

RUBY LAKE NATIONAL WILDLIFE REFUGE
Ruby Valley, Nevada

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ANNUAL NARRATIVE REPORT - Calendar Year 1979

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

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I. GENERAL

A. Introduction

Ruby Lake National Wildlife Refuge lies in northeastern Nevada. The refuge lies 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 there is some subsurface outflow from the refuge 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.

Ruby Lake NWR is one of the few permanent water bodies in northeastern Nevada; a fact that makes the refuge attractive to wildlife and people. The refuge is one of the few areas capable of supporting water-based recreation in northeastern Nevada. In the past this recreational demand has conflicted with wildlife production. The current regulations have resolved most of these conflicts although the controversy continues.

B. Climatic and Habitat Conditions

The winter of 1978-79 was the coldest since we started keeping records about 1951. The cold caused problems with frozen pipes.

Precipitation was above normal with 14.95 inches but was poorly distributed. Over 4 inches fell in January and most of that as rain. The greatest 24-hour amount of precipitation ever recorded at Ruby Lake NWR was 2.6 inches of rain that fell on 11 January and caused flooding problems. Only 2.27 inches fell during June through September. Because of good snowpack the marsh did not drop seriously but the upland areas were extremely dry all summer. The last spring frost was on 8 June and on 17-18 June we received 3 inches of snow. It was fortunate that the first fall frost was on 15 October nearly a month later than normal.



Spring thaw slowed the progress of many Ruby Valley motorists and brought others to a complete halt. MSM 4/79

D. Land Acquisition

Nothing to report.

E. Systems Status

1. Objectives

Included in Table 1 is a list of selected output categories for Ruby Lake NWR.

Table 1. Outputs for selected categories at different funding levels at Ruby Lake NWR for calendar year 1979.

Output Category	Minimum Funding Level	Objective Level	1979 Output
Interpretation & Education (AH)	120	3,900	145
Wildlife Recreation (AH)	152,000	204,200	182,584
Waterfowl & Other Migratory Bird Maintenance (U/D)	4,500,000	8,000,000	*2,553,360
Waterfowl Production	6,000	15,000	11,505
Refuge Receipts			
Grazing		(5,000)	(10,737.58)
Furbearers		(20,000)	(2,332.57)
TOTAL	16,000	25,000	13,070.15

*Figure for Fiscal Year 1979

Much inconsistency in outputs at objective and minimum funding levels is noted between the two most recently submitted program scheduling efforts. Those levels presented in the above table are from levels submitted by Papike, 6/77 rather than Kline, 10/77, since no written rationale can be found to support the latter revisions. Wildlife Recreation and Waterfowl Production levels submitted by Papike in 6/77 seem realistic. Waterfowl and Other Migratory Bird Maintenance levels as well as Refuge Receipts levels need revision downward.

Since recreational programs (boating) have undergone substantial changes in recent years it is time to take another look at the type of visitation we now receive as well as the wildlife oriented responses that have occurred because of those changes. Revision of objectives is inevitable. Purchase and installation of six traffic counters in the summer of 1979 has helped provide more reliable public use figures toward that end.

2. Funding

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

Funding	FY-1979	FY-1980 (Projected)
O&M		
1210	116,400 ^a	101,400
1240	16,500 ^b	11,700
Cyclical Maintenance		
1210	9,000	10,000
1240	12,100	13,000
Construction & Anadromous Fish (CAF)		
PDW-5,10,19 Gravel Dikes 38,134 (FY-78 carryover)		-----
PDW-3, Headquarters Rehab		411,500 (FY-79
PDW-2, Water facilities 92,000		----- carryover)
Reverted PR		
5300	15,000	-----
Total		
Manpower		
Permanent	4(770 MD)	4(845 MD)
Career Seasonal	1(250 MD)	2(250 MD)
Temporary	3(247 MD)	3(272 MD)

a) Includes \$4,300 Pay Act Money and \$16,000 reprogrammed from San Luis NWR for reseeding of 643 acres August 1979 fire. An additional \$3,000 for fire costs and replacement of lost supplies was billed directly against San Luis w/o AWP revision.

b) Includes \$800 Pay Act Money.

Funding was adequate for projects that were annual work planned, but 1210 CM projects exist that will need additional funding in the near future. Additional responsibilities complicated the funding picture in FY '79. In late June \$15,000 in the 5300 activity was reprogrammed to us for study of the effects of our new boating regulations on wildlife. This was very short notice. An August fire destroyed the refuge water system. Also the BLHP project for rehabilitation of water control structures was given to this station as a force account project. Plans were not complete on this project until mid summer, and only one structure was completed. Materials were purchased for five other structures, but no time remained to complete the rehabilitation. Planning of the construction, an additional study, and purchases suffered from the turnover in personnel Ruby Lake has undergone recently. Ongoing biological studies were given the necessary attention and continuity remained good in that aspect of refuge operations. As all refuge operations continue to be under very close political scrutiny, sound biological data proves imperative in justifying our actions.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

The dike resurfacing project that started last year was finally finished. The project was way behind schedule because of poor scheduling by the contractor and inexperienced equipment operators which led to lots of down time for repair and getting unstuck.



The BLHP dike resurfacing project had several delays including this mired mass of equipment. The \$38,134 job was completed in May 1979.

MDS 3/79

A major BLHP project for this year was rehabilitation of several water control structures. We were not allowed to contract the job and managed to repair only 1 of 6 structures. It entailed diverting the Collection Ditch, and refacing the existing structure. We purchased most of the materials and equipment necessary to repair the remaining 5 structures.



The \$92,000 BLHP project for repair of water control structures was left incomplete at years' end. This structure behind Gallagher Hatchery was the only one completed. MDS 8/79



This aerial view of headquarters was taken the day after the 8,500 acre Shantytown Fire. It made the archaeological exploration for the BLHP headquarters project much easier. MDS 8/5/79

We have completed the planning and site surveys for 2 other BLHP construction projects. These 2 projects are the headquarters project and the spring rehabilitation project. The refuge office will be remodeled, two new houses will be built and the existing houses will be improved. In the FY-1981 spring rehabilitation project, water control structures will be added or improved at several springs, contour ditches will be cleaned, springs will be fenced from grazing, and watering troughs will be installed as necessary to keep cattle from important springheads.

B. Maintenance

The maintenance shop was moved from the old office/shop building to the new maintenance/storage building. The new shop was equipped with new equipment and tools. Propane heaters were installed and the building was insulated.

The old raptor pens were torn down and replaced with a new 10x40x8 chain link pen. The old pens were chicken wire which was hard on the birds and were badly damaged during the fire.



The old raptor pen was mostly destroyed during the August fire.

FWC 9/79



Refuge and YACC personnel began constructing a new raptor rehabilitation facility in September. FWC 9/79



Nearly completed, the new raptor pen was filled with slats to reduce visibility and consequently disturbance to birds. Slats also slow wind velocity and shelter the birds during rain and snow storms. FWC 10/79

The power line to the water supply pump was replaced because the old lines were damaged by the fire. About 1,000 feet of lines were placed in plastic pipe and buried. The trench took over a week to dig because it was all through caliche. The wire was in one piece so the 20 foot plastic pipes had to be threaded on the wire at each end and dragged to the center.

With the help of some private equipment operators who made the mistake of stopping by the office on a fishing trip, we finally got our 1943 dragline running. It had not ran for 3 or 4 years. We did not dare do too much with it because it was sitting on a slope just above our new shop building. The equipment operators moved it to a safer location. It was running only on 3 of 6 cylinders. Stillwater NWR needed a dragline badly and borrowed it and is planning to replace the old gas engine with a new diesel engine. We will repossess it when repairs are complete.

C. Wildfire & Other Natural Disasters

On January 11 we received 2.60 inches of rain in 24 hours on 6 inches of snow over frozen ground. All the buildings had water in the basements, one to a depth of 18 inches. Refuge and county roads washed out in numerous places; some washouts were several feet deep. The main problem was that the Collection Ditch could not handle the runoff. Four foot culverts could not carry all the flow. We began pulling stop-logs out of the 6 water control structures on the Collection Ditch to get the water out of the ditch. We pulled every board we could by hand, but many were stuck so we got the backhoe and ripped them out. Where the backhoe would not reach we went into the water and cut the boards out with an old crosscut saw. It rained and blew all that day and the temperature was in the mid 30's. Before the day ended everyone went through several changes of clothes.



The area to the right of this structure into Unit 21 has been washed away. The photo was taken after water had receded about two feet.

MDS 1/79

With all the boards removed the water finally dropped below the 2 holes in the dike and we were able to patch the holes over the next 4 days.

Because of the scanty precipitation during the summer months the fire danger was extreme all summer. This year was the worst fire season ever recorded in the Ruby Mountains; in all, 4 fires burned about 15,000 acres. The biggest fire was 8,500 acres in size and involved the refuge.



This picture, taken as the fire approached headquarters, is the only one we have of the fire in progress. It was taken by Polly Bowser as she was fleeing from her house. The fire was diverted just short of the fence. PB 8/79

The fire began just before noon at the BLM campground about 1½ miles south of the refuge headquarters. A careless camper allowed sparks to blow from his fire into some dried cheatgrass. The humidity was 10% or less; the temperature was around 90° F and the wind was steady out of the south at 40 m.p.h. Needless to say, the fire moved extremely fast.

The Ruby Valley Volunteer Fire Department (RVVFD) made the initial attack with a 1,000 gallon pumper stationed at the Gallagher Fish Hatchery only 200 yards north of the fire origin. We were unable to stop the fire and decided to drop back to the hatchery and prepare to meet the fire there. The refuge cat was used to make the fire lines around the hatchery. The firefighters managed to save all five houses at the hatchery even though the fire jumped firelines.

The fire continued to the refuge and threatened all 7 buildings and both YACC trailers. Fortunately, both other RVVFD trucks and several Nevada Division of Forestry (NDF) trucks had arrived. The fire jumped all the cat lines and nearly burned the YACC trailers, one house, a 4-car garage and the new maintenance building, but the pumper trucks and crews saved all the buildings. With smoke making visibility near zero, local ranchers hooked their trucks onto two law enforcement camp trailers and dragged them to safety.

We lost some supplies and minor equipment. All the refuge vehicles and heavy equipment was saved; one privately owned truck was lost. We were unable to use the refuge fire system because we had no power; the power company had shut off all power in the valley when several power poles fell. We nearly lost a house because we have no auxilliary power to the water pump. Flames burned within 3 feet of the house; fortunately a pumper truck showed up just in time. Flames burned right up to the YACC trailers. One enrollee lost his phonograph records; they melted and warped inside the trailer. Flames burned the brush underneath an elevated gas storage tank containing about 200 gallons of gasoline. We were lucky; we did not lose much.

There is a house trailer belonging to the Nevada Department of Wildlife about 1 mile north of the refuge. Once the fire was past the refuge all pumper trucks moved to the trailer. It was a tough battle, but it was saved also. All the trucks were forced to flee or be cut off as the fire approached. Most trucks drove through flames to retreat but a new NDF truck high-centered an axle and was lost. The refuge cat broke a fanbelt but we were able to drive it clear. A haystack 10 feet from the building caught fire but was pushed over with the backhoe after the main front went by to keep the garage from catching fire.

All this happened by 3 p.m. The fire ran another 8-9 miles before it started cooling down about 10 p.m. Over 150 people fought the fire the first day; the majority were volunteers. By nightfall the first day, the U.S. Forest Service began arriving and took command of the fire.

They set up a field camp at the refuge headquarters and fought the fire with BLM and Nevada Department of Forestry assistance on the second day. For the next few days they continued with mop-up operations.



With aerial seeding in progress, three young redheads decided to get involved. They had to walk nearly a mile from water to supervise the job.

MDS 8/79

Reseeding operations began about a week after the fire was out. The steeper elevations were seeded by plane. The flat, but rocky or tree-covered areas were also seeded by plane, but the seeding was followed by chaining to cover the seed. The remaining flat areas were drilled with rangeland drills in November and December. The seed was a mixture of grasses, forbs and shrubs. All the area burned was winter deer range so the browse species were an important part of the mixture, and additional bitterbrush seedlings are to be planted in March, 1980. The U.S. Forest Service coordinated the \$48,000 seeding effort and did most of the drilling. The BLM and Nevada Department of Wildlife contributed funds, seeds, equipment and manpower. The refuge contributed \$16,000 for the seeding and also contributed manpower.

III. HABITAT MANAGEMENT

A. Croplands

None.

B. Grasslands

Four permittees grazed nearly 13,700 acres with about 5,500 AUM's. Approximately 10,000 acres have not been grazed for 10 years. The current grazing plan follows U.S. Soil Conservation Service stocking recommendations to maintain a good range quality rather than for wildlife benefit. We anticipate making improvements in our grazing plan in the next few years and will begin gathering data in this coming year.

We completed the planning and preliminary field surveys to rehabilitate some of the flood irrigation system on the refuge meadows. This will involve new water control structures on some springs and cleaning the contour ditches. Most of the ditches have not been used since the land was in private hands. We hope to convert some sagebrush and rabbitbrush lands back to grasslands.

C. Wetlands

We followed the water management plan written by Bob Howard in 1977. All the units are on a rotating drawdown schedule, but none was drawn down this year. Unit 13 and the East Sump were reflooded over the winter. The drawdown opened up some of the solid bullrush stands in Unit 13. Seed production on moist soil plants was excellent during the drawdown. When Unit 13 was reflooded seeds built up to a depth of 4 inches at the outlet structure. Unit 10 is scheduled next but we will probably hold off until we install a new water control structure from the Collection Ditch to the North Sump. To get water to the North Sump we have to route it through Unit 10 or through the East Sump via several other dike units. A direct connection from the Collection Ditch to the North Sump would have alleviated the flooding problems in January. We plan to install this structure next year.

We have considered a drawdown of the South Sump, but it has been postponed for several years while we gather baseline information. Without this information it would be impossible to evaluate the effects of the drawdown. The predrawdown studies will be coordinated by the Northern Prairie Wildlife Research Center and will be discussed in great detail in the section on Field Investigations.

D. Forestland

None.

E. Other Habitat

Nothing to report.

F. Wilderness and Special Areas

Ruby Lake National Wildlife Refuge has been designated as as National Natural Landmark.

G. Easements for Waterfowl Production

None.

IV. WILDLIFE

A. Endangered Species

Several bald eagles were seen on the refuge during the winter. No peregrine falcons have been seen on the refuge since 1976.

The relict dace (Relictus solitarius, Hubbs & Miller) was once abundant throughout the refuge. Since the establishment of bass and trout in the marsh the endemic species has been extirpated in the marsh and larger springs. Last year we reported that we were unable to locate any relict dace. This year we are happy to report that we have found 2 populations on the refuge and another large population occurs in Franklin Lake.



An extensive relict dace inventory was conducted in June and in September, 1979 in cooperation with Thom Hardy, University of Nevada, Las Vegas, and Don Sader, Endangered Species, FWS, Sacramento, MDS 9/79

The status of this fish is under review and may be listed as threatened. This fish occurred in Ruby Valley and 4 other valleys nearby. The Ruby Valley population is distinct from all other populations in that it is a much smaller fish.

B. Migratory Birds

1. Waterfowl

Ruby Lake National Wildlife Refuge is primarily a waterfowl production area. We are not a major migration stop and not a wintering area.

There were no disease outbreaks on the refuge this past year. The past 2 years we have had minor botulism outbreaks in July, August, and September involving up to 500 waterfowl. The outbreaks occurred in the Collection Ditch and the upper end of the South Sump and Unit 21. The outbreaks occurred below the Gallagher Fish Hatchery outflow where untreated waste was dumped directly into the Collection Ditch. The fish hatchery was closed for modifications during the summer of 1979 and no botulism cases were observed. The hatchery now has a settling lagoon to remove the dead fish, uneaten food and fish wastes from their outflow.

a. Swans

About 7 pairs of trumpeter swans nested on the refuge and another 3 or 4 nested on Franklin Lake, a 6,000—8,000 acre marsh a few miles north of the refuge. We saw several swans on Boyd and Hooper Reservoirs in Lamoille but did not see any indication of nesting. There are not suitable nest sites on either reservoir. The swans at Franklin Lake hatched 13 cygnets and fledged 11 of them. Five pairs hatched 11 cygnets on the refuge, but only 2 are known to have fledged. One nest in Unit 14 was predated by birds before hatching. It is not known why the refuge population lost so many cygnets. This problem has been noted in Yellowstone-Teton populations also. Franklin Lake is more fertile than Ruby Lake; it is slightly more alkaline and dries out every few years. Sago pondweed covers nearly the entire Franklin Lake bed. On refuge Unit 10 there were 2 broods of swans, one with 2 cygnets and another with 5. The brood of 2 thrived and fledged while the other brood showed stunted growth and none fledged.

Some of the 40-45 trumpeters winter off the refuge, but we are not sure where. Also, some of the non-breeders apparently leave the area during the summer but we do not know where. We have been trying to capture some of them so we could apply neck collars. We were able to catch only cygnets from the same brood in Franklin Lake.



Assistant manager Spanel applies a neck collar to a young trumpeter swan in Franklin Lake. JWH 8/79

Seventy to 80 whistling swans used Franklin Lake during October and November. Thirty-five of those moved to the refuge after Franklin Lake froze and remained for the winter.

b. Geese

Canada goose production dropped from 200 to 185 this year even though the number of breeding pairs increased slightly. For unknown reasons brood size was smaller this year. Peak fall population was around 300, up somewhat from last year. We saw only 1 snow goose this year.

We had one goose depredation complaint in a hayfield in Lamoille. Forrest, Steve, and 2 Nevada Department of Wildlife biologists investigated the complaint. We arrived at the peak of the sunset and the sight and sound of all the birds was really fantastic. There were several hundred geese in flocks on the ground and silhouetted against the red sky. Large flocks of mallards were flying back and forth and in the distance we could hear several sandhill cranes calling. We all thought we were in paradise except the rancher who was totally oblivious to the beauty of the situation. One of the state biologists jokingly said that "this ought to be part of the refuge." The rancher did not appreciate that either. We set both our zon guns out, but the field was so big the geese just moved to a different part of th field. We kept moving the guns and set out two more, but that did not help either. The geese finally left on their own accord just before hunting season.

c. Ducks

Waterfowl use days declined again this year. Lower fall migration contributed to this decline. Production declined slightly for most species but was up for several of the diving ducks. Canvasbacks and redheads had larger broods than last year. See Figures 1, 2, and 3.

d. Coots

Coot production has declined for the third consecutive year. Coot clutches were smaller than last year and the breeding population was lower also. See Figures 1 and 2.

2. Marsh and Water Birds

There were several nesting colonies of these birds on the refuge in 1979. Great blue herons nested around an island in the South Sump. There were about 35 nests in this colony, and no other species were observed in this colony. There was a mixed colony in the South Sump containing 30 snowy egret nests, 30 black-crowned night heron nests, 150 white-faced ibis nests and 4 great blue heron nests.

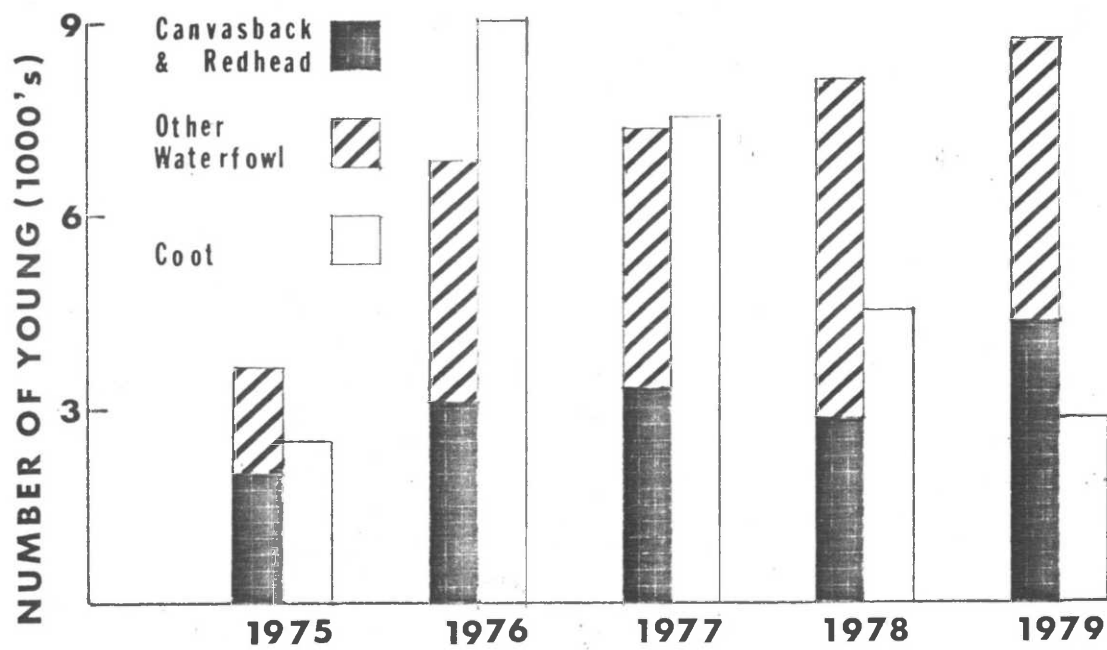


Figure 1. Estimated waterfowl production at Ruby Lake National Wildlife Refuge.

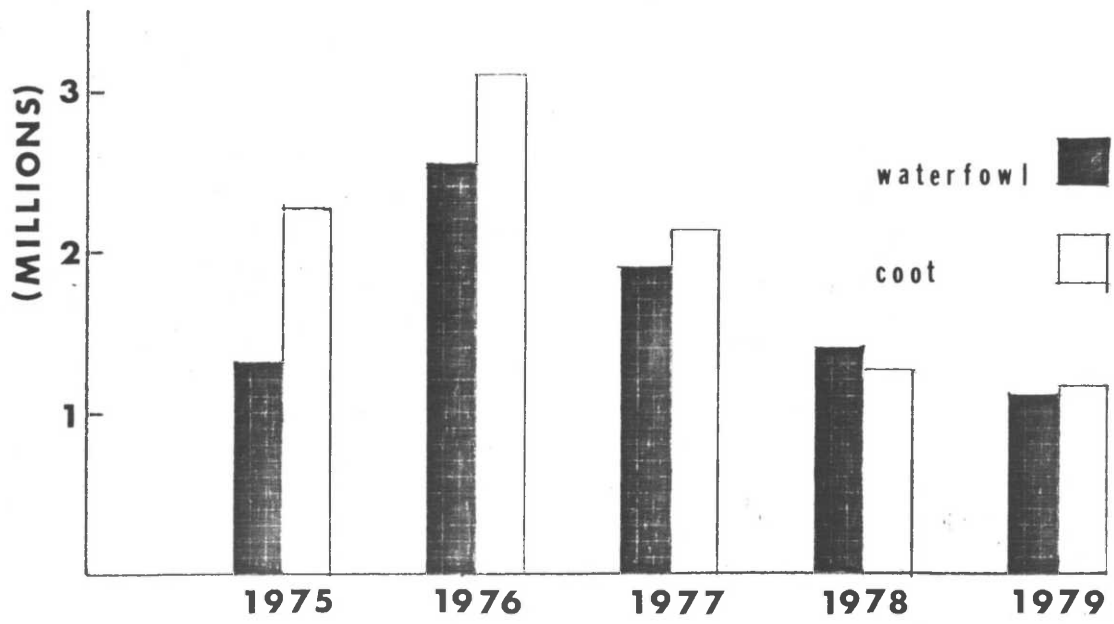


Figure 2. Estimated waterfowl use days at Ruby Lake National Wildlife Refuge.

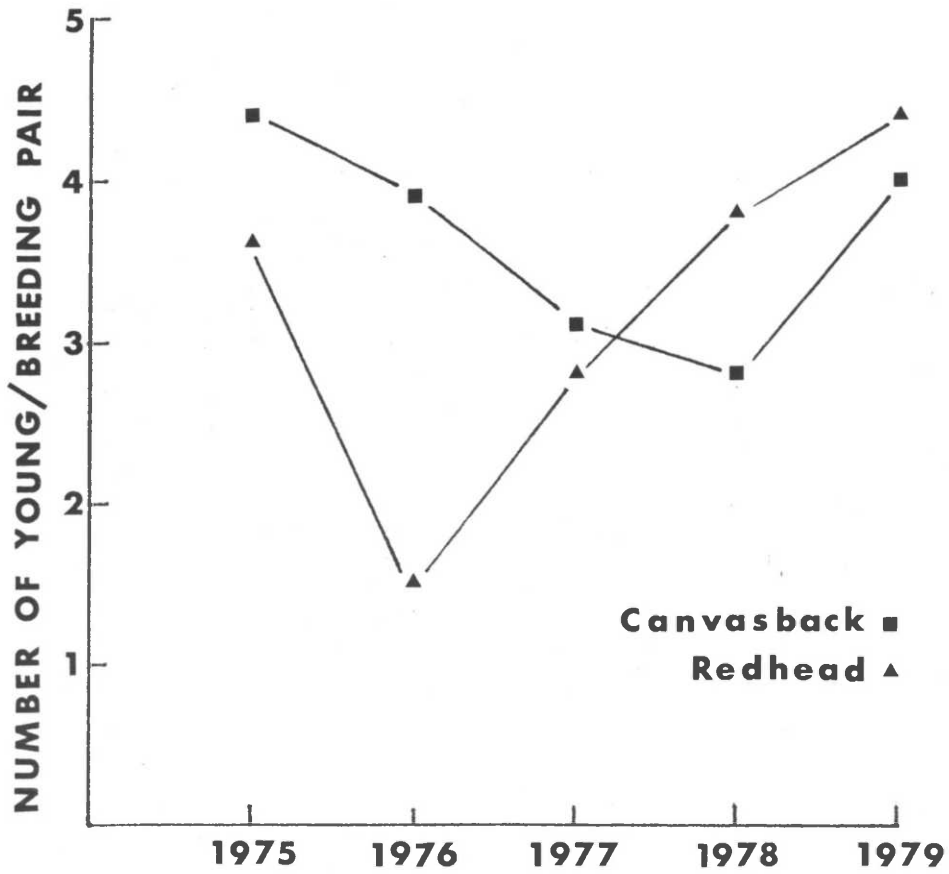


Figure 3. Estimated breeding success of canvasbacks and redheads at Ruby Lake National Wildlife Refuge.

In Unit 14 there was a colony with 50 white-faced ibis nests, 15 black-crowned night heron nests and 1 snowy egret nest. There was a colony in Franklin Lake with 100 snowy egret nests and 120 white-faced ibis nests.

We assisted Dr. Charles Henny of the Corvallis Oregon Field Station of the Patuxent Wildlife Research Center in a pesticide study of black-crowned night herons and white-faced ibis. Preliminary data analysis indicates little problem with the ibis and severe problems in the night heron. The herons showed severe egg shell thinning and several broken eggs were found in the nests. Apparently they are getting the pesticides during migration or on the wintering grounds. We banded as many young wading birds as we could in hopes of learning the migration routes and wintering ground.



The crack in this black-crowned night heron egg was not caused from pipping but from egg-shell thinning, probably due to high pesticide residues in the population. SHB 6/79

Other species in this group that nest on the refuge include pied-billed and eared grebes, American bittern, sora and Virginia rails, and about 15 pairs of greater sandhill cranes. The cranes had a very poor year; few young cranes hatched and very few fledged. We had 1 crane depredation complaint 25 miles north of the refuge. A rancher was worried about his new alfalfa seeding because 300 cranes fed in that field, but he also had 80 head of cattle in the field. The cranes were eating waste grain that was laying all over the ground. We could not use zon guns or shellcrackers because of the cattle and fire danger so we let the cranes leave when they were ready to go.

3. Shorebirds, Gulls, Terns, and Allied Species

Willetts, long-billed curlew, Wilson's phalarope, American avocet, black-necked stilt, spotted sandpiper, Forster's and black terns nest on the refuge. We have been looking for snowy plovers, but

have not seen any yet. Starting in August we began seeing other species such as greater and lesser yellowlegs, several species of peeps, and large flocks of long-billed dowitchers. We see very few shorebirds during the spring migration. California and ring-billed gulls visit each year, but no nesting has ever been reported.

4. Raptors

Golden eagles, prairie falcons, marsh hawks and great horned owl all nested in the area and used the refuge year around. Of these only the marsh hawks nested on the refuge. Red-tailed hawks and American kestrels nested near the refuge, but wintered elsewhere. During the winter we normally see a few bald eagles and 20 to 30 rough-legged hawks. Last year we had a pair of long-eared owls near the refuge headquarters, but this year we could not locate them. Last year short-eared owls were common nesters on the refuge; we would see 1 to 3 each day in the marsh. This year we did not see any during the nesting season and only 4 to 5 during the fall migration.

5. Other Migratory Birds

Most of the habitat on the refuge that attracted migrant song-birds was destroyed in the fire. The aspen and willows along Cave Creek will sprout and provide new habitat in a few years. We saw several uncommon species this year, a varied thrush, and a rose-breasted grosbeak and had several unusual late records of a yellowthroat and American bittern on the Christmas Bird Count.

C. Mammals, Non-Migratory Birds and Others

1. Game Animals

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.

Coyote 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.

Four permits were issued for the 1978-79 season to control muskrat numbers on the refuge. The total quota of the four permits was 3,000 and 2,700 were taken.

2. Other Mammals

These other mammals are present on the refuge: porcupine, mountain cottontail, black-tailed jackrabbit, badger, spotted skunk, 1 nuisance beaver, weasels, a few mink, a few kit fox, and many species of bats and rodents.

3. Resident Birds

There were several flocks of sage grouse on the refuge (100-150 birds). We counted 30 plus cocks in the strutting ground 1/2 mile north of the Indian Creek gravel pit; we saw only 11 cocks there last year. There should be another strutting ground near the south end of the refuge but we have not found it yet.

Several flocks of chukars watered at the refuge springs, and one flock resided on the refuge near headquarters.

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. They are stunted and overpopulated. They are easy to catch and taste great, and the creel limit is 20.

About 60-70% of the fishing is for this species.

Rainbow, brown, and brook trout also occur on the refuge. They are not as popular with the fishermen because they are harder to catch and have a strong muddy flavor even though they average about 2 to 3 pounds.

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 the cranes and herons.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On Refuge

We gave 3 guided tours this year, a YCC group from Mountain City, NV., the first and second grades from McDermitt, NV., and a small group of the Red Rock Audubon Society of Las Vegas, NV. We also made a large number of contacts with refuge visitors while in the course of our normal work and answered many questions about wild-life ecology and management.

Table 3. Estimated number of visits to Ruby Lake National Wildlife Refuge from 1975 to 1979.

Year	Fishing	Boating ^a Waterskiing	Other ^b	Total for yr.
1975	41,575	2,945	1,170	45,690
1976	45,295	3,300	1,420	50,015
1977	45,885	3,720	1,775	51,380
1978 ^c	41,515	180	1,815	43,510
1979	51,419	10	1,948	53,377

a. Includes boating, waterskiing and boating while observing wildlife.

b. Includes hunting, trapping, camping, picnicking, wildlife observation while on foot and in a land vehicle, photography, swimming, ice skating, and snow skiing.

c. These figures are probably way underestimated.

2. Off Refuge

Manager Cameron attended several meetings in Elko and Ely concerning refuge operations and boating regulations. We made several news releases to the local newspapers and wrote a monthly column for the Ruby Valley News. We printed a leaflet explaining our boating regulations and distributed them to the other government agencies and local sporting goods dealers for wide dissemination.

B. Recreation

1. Wildlife Oriented

Refuge visits have continued to rise even though boating regulations have become more restrictive. The 1979 data is the most accurate we have since we had road counters at all six refuge entrances. In 1978 we only had one road counter and the number of visitors is probably seriously underestimated. Prior to 1978 we had three road counters. Fishing accounted for over 95% of the 53,577 visits in 1979. Hunting and wildlife observation accounted for about 3% of the visits. Most of the fishing was concentrated from May though early September.

2. Non-Wildlife Oriented

Because of the new boating regulations activity hours of non-wildlife oriented recreation have been reduced to almost zero. The regulations do not allow any motors over 10 horsepower and prohibit water skiing.

The few non-wildlife activity hours came as skating, unauthorized swimming, and some recreational boating.

We do not allow camping on the refuge, but many people camp adjacent to the refuge boundary. These campers cause a variety of problems. They keep wildlife away from the springs, and leave piles of garbage behind. One group of campers tried to run several fishermen off a large pond near their camp by having their dog swim around the pond. We masqueraded as fishermen, but were unable to catch them in the act.

C. Enforcement

Some minor hunting, boating, and fishing violations were written, but overall it was a quiet year for law enforcement.

One situation of great concern was the possibility of another "4th of July Boat-In," similar to the 1978 occurrence when "pink slips" were given to over 140 boaters who opted to launch motorboats in defiance of a U.S. District Court order. A meeting was held in the Area Office in June 1979, with a group of agents and prospective enforcers from other refuges in this area. Plans were layed regarding what was to

be done should another confrontation develop during the summer of 1979. The plan was to sieze and prosecute.

Agents Branzell (NV), Pearson (CA), Stribling (CA), and Wilson (CA), arrived at Ruby Lake July 1. Four refuge officers met in nearby Elko and stayed on alert anticipating any enforcement problems during the first week of July. Other refuge agents were on call. No problems occurred and most agents and refuge officers returned to their duty stations around July 6. The situation still bears watching of course, but hopefully no further attempts will be made at openly defying refuge boating regulations.

The following is a listing of citations issued for violations of refuge regulations. Information regarding citations issued by Nevada Department of Wildlife agents is not available though, since the boating controversy the state has been very reluctant to write any citations on refuge land, probably for fear of being linked with our locally unpopular management programs. This reluctance by the state has subsided in recent months however.

Table 4. Below is a summary of citations issued for violations at Ruby Lake during 1979. All cases filed were successfully prosecuted.

Citation	Number	Fine	Total	Remarks
50 CFR 20.24	1	50.00	50.00	Overlimit, redheads
50 CFR 20.72	2	50.00	100.00	No State duck stamp
50 CFR 27.31	1	50.00	50.00	Off road vehicle use
50 CFR 27.32	8	50.00	400.00	Violations boating regulations
50 CFR 27.34	1	100.00	100.00	Overlimit, trout
TOTALS	13		\$700.00	

As an update to the over 200 citations issued to 147 individuals during July, 1978, no prosecutions were made. The citation was 50 CFR 27.32 (a), unauthorized boating in defiance of a court ordered injunction. Reason given on the 147 disposition reports was "On December 21, 1978, U.S. Attorney M. Brown, IV of Las Vegas, NV declined prosecution of case due to lack of prosecutable merits and jury appeal. Apprehension made during the time in which a federal injunction was in effect." Such is life in the swamp.

VI. OTHER ITEMS

A. Field Investigations

We have evidence that Ruby Marsh is not as productive as other marshes. The canvasbacks and redheads are laying fewer eggs and raising smaller broods. We have hypothesized that the macroinvertebrate food supply may be low as a result of predation by fish. Since there are no forage

fish in the marsh the fish must feed on macroinvertebrates. The bass are stunted and overpopulated and are probably competing with waterfowl for macroinvertebrates.

The Northern Prairie Wildlife Research Center is coordinating several field studies to determine if the marsh is under-productive and needs a drawdown and if there is competition between fish and waterfowl for macroinvertebrates.

Three portions of this study will be contracted out to a Cooperative Wildlife Research Unit. These studies will be feeding ecology of waterfowl, feeding ecology of bass and trout and floral and faunal distribution and abundance. These will begin in 1980.

The refuge staff is monitoring productivity of diving ducks as part of this study. This portion of the study began in 1977 to determine the effects of boating on canvasback and redhead production. It was continued in 1978 and in 1979. Its objectives encompass other factors affecting productivity, such as food supply. This study involves breeding pair populations, and brood counts, nest location, trapping hens on the nest, measuring the growth rate of ducklings, banding and nasal saddling hens.



As part of the study monitoring productivity in diving ducks, this female redhead was fitted with a nasal saddle in August 1979. MDS 8/79

The refuge conducted an additional study entitled "The Effects of Recreation on Wildlife Production at Ruby Lake NWR." This study was ordered by someone in Washington, D.C. The objectives of this directive were rather vague so we did not receive much guidance from them. We were not prepared to handle this project and had little warning. We received the funds (\$15,000) about the 10th of June after the peak hatch of canvasbacks and redheads.

We had to hire an additional biotech, prepare a study plan, order additional equipment, and apply for color-marking authorization. Most of the equipment and permits arrived too late to be of any use in the 1979 field season. We could have done a much better job and obtained better information with several months advance notice. The major benefit of these funds is, it allowed us to purchase equipment we could not otherwise afford. This equipment will enable us to gather better information in the next few years.

B. Cooperative Programs

1. Young Adult Conservation Corps

The Young Adult Conservation Corps (YACC) program slowed down in 1979. There were five enrollees on board January through March, four enrollees in April and one enrollee from May to October. The hiring freeze imposed on YACC prevented hiring additional enrollees for several months. In November Ruby Lake was given approval for three YACC positions. Jim Klingensmith was hired November 19th for maintenance help and Suzanne Duval was hired December 10 for clerical assistance. The remaining position has not been filled.

YACC group leader Perry Johnson transferred to Trout Lake, Washington where he accepted a YACC leader position with the U.S. Forest Service on July 7, 1979. His position will not be refilled.

Projects accomplished with YACC enrollee manpower were litter pick-up, cattleguard maintenance and installation, waterfowl banding, wildlife populations projects, facility maintenance, range fence construction and maintenance, flood control, clerical help, and vehicle maintenance. Enrollees also provided assistance to the Department of Wildlife at the Gallagher Fish Hatchery with fish planting and feeding.

2. Other Consumptive Programs

The Gallagher Fish Hatchery, operated by the Nevada Division of Wildlife is located on refuge grounds through a long-term agreement. It was primarily a hatching and rearing station but \$700,000 in modifications were made in 1979 to establish capability of raising and maintaining brood stock.

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

We held our second annual Christmas Bird Count. We only had two refuge employees as observers last year. This year we were fortunate

to have the assistance of five Bureau of Land Management and one Nevada Department of Wildlife employee on the bird count. We saw about 1,100 individuals of 46 species. We have an introduced species of grouse, the Himalayan snow partridge in the Ruby Mountains. The species exists nowhere else in North America. It lives above the timberline on the crest of the Rubies. There is a small population in the count circle, and we tried to find them. Two people climbed for 7 hours to the crest of the Rubies, but were unable to find them. They experienced difficulties descending and spent 3 hours walking in the dark before they were picked up along the road. They did not find any snow partridges, but counted 9 blue grouse which stands a good chance of being high count in North America. Next year we decided that the snow partridge team will camp out near the top the day before the count and they will be equipped with crampons, ice axes and portable radios.

3. Visitors

Jerome Serie of the Northern Prairie Wildlife Research Center in North Dakota and Chuck Meslow Cooperative Unit Leader at Oregon State University, and Bob Jarvis from the Department of Wildlife at Oregon State University visited the refuge in September to plan and coordinate the nesting study.

Chuck Henny from Patuxent Wildlife Research Center Field Station in Corvallis, Oregon visited the refuge several times during the summer to study the pesticide levels in black-crowned night heron eggs.

Visitors from other refuges included Glen Elison from Fish Springs NWR, Dave Stanbrough and Jim Stack from Pahrangat NWR, and Gerry and Nancy Deutcher from Bear Lake NWR.

C. Items of Interest

1. Personnel Changes

Refuge manager Forrest Cameron transferred to Ruby Lake NWR on June 3, 1979 from Tewaukon NWR in Cayuga, North Dakota. Assistant manager Michael Spanel transferred to the U.S. Forest Service, Shawnee National Forest in Harrisburg, Illinois on December 15, 1979. Jonny "Trapper" Lemback joined Ruby Lake staff as a laborer on December 3, 1979. Trapper had previously worked at the refuge as a YACC enrollee. YACC group leader Perry Johnson transferred to the U.S. Forest Service in Trout Lake, Washington on July 7, 1979.

2. Training

Assistant manager Michael Spanel attended Federal Law Enforcement Training in Glynco, Georgia from January 14, 1979 to February 9, 1979. Mike then attended Refuge Manager training in Beckley, West Virginia from February 12, 1979 through March 18, 1979. Clerk Niki McQueary attended secretarial training in Portland, January 17-18, 1979.

D. Safety

Safety meetings were held monthly. Consecutive lost-time accident-free days increased to 8766 days this year. However, we did have a few minor accidents, cuts and mashed fingers, this year.

The new boating regulations have reduced safety hazards to the public. The 10 horsepower motor restriction reduces the danger of collisions and swampings in the narrow channels. The prohibition of waterskiing eliminates the danger caused by spills in shallow water. There are still some dangers to careless boaters. Strong spring storms can come up suddenly and prevent people in motorless boats from returning to safety. No one was caught in 1979, but in 1978 we rescued 4 people caught in a June blizzard; one of the people was in the early stages of hypothermia. Often people tend to stay in the marsh too late at night when the fishing is best and become lost. The temperatures usually drop 30-40⁰ F. during the night and if people are not dressed well they can be susceptible to hypothermia. We rescued one group in 1979, who got lost at night and heard of several other groups that did not return to the landing until 2:00 am because they fished too late in the evening.

E. Credits

Forrest Cameron: I-(D), V-(C)

Steve Bouffard: I-(A,B,C,) II, III, IV, V-(A,B), VI-(A,B,C,D)

Niki McQueary: VI-(B,C,) & Typing