

WEATHER CONDITIONS

	<u>Snowfall</u>	<u>Rainfall</u>	<u>Max.</u> <u>Temp.</u>	<u>Min.</u> <u>Temp.</u>
August		.02	100	36
September		1.11	83	26
October	trace	.98 1.01	80	20

The period during August, September and October was unusually dry. The total percipitation for this period was less then 1.20 inches.

The high evening winds recorded for the last two weeks of July abated early in August. This same southwest wind has freshened up since August 17 th but intermittedly and with less intensity.

As a result of the prolonged dry spell the water level of the lake has dropped about 25% below that of last year at the same period. Although during the month of October the ponds in the center of the lake showed signs of filling, the north end ponds were still absolutely dry and the water level of the ponds in the south end was still dropping.

With the rainy season here and the increased humidity we expect a general increase in the water level over the entire lake area.

WILDLIFE

Waterbirds

The unusual dry spell through the summer and fall period of 1940 had a definite effect upon the local concentrations of the various species of waterfowl on the refuge. The dabbling ducks, which normally occupied the large shallow ponds in the north and south ends of the refuge and the shallow ponds spotted along the west border were forced deeper into the lake area. A small percentage of the dabbling ducks moved up to the heads of the spring-fed creeks greatly increasing the normal population along these waterways. This was especially true for the mallards.

The shore birds did not seem to be affected in the least by the low water level. They could be seen feeding along the nearly dried ponds at any time of the day. On August 24 th concentrations of forty to fifty avocets were observed in several of the large ponds in the south end. These birds were standing in several inches of water directly in the center of ponds which had harbored thousands of dabblers twenty-four days earlier. At the time the avocets were observed the dabbling ducks had deserted the pond. No ducks have been seen on the same ponds since.

No nesting records were recorded during this period. However broods of mallard, gadwall, canvas-back, red-head, pin-tail, coot, grebe and cinnamon teal were observed and

recorded. This information is recorded with the notes on individual species.

The total estimated population of ducks on the refuge (Sept. 15 th to Oct. 15 th) at the highest peak was approximately 15,000 birds (exclusive of coots and grebes). There appears to have been but little change in the trend of population since the last date given. A slight increase may have occurred.

The mallard is the most numerous duck on the refuge. There is an estimated 3,500 of these birds distributed largely about the periphery of the lake area. Since the large ponds have dried (shallow north and south end ponds) these birds have swelled the population of the creeks on the west border of the refuge. Every small puddle, irrigation ditch and creek has its mallards. There has been practically no influx of mallards with the coming of fall. The birds mentioned have been residents throughout the summer. There have been twenty-eight distinct broods of mallard recorded for the refuge. These broods were located largely along the west border in small ponds and creeks. Several, however, were recorded from the larger ponds in the south end before the ponds had shrunk to the point that the ducks were forced to move. The broods in number ranged from four to nine with an average of six to the brood for a total of one hundred

and sixty-eight young mallards brought under observation.

The pin-tail like the mallard is a resident bird. A few of these birds, probably, have sifted in with the fall migration but for the most part the birds were here the entire summer. The pin-tails were found in high concentration in the large south end ponds. Very few observations were made of these birds in the western border creeks along with the mallards. Twenty broods were recorded in the early part of August with young ranging from four to seven per brood or 100 young pin-tail to be observed.

There were practically no redheads here before September. On several occasions a single bird was observed but no concentration worth noting. Two broods were recorded for August each with three young for a total of six young redheads observed. On September the twenty-sixth a total of eight-hundred redheads were observed in several ponds in the south central portion of the lake. This was the first large concentration noted. From this point to date they have built up to an estimated population of 2,000 birds.

The gadwall has been observed on the refuge in small groups throughout the summer. However, there has been an approximate 50% increase in their number since the middle of September bringing their total population to an estimated 1,500 birds. During the early part of August seven broods of gadwall were recorded. The broods ranged from five to

seven in number with an average of six for a total of forty-two young gadwalls observed. In the months of July and August the gadwall were scattered along the creeks and border ponds with the mallards and in the large shallow ponds in the south end with the pin-tails. With the influx of new birds in the early fall, large concentrations of these birds were observed along with the redhead and ruddy ducks in the south central portion of the lake. The population of this species along the border of the lake, however, did not diminish in number.

Although fairly large numbers of canvas-backs were observed in the spring, only a small remnant of scattered individuals could be found during the late summer. Two broods were located early in August with three young in each brood making a total of six young canvas-back seen. Toward the last of August and the early part of September the canvas-back began to come under observation with increasing frequency and in increasing numbers. The present estimation is approximately 1,500 birds with an increase still evident. These birds are never observed along the west border or shallow north and south end ponds. All observations on them have been made on the east and south-east area of the lake in the deepest and most secluded ponds.

It is very probable that the moulting redheads and canvas-backs were present but escaped observation. Both of these birds inhabit the deepest and most secluded ponds on

the refuge where the vegetation forms excellent protection against any observations. This would be especially true for moulting birds which are in hiding a good portion of the moulting season and at a point where vegetation is so abundant as to make even pond observations difficult.

The baldpate although fairly well represented throughout the entire summer began to appear in numbers, according to observations, on August 19 th. On August 24 th three hundred birds were observed on the east side of the lake directly across from the refuge headquarters. Groups ranging from twenty-five to one-hundred could be observed on the spring fed ponds along the west border of the refuge at any time following the 1 st of September. A total population of 1,200 birds was estimated. No young of the baldpate were positively identified although a brood of six birds was located that appeared to be young baldpates.

Cinnamon teal were present upon the area the entire summer. No indication of increase was found during the fall migration, the population remaining at an approximate 1,000 birds. The birds in small groups were noted mainly along the shallow border ponds with the highest population concentrated in the north-west area of the refuge. Twelve broods of young were positively identified. Of the twelve identifications the broods ranged from three to seven birds with an average of six and a total population of seventy-two young cinnamon teal noted.

Since examination of broods did not begin until the birds were half grown it is impossible to give the nest, clutch and young bird mortality. However as observations continued it became evident that approximately 35% of the normal brood, of all species observed, was missing. This does not appear to be excessively high in spite of the dry season. However, we did note that mortality continued at a rate greater than normal after the birds were half grown. This we contribute to the drying up of ponds and the resulting influx of coyotes coming to pick up the now available old moulting and immature birds.

No observations were made on green-winged teal until August 17 th. At that date several hundred were observed on the east side of the refuge at the south end. It is probable the green-winged teal were here earlier but escaped observation until that date. On August 26 th two flocks totaling over four hundred birds were seen feeding on a nearly dried pond in the south-east section of the lake area. They seemed to favor the nearly dried ponds where the aquatic vegetation was protruding above the water in great masses. To date there is an estimated 1,000 green-winged teal on the lake.

A few ruddy ducks were spotted on the lake throughout the summer but not until August 24 th were they in noticeable concentration. At this date several small flocks totaling fifty birds were located in one of the shallow ponds in the

south-east section of the lake area. On September 26 th several hundred were observed mixed among a flock of redheads. To date we have an estimated 500 birds. No young were recorded.

The first record for the lesser scaup duck was made on August 28 th. On this date 12 birds, probably non-nesting were observed on ^a spring fed pond along the west border of the refuge one mile north of the refuge headquarters. We have approximately 200 of these birds on the refuge to date with a probable increase with the coming month of November. No broods were recorded.

There are an estimated 100 mergansers (american) on the refuge. No concentrations of these birds have been observed in the last three months. Moulting individuals were observed as late as August 26 th scattered throughout the shallow semi-dried ponds. These birds when chased were unable to raise their body free of the water. No young of the merganser duck was recorded.

Coots dot the waters of every interior and border pond on the refuge. The highest concentration can be found in the large and small interior ponds which are more isolated than the border ponds and better protected by vegetation. The total population of coots for the refuge ranges at about 4,000 birds with approximately 80% of this number being concentrated in the south end. Thirty-two broods of these birds

were recorded for August with young numbering from one to three per brood. The average per brood was two birds for a total of 64 young coots observed.

Grebes, both western and pied-billed were observed throughout this period. We have a total estimated population of 1,000 grebes. Eighty per-cent of this total is made up of the pied-billed with the balance being the western grebe. No eared grebes were recorded. There were no positive identifications of young of either species.

As early as August 3 rd we recorded 625 canada geese on the refuge. The increase has been slow but steady to date with a counted population of 800 birds at this point. This entire number, but for a small percentage which is scattered along the west border on the south half of the refuge, is concentrated in the south-east area of the lake region and refuge proper.

Two records were made on the shoveller duck. One on the 28 th of August and two birds on the 26 th of September.

Observations during the period of August, September and October were made on waterbirds other than duck. Among this group was the white pelican, white-faced glossy ibis, great blue heron, Brewster's egret, black-crowned night heron, american bittern, killdeer, Wilson's snipe, long-billed curlew, western willet, spotted sandpiper, western dowitcher, Wilson's phalarope, northern phalarope, avocet and sandhill crane.

Of the shore birds in this group, including the killdeer, Wilson's snipe, long-billed curlew, western willet, spotted sandpiper, western dowitcher, Wilson's phalarope, northern phalarope, and avocet, there is a population of between four and five thousand birds. The only records on these birds since September 20 th were made from observations on the killdeer, Wilson's snipe and avocet. Of this group the avocet was most conspicuous although not the most numerous. The remainder (shore birds) migrated from the refuge before the 20 th for the greater part. Probably some stragglers are still about the refuge but have escaped observation.

We have only one record for the white pelican. That was made on August 26 th when a flock of eight birds were observed flying over a pond on the east side of the refuge just south of headquarters.

The white-faced glossy ibis was present in numbers throughout the season. Flocks as high as twenty-five were observed on occasions ranging the entire length of the lake area. The majority of ibis, some 300 by count, were located along the east border with the greatest number concentrated in the southern half of the refuge. The last record for this bird was September 5 th.

Brewster's egret about 800 in number were found in the same area the white-faced glossy ibis was inhabiting. The last observation made on the egret was September 10 th.

Individual great blue herons were observed frequently over the entire refuge. However, by count we have but thirty of these birds on the area. The last observation on the heron was made September 10 th.

The last record for the sandhill crane was made October 14 th, however, we suspect that several of these cranes were present on the refuge after that date (descriptions furnished by people not too familiar with the sandhill crane). There were at least 150 of these cranes on the refuge before migration.

The american bittern and black-crowned night heron were both residents of the refuge the entire summer. Although we have no evidence that the herons nested here we are quite sure through observations of the young birds that the american bittern did. The last record for the black-crowned night heron was September 12 th, for the american bittern October 25 th.

Upland game birds

The only systematic observations carried on among the upland game birds were those on the sage grouse. Casual observations were made on the mourning dove and dusky grouse, although the latter was not observed on the refuge proper. No quail were observed, either mountain or valley, in the period covered by this report.

The sage grouse (*centrocercus urophasianus*) is by far the most important upland game bird on the refuge. This bird is present on the refuge the entire year. Because of its apparent increase in abundance an effort was made to census this bird

on the refuge property. This census was carried out between August 15 th and September 15 th when the flocks were fairly well together and the young birds nearly full grown. It was believed the males would be with the rest of the individuals by this time of year, yet the flocks would still be operating as separate units and not grouping as often occurs later in the season. An attempt was made during this period to establish every flock, the number in the flock and the approximate range of this group of birds so as not to confuse two flocks. The final result of the census is as follows: forty-seven flocks of sage hen were located on the refuge. These flocks ranged in number from eight to twenty-seven birds with an average of 13.7 birds per flock. The total number of birds on this basis, that are located on the refuge, would be 642. This number although slightly higher than previous estimations is deemed fairly accurate. The flocks for the most part were seen about springs, creeks and watering holes. The ranges often overlapping causing confusion at times in censusing. The birds apparently ranged from the foot hills to the refuge proper at will, walking down and feeding in the early morning, spending the entire day on the refuge about the water, and flying back to the foot hills in short stages in the late afternoon. Some of the birds apparently never moved off of the refuge although we have no accurate count as to the actual number. None of the flocks were located adjacent to the lake proper. The sage grouse apparently preferred the higher and

drier ground at the periphery of the refuge proper. The greatest concentration of birds was found along the west border of the refuge. Only 12 flocks were recorded for the east side. The majority of the birds were found south of the headquarters although there was a fairly even flock distribution along the entire east side.

Mourning doves were scattered generally over the entire refuge. The highest local concentration of doves was found on the west side of the refuge over an area of three miles from the refuge headquarters south. The doves were observed flocking by September 5 th the majority leaving between September 20 th and 30 th. Individuals, however, were recorded as late as October 24 th on the refuge.

There were no dusky grouse observed on the refuge. Of late the grouse have been moving down from their high summer habitats and a number have been recorded in the foot hills of the Ruby Mountain Range several hundred yards from the refuge boundary.

Big-game animals

The only big game animal that occurs on the refuge, and then only as a visitor, is the mule deer. We have surprised deer in the early morning and evening consistently along the west border of the refuge. In correlating our findings we discovered nine places in particular where deer can be seen most any morning over the entire period. During the early

part of this period there were but 15 to 20 visitors. However since the deer have been moving south through the mountains the number of regular visitors has increased to about 40 deer. These deer apparently are coming from the foothills for water and possibly some grazing.

Fur bearing animals and predators

There were several reports during the month of September and October that mountain lions were seen on the refuge just south of headquarters. Although some of these sources are reliable we have no more definite evidence of the whereabouts of the big cats. Fresh sign, however, has been found directly above and west of the refuge in the Ruby Mountain foothills.

Limited direct control work has been undertaken against the coyote during the last two months. Tracks of these predators are common about the duck ponds. Several kills (duck) have been found that point strongly to this predator. To date four coyotes have been taken in traps. All coyotes were in the traps several days (2-3) before removal precluding stomach analysis.

Although the marsh hawk is not considered a game predator several interesting observations at points about the lake proper were recorded for this predator. Both of these instances were between the hawk and the coot. The first observation was made directly across the lake from headquarters in a coot inhabited border pond on the east side of the refuge.

A marsh hawk was seen circling over and diving at a group of coots along the border of the pond. It appeared to the observer as if the hawk was attempting to drive the coots into the vegetation so as to make an attack on dry ground. It apparently was successful in doing this for it dove into the vegetation and out of the observers sight. The observer, after wading the pond, reached this point and flushed the hawk. On examining the point of flushing a coot was found. The coot was suffering from fresh punctures on the head and neck region undoubtedly made by the sharp talons of the hawk. The coot was released after examination and appeared dazed swimming about in circles for several minutes. Later it seemed to gain some strength and swam across the pond to join the other birds. In the other observation the hawk went through the same maneuvers but was unsuccessful in driving the coots out of the water.

The coots paying absolutely no attention to the rushes of the flyer.

Muskrats are fairly abundant on the refuge. Feeding indications have become somewhat more evident of late. No census has been carried on.

Jackrabbits and cotton-tails are abundant over the whole of the refuge with the exception of the marsh area.

Fish

On September 18 th thirty trout varying from three to thirteen inches were removed from a stream draining one of the

several ponds at the fish hatchery. The pond was lowered, to permit the construction of a central structure, thus partially drying up the outlet stream from which the trout were removed. These fish were planted in streams at the south end of the refuge already inhabited by the same species of trout.

PHYSICAL DEVELOPMENT

Major work projects carried on through the CCC Camp on the refuge included the partial construction of a type 10 service building, water structures and a truck trail to be used as a winter outlet for the refuge and CCC Camp.

Progress was made on the service building and it is planned to occupy office quarters therein shortly after Thanksgiving Day. Two large water structures have been partially completed in unit one near Cave Creek. Excellent progress has been made in the construction of a truck trail leading from the refuge 34 miles north to the highway running into Wells, Nevada. This trail is located on the east side of Ruby Valley where the snowfall is much lighter and where drifting snow is not so much of a hazard as on the west side of the Valley along the present County road. It is thought that, barring a breakdown of the equipment, this new road will be in fair shape by December 1.

Plantings

The 30-acre patch of barley put in last spring was taken over by the Canada geese shortly after it matured in September. The entire patch was left in the field and from 50 to 100 of these birds occupied the field morning and night until about October 21.

Ten pounds of wild celery seed was received September 30 for experimental plantings on the refuge. One quarter pound of this seed was immediately planted in a pool formed by a flowing spring one mile south of headquarters. The seed pods were encased in clay and dropped in about two feet of water on a mucky

bottom. It was apparent that the seed pods if thrown in the water by themselves would float; for that reason it was thought that while the seed appeared to be mature some sort of after-ripening process was necessary to secure good germination. The remainder of the seed was, therefore, placed in a shallow metal container and water from Cave Creek was run through in a slow trickle at a temperature of about 45 degrees F. This seed was subject to freezing temperatures at night and it was otherwise concluded that we simulated natural conditions under which the seed would have remained had it not been harvested. This, of course, with the exception that the chemical content of the water in Cave Creek is no doubt different from that in which the seed pods were grown. Cave Creek is known to have a PH of about 8 and an oxygen content of 8.3 parts per million; full exposure to sunlight was provided for.

As a result of this treatment, thirty percent of the seed had sunk to the bottom of the container by October 24, and by November 5, eighty percent. A random sample will be taken from the seed for germination test and the remainder planted in at least two different sites about November 15.

Violations

For the first time since the refuge was established in 1938 two violations occurred on mule deer near the west side of the refuge. The cases were taken to State Court at Elko, Nevada.

<u>Violator</u>	<u>Offense</u>	<u>Disposition</u>
O. V. Deming	Killing three deer.	Fined \$50; 30 days jail.
M. O. Wright	Killing doe and fawn.	Fined \$50.

Economic Uses

Two special use permits were issued covering the grazing of cattle along the west side of the refuge effective August 1. Approximately 750 head were turned in at that time. The lands north of Cave Creek on the west side of the Lake carried 200 head from August 1 to October 1. The corresponding acreage south of Cave Creek supported 550 head from August 1 to October 1; 350 head were allowed to remain at that time and will be carried there until about the first of the year without supplementary feeding.

The price of pasture was raised ten cents over last year and an effort was made to secure greater utilization, particularly on tract 5 south of Cave Creek. This was by reason of the fact that after the grazing season of 1939 a considerable amount of dead grass remained creating a fire hazard during the summer of 1940. It appears that this year we will have a much more desirable condition in the fields grazed, for revenue was increased, more feed was utilized, and sufficient cover has been left for early nesting waterfowl next spring.