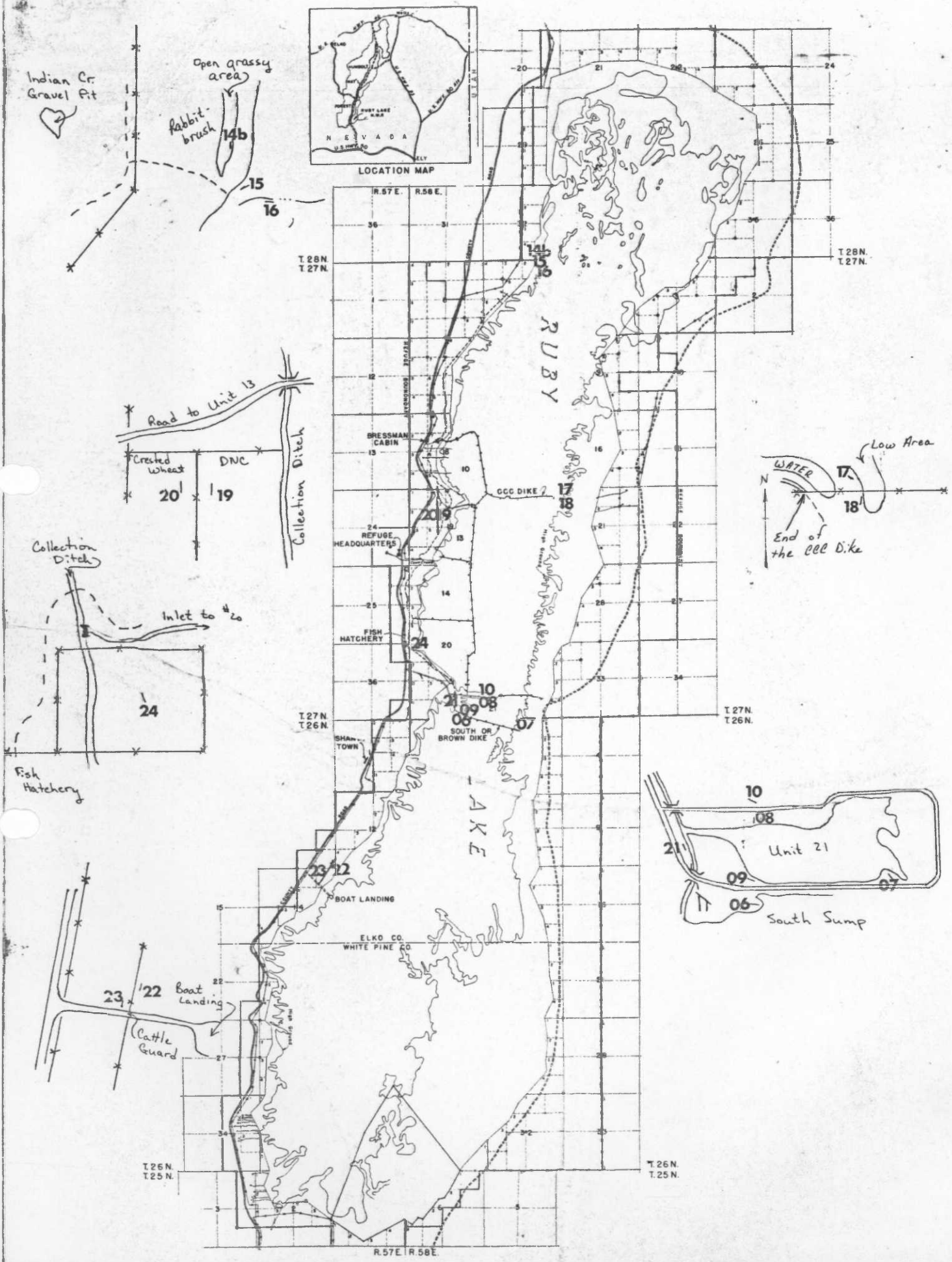
NATIVE VEGETATION	4	More than 50% of total vegetation is composed of species native to the plant community.
	2	25 to 50% of the vegetation is composed of species native to the plant community.
	1	Less than 25% of the vegetation is composed of species native to the plant community.
	4	Undesirable vegetation is absent or nearly so.
	2	Limited amounts(<20%) of undesirable vegetation present.
	1	Undesirables abundant.
	3	Major native forage species occur in open, unprotected areas.
	2	Major native forage species sometimes occur in open, unprotected areas.
	1	Major native forage species rarely occur in open, unprotected areas; occur more often where protected by shrubs or rocks.
SEEDED VEGETATION	4	More than 50% of total vegetation is composed of desirable seeded species.
	2	25 to 50% of the vegetation is composed of desirable seeded species.
	1	Less than 25% of the vegetation is composed of the desirable seeded species.
	4	Undesirable vegetation is absent or nearly so.
	2	Limited amounts(20%) of undesirable vegetation present.
	1	Undesirables abundant.
	3	If shrubs are present, seeded species occur mainly in open spaces between shrubs.
	2	If shrubs are present, some seeded species occur in open areas.
	1	Seeded species are generally protected by shrubs or rocks.
REPRODUC-TION	6	Desirable vegetation is present in all age forms(seedlings, young, mature).
	4	Desirable vegetation present mainly by mature plants and seedlings.
	2	Desirable vegetation is present only as mature or decadent plants.
	6	Invaders or undesirable plants are decadent or absent, with few established seedlings.
	4	Some seedlings and young plants of invaders and undesirables present.
	2	All age forms of invaders or undesirables present and unprotected.
VIGOR	2	Little or no trampling of plants.
	1	Moderate trampling; damage slight to moderate.
	0	High percentage of plants affected by trampling

VIGOR (cont'd)	4	Desirable grasses, forbs, and shrubs are vigorous, having good color, size, and producing abundant vegetation. Browse showing little hedging and good leader growth.
	2	Desirable species showing moderate vigor. Some hedging occurring, some leader growth evident.
	1	Desirable species showing low vigor. Portions of clumps or entire plants are dead or dying. Seed stalks or seed heads almost non-existent. Heavy hedging and very little leader growth.
SOIL MOVEMENT	3	No visual evidence of soil movement.
	2	Some soil movement is detectable.
	1	Soil movement occurs with each event.
	3	Persistent surface litter, where present, is accumulating in place.
	2	Persistent surface litter is deposited against obstacles.
	1	Persistent surface litter is absent.
	2	Lichen lines not apparent and extend to soil level and/or pedestaling of plants not apparent.
	1	Lichen lines do not extend to soil; little if any, pedestaling apparent.
	0	Stones or rock fragments pedestalled; pedestalling of vegetation also occurring.
GULLIES	0	Gullies absent, or if present, in stable condition with perennials establishing themselves on bottom and sides of channel.
	-2	Gullies are well developed with small amounts of active erosion. Some vegetation may be established.
	-4	Active gullies indicated by recent cutting and sloughing. Vegetation which is present has roots exposed.

TOTAL POINTS_____

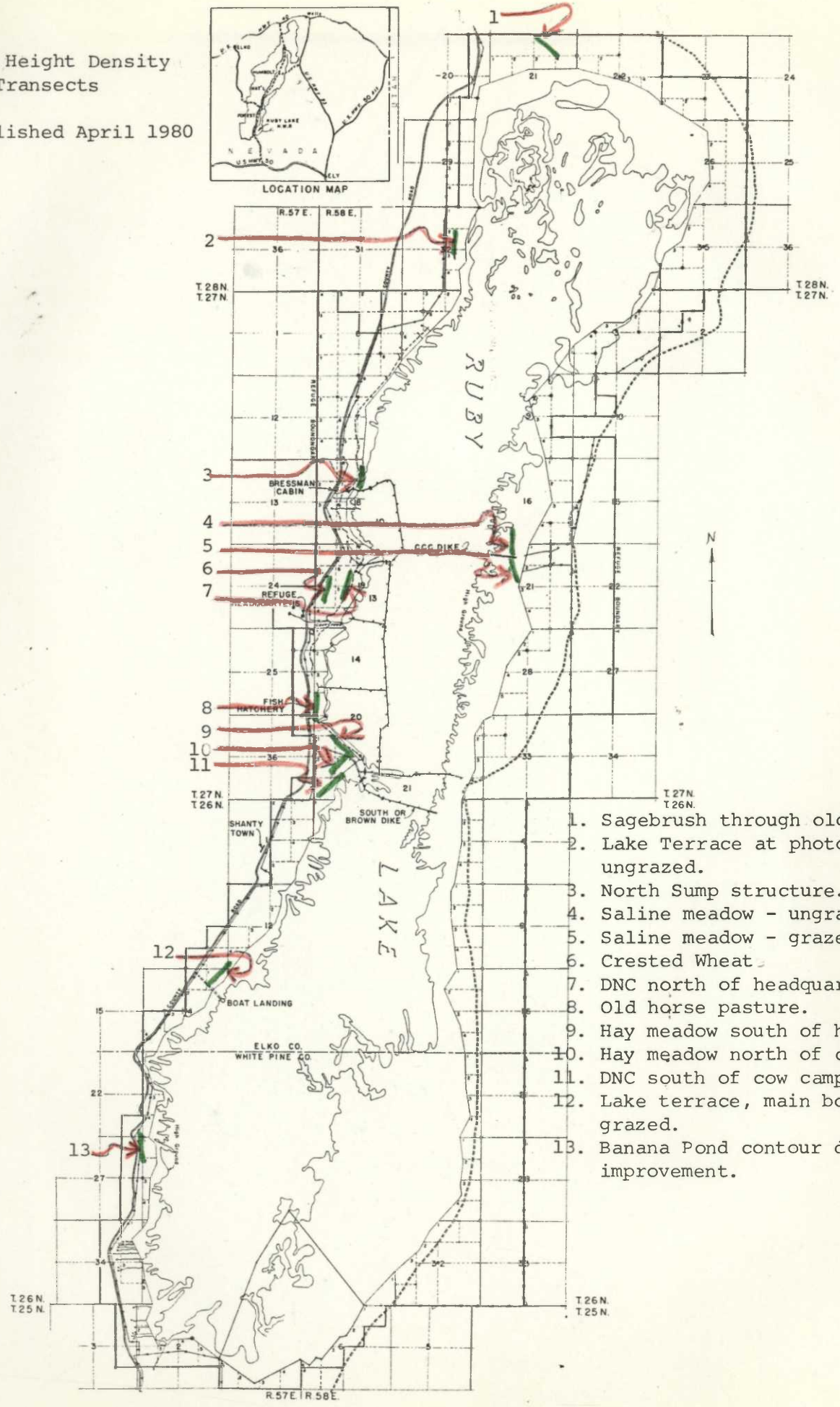
Apparent condition_____

General Comments:


LOCATION MAP
NEVADA
Indian Cr. Gravel Pit
Open grassy area
Rabbit-brush
14b
15
16
Road to Unit 13
Crested Wheat
DNC
20
19
Collection Ditch
Collection Ditch
Inlet to #20
24
Fish Hatchery
Low Area
WATER
17
18
N
End of the CCC Dike
RUBY LAKE
CCC DIKE
REFUGE HEADQUARTERS
BRESSMAN CABIN
FISH HATCHERY
SOUTH OR BROWN DIKE
SHAW TOWN
BOAT LANDING
ELKO CO.
WHITE PINE CO.
Boat Landing
Cattle Guard
Unit 21
South Sump
T.28N.
T.27N.
T.27N.
T.26N.
T.26N.
T.25N.
R.57E.
R.58E.

Robel Height Density
Transects

Established April 1980



1. Sagebrush through old enclosure.
2. Lake Terrace at photo plot 14b- ungrazed.
3. North Sump structure.
4. Saline meadow - ungrazed.
5. Saline meadow - grazed.
6. Crested Wheat
7. DNC north of headquarters.
8. Old horse pasture.
9. Hay meadow south of hatchery.
10. Hay meadow north of cow camp.
11. DNC south of cow camp.
12. Lake terrace, main boat landing- grazed.
13. Banana Pond contour ditch improvement.