Narrative Report Routing Slip

Mr. Salyer ______ ~~Mr. Ackerknecht~~ WG ______

Mr. Crawford ______

Administrative Services

Miss Baum ______

Operations

Mr. Fermenich ______ Mr. Regan ______

Public Use

Mr. DuMont ______ Mr. Kubichek ______

~~Mr. Stollberg~~ BF ______

Resource Management

Dr. Morley ______ Mr. Hickok ______

Wildlife Management

Mr. Banko B ______ Mr. Stiles ______

Mr. Goldman ______

Refuge TULE LAKE, LOWER KLAMATH, CLEAR LAKE, UPPER KLAMATH & KLAMATH FOREST

Period Jan. - Apr. 1961

NARRATIVE REPORT

January - April 1961

TULE LAKE, LOWER KLAMATH, CLEAR LAKE,
UPPER KLAMATH AND KLAMATH FOREST
NATIONAL WILDLIFE REFUGES
CALIFORNIA AND OREGON

* * *

PERSONNEL

Robert F. Russell, Refuge Manager
Lynn C. Howard, Refuge Manager
Robert M. Abney, Wildlife Management Biologist
Burton W. DeGraw, Administrative Assistant
Pauline R. Chapman, Clerk-Typist
James MacFarlane, Clerk-Stenographer
Blake F. Chapman, Shop Foreman
Earl M. Irvine, Jr., Heavy Duty Mechanic
Vernon R. Blank, Truck Driver (Truck-Trailer)
Richard R. Wiedemer, Building Repairman
Henry Christensen, Construction & Maintenance Foreman
S. Virgil Cobb, Dragline Operator
Joe Fabianek, Dragline Operator
Peter A. Davies, Maintenanceman
Edward R. Downing, Maintenanceman
Ralph W. Swisher, Maintenanceman
Ivan L. Morfitt, Caretaker
Raymond H. Hanson, Maintenanceman WAE
Khlar Heaton, Maintenanceman WAE
Roland M. Shults, Maintenanceman WAE
Samuel D. Merriman, Oiler WAE

SPECIAL DETAIL

Jean F. Branson, Refuge Management Staff Officer

TL

CONTENTS

Tule Lake National Wildlife Refuge
January-April 1961

I GENERAL

A. Weather Conditions

	Precipitation			Temperature	
	Snowfall	This Month	Normal	Max. Temp.	Min. Temp.
January	.80	.33	.98	60	5
February	4.20	1.57	1.06	55	27
March	8.50	.71	.82	65	32
April	1.75	.14	1.04	75	9
Total	15.25	2.75	3.90		
			Extremes	75	5

Weather data was obtained from the weather station at Tulelake, California, except for the record of snowfall which was not recorded at Tulelake and which was secured from the U.S. Weather Bureau Station at Klamath Falls, Oregon.

While the Klamath Falls U.S. Weather Bureau Station is centrally located with respect to the five basin refuges, snowfall recorded is light for the Upper Klamath and Klamath Forest Refuges and, conversely, heavy for the Tule Lake, Lower Klamath and Clear Lake Refuges. It is however, the best presently available. The Klamath Falls Herald and News recently reported the U.S. Weather Bureau is giving consideration to a weather station on Klamath Marsh (Klamath Forest Refuge).

Precipitation was sub-normal every month of the period except February. Farming progressed rapidly in April since little moisture fell and farmers experienced no difficulty getting in the fields. Both March and April were extremely windy. Duststorms as bad or worse than any I have experienced in North Dakota were common. One exceptionally strong south

wind caused minor damage to buildings in the locality and levelled a considerable stretch of telephone poles along the East-West road to Tulelake. The California-Oregon Power Company spent a long anxious day bracing power poles on the East-West road against the screeching wind. When the wind died and the dust settled, the poles were strangly canted to the north!

The lack of precipitation in April and the reoccurring, strong winds which sapped the ground moisture have many farmers apprehensive that, dispite pre-irrigation, they will be unable to get their crops up. Some have already had their seed blown out and have replanted.

B. Habitat Conditions

1. Water

There has been some improvement in the over-all run-off picture compared with earlier reports. Upper Klamath Lake benefitted from heavy increases in the snowpack in March. Stored water in Upper Klamath Lake is now 104 percent of the 1943-57 average. While Clear Lake and Gerber reservoirs filled appreciably, they were still 43 percent and 35 percent of average respectively.

The Tule Lake sump water level was higher and more favorable during most of the period this year than last. The Tulelake Irrigation District chose to discontinue pumping at Plant "D" January 9 with the sump at elevation 4033.90'. The Rules and Regulations governing the management of the sump (a part of the contract between Tulelake Irrigation District and the United States) permit a winter drawdown to 4033.50' and we had anticipated that the District would evacuate to that level. The sump rose slowly until early February when run-off and inflow increased and the rise accelerated. The rise continued until February 27 at which time the elevation was 4034.42', and we were looking forward to having the sump at the 4034.45' Objective Level on April 1. Our optimism was short-lived; on February 27 the District again began pumping and continued through March 6. This removed 2,149 acre feet from the sump and brought it down to 4034.22'. The Bureau of Reclamation, which is charged with policing the District's water management and ascertaining that its operations conform to the contract, informed us that this pumping was permissible for flood control under the guidelines outlined in the Rules and Regulations.

Irrigation releases beginning in early March continued to draw down the sump until it reached a low of 4033.60 in late March and early April. As irrigation demands from sump water declined and upstream return flow increased, the sump again began to rise and by May 1 had attained 4034.16'. In 1960 the sump stood at 4033.86 on May 1 and did not reach objective level until May 24.

2. Food and Cover

Waterfowl food on the refuge was inadequate for spring migrants, particularly during March and early April. Most of the waterfowl feeding flights were to privately owned farm lands in the basin. The Southwest Sump and headquarters fields were principal feeding areas on the refuge.

Waterfowl, which usually concentrate on the refuge sumps for resting, were repeatedly "blown off" by high winds which prevailed during most of the period. Low water levels which exposed much of the marsh area, greatly reduced these areas of protective cover.

Crop seedings on the dikes were showing green by about April 15, and field seedings by April 20. While both field and dike grain seedings provide much needed graze for the resident honkers, the seeded dikes provide no nesting cover for honkers nor dabbling ducks.

Grass seedings made on the headquarters and Hotel Rock dikes this spring will, if successful, provide some good cover. Additional seedings this fall are needed.

Considerable difficulty has been experienced in establishing dike cover. Lack of moisture is a factor limiting survival of spring seedings. Fall and winter plantings are recommended when possible; otherwise, watering by sprinkler system is a necessity. The "old" flood type irrigation has hampered the establishment of dike seedings. It is believed that the controlled irrigation now being adopted will provide better opportunities for establishing permanent cover.

II WILDLIFE

A. Migratory Birds

The 10 million waterfowl use days this spring are little more than half of last springs record peak, but compare favorably with the 5-year average--not quite 2 million less. This reduced usage is distributed through all waterfowl groups, except Canada geese which show an increase over both last year and the 5-year average.

The decrease in Whisting swan use on Tule Lake was drastic this spring, but Lower Klamath was average.

Comparative waterfowl use days are presented in the following table.

January-April Waterfowl Use Days on Tule Lake Refuge
Group Comparisons of This Year With Last Year and 5-yr. Average

Group	1956-60 Average	1961	1960
Swans	298,600	27,500	303,700
Geese (Canada ssp.)	82,100	129,500	110,800
Other Geese	3,380,300	4,970,350	4,656,500
Dabbling Ducks	3,760,600	2,386,650	7,677,800
Diving Ducks	2,844,400	1,557,500	3,336,800
Coots	1,164,000	746,200	1,243,500
Total Waterfowl	11,530,000	9,817,700	17,329,100*

* Record peak spring use

Extremely high velocity winds which prevailed this spring is the major local factor which caused the decreased waterfowl usage. The birds were literally blown off the sumps; and during the peak migration in early March, water levels were too low in the marsh areas to afford adequate protective cover.

Spring populations are considered to be northern migrants, except the honkers which are nesting. However, by the close of the period breeding populations of early nesting mallards, pintails, and gadwalls were building up.

Breeding pairs of honkers were estimated at 220 this spring, about 20 pairs more than last year. The first brood was seen April 3, compared with April 11 a year ago. At the close of the period 65 broods had been counted this year, 50 last spring. The prospects are presently good for producing more than a thousand honkers, providing The Grand Architect and Tulelake Irrigation District are not too unkind.

It is interesting to study the comparative trend of duck and goose usage on Tule Lake and Lower Klamath Refuges. This picture is presented in the following two graphs by plotting the data recorded since 1952.

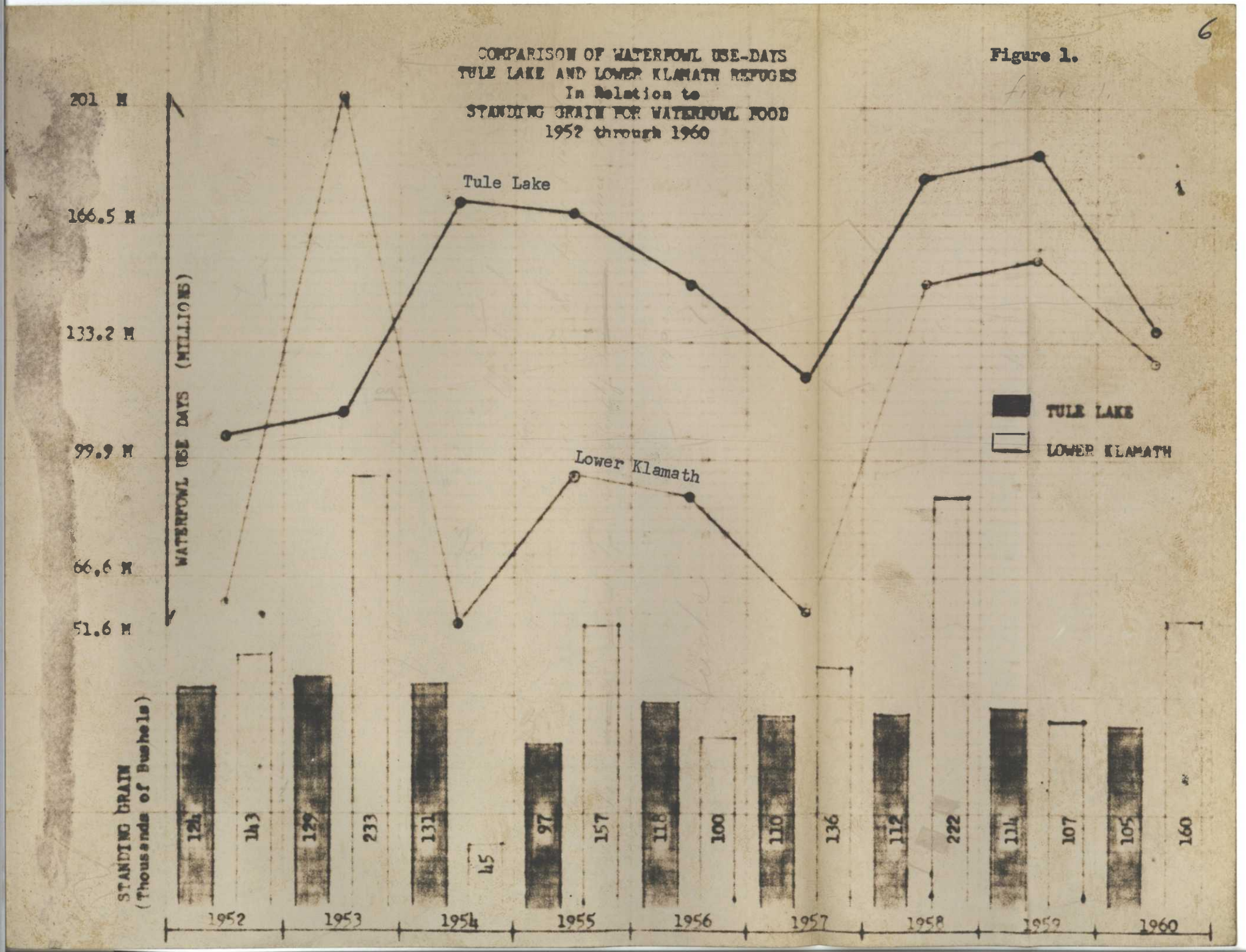
Some of the salient features are:

1. Figure 1 shows an increase in the trend of total waterfowl use (including swans and coots) on both Tule Lake and Lower Klamath, with the greatest increase on Lower Klamath.

2. Figure 1 indicates a correlation of available food to increased use on Lower Klamath; Figure 2 distinguishes this correlation between ducks and geese. The year 1953 is especially significant.

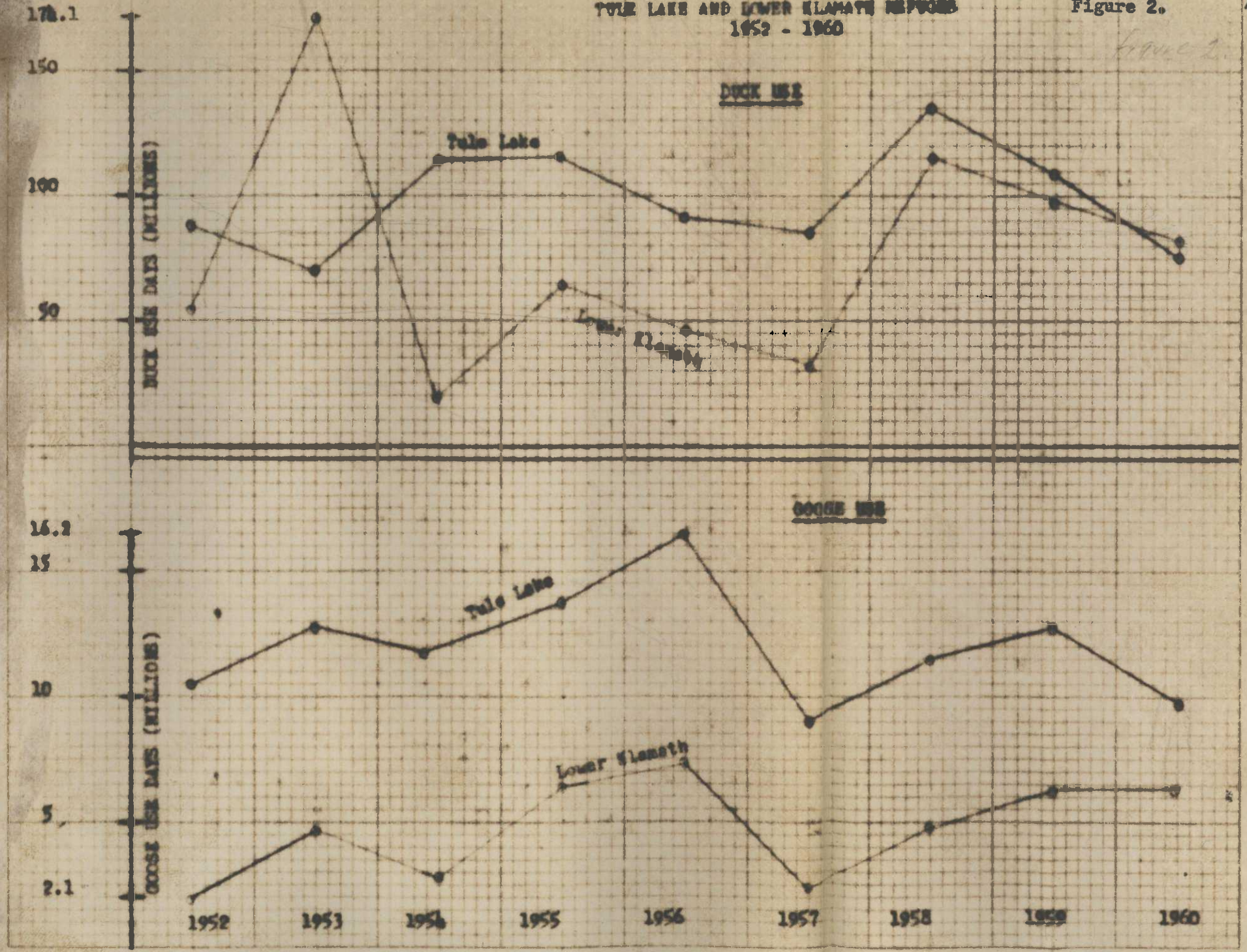
3. Figure 2 shows that usage by both ducks and geese on Tule Lake is essentially the same in 1960 as it was in 1952, while use by both ducks and geese has increased on Lower Klamath. This is readily apparent on the duck graph; note how the Lower Klamath use day line has climbed toward the Tule Lake line and finally crossed it in 1960. The proportion of total duck use days (Tule Lake and Lower Klamath use days) occurring on Lower Klamath has increased fairly consistently since 1952. This trend is not so apparent for goose use days.

Figure 1.


COMPARISON OF WATERFOWL USE-DAYS
TULE LAKE AND LOWER KLAMATH REFUGES
In Relation to
STANDING GRAIN FOR WATERFOWL FOOD
1952 through 1960
201 M
166.5 M
133.2 M
99.9 M
66.6 M
51.6 M
WATERFOWL USE DAYS (MILLIONS)
Tule Lake
Lower Klamath
TULE LAKE
LOWER KLAMATH
STANDING GRAIN
(Thousands of Bushels)
124
143
129
233
131
45
97
157
118
100
110
136
112
222
114
107
105
160
1952
1953
1954
1955
1956
1957
1958
1959
1960

COMPARISON OF DUCK AND GOOSE USE DAYS
TULE LAKE AND LOWER KLAMATH REFUGES
1952 - 1960

Figure 2.



Detailed observations of other migratory birds are presented on NR-1A. Decreases are noted in several species, especially the pelicans, egrets and black-crowned night herons. This may be the result of pesticide losses last spring. No losses have yet been detected this spring.

Observations this spring show about half the number of nesting pairs of egrets and black-crowned night herons as was recorded in the 1959 survey.

Arrival of doves in mid-April is two weeks earlier than last year, and mating calls were commonly heard by April 23 this season.

B. Upland Game Birds

The pheasant population is estimated to be 2,500, which is 500 below last spring. The hunting harvest was greater than the preceding season, and the winter was more severe with one snow measuring 20" on the level. However, the population is well balanced for production with 20% roosters. The cocks are engaged in seasonal fighting and collecting their harems averaging 4 hens.

Estimated populations of valley quail and chukars of 600 and 2,000 respectively are just slightly below last springs populations.

C. Big Game Animals

Occasional observations of 30-40 mule deer along the Hill Road are about the same as last year.

D. Fur Animals, Predators, Rodents, and other Mammals

The pre and post-season estimates of muskrat populations of 14,000 and 6,000 are 1,000 higher than last year. This year 5,692 rats were pelted compared to 3,231 last season.

While low water levels in the marsh hampered trapping operations, conditions were better than last season.

Field mouse populations continued to hold at a low level. A mutual understanding prevails on this point with county agricultural officials, and additional cooperative field checks are planned with them.

E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies

Most of the eagles moved out with the duck concentration. We are cooperating with the Audubon Society on the Bald Eagle survey. Also Mr. Jim O'Donahue of Klamath Falls is cooperating on the nesting survey. Jim is an excellent and discreet observer, and has located several nests in the Upper Basin during the last two decades.

No unusual concentrations of hawks or owls were present as was the case during the 1957-58 mouse irruption. Refer to NR-1A for observation and population records.

F. Other Birds

No new observations this period.

G. Fish

No additional fish collections were made this period. No winter kill or other die-off was known to occur.

Copies of 6 analysis reports on tui chubs, Klamath dace, other forage fish and 1 crappie received from Denver Research Center are included in Section V. All the samples contained small quantities of DDD, Toxaphene, DDT and DDE.

H. Reptiles

No snakes have been observed this spring.

I. Disease

No unusual losses were known to have occurred this period.

Analysis reports from Denver on specimens collected last spring in connection with losses from pesticides are included in Section V.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

Quarters No. 1 was completely rewired after an inspection revealed several charred rafters in the attic where overheating of the overloaded, antiquated circuits had occurred. The headquarters office and shop both of which contained sub-standard wiring, were rewired to the extent of available funds. The COPCO power company was called in for its recommendations so that rewiring would conform to state regulations. The garage stalls between Quarters No. 1 and Quarters No. 2 were also rewired.

A new pump was installed in the domestic water system at Peninsula Sub-headquarters.

Tule Lake irrigation pump #2 was removed since the irrigation and drainage system for reserve Sump 2, being constructed by the Bureau of Reclamation, makes it obsolete.

Three CMP's were installed in north-south drains to provide crossings and access to the "B" buffer fields.

Shop Foreman Chapman fabricated a ridger for use in constructing field checks. ~~See photograph~~.

B. Plantings

1. Aquatics and Marsh Plants -None this period.

2. Trees and Shrubs -None this period.

3. Upland Herbaceous Plants

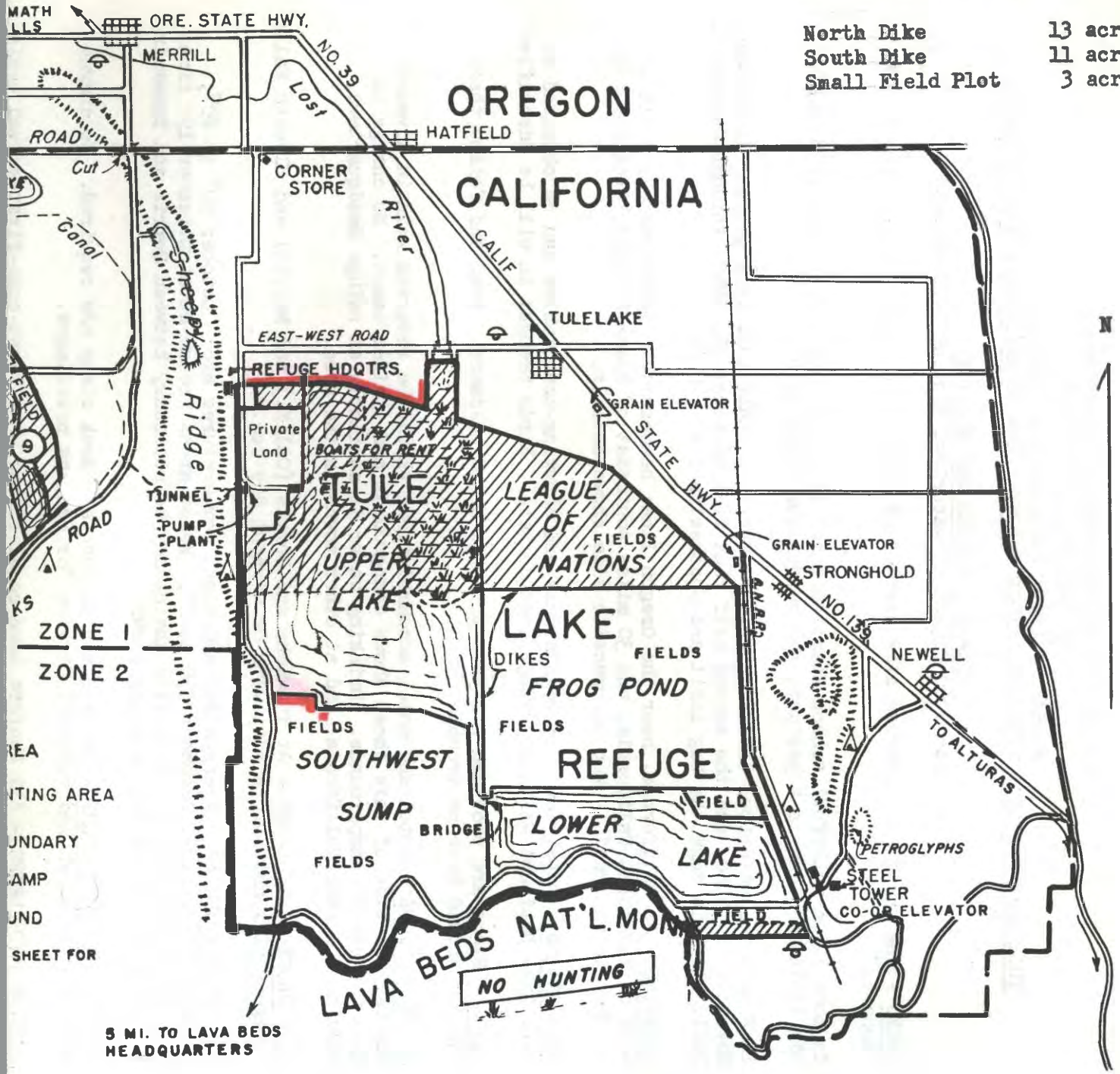
On February 20 and 21 approximately 27 acres of dike and berm were seeded to a mixture of grass seed consisting of 2 parts tall wheatgrass to 1 part Alta fescue. The seed was applied at the rate of 11 lbs. to the acre.

To date, germination has been practically nil, but recent rains may provide moisture for sprouting.

The following map shows the areas seeded and acreages involved.

Areas seeded to grass on February 20-21, 1961 //

North Dike	13 acres
South Dike	11 acres
Small Field Plot	3 acres



All unique information in the document is visible in this image.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
TULE LAKE NATIONAL WILDLIFE REFUGE - LOWER KLAMATH NATIONAL WILDLIFE REFUGE

GENERAL HUNTER INFORMATION
(See Also 1960 Digest of Waterfowl Hunting Regulations)

ZONES - The map on the reverse side carries as part of the inscription "Zone 1" and "Zone 2."

In Zone 1 the waterfowl season starts October 11, 1960, and closes January 8, 1961. Bag limit of ducks is 4 per day, and possession limit is 8.

In Zone 2 the waterfowl season is split. The first half runs from October 15 through November 20, 1960, and the second half runs from December 10, 1960, through January 8, 1961. In this zone the bag limit and possession limit is 6.

LOCATION - In California, near the Oregon line; headquarters approximately 6 miles west of Tulelake, California, and 30 miles southeast of Klamath Falls, Oregon - part of the Klamath Basin. Map on opposite side shows details.

INFORMATION - Maps, laws and regulations and shooting-hour tables can be obtained at Tule Lake National Wildlife Refuge Headquarters. Birds brought in will be identified.

SIGNS - Signs are provided for your protection and guidance. Read and follow these and you should have no trouble.

ACCOMMODATIONS - Hotel and motel accommodations should be reserved well in advance. The reverse side of this sheet shows campgrounds and trailer camps. No charge is made for use of campgrounds. Drinking water is available at Refuge Headquarters, also at Tulelake, California, and at other towns in the area.

DUCK PROCESSING PLANTS - At Tulelake and Dorris (Calif.) and Merrill and Klamath Falls (Oregon) pick and ship birds, with or without dry ice.

WEATHER CONDITIONS - Average day and night temperatures are: October 50° to 20°, November 40° to 10°, December 35° to 0°. Water areas freeze about November 15; first snow about December 2. Auto tire chains may be necessary between Dorris and Dunsmuir in California after the December snows.

LICENSE AND DUCK STAMP - Valid State license and duck stamp are required. No charge made by U. S. Fish and Wildlife Service for hunting privileges.

HUNTING PRIVILEGES - All hunters have equal rights on a first-come-first-served basis

4. Cultivated Crops

With the exception fo Fields A-1 and D-6, and to a lesser extent Fields D-1 thru D-5, major changes and development were necessary to convert from the system of irrigation requiring inundation of crop land to that involving spreading the water on the surface of the fields and removing the excess through deep drains. This is completely revolutionizing our farm program on Tule Lake. We estimate that it triples the cost of cropping the 2,500 acres of buffer fields, This first year it involved the construction of several miles of supply lateral to convey irrigation water to our buffer fields. Changeover to the new system was only partial as Bureau of Reclamation construction of irrigation facilities for the lease lands has not been completed. Our irrigation system, of necessity, ties in with Reclamation's. Since the new type of irrigation eliminated inundation of fields prior to planting, the soil is less saturated with moisture than formerly. As a result a second irrigation during the growing season is required. Conversion to the new system has not progressed to the point that our large buffer fields such as B-2, C-1 and C-2 have been broken up into smaller units so as to accomplish the in-season irrigation rapidly and avoid scalding the crop being irrigated. Consequently, we anticipate below average yields for these large fields unless rainfall is above average.

A total of 4 herding permits were issued. One was on lease lands in the refuge, three on private lands. Considering the thousands of geese in the basin and the new plantings of pasture lands, hay lands, and grain, it is amazing that additional complaints and requests for herding permits were not received. It behooves us to step up production of browse; as the basin farmers go in for more diversity of crops, depredations will increase,

C. Collections and Receipts

1. Seed or other Propagules -None this period.

2. Specimens

One specimen collection was made during this report period. Dr. Charles Yocom, Humboldt State College, had obtained a federal permit allowing him to possess and transport migratory waterfowl.

On February 27 we received a request from Dr. Yocom for one brood of Canada geese, preferably one week old or less. Dr. Yocom proposed to record growth rates, measurements of appendages (bill, feet, etc.), and record feather development.

On April 7 a brood of four honkers, approximately 7 days old, were captured, and Dr. Yocom arrived on April 9 to take possession and transport the birds to Humboldt State College.

Upon completion of the study the geese are to be donated to a public zoological park or released into the wild.

D. Control of Vegetation -None this period.

E. Planned Burning -None this period.

F. Fires -None this period.

IV RESOURCE MANAGEMENT

A. Grazing -None this period.

B. Haying -No Haying on Tule Lake.

C. Fur Harvest

During the 1960-61 muskrat trapping season one special use permit was issued to Arnold Gosnell who has trapped on Tule Lake for several seasons. This particular trapper as well as the trappers on Lower Klamath Refuge are gradually replacing their conventional type steel traps with the new conibear traps. The conibear trap has greatly reduced trap losses.

It was interesting to note the variation in pelt prices in relation to the different trapping areas. The average pelt price for Tule Lake was $0.58, Lower Klamath averaged $0.60, whereas Upper Klamath and Klamath Forest Refuges averaged $0.68 and $0.73 respectively which gives an overall price range of $0.15.

The following table summarizes the fur harvest for Tule Lake Refuge.

Permittee	Total Catch	Trappers Share			Government Share
		Pelts	Total Money	Price/ Pelt	
Gosnell #T-6686	5692 pelts	4269	$2531.15	$0.58	1423 pelts

D. Timber Removal -No timber on Tule Lake Refuge.

E. Commercial Fishing -No commercial fishing on Tule Lake Refuge.

F. Other Uses -None this period.

V FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report

Banding - As a part of our cooperative program with California Department of Fish and Game, W. C. "Bud" Rienecker spent the month of March at Tule Lake banding geese. Cannon net traps baited with barley were used in trapping the following geese for banding:

Species	Adult Males	Adult Females	Imm. Uncl.
Ross' Goose		1	
White-fronted Goose		2	
Lesser Snow Goose	41	32	51

The following information was received from U.S.S.R. on the use of Russian bird band #B 70338 which was taken from a snow goose bagged by a hunter November 1, 1960 at Tule Lake:

The band was placed on a young snow goose at Vrangel Island on July 19, 1960. Vrangle Island is 71° 10' north latitude and 179° 20' west longitude.

Status of Snow Goose - Flyway Biologist G. Hortin Jensen again provided us a copy of his progress report on the status of Snow Goose, Pacific Flyway - 1960. The summary is quoted:

"1. Significant snow goose family counts were made at Tule Lake and Sacramento Valley refuges.

2. Fragmentary snow goose family counts were also made in Utah and Alberta.

3. Family counts gave proof of another very successful breeding season. The flocks were composed of 39 percent juvenile birds and 49 percent of the eligible adults were successful.

4. Winter survey indicated a 28 percent increase from last year. There is a possibility that this estimate is on the high side.

5. The status of snow geese in the Pacific flyway is again judged to be ~~about~~ above average. Family counts would give their status well above average but do not allow an increase as significant as reflected by the winter survey.

6. There is very good agreement between results of family counts in Pacific and Central-Mississippi flyways."

Pesticide Study - No further wildlife losses have been attributed to pesticides this period. However, the die-off of fish eating birds occurred in May last year.

Our efforts this period have been mainly directed toward selection and determination of safer, effective sprays, and toward encouraging and planning full scale research on this problem by interested agencies.

The Branch of Research has assigned Biologist Jim Keith from the Denver Center to this west coast area with headquarters at Davis, California. His assignment will include the Klamath Basin Refuges.

The Public Health Service commissioned Mr. Paul Shaw to make a reconnaissance report on the problem in order to formulate and justify an extensive study.

We are considering trial applications of Dibram, Dylox, Dizainon, Dipterex, and possibly Methoxychlor to determine effectiveness in control of cut worms.

Meanwhile the Denver Research Center has continued laboratory analysis of specimens collected last summer. Copies of these reports completed since our last narrative report follows.

Sta #8

17

REPORT NO. _____

Invoice No. 4183 Date received 28 Oct 1960 Submitter's No. ____

Sample submitted by R.E.P.

Amount of sample received 10 small fish (composite) 4-5" class 151grams, grnd

Composition of sample Tui Chubs

Analysis desired: Quantitative x Qualitative x Other ____

For: Rodenticide (s) _____

Insecticide (s) x

Other _____

Results: DDE ---------- 0.6 ppm

DDD ---------- 0.2 "

Toxaphene ---------- 0.1 " (approximate)

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: x

Other: _____

Notes:

Necessary sheets filed with _____

Send report to R.E. Pillmore

Date 12 Dec 1960

M.A. Mehm Analyst

Sta #8

REPORT NO. _____

Invoice No. 4184 Date received 28 Oct. '60 Submitter's No. ____

Sample submitted by R. E. Pillsbury

Amount of sample received Composite of ten 6-7" fish

Composition of sample Tai Chung

Analysis desired: Quantitative X Qualitative X Other ____

For: Rodenticide (s) _____

Insecticide (s) X (chlorinated hydrocarbons)

Other _____

Results: Sample composite contains 0.2 ppm of DDD (Rhothane), 0.1 ppm of DDE (metabolite of DDT), 0.3 ppm of Toxaphene.

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: X

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to R. E. Pillsbury

Date 13 Dec. 1960

James E. Peterson Analyst

Sta.
#11

19

REPORT NO. _____

Invoice No. 4185 Date received 28 Oct. '60 Submitter's No. ____

Sample submitted by R. E. Pillmore

Amount of sample received One Gruppie

Composition of sample As above

Analysis desired: Quantitative X Qualitative X Other ____

For: Rodenticide (s) _____

Insecticide (s) X (chlorinated hydrocarbons)

Other _____

Results: Sample contains 0.2 ppm of DDD (Rhothane), 0.1 ppm of DDE (metabolite of DDT), ca. 0.1 ppm of DDT and a somewhat lesser amount of Toxaphene, i.e., less than 0.1 ppm.

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: X

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to R. E. Pillmore

Date 13 Dec. 1960

James E. Peterson Analyst

Sta.
#11

20

REPORT NO. _____

Invoice No. 4286 Date received 28 Nov 1960 Submitter's No. ____

Sample submitted by E. F. Pillmore

Amount of sample received Five small fish 4" to 6"

Composition of sample Sac Sal & 3 Bluegill

Analysis desired: Quantitative x Qualitative x Other ____

For: Rodenticide (s) _____

Insecticide (s) x

Other _____

Results: Composite sample contained: DDD 0.06 ppm (approx)

DDT 0.03 " "

DDE 0.03 " "

The quantitative results are approximate due to the very low concentration of each insecticide. (10 microgram total)

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: x

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to E. F. Pillmore

Date 15 Nov 1960

M. M. Mehn Analyst

Sta.
#11

20

REPORT NO. _____

Invoice No. 4286 Date received 22 Nov 1960 Submitter's No. ____

Sample submitted by L.H. Pillsbury

Amount of sample received Nine small fish 4" to 6"

Composition of sample Sac Sud 6-3 Klamath

Analysis desired: Quantitative x Qualitative x Other ____

For: Rodenticide (s) _____

Insecticide (s) x

Other _____

Results: Composite sample contained: DDD ..... 0.06 ppm (approx)

DDT ..... 0.03 " "

DDE ..... 0.03 " "

The quantitative results are approximate due to the very low concentration of each insecticide.

Determination (s) via: (10 microgram total)

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: x

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to L.H. Pillsbury

Date 15 Nov 1960

M.H. Mohn Analyst

Sa.
#13

REPORT NO. _____

Invoice No. A187 Date received 28 Oct. '60 Submitter's No. ____

Sample submitted by R. E. Pillmore

Amount of sample received Some 12 lbs fish

Composition of sample Whole fishes

Analysis desired: Quantitative ___x___ Qualitative ___x___ Other ____

For: Rodenticide (s) _____

Insecticide (s) x (Chlorinated hydrocarbons)

Other _____

Results: Sample contains 0.4 ppm of DDE (metabolite of DDT), 0.3 ppm of DDD (Rhothane), approximately 0.2 ppm of Toxaphene.

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: x

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to R. E. Pillmore

Date 13 Dec. 1960

James Peterson Analyst

Sta.
#18

REPORT NO. _____

Invoice No. 4186 Date received Nov.16, 1960 Submitter's No. ____

Sample submitted by R. E. Fillmore

Amount of sample received 10 Tui and 10 Klamath Chubs, 4-6 inch class

Composition of sample Tui and Klamath Chubs run separtly

Analysis desired: Quantitative X Qualitative X Other ____

For: Rodenticide (s) _____

Insecticide (s) X Chlorinated hydrocarbons

Other _____

Results: Tui chubs---DDE, DDD less then .05ppm, probably a lesser amount of Toxaphene present.

Klamath chubs---DDE, DDD less then .05ppm, probably a lesser amount of Toxaphene present.

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: X

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to R. E. Fillmore

Date Dec. 12, 1960

R. A. Wilcox
Analyst

REPORT NO. _____

Invoice No. 4156 Date received: Nov. 7, 1960 Submitter's No. [illegible]-9

Sample submitted by E. E. Fillmore

Amount of sample received 7.47 Gm.

Composition of sample Fat sample from W. Droebe

Analysis desired: Quantitative X Qualitative X Other ____

For: Rodenticide (s) _____

Insecticide (s) X Chlorinated hydrocarbons

Other _____

Results: DDE---348ppm, DDT---302ppm, Toxaphene---39ppm approx.

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: X

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to E. E. Fillmore

Date Dec. 12, 1960

R. A. Wilson Analyst

REPORT NO. _____

Invoice No. 4189 Date received Nov. 7, 1960 Submitter's No. 600602-9

Sample submitted by R. B. Pillsbury

Amount of sample received 319 gm. without skin--W Grebe

Composition of sample Western Grebe

Analysis desired: Quantitative x Qualitative x Other ____

For: Rodenticide (s) _____

Insecticide (s) x Chlorinated Hydrocarbons

Other _____

Results: DDE and/or DDT----[illegible], DDD--16ppm, and a lesser amount of DDD metabolite.

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: x

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to R. B. Pillsbury

Date Dec. 12, 1960

M. A. Wilson Analyst

REPORT NO. _____

Invoice No. [redacted] Date Received [redacted] Submitter's No. BHP 600619-10

Sample submitted by [redacted]

Amount of sample received [redacted]

Composition of sample [redacted]

Analysis desired: Quantitative [redacted] Qualitative [redacted] Other _____

For: Rodenticide (s) _____

Insecticide (s) [redacted]

Other _____

Results: [redacted]

Determination (s) viz:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: [redacted]

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to [redacted]

Date [redacted]

[redacted] Analyst

REPORT NO. _____

Invoice No. 4198 Date received 26 Oct 1960 Submitter's No. ____

Sample submitted by L.E.P.

Amount of sample received (a) ½ bird; (b) ½ kidney; (c) ½ liver

Composition of sample Pelican, male

Analysis desired: Quantitative X Qualitative X Other ____

For: Rodenticide (s) ____

Insecticide (s) X

Other ____

Results:	(a) ½ bird	(b) ½ kidney	(c) ½ liver
Toxaphene:	4 ppm *	4 ppm *	7 ppm *
DDE :	48 *	24 *	64 *
DDD :	15 *	12 *	15 *

* approximate value

Determination (s) via:

Chemical methods: ____

Spectrophotometric: ____

Chromotographic: X

Other: ____

Notes:

Bioassay sheets filed with ____

Send report to L.E.Fillmore

Date 12 Dec 1960

F.E. Mohn

Analyst

REPORT NO. _____

Invoice No. 4193 Date received Nov. 16, 1960 Submitter's No. ____

Sample submitted by R. E. Pillsbury

Amount of sample received One male bird

Composition of sample Great Horned Heron

Analysis desired: Quantitative X Qualitative X Other ____

For: Rodenticide (s) _____

Insecticide (s) X Chlorinated hydrocarbons

Other _____

Results: DDE and metabolite of DDT---3ppm.

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: X

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to R. E. Pillsbury

Date Dec. 12, 1960

R. A. Wilcox

Analyst

REPORT NO. _____

Invoice No. 4196 Date received 28 oct 1960 Submitter's No. E.E.P 600619-12

Sample submitted by E. E. P.

Amount of sample received one bird

Composition of sample W. Grebe, male

Analysis desired: Quantitative X Qualitative X Other ____

For: Rodenticide (s) _____

Insecticide (s) X

Other _____

Results: DDE ---------- 5 ppm

DDE ---------- 38 "

Toxaphene ------- 0.8 ppm (approximate)

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: X

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to E. E. Pillsbury

Date 12 Dec 1960

M.H. Mohn Analyst

REPORT NO. _____

R.E.P.

Invoice No. 4197 Date received 28 Oct 1960 Submitter's No. 600619-13

Sample submitted by [redacted]

Amount of sample received One bird

Composition of sample M. Grebe

Analysis desired: Quantitative x Qualitative x Other ____

For: Rodenticide (s) _____

Insecticide (s) x

Other _____

Results: [redacted] 6 ppm

[redacted] 7 ppm

Toxaphene [redacted] 0.8 ppm (approximate)

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: x

Other: _____

Notes:

Biomassy sheets filed with _____

Send report to [redacted]

Date 12 Dec 1960

[redacted] Analyst

REPORT NO. _____

Invoice No. [redacted] Date received [redacted] Submitter's No. BRP [redacted]-10

Sample submitted by [redacted]

Amount of sample received [redacted]

Composition of sample [redacted]

Analysis desired: Quantitative _____ Qualitative _____ Other _____

For: Rodenticide (s) _____

Insecticide (s) [redacted]

Other _____

Results: [redacted]

Determination (s) via:

Chemical methods: _____

Spectrophotometric: _____

Chromotographic: _____

Other: _____

Notes:

Bioassay sheets filed with _____

Send report to [redacted]

Date [redacted]

[redacted] Analyst

VI PUBLIC RELATIONS

A. Recreational Uses

1. Hunting: -Reported in September-December report.
2. Fishing: -None
3. Miscellaneous:

(a)	Recreation:	300
(b)	Official:	500
(c)	Economic Use:	15,000
(d)	Other:	2,000

B. Refuge Visitors

Jan. 11 — Floyd O. "Ollie" Tumelson, Area Conservationist, Red Bluff, Calif. and Norman C. McGourty, Soil Conservationist, Klamath Falls, Oregon, Lower Klamath soil conservation work.

Jan. 13 — Noel L. Cagle, Malheur Refuge, Burns, Oregon to pickup surplus property.

Paul E. Steel, Refuge Manager, Columbia Refuge, on visit.

Jan. 16 — Loren Herman, Soil Scientist, Soil Conservation Service, Yreka, Calif. and Norman "Mike" McGourty, Klamath Falls, Oregon on soil survey.

Winston Farr, Construction Management Engineer and Roy Ellerman, Engineer, both of Portland, Oregon on Lower Klamath Development.

Jan. 18 — Otto F. Bauer, Game Manager I, and Roger L. Allemand both of Gridley, California with California Fish and Game Department on pheasant sex-ratio counts.

Jan. 19 — Wilber Womer, Manager, Social Security Office, Klamath Falls, Ore. planning meeting for refuge staff to be held Feb. 17.

Jan. 23 — Leroy B. Smith, Agriculture Inspector, Tulelake, Calif.

Jan. 25 — F. Ross Brown, V.P. National Wildlife Federation; Claude D. Kelley, President, National Wildlife Federation; Ernest Swift, Wildlife Mgt. Institute; Charles Collins, C. L. Langslet, Gene V. Hansen, P. W. Schneider, Director, Oregon State Game Commission, R. E. Griffith, R.O., Chief, Div. of Wildlife, all of National Wildlife Federation; John McKean, Chief of Operations, Oregon Game Commission, Portland, Ore; inspection of basin refuges.

Jan. 27 — Bill Skelton, California Highway Patrol, Tulelake, Calif. presented film at station SAFETY meeting.

Jan. 27	Jim King, Game Agent, FWS, Fairbanks, Alaska courtesy visit.
Jan. 31	Leroy B. Smith, Inspector, Modoc County, Department of Agriculture - microtus control.
Feb. 2	Loring White, Agriculture Commissioner, Modoc County, Alturas, Calif. and Leroy Smith, Inspector, Tulelake, microtus control.
Feb. 6	Ed Hansen, Klamath Br. Experiment Station, Klamath Falls, Oregon inspect mouse population.
Feb. 9	Paul C. Kemble, Sutter Refuge, Edward Burua, Colusa Refuge, Johnnie Johnson, Sacramento Refuge on visit.
Feb. 10	James Cromwell, Game Management Agent, Klamath Falls, Oregon on depredations control.
Feb. 14-21	Paul A. Shaw, Public Health Service, Region IX Water Supply and Pollution - pesticide and pollution report.
Feb. 17	Wilber Womer, District Manager, Social Security Adm., Klamath Falls, Oregon - met with 20 refuge employees. Forest Service and Lava Beds were also represented.
Feb. 21	Lyle Ingold, Fish and Game Warden, Tulelake, Calif. enforcement.
Feb. 23	Bert Knowles, California Department of Fish and Game to borrow bird mounts for exhibit.
March 1	Bill Huse, Frank Wallier, and Jess R. Grisham, Siskiyou County Department of Agriculture, exhibits for Sacramento fair.
March 6	John A. Ludeman, Sacramento, R.E. Talbert, Sacramento, R.H. Dana, Sacramento, State Department of Agriculture, Jess R. Grisham, Siskiyou County Ag. Comm., Loring White, Modoc County Dept. Agriculture, Leroy B. Smith, Modoc County Inspector, on rodent control and field inspection.
March 7	Gordon C. Ashcraft, Montague, Calif. securing feed for live trapping and marking cottontail and chukar.
	Warren C. Rienecker, California Fish and Game Department goose trapping and banding program - 3 weeks.
March 10	Ray Glahn, pilot biologist, R.O. on waterfowl census.

March 15	John W. Wentzel, Alturas, Calif. waterfowl depredations control.
	Frank Kozlik, California Fish and Game Department, Game Management Supervisor - Tule Lake problems.
March 20	Leroy B. Smith, Inspector, Loring White, Ag. Comm., Bill Huse, Ag. Comm. on rodent inspection.
March 28	G. Ashcraft, Montague, Fish and Game Department, feed grain for live trapping.
	Bill Huse, Tulelake, Gary Golden, Yreka, and Frank Wallier, Yreka, Department of Agriculture concerning exhibits for fair.
April 6	Ray Glahn, R.O. pilot biologist on Canada goose breeding pair census and aerial photography.
	Bob Houser, Refuge Manager, Willapa Refuge to pickup property item.
April 10	Loren Herman, Yreka, California and Norman McGourty, Klamath Falls, Oregon, Soil Conservation Service, soil surveys on Lower Klamath.
April 11	Vernon Ekedahl, Assistant Regional Supervisor, Portland, Oregon and John McNally, Melborne, Australia on four of refuges.
	Jim Cromwell and J.R. Norris, Game Management Agents, Klamath Falls, Oregon "looting".
April 17	Sam C. Dugan and Derrill Stein, Bureau of Reclamation, Klamath Falls, Oregon.
	Don Chipman, Yreka, California; George Bryceson, Yreka, Calif. and Lyle Ingold, Tulelake, California Fish and Game Department - rodent control.
April 19	Ray Glahn, R.O. pilot biologist on waterfowl census.
April 21	A. Roy Bungard, Yreka, California, California Division of Forestry courtesy visit.
April 26	Bill Huse, Tulelake, and Frank Wallier, Yreka, Dept. of Agriculture - rairs and exhibits.
April 28	Gilbert Stamm, Office of Commissioner, Bureau of Reclamation, Washington, D.C. getting acquainted.

C. Refuge Participation

Robert F. Russell - Refuge Manager

Jan. 24-25 Conducted tour of Klamath Forest, Upper Klamath, Lower Klamath, and Tule Lake Refuges with representatives of Oregon State Game Commission and National Wildlife Federation. Presented slides to same group and certain key individuals in Klamath Falls interested in conservation.

Attended weekly meeting of Rotary. Became chairman of the Tulelake Branch (Tulelake-Malin area) of the American Red Cross for 1961, and was active in Red Cross affairs throughout the period.

Robert M. Abney - Wildlife Management Biologist

Mar. 6 With John Ludeman and California Agriculture officials White, Grisham, Talbert, Huse, and Smith surveyed status of field mouse population on Tule Lake Refuge. Project iniated January 23 and news release made March 22.

Mar. 27 Prepared exhibit material and slide selection for California Agriculture officials Wallier and Huse for display at Sacramento Spring Festival. These gentlemen later reported average attendance of 4 to 5 thousand a day for 10 days of exhibit, averaging 45,000 attendance.

During the period cooperated with Western Bird Banding Association and Audubon Society on field notes, banding notes and eagle study.

Lynn C. Howard - Refuge Manager (trainee)

March 24 Presented slide talk to 25 Malin Elementary School students.

Henry Christensen - Construction & Maintenance Foreman

Feb. 6-8 Attended Foreman's Workshop Session at Regional Office.

D. Hunting -All hunting covered in September-December report.

E. Violations -There were no violations this period.

VII OTHER ITEMS

A. Items of Interest

Manager of the Tulelake Irrigation District, Maurice Strantz, announced his resignation effective July 1, 1961, to accept an appointment as assistant manager of the Westlands Irrigation District near Fresno, California. It is our understanding that this is one of the largest irrigation districts in California and that this will be an advancement for Mr. Strantz. Needless to say, we are overjoyed at the prospects of Mr. Strantz' departure.

The assistant manager, Mr. Edward Lance, has been promoted to the manager position. Mr. Lance is a young man not long out of college who was well liked in the community while he served as assistant manager. He is not the "big wheel political pressure type" of individual which we associate with Mr. Strantz. Recently, several new members were elected to the District's board. The new board members and Mr. Strantz' departure suggests a possible change in attitude of the District. In any event, we are certain that Mr. Lance will be a great deal easier to deal with than his predecessor. We do not anticipate a drastic change in the District's position while Mr. Sam Anderson remains President of the Board.

Mr. John S. Hamilton, Project Manager, Bureau of Reclamation Klamath Project, transferred to Washington, D. C. as Special Assistant to Assistant Secretary William Carr. We were reluctant to see John leave as he controlled the Tulelake Irrigation District with a firm rein and by other actions demonstrated his interest in conservation and the wildlife program of the Klamath Basin. John is a member of the Sierra Club and views the Departmental program from the broad perspective and the over-all good of the country.

While we were disappointed to have John leave the Klamath Basin, we believe that with his knowledge of our problems he is now in a key position to help resolve the wildlife-agricultural controversy which has plagued the basin for years.

The project manager's position vacated by Mr. Hamilton has not yet been filled.

Task Force Development Plan for Klamath Basin Refuges: The task force team composed of personnel from refuges, River Basin Studies, Realty and Engineering completed the preliminary draft of the Plan for Development of the Upper Klamath Basin and submitted it to Washington on February 24, 1961. This report was the product of a crash program which occupied the team for a four-month period. Washington has remained silent on the report.

The five miles of East-West Road between the town of Tulelake and the Hill Road is being widened, brought up to county standards and resurfaced. This work is being done under contract and is about half completed.

Laird's Landing, the historic steamboat landing on the south end of Lower Klamath, burned to the ground the night of January 31, 1961. The cause of the fire has not been determined. Arson is suspected.

The March 1961 issue of National Parks Magazine contains an interesting article on Tule Lake and Lower Klamath National Wildlife Refuges, containing a minimum of errors, entitled "Crossroads for Western Waterfowl", by Daniel A. Poole. The article is enclosed in the envelope attached to the back cover.

Personnel - At the February 17 staff meeting Ralph W. Swisher, former regional transport operator, was presented with a $97.00 check. Through an error in estimating the load weight, "Swish" received an overload citation and $97.00 fine on his last trip out. The check presented was the result of region wide contributions by Branch of Refuge personnel and is indicative of the esteem in which he is held.

At the same meeting Robert M. Abney, Wildlife Management Biologist, was presented with a 20-year service pin.

Roger Vorderstrasse, Wildlife Management Biologist, working as assistant to Mr. Jean Branson, Refuge Management Staff Officer, since December 19, 1960 was transferred to Regional Office (River Basins) January 22, 1961.

Social Security Meeting - February 17 Mr. Wilber Womer, District Manager, Social Security Administration, Klamath Falls, Oregon met with 20 refuge employees and representatives from Forest Service and Lava Beds National Monument. Mr. Womer outlined the Social Security program and then answered questions presented by those in attendance.

SAFETY meetings were held the last Friday of each month. Leaders of the meetings were: Virgil Cobb, Bud Chapman, Ralph Swisher, and co-leaders Earl Irvine and Hank Christensen.

The SAFETY Committee met monthly and at other occasions as necessary. New members elected to serve on the Committee from January through June are Lynn Howard, Chairman, Rosie Chapman, Secretary-Member, and Ralph Swisher, Member.

The SAFETY Record was shattered on April 24 by a lost time accident. As of that date the refuge had accumulated 547 days without a lost time accident. Previous record was 1,472 days (176,388 man-days of work).

Sign Shop work was held up pending a decision by regional and central offices on changes in design, materials, etc.

Shop Operations - Word has been received that a new International truck tractor has been shipped from the factory. This will replace the 1954 6x6 Ward LaFrance transport truck tractor in use. The 40-ton Ward LaFrance now has travelled 348,760 miles throughout Region I.

Regional Truck-Transport Operations -

During the period the transport made four trips, travelled 10,498 miles, and transported the loads shown below:

Trip No.	Load	Origin	Destination
131	Surplus grain	Willapa Refuge	Sacramento Refuge
132	Refrigerators, walk-in, 5 each (with 5 condensers in separate crates)	Norton AFB, Mira Loma, Calif.	Boise, Idaho
	Barbed wire, 25 spools	Pocatello, Idaho	Willapa Refuge
133	Petrified log sign	Tule Lake Refuge	Sheldon Refuge
	Electric motors (2)	Tule Lake Refuge	Stillwater Refuge
	Gorman pumps (2), welder, 30-HP outboard motor	Stillwater Refuge	Fort Peck Game Range
	Insulating board (52 sheets), steel bars, copper tubing	Sacramento Refuge	Columbia Refuge
134	Oliver tractor	Stillwater Refuge	Columbia Refuge
	Concrete mixer	McNary Refuge	Bison Range
	Timbers	Camas Refuge	Malheur Refuge
	Aircraft tanks (2)	Deer Flat Refuge	Hart Mt. Refuge
	LeTourneau power unit	Malheur Refuge	Tule Lake Refuge

Example of faulty wiring common in Quarters #1 prior to rewiring. Note charred rafter beside connection.
Exposure 58 - 1/15/61

Example of faulty wiring common in Quarters #1 prior to rewiring. Note charred rafter beside antiquated wiring.
Exposure 59 - 1/15/61

Frequent severe south winds caused heavy wind erosion.
Bank of windblown soil built up along fence on south
side of Duck Hospital Pond.
Exposure 60 - 3/1/61.

Indication of severity of wind erosion after one of
frequent spring wind storms.
Exposure 61 - 3/1/61.

Refuge Manager Russell on left presenting 20-year service pin to Wildlife Management Biologist Abney at staff meeting.
Exposure 62 - 2/17/61

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Tule Lake MONTHS OF January TO April, 1961

(1) Species	(2) Weeks of reporting period: 1/1-7 (1)	1/8-14 (2)	1/15-21 (3)	1/22-28 (4)	1/29-2/4 (5)	2/5-11 (6)	2/12-18 (7)	2/19-25 (8)	2/26-3/4 (9)	3/5-11 (10)
Swans:										
Whistling	500	500	500	500	500	400	300	200	200	200
Trumpeter										
Geese:										
Canada	700	700	800	900	1,000	1,000	1,000	1,000	1,000	1,000
Cackling	800	500	200	100	100	100	100	100	100	200
Brant										
White-fronted	25	50	50	100	100	2,000	4,000	8,000	25,000	25,000
Snow)	25	100	100	500	1,000)	8,000	15,000	35,000	75,000	75,000
Ross')					3,000)					
Other										
Ducks:										
Mallard	2,000	2,000	2,000	2,000	2,000	2,000	3,000	4,000	5,000	10,000
Black										
Gadwall									200	200
Baldpate	500	700	800	900	1,000	2,000	2,000	2,000	2,000	2,000
Pintail	500	700	800	900	1,000	5,000	10,000	20,000	40,000	50,000
Green-winged teal					200	500	500	1,000	1,000	1,000
Blue-winged teal										
Cinnamon teal								100	200	200
Shoveler	2,000	1,000	800	600	500	1,000	1,000	1,000	1,000	1,000
Wood										
Redhead	100	100	100	100	100	100	100	200	200	200
Ring-necked	100									
Canvasback	1,000	1,000	1,000	1,000	1,200	1,200	1,200	2,000	1,200	1,000
Scaup	1,000	1,200	1,300	1,400	1,500	1,500	1,500	3,000	1,500	1,000
Goldeneye	100	100	100	100	100	100	100	100	100	100
Bufflehead	500	400	300	200	200	200	200	500	500	500
Ruddy	2,500	4,000	5,000	7,000	10,000	10,000	20,000	10,000	5,000	5,000
Other										
Coot:	500	500	500	500	600	1,000	1,000	2,000	1,000	1,000

Int. Dup. Sec.,
Wash., D. C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Tule Lake MONTHS OF January TO April, 1961

(1) Species	(2) Weeks of reporting period: 3/12-18 (11)	3/19-25 (12)	3/26-4/1 (13)	4/2-8 (14)	4/9-15 (15)	4/16-22 (16)	4/23-30 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	100	10	5	5	3	1	1		27,500		
Trumpeter											
Geese:											
Canada	1,000	1,000	800	800	800	800	800		105,700		
Cackling	200	200			200	300	200		23,800		
Brant											
White-fronted	30,000	30,000	35,000	36,000	40,000	45,000	30,000		2,172,275		
Snow	55,000	50,000	40,000	28,000	6,000	6,000	2,000		2,698,075		
[redacted] Ross'									100,000		
Other											
Ducks:											
Mallard	10,000	10,000	8,000	6,000	5,000	5,000	3,000		567,000		
Black											
Gadwall	300	400	400	500	700	800	1,200		32,900		
Baldpate	1,000	500	500	500	500	600	50		122,850		
Pintail	30,000	15,000	5,000	500	1,000	1,000	600		1,274,000		
Green-winged teal	1,000	1,000	10,000	5,000	4,000	2,000	1,000		197,400		
Blue-winged teal											
Cinnamon teal	300	400	500	600	700	800	800		32,200		
Shoveler	3,000	3,000	2,000	1,000	2,000	1,000	1,000		160,300		
Wood											
Redhead	200	200	200	200	500	600	1,500		32,900		
Ring-necked									700		
Canvasback	2,000	2,000	1,000	1,000	800	800	500		139,300		
Scaup	2,000	3,000	2,000	2,000	2,500	2,500	1,000		209,300		
Goldeneye					2				7,014		
Bufflehead	500	500	500	500	400	300	200		44,800		
Ruddy	10,000	15,000	15,000	12,000	10,000	10,000	10,000		1,123,500		
Other											
Coot:	3,000	5,000	10,000	15,000	20,000	25,000	20,000		746,200		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	27,500	500	
Geese	5,099,350	101,000	
Ducks	3,944,150	72,200	
Coots	746,200	25,000	

SUMMARY

Principal feeding areas — Swans: Units 1 & 2; Geese: Units 3, 4 & 5; Ducks: Units 1, 2, 4 & 5; Coots: Units 1 & 2

Principal nesting areas

Reported by R. M. Abney
Wildlife Management Biologist

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

INT.-DUP., D.C.-53824-59

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Tule Lake Months of January to April xxxx 1961

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared grebe	8	3/14	2,000	4/30	Summer Resident					2,000
Western grebe	20	3/14	2,000	4/30	ditto					2,000
Pied-billed grebe	Wintered		50	4/30	"					50
White pelican	10	3/3	200	4/30	"					200
Cormorant	5	3/3	50	4/30	"					50
Great blue heron	Wintered		30	3/3	"					40
Common egret	12	3/3	300	4/30	"					300
Snowy egret	4	3/14	30	4/30	"					30
Night heron	30	2/22	100	4/30	"					100
American bittern	1	2/22			"					10
Common merganser			4,000	1/29	100	4/7				5,000
II. Shorebirds, Gulls and Terns:										
Killdeer	Wintered									100
Willet	5	4/23								10
Least sandpiper	12	4/16								100
Dowitcher	70	4/16								200
Western sandpiper	8	4/7								60
Avocet	40	4/1	300	4/7						300
California gull	Wintered									1,000
Ring-billed gull	Wintered									1,000
Forster's tern	1	4/27								
Caspian tern	1	4/11								10

(over)

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove	1	4/16	35	4/23	Summer Resident		50
White-winged dove							
IV. Predaceous Birds:							
Golden eagle							3
Duck hawk							
Horned owl						1 known nest - 2 young	6
Magpie							10
Raven	3	4/27					5
Short-eared owl			"				10
Turkey vulture	2	4/7	"				5
Red-tailed hawk			"				10
Rough-legged hawk			"				5
Bald eagle	Wintered		" 11	1/6			15
Marsh hawk			"				50
Prairie falcon			"				15
Sparrow hawk			"				10

Reported by R. M. Abney
Wildlife Management Biologist

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Tule Lake Months of Janu[illegible] to April, 19 61

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant					20 cocks 80 hens				2500	
Valley Quail									600	
Chukar Partridge									200	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Tule Lake Year ending April 30, 1961

(1) * Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator * Control	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula-tion
Muskrat				5692				6686	4269 *	1423	1423			Pre-season 14,000 Post-season 6,000

*Trapper averaged $0.58/pelt.

* List removals by Predator Animal Hunter

REMARKS:

Reported by R. M. Abney

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

3-1570
NR-8a
(4/54)

REFUGE GRAIN REPORT

Refuge Tule Lake Months of January through May 9, 1961

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.			
Rye	207	—	207	—	207	—	207	—			
Utah Winter Barley	2062	—	2062	—	1132	—	1132	930	x		
Hannchen Barley Cleaned & Treated	10,997	—	10,997	—	7660	—	7660	3337	x		
Hannchen Barley not cleaned or treated	6740	—	6740	—	—	127	127	6613	x	x	

(8) Indicate shipping or collection points

(9) Grain is stored at Tule Lake Headquarters Granary

(10) Remarks

*See instructions on back.

HC

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

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CONTENTS

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Lower Klamath National Wildlife Refuge
January-April 1961

I GENERAL

A. Weather Conditions -Refer to the Tule Lake section.

B. Habitat Conditions

1. Water

Refer to the Tule Lake section for watershed and general conditions. Despite our efforts to irrigation Lower Klamath agricultural units early and waste as much excess water as possible out the Straits Drain last report period, Lower Klamath pools were higher than desired on January 1.

The additional water (2,149 acre feet) pumped by Tulelake Irrigation District via Plant "D" in late February and early March was the straw which almost broke the camel's back! With pools full, return flow from lease lands east and west of the refuge being or about to be dumped into refuge pools, and the Klamath Drainage District using the Straits Drain facilities which prevented us from evacuating water, we were faced with the prospect of reflooding Unit 12 which was being dewatered for farming, ~~up until the Straits Drain facilities were usurped by the Klamath Drainage District.~~ Fortunately, arrangements were worked out with the Klamath Drainage District (several members on the KDD board sharecrop in Unit 12) for the use of the capacity of one pump at Plant "E" for one week to ease the water situation, thus the reflooding Unit 12 was avoided.

To further delay evacuation of water from the Lower Klamath area one pump at Plant "E" went out near the tag end of irrigation dewatering and several weeks elapsed before it was repaired and returned to operation. The net result has been that althoughwe started irrigation in December in hopes of finishing early, irrigation dewatering has been materially delayed and Unit 12 crops will be sown later than last year.

2. Food and Cover

More waterfowl food was available this spring on Lower Klamath than on Tule Lake. When Unit 12 is flooded for irrigation, this unit is a favored feeding area. The flood type irrigation on lands adjacent to Units 1, 2, 3, 4, and 9 is conducive to spring waterfowl use. Also, the greater areas of protective marsh cover in Units 2, 3, 4, and 9 are superior to the Tule Lake marsh. These are important factors during the spring migration, the protective cover especially this windy season.

Water levels were lower than desirable this spring, but this is an inherent handicap of the one-way gravity flow water system. A drawdown of Units 2, 3, 4, and 9 is required to dewater irrigated units.

Wind erosion damage was readily noticeable on Units 5 and 6. About one-third of the Unit 6 seeding was blown out.

Good progress has been made on establishment of dike cover, however, fire destroyed about 3-1/2 acres of existing vegetation on two sections of dike in Units 12 and 7. Refer to Section III F. for details of the fire report.

II WILDLIFE

A. Migratory Birds

This periods waterfowl use days of 14 million is about the same as the 5-year average of 15 million; it is 5 million less than last year, and only half as much as the spring of 1959. No spectacular peaks occurred during the spring migration, but rather a uniform movement. Comparative use by waterfowl groups is presented in the following table.

January-April Waterfowl Use Days on Lower Klamath Refuge
Group Comparison of This Year With Last Year and 5-yr. Average

Group	1956-60 Avg.	1961	1960
Swans	140,800	135,950	92,000
Geese (Canada ssp.)	686,600	1,089,200	1,301,900
Other Geese	884,000	801,900	1,695,400
Dabbling Ducks	10,982,600	9,238,600	12,660,100
Diving Ducks	1,685,000	1,708,000	2,073,400
Coots	1,473,300	1,193,500	1,870,100
Total	15,852,300	14,167,150	19,692,900

Breeding honker pairs are estimated at 600 this spring, compared with 460 last spring. The first brood was seen March 27 on Unit 9. At the close of the period 133 broods had been counted. The prospects are favorable for a bumper crop of honkers. All refuges, except Clear Lake which indicates a decrease, show excellent prospects for increased honker production. Present indications are that the increase on Lower Klamath may approximate 500 birds.

Lower Klamath duck and goose usage since 1952 is compared with Tule Lake in that section of the report; see Tule Lake, Figures 1 and 2.

Weekly populations for each species is reported on Form NR-1.

Detailed observations of other migratory birds are listed on NR-1A. Populations of colonial nesters are similar to last year.

Some of the birds seen on Lower Klamath and not on Tule Lake are: Long-billed Curlews, Dunlins, and Sandhill Cranes.

Jim O'Donahue reported seeing 12 yellow legs on Easter Sunday, April 2, this was our earliest observation for this species. All observations of first arrivals for the season are listed on the NR-1A.

B. Upland Game Birds

The pheasant population is estimated at 3,500, which is the same as last spring. The sex ratio of 30% cocks indicates that a greater harvest of roosters could be made.

Valley Quail are estimated at 400, which is 100 more than last spring. These birds are largely boundary rangers, and may not represent an increase in population--perhaps a greater use of the refuge for water.

C. Big Game Animals

Aerial observations of deer in Units 2 and 12 were common. Use by about 100 animals is similar to each year. Antler shedding was noted by mid-January.

About 20 antelope were seen near Laird's Landing. California Department of Fish and Game personnel report a near static condition of the population south of Lower Klamath.

D. Fur Animals, Predators, Rodents, and other Mannals

Muskrats were estimated at 13,000 prior to the trapping season and 5,000 afterwards, compared to 10,000 and 4,000 last year. This season 4,168 were pelted, 2,107 last season.

Field mouse populations continue at a relatively low level, and were included in the cooperative news release made with county agriculture officials in March.

E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies

There were no unusual concentrations of avian predators this period. Observations of 23 bald eagles and 3 goldens are similar to last year.

A falcon (probably Prairie) was seen striking down a Green-winged Teal in flight. This was observed while on tour with Messrs. Russell, Ekedahl, and McNally of the Australian Wildlife Agency.

Populations of avian predators have declined drastically since the years of high field mouse populations. For example, in 1959 300 short eared owls were present compared to 30 this spring.

F. Other Birds -No new observations.

G. Fish

Laboratory analysis reports of fish samples are reported in Tule Lake Section V.

H. Reptiles

Two bull snakes were seen along the Chalk Banks Road. No water snakes have been seen this period.

I. Disease

A progress report on pesticide losses is included in Tule Lake Section V.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

We have nothing to report other than that included in the Tule Lake section. Irrigation of Unit 12 commenced in December which prevented us from doing any construction work there this period.

B. Plantings

1. Aquatics and Marsh Plants

No plantings this period.

2. Trees and Shrubs

No plantings this period.

3. Upland Herbaceous Plants

No plantings this period.

4. Cultivated Crops

Because of the shortage of funds all of the Lower Klamath was share-cropped with the exception of 3F-1 (700 acres) and 6F-1 (1100 acres). Neither required much spring work. Field 3F-1 was fall plowed. It will be flooded during the spring and early summer, drained in late summer and seeded to winter barley this fall. Field 6F-1 was sown to Utah winter barley and rye last fall. This unit provided great quantities of green browse during the 1960 hunting season and held thousands of Cackling geese and Canada geese inside the protected area. The severe south winds this spring severely damaged several hundred acres of the fall planted grain which was beginning to flourish and put on new growth. This field is rather sandy and subject to blowing. Portions of the field damaged by windstorms were replanted to rye this spring. It remains questionable whether the crop will survive.

Field 1F-3 (110 acres), under permit to Murel Long, has been taken over by quack grass. This field is too rough and irregular to flood and hold water to kill out the quack. At our request the Soil Conservation Service ran elevations on the unit and worked up the necessary grade data so we can level the field with heavy equipment. We propose to rehabilitate the irrigation lateral so that Unit 3 can be tapped for a source of irrigation water. Plans include the installation of an electric pump to bring water onto the field at

the necessary elevation. This project will enable us to hold the unit under water for the one to two years necessary to kill out the quack grass and is the first step in our plan to develop a better system of irrigation and drainage on Lower Klamath agricultural lands.

Field 4F-2 (650 acres), under permit to Verland Huff, has been flooded for quack grass control, a portion of it for two years and the remainder for one year. This unit will be farmed again this year. From all indications an excellent kill was obtained on the quack grass. It will be interesting to note whether the kill on that portion of the field which has been flooded for one year is as complete as that inundated for two years. We are also vitally interested in the fertility of this field after being inundated. Future development plans provide for cyclic management of units and periodic inundation of agricultural areas. We hope that inundation has leached salts from the soil and enhanced its fertility.

Approximately 25 acres east of the Mitchell bridge in Unit 2 which has begun to blow was sown to a mixture of rye and winter barley to stabilize the area. Germination was good but continued dry weather has taken its toll.

C. Collections and Receipts -None this period.

D. Control of Vegetation -None this period.

E. Planned Burning -None this period.

F. Fires

On Sunday, April 9, 1961, three fires believed to be the work of an incendiary occurred on the Lower Klamath Refuge. Two of the fires were discovered and promptly extinguished by Foreman Henry Christensen. The refuge manager received a telephone call reporting the third fire in the early evening. The fire truck was dispatched to the fire and it was extinguished without difficulty. Total acreage burned was approximately 3-1/2 acres. The loss of nesting cover would have been substantial had not the fires been discovered in their early stages.

Last period we commented on the fire hazard to Tule Lake and Lower Klamath refuges resulting from the location of the Tulelake City Dump at the north end of Sheepy Ridge. Tulelake has abandoned this dump and moved to another location on the far side of the basin. This will substantially lessen the fire hazard, providing illegal dumping at the old site can be eliminated.

IV RESOURCH MANAGEMENT

A. Grazing

Three grazing permits were in force during the period. Heitman's stock were removed early from Units 2 and 5 as indications of over-use began to appear. Unit 5 has been flooded, and the Heitmans notified that grazing will be discontinued in Unit 5, that portion of Unit 2 which they grazed in 1960, and that the intensity of use in Units 10 and 12 will in all probability be curtailed this fall.

A reappraisal of our grazing program is in order as forage production was sub-normal last year and the prospects are for another dry year. Pasture surveys will be made this spring.

B. Haying -None

C. Fur Harvest

Five trapping permits were issued for Lower Klamath Refuge during the 1960-61 season. The varying degrees of trapping success are indicated in the following table.

Permittee	Total Catch	Trapper Share			Government Share
		Pelts	Total Money	Price/ Pelt	
Baker & Wall #T-6685	2336	1752	$1115.29	$0.64	584 pelts
Parker #T-6688	1098	824	458.90	0.56	274 pelts
Poitra #T-6687	677	508	295.30	0.58	169 pelts
DeCoteau #T-6693	19	14	8.12	0.58	5 pelts
Otey, Craddock & Craddock #T-6692	38	28	Sales record not yet received		10 pelts
Totals	4168	3126	$1877.61*	$0.60	1042 pelts

* Total sales based on 3098 pelts as records for the sale of 28 pelts have not yet been received.

D. Timber Removal -There is no timber on Lower Klamath Refuge.

E. Commercial Fishing -There is no fishing on Lower Klamath Refuge.

F. Other Uses -None this period.

LK

V FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report -See Tule Lake section for progress reports.

VI PUBLIC RELATIONS

A. Recreational Uses

1. Hunting: Reported in September-December report.
2. Fishing: None
3. Miscellaneous:
   - (a) Recreation: 300
   - (b) Official: 300
   - (c) Economic Use: 6,000
   - (d) Other: 5,000

B. Refuge Visitors -All visitors listed in Tule Lake section.

C. Refuge Participation -All participation listed in Tule Lake section.

D. Hunting -All hunting covered in September-December report.

E. Violations -None this period.

VII OTHER ITEMS

A. Items of Interest -All items of interest listed in Tule Lake section.

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Lower Klamath MONTHS OF January TO April, 1961

(1) Species	(2) Weeks of reporting period 1/1-7 : 1	1/8-14 : 2	1/15-21 : 3	1/22-28 : 4	1/29-2/4 : 5	2/5-11 : 6	2/12-18 : 7	2/19-25 : 8	2/26-3/4 : 9	3/5-11 : 10
Swans:										
Whistling	6,000	6,000	3,000	1,000	500	500	500	500	500	500
Trumpeter										
Geese:										
Canada	3,000	3,000	2,500	2,000	2,000	2,000	2,000	3,000	2,500	3,000
Cackling						200	200	1,000	5,000	8,000
Brant										
White-fronted						1,000	1,000	2,000	5,000	7,000
Snow						2,000	2,000	4,000	8,000	10,000
Blue										
Other										
Ducks:										
Mallard	20,000	15,000	15,000	10,000	10,000	10,000	15,000	15,000	15,000	15,000
Black										
Gadwall	500	500	1,000	1,000	1,500	500	1,000	1,000	1,000	1,000
Baldpate	25,000	20,000	15,000	15,000	14,000	15,000	15,000	15,000	15,000	15,000
Pintail	40,000	30,000	25,000	20,000	20,000	30,000	40,000	50,000	60,000	70,000
Green-winged teal	2,000	2,000	3,000	4,000	4,200	4,000	4,000	4,000	4,000	4,000
Blue-winged teal										
Cinnamon teal								100	200	500
Shoveler	12,000	15,000	20,000	25,000	29,000	30,000	30,000	20,000	10,000	10,000
Wood										
Redhead				100	200	200	200	200	200	200
Ring-necked										
Canvasback	1,000	1,000	500	500	500	500	500	500	500	500
Scaup	2,000	2,000	3,000	3,000	3,500	3,500	3,500	3,000	2,000	2,000
Goldeneye	100	100	100	100	100	100	100	100	100	
Bufflehead	400	300	300	200	200	200	500	1,000	1,000	1,000
Ruddy	2,000	4,000	8,000	10,000	12,000	12,000	12,000	10,000	10,000	10,000
Other										
Coot:	1,000	1,000	1,000	1,000	1,500	2,000	2,000	2,000	2,000	2,000

Int. Dup. Sec.,
Wash., D. C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Lower Klamath MONTHS OF January TO April, 1961

(1) Species	(2) Weeks of reporting period: 3/12-18 (11)	3/19-25 (12)	3/26-4/1 (13)	4/2-8 (14)	4/9-15 (15)	4/16-22 (16)	4/23-30 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	300	100	5	5	5	3	3		135,950		
Trumpeter											
Geese:											
Canada	3,000	3,000	3,000	3,200	3,200	3,200	2,600		323,400		
Cackling	5,000	5,000	17,000	20,000	20,000	16,000	12,000		765,800		
Brant											
White-fronted	6,000	5,000	9,000	10,000	12,000	6,000	4,000		476,000		
Snow	8,000	5,000	4,000	3,000	1,000	500	200		333,900		
Blue											
Other											
Ducks:											
Mallard	12,000	10,000	8,000	7,000	7,000	7,000	5,000		1,372,000		
Black											
Gadwall	1,000	2,000	2,500	3,000	4,000	3,500	4,000		203,000		
Baldpate	5,000	1,000	1,000	1,000	2,000	3,000	1,000		1,246,000		
Pintail	40,000	15,000	5,000	2,000	1,500	1,000	1,000		3,153,500		
Green-winged teal	5,000	5,000	5,000	5,000	7,000	9,000	2,000		512,400		
Blue-winged teal											
Cinnamon teal	500	500	800	800	1,000	1,200	1,500		49,700		
Shoveler	20,000	30,000	35,000	40,000	30,000	20,000	10,000		2,702,000		
Wood											
Redhead	300	400	500	1,000	1,200	1,500	2,500		60,900		
Ring-necked											
Canvasback	500	500	500	500	800	500	300		67,800		
Scaup	3,000	3,000	2,000	1,500	2,500	2,000	1,500		301,000		
Goldeneye									6,300		
Bufflehead	1,000	1,000	1,000	1,000	800	500	400		75,600		
Ruddy	12,000	15,000	12,000	10,000	15,000	10,000	7,000		1,197,000		
Other											
Coot:	5,000	10,000	20,000	30,000	40,000	30,000	20,000		1,193,500		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	135,950	6,000	
Geese	1,899,100	36,200	
Ducks	10,946,600	130,000	
Coots	1,193,500	40,000	

SUMMARY

Principal feeding areas

Swans: Units 1,3,4, & 12
Geese: Units 1,4,9, & 12
Ducks: Units 2,4,8,9, & 12
Coots: Units 2,3,4,7, & 12A

Principal nesting areas

Reported by R. M. Abney

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

16242

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Lower Klamath Months of January to April 1961

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared grebe	5	4/7	2,000	4/30	Summer Resident					2,000
Western grebe	10	3/14	1,000	4/30	ditto					1,000
Pied-billed grebe	3	2/22	50	4/30	"					50
White pelican	15	3/3	1,200	4/30	"					1,200
Cormorant	10	3/3	600	4/30	"					600
Great blue heron	Wintered		80	4/30	"					80
Common egret	10	3/3	150	4/30	"					150
Snowy egret	3	4/1	15	4/30	"					15
Night heron	20	2/22	400	4/30	"					400
American bittern	1	2/22			"					10
Hooded merganser	20	1/31			10	4/7				50
Common merganser	5,000	1/31			50	4/20				6,000
Sandhill crane	2	4/12			Summer Resident					4
II. Shorebirds, Gulls and Terns:										
Killdeer	Wintered				Still present					200
Long-billed curlew	10	4/12			ditto					20
Willet	10	4/23			"					30
Greater yellowlegs	12	4/2								50
Dunlin	20	4/30			"					100
Dowitcher	80	4/16			"					500
Avocet	60	4/1			"					400
Black-necked stilt	5	4/11			"					60
California gull	Wintered				"					2,000
Ring-billed gull	Wintered				"					2,000
Forster's tern	3	4/27			"					30
Caspian tern	2	4/11			"					10

(over)

(1)	(2)	(3)		(4)	(5)	(6)
III. Doves and Pigeons:						
Mourning dove	Not yet recorded on refuge proper.					
White-winged dove						
IV. Predaceous Birds:						
Golden eagle	Wintered	3	4/30	Still present		5
Duck hawk						
Horned owl						5
Magpie						20
Raven						
Crow						
Turkey vulture		"				5
Red-tailed hawk		"				15
Rough-legged hawk		"				10
Bald eagle	Wintered	23	1/31	Still present		30
Marsh hawk		"				60
Praire falcon		"				20
Short-eared owl		"				30

Reported by R. M. Abney
Wildlife Management Biologist

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Lower Klamath Months of January to April, 19 61

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant					30 cocks 70 hens				3500	
Valley Quail									400	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Lower Klamath Year ending April 30, 1961

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator * Control	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Population
Muskrat				2336				6685	1752	584	584			Pre-season 13,000
				1098				6688	824	274	274			
				677				6687	508	169	169			Post-season 5,000
				19				6693	14	5	5			
				38				6692	28	10	10			
	Totals			4168				*	3126	1042	1042			

*Trappers averaged $0.60/per pelt

* List removals by Predator Animal Hunter

REMARKS:

R. M. Abney

Reported by _____

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

CL

CONTENTS

Clear Lake National Wildlife Refuge
January - April 1961

I GENERAL

A. Weather Conditions

Refer to Tule Lake and Upper Klamath sections for general weather conditions.

B. Habitat Conditions

1. Water

Run-off on the Clear Lake watershed was light. At the close of April the lake was at elevation 4466.45'. At this level storage was 43 percent of average and about 65 percent of last year.

2. Food and Cover

Conditions are poor. The receding lake level has exposed a wide zone of scab rock and mud flat between the water and the surrounding sagebrush and native grass uplands, which is unattractive to wildlife and waterfowl in particular. This may account for the decline in the number of nesting pairs of Canada geese this spring.

Cover bordering the reservoir is in only moderately good condition on grazing lands managed by the Forest Service on an "on-and-off" basis, and is in somewhat over-grazed condition on the "U", which is under the jurisdiction of the Bureau of Reclamation.

II WILDLIFE

A. Migratory Birds

Canada Goose use days of 40,000 is essentially the same as last year, however, the number of breeding pairs are decreasing - this year 70 pairs, last year 100, and the previous year about 200 pairs. The receding lake level is progressively leaving a wider band of sterile sand and scab rock exposed.

About a dozen swans used the lake during April; use by swans has not been previously observed in recent years.

Approximately 300 Green-winged Teal used the mud flats in the neck of Nigger Bend Springs. This was a new observation and accounted for a few extra duck use days, which were 48,000 compared to 33,000 last spring.

Colonial nesting White Pelicans and Cormorants began moving in the second week of March. An Estimated 1,000 pelicans is only a third of last seasons estimate. Absence of birds on the biggest colony at the northwest point of the peninsulais the reason for this drastic reduction. It appears that lower lake levels have changed this colony site from an island into more of a smaller peninsula, and is now unacceptable to the pelicans.

No color marking or banding information is available on movements of these colonial populations in the basin. Such information may become a desirable feature of expanded study of the pesticide study.

B. Upland Game Birds

Sage Grouse use the refuge "off and on". The population seems to be at a relatively low level. Many spring areas frequented by these birds have dried up during the last two years tending to concentrate the flocks. We understand the California Gish and Game Commission is considering closing the hunting this season on all grouse. This would be the second consecutive year of closure.

C. Big Game Animals

The principal use by big game animals on the refuge proper is by antelope. The Peninsula or "U" carries the heaviest use. Bands numbering about 40 animals are commonly seen. The total Clear Lake head population is between 300 and 400 animals.

D. Fur Animals, Predators, Rodents, and other Mammals

Porcupines are numerous through the juniper areas. Occasional 'coon sign is seen along the feeder streams. Beaver are present in Willow Creek.

E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies

This periods population of 10 Bald Eagles reflects little change from last years 12, and 9 the previous year.

F. Other Birds

There are no new bird observation records.

G. Fish

There is no information on fish this period.

H. Reptiles

There is no information on reptiles this period.

I. Disease

No disease losses were known to have occurred.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development -None this period.

B. Plantings -None this period.

C. Collections and Receipts -None this period.

D. Control of Vegetation -None this period.

E. Planned Burning -None this period.

F. Fires -None this period.

CL

5

IV RESOURCE MANAGEMENT

A. Grazing

Last report period we mentioned that there had been some abuse of grazing privileges on the "U" which is leased for grazing by the Bureau of Reclamation. A visit to Clear Lake in late November by Dr. William Graf and Dr. L. J. Hendrickson, on the staff of San Jose State College, resulted in a letter of protest to the Secretary. We have not seen a copy of Reclamation's reply.

I have suggested to the Reclamation Klamath Project Manager that Reclamation consider transferring jurisdiction of grazing on the "U" to this Bureau to rid Reclamation of the problem.

B. Haying - None

C. Fur Harvest - None

D. Timber Removal - None

E. Commercial Fishing - None

F. Other Uses - None

V FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report -None this period.

VI PUBLIC RELATIONS

A. Recreational Uses

1. Hunting: -None
2. Fishing: -None
3. Miscellaneous:

(a)	Recreation	100
(b)	Official	100
(c)	Economic Use	500
(d)	Other	100

B. Refuge Visitors -All visitors listed in Tule Lake Section.

C. Refuge Participation -All participation listed in Tule Lake Section.

D. Hunting -None.

E. Violations -None this period.

VII OTHER ITEMS

A. Items of Interest -All items of interest listed in Tule Lake Section.

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Clear Lake MONTHS OF January TO April, 1961

(1) Species	(2) Weeks of reporting period: Jan.-Feb. 11	12 March	13 April 8	14 April 20	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling			12						100		
Trumpeter											
Geese:											
Canada	300	500	300	300 (Incl. 70 pairs)					40,000		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	50	200	250	100					16,500		
Black											
Gadwall											
Baldpate											
Pintail		400	200						18,000		
Green-winged teal				300					9,000		
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked											
Canvasback		20							500		
Scaup	25	50	75						4,500		
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	100	12	
Geese	40,000	500	
Ducks	48,500	700	
Coots	Nil		

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by R. M. Abney
Wildlife Management Biologist

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

INT.-DUP., D.C.-53824-59

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Clear Lake Months of January to April ~~1961~~ 1961

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
White pelican	20	3/9	900	4/20						1,000
Cormorant	15	3/9	100	4/20						100
Great blue heron										30
Common merganser	100	1/31								100
II. Shorebirds, Gulls and Terns:										
Killdeer										200
Avocet										20
California and ring-billed gulls										200

(over)

(1)	(2)	(3)		(4)	(5)		(6)
III. Doves and Pigeons:							
Mourning dove							
White-winged dove							
IV. Predaceous Birds:							
Golden eagle							
Duck hawk							
Horned owl							
Magpie							
Raven							
Crow							
Bald eagle		**6**	**1/31**				**10**

Reported by **R. M. Abney**
Wildlife Management Biologist

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

M17058

Upper Klamath National Wildlife Refuge
January - April 1961

I GENERAL

A. Weather Conditions

	Precipitation			Temperature	
	Month*	Normal **		Maximum	Minimum
January	.66	2.07		59	10
February	1.92	1.48		55	13
March	1.62	1.17		66	39
April	.20	.93		77	20
Total	4.40	5.65	Extremes	77	10

* U. S. Weather Bureau Station, Klamath Falls

** Klamath Basin precipitation average for 50 years prior to 1954.

B. Habitat Conditions

1. Water

Upper Klamath Lake continued to rise throughout the period and stood at 4142.59' April 30. At the close of the period stored water in the lake was 104 percent of average.

The 4142.60' elevation appears to be the optimum (maximum) elevation for the south half of the refuge.

2. Food and Cover

At the close of the period the hardstem bulrush marsh was flooded to an ideal elevation. The interspersion of marsh and open water areas appeared excellent and should be attractive to over-water nesters. However, the inevitable summer decline in levels will likely expose mudflats before fall.

II WILDLIFE

Total waterfowl use days of 116,000 is essentially the same as last spring's use of 108,000.

Swans, which were absent last year, were again present during March; 50 birds totalling 1,500 use days. Swan use is down considerably from the 22,000 use days in the Spring of 1959.

Canada goose use days of 12,000 is up about 2,000 days over last Spring. Breeding pairs of honkers are up to 25 compared with 14 last Spring and 12 the previous one.

Duck use days of 80,000 is an increase of about 10,000 over last Spring. This increased use was largely Green-winged Teal.

The muskrat population is estimated at 1,000 compared with 3,000 last Spring at the close of trapping. Low water levels and freeze-ups are limiting factors. Only 242 rats were pelted this season, 1,000 last year.

Eagles, which were not seen on the refuge last Spring, were again present similar to previous years. Ten Balds and 4 Goldens were recorded.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development -None this period.

B. Plantings -None this period.

C. Collections and Receipts -None this period.

D. Control of Vegetation -None this period.

E. Planned Burning -None this period.

F. Fires -None this period.

IV RESOURCE MANAGEMENT

A. Grazing -None

B. Haying -None

C. Fur Harvest

The Upper Klamath Refuge had one trapper operating for the 1960-61 season. His catch was as follows.

Permittee	Total Catch	Trappers Share			Government Share
		Pelts	Total Money	Price/ Pelt	
Baily #T-6694	242 pelts	182	$122.75	$0.68	60 pelts

D. Timber Removal -None

E. Commercial Fishing -None

F. Other Uses -None this period.

V FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report -None this period.

VI PUBLIC RELATIONS

A. Recreational Uses

1.	Hunting:	None
2.	Fishing:	1,000
3.	Miscellaneous:	
	(a) Recreation	500
	(b) Economic Use	50
	(c) Official	50
	(d) Other	None

B. Refuge Visitors -All visitors listed in Tule Lake section.

C. Refuge Participation -All participation listed in Tule Lake section.

D. Hunting -None this period.

E. Violations -None this period.

VII OTHER ITEMS

A. Items of Interest -All items of interest listed in Tule Lake section.

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Upper Klamath MONTHS OF January TO April, 1961

(1) Species	(2) Weeks of reporting period: Jan.-Feb. 11	March 12	April 13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling		50							1,500		
Trumpeter											
Geese:											
Canada	50	200	150 (Incl. 25 pairs)						12,000		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	500	200	50						12,000		
Black											
Gadwall											
Baldpate		100	50						4,500		
Pintail		300							9,000		
Green-winged teal	200	200	100						15,000		
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood											
Redhead			50						1,500		
Ring-necked											
Canvasback											
Scaup	150	200	200						16,500		
Goldeneye	25								800		
Bufflehead	50	200	300						16,500		
Ruddy			150						4,500		
Other											
Coot:	150	300	300						22,500		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	1,500	50	
Geese	12,000	200	
Ducks	80,300	1,200	
Coots	22,500	300	

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by R. M. Abney
Wildlife Management [redacted]

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

INT.-DUP., D.C.-53824-59

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Upper Klamath Months of January to April 1961

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Holboell's grebe	4	4/7								15
White pelican	10	3/9								150
Cormorant	12	3/9								300
Great blue heron										50
Common egret	5	3/9								100
Night heron	15	3/9								50
II. Shorebirds, Gulls and Terns:										

(over)

(1)	(2)		(3)		(4)	(5)			(6)
III. Doves and Pigeons:									
Mourning dove									
White-winged dove									
IV. Predaceous Birds:									
Golden eagle			2	4/8					4
Duck hawk									
Horned owl									
Magpie									
Raven									
Crow									
Bald eagle			6	1/31					10

Reported by R. M. Abney
Wildlife Management Biologist

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Upper Klamath Year ending April 30, 1961

(1) * Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
									Share Trapping					
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator * Control	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula-tion
Muskrat				242				6694	182	60	60			Pre-season 3,000 Post-season 1,000

Trapper averaged $0.68/pelt

* List removals by Predator Animal Hunter

REMARKS:

R. M. Abney
Reported by _____

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

32715

Klamath Forest National Wildlife Refuge
January - April 1961

I GENERAL

A. Weather Conditions

There is no weather station on or near Klamath Forest Refuge, although we have learned that the U. S. Weather Bureau is considering establishing a station near the marsh. The winter was open with only moderate snowfall. In general the weather is similar but more severe than that of Klamath Falls because of the higher altitude.

B. Habitat Conditions

1. Water

All indications point to another dry year on the Klamath Forest Refuge. Measurements taken at the Silver Lake Road bridge (Lamm Grade) show a rise of .10' between December 12, 1960 and April 17, 1961. The gage at the Military Crossing did not change between these dates. However, we are inclined to discount these gage readings as there is a slight rise in the contour south of the Military Crossing which likely affects the readings; and further, upstream diversions of the Williamson River surely bear on the river elevation.

While we have no records to compare the elevation of the marsh with previous years, it is, according to local residents, much lower than normal. The flow of Big Springs Creek is also low for the spring period. Unless precipitation is unusually heavy through the spring and summer, which is most unlikely, it appears that most of the marsh will be dry by late summer.

2. Food and Cover

The meadows and marsh periphery, particularly those around Little Wocus Bay and along the entire east side, have been heavily overgrazed by trespass stock. The west side south of the Silver Lake Road is in surprisingly good condition. The emergent marsh is in good shape for over-water nesters but will likely suffer for lack of water by early summer.

II WILDLIFE

Total waterfowl use days of 1,136,000 were mainly during March and April when migration was in full swing. About 70% of the use was ducks, narly 25% geese, 5% coots, and 1% swans.

About 6,000 migrant specs, 2,500 cacklers, and 100 snows were present in April. Honkers gradulally built up to 650 residents, including 100 pairs, at the close of the period.

Information obtained from our Game Agents and Oregon personnel indicates the average number of honker broods seen to be 54 during past five years. The highest number was 134 in 1957.

Duck use was heaviest in March when 10,000 pintails were present, along with widgeon, mallards, green-winged teal, and buffleheads.

This new refuge area supports significant population of sandhill cranes and Wilson snipes which are not common on any of the other Klamath Basin Refuges. Twenty-five pairs of sandhills were counted during the first week in April. Jack snipe observations indicate that several hundred were present in the Marsh in April.

The pre-season muskrat population was estimated to be 12,000 and the post-season 4,000. Nearly 4,000 rats were pelted this season.

Twenty eagles, half and half Bald and Golden were present in March.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development -None this period.

B. Plantings -None this period.

C. Collections and Receipts -None this period.

D. Control of Vegetation -None this period.

E. Planned Burning -None this period.

F. Fires -None this period.

IV RESOURCE MANAGEMENT

A. Grazing

Control of livestock on the refuge poses a serious problem as the south end and the entire east side of the refuge are unfenced. Fence on the west side is in varying state of disrepair. Permits were issued to Cora Crystal and Ora Summers to legalize grazing which is unavoidable until the boundary is fenced.

Contact has been made with representatives of the new Winema National Forest which borders the refuge for some distance along the east side and arrangements made to inspect the area to consider the possibility of a common boundary fence.

For many years Indians have grazed their stock on this tribal marsh with scant attention to cattle numbers or leases. Although the marsh has been sold to the Bureau of Sport Fisheries and Wildlife, it is difficult for these individuals to accept the idea that they cannot continue to graze the marsh indiscriminately and must pay a grazing fee! We have spent considerable time and effort in working out grazing permits and laying the groundwork for future more restrictive measures. If we can seperate our Indian neighbors from their "free" grazing lands without incurring their enimity, it will be effort well spent.

B. Haying -None this period.

C. Fur Harvest

In addition to the following summary or the muskrat harvest on Klamath Forest Refuge, two mink were caught by trapper Barker and turned over to the government as his permit called for trapping muskrats only. An offer of $1.00 each for the two mink pelts was received at the Seattle Fur Exchange . At our request, the mink pelts were returned for further appraisal prior to final disposition.

Permittee	Total Catch	Trapper Share			Government Share
		pelts	total money	price/ pelt	
Barker #T-6689	1414 pelts	1061	$ 798.75	$0.75	353 pelts
Ray #T-6691	Did not trap				
Negus and Richardson #T-6690	1816 pelts	1363	971.30	0.71	453 pelts
Apted #T-6695	Included with Negus and Richardson's catch				
McMullin and Nestle #T-6696	714 pelts	536	393.96	0.73	178 pelts
Totals	3944 ,pelts	2960	$2164.01	$0.73	984 pelts

D. Timber Removal -None

E. Commerical Fishing -None

F. Other Uses -None

V FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report -Refer to the Tule Lake section.

VI PUBLIC RELATIONS

A. Recreational Uses

1. Hunting: -None
2. Fishing: -None
3. Miscellaneous:
   - (a) Recreation -None
   - (b) Economic Use 200
   - (c) Official 50
   - (d) Other 1200

B. Refuge Visitors -All visitors listed in Tule Lake section.

C. Refuge Participation -All participation listed in Tule Lake section.

D. Hunting -None this period.

E. Violations -None this period.

VII OTHER ITEMS

A. Items of Interest -All items of interest listed in Tule Lake section.

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Klamath Forest MONTHS OF January TO April, 1961

(1) Species	(2) Weeks of reporting period: Jan.-Feb. March 11	12	April 13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling		50							1,500		
Trumpeter											
Geese:											
Canada	160	500	650	(Incl. 100 pairs)					40,000		
Cackling			2,500						75,000		
Brant											
White-fronted		200	6,000						186,000		
Snow			100						3,000		
Blue											
Other											
Ducks:											
Mallard		2,000	2,200						126,000		
Black											
Gadwall			2,000						60,000		
Baldpate		3,000	3,000						180,000		
Pintail		10,000	500						315,000		
Green-winged teal		400	800						24,000		
Blue-winged teal											
Cinnamon teal											
Shoveler			1,000						30,000		
Wood											
Redhead			50						1,500		
Ring-necked											
Canvasback											
Scaup			400						12,000		
Goldeneye											
Bufflehead	20	50	300						12,000		
Ruddy			50						1,500		
Other											
Coot:		300	2,000						69,000		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	1,500	50	
Geese	304,000	9,500	
Ducks	762,000	16,000	
Coots	69,000	2,000	

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by R. M. Abney
Wildlife Management Biologist

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

INT.-DUP., D.C.-53824-59

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Klamath Forest Months of January to April ~~May~~ 1961

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Sandhill crane			25 pairs	4/7						70
II. Shorebirds, Gulls and Terns:										
Common snipe			29	4/14						200

(over)

(1)	(2)	(3)		(4)	(5)		(6)
III. Doves and Pigeons:							
Mourning dove							
White-winged dove							
IV. Predaceous Birds:							
Golden eagle		6	3/9				10
Duck hawk							
Horned owl							
Magpie							
Raven							
Crow							
Bald eagle		6	3/9				10

Reported by R. M. Abney
Wildlife Management Biologist

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

M17058

3-1754
Form NR-4
(June 1945)

Klamath [illegible]st SMALL MAMMALS 1961

Refuge_____ Year ending April 30,_____

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula-tion
Muskrat				1414				*6689	1061	*353	353			Pre-season 12,000
								6690 and 6695	1363	453	453			Post-season 4,000
				714				6696	536	178	178			
	Totals			3944					2960	984	984			

Trappers averaged $0.73 per pelt

* Permittee also turned in 2 mink

* List removals by Predator Animal Hunter

REMARKS:

R. M. Abney

Reported by _____

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

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CREDITS

		Tule Lake	Lower Klamath	Clear Lake	Upper Klamath	Klamath Forest
Robert F. Russell	Reading and editing all rough drafts and recommendations for improvements. Final proof reading.	I.A. I.B.1. III.A. III.B. VII.A.	I.A. I.B.1. III.A. III.B. III.F. IV.A.	I. IV.A.	I.	I. IV.A.
Robert M. Abney		I.B.2. II. V.A. VI.A. VI.C.	I.B.2. II. VI.A.	II. VI.A.	II. VI.A.	II. VI.A.
Lynn C. Howard		III.B. III.C. IV.C. VI.C. VII.A.	IV.C.		IV.C.	IV.C.
Pauline R. Chapman		III.B. VI.B. VI.E. VII.A.	VII.E.			
James MacFarlane		VII.A.				

SIGNATURE PAGE

Submitted by:

Robert F. Russell
(Signature)

Robert F. Russell
Refuge Manager
(Title)

Date: MAY 23 1961

Approved, Regional Office:

Does

Date: 6-9-61

Richard E. Griffith
(Signature)

Chief, Division of Wildlife
(Title)

NATIONAL PARKS MAGAZINE

OFFICIAL PUBLICATION OF THE NATIONAL PARKS ASSOCIATION

MARCH 1961 Vol. 35, No. 162

Paul M. Tilden, Editor

Contents

THE FRONT COVER FOR MARCH

Appropriate to the observation of National Wildlife Week—March 19 to 25—is our front cover photograph of the coyote, keen and able kin to the wolf and fox, and hearty survivor of man's assault with the gun, the club and the poisoned bait. Once a mammal of the great American plains, the coyote has greatly increased the extent of its habitat; it may now occasionally be found as far east as New York State and as far north as the interior of the new State of Alaska.

A Photograph by Charles J. Ott

THE NATIONAL PARKS AND YOU

Few people realize that ever since the first national parks and monuments were established, various commercial interests have been trying to invade them for personal gain. The national parks and monuments were not intended for such purposes. They are established as inviolate nature sanctuaries to preserve permanently outstanding examples of the once primeval continent, with no marring of landscapes except for reasonable access by road and trail, and facilities for visitor comfort. The Association, since its founding in 1919, has worked to create an ever-growing informed public on this matter in defense of the parks.

The Board of Trustees urges you to help protect this magnificent national heritage by joining forces with the Association now. As a member you will be kept informed, through NATIONAL PARKS MAGAZINE, on current threats and other park matters.

Dues are $5 annual, $8 supporting, $15 sustaining, $25 contributing, $150 life with no further dues, and $1000 patron with no further dues. Contributions and bequests are also needed to help carry on this park protection work. Dues in excess of $5 and contributions are deductible from your federal taxable income, and bequests are deductible for federal estate tax purposes. As an organization receiving such gifts, the Association is precluded by relevant laws and regulations from advocating or opposing legislation to any substantial extent; insofar as our authors may touch on legislation, they write as individuals. Send your check today, or write for further information, to the National Parks Association, 1300 New Hampshire Avenue, N.W., Washington 6, D.C.

NATIONAL PARKS MAGAZINE is published monthly by the National Parks Association. School and library subscription $4 a year. Individual copy 50 cents. Letters and contributed manuscripts and photographs should be addressed to the Editor, 1300 New Hampshire Avenue, N.W., Washington 6, D.C. The National Parks Association is not responsible for loss or injury to manuscripts and photographs in transit. Return postage should accompany contributions. Title Registered U.S. Patent Office. Printed in the United States. Second-class postage paid at Washington, D.C.

Robert W. Hines, U.S. Fish and Wildlife Service

The Tule Lake National Wildlife Refuge, shown in part above, is one of the Klamath Basin refuges of northern California and southern Oregon that are twice-yearly havens for countless millions of Pacific flyway waterfowl.

Tule Lake and Lower Klamath Wildlife Refuges are

Crossroads for Western Waterfowl

By Daniel A. Poole

AIR TRAFFIC CONTROL IS strictly for the birds along the Oregon-California boundary each spring and fall as millions of ducks, geese and other migratory birds wing into the Tule Lake and Lower Klamath National Wildlife Refuges.

Some of the northbound migrants go no farther. They filter into the refuges and busy themselves with nesting, rearing their young, and preparing them to take part in the great semi-annual flights that have washed up and down the continent for eons. Others rest and feed, and then push on into the vast breeding grounds of Canada, Alaska and the Northwest Territories. But no matter how widely the birds disperse, most of them touch base again in the fall at Tule and Lower Klamath Lakes as their retreat from winter moves the massed migrants down the Pacific waterfowl flyway.

Tule Lake and Lower Klamath Refuges are truly the waterfowl crossroads of the West. Not less than seventy percent of the flyway's waterfowl population uses the refuges at least twice a year. Recapture of ducks and geese that have been leg-banded in various parts of the continent's westernmost flyway shows that during the fall migration, many of the birds halt their southward movement along the coast and turn inland, crossing the Cascade Range to settle in the Klamath Basin refuges. Others from the eastern limits of the flyway swing westward at Idaho's Snake River, and at Great Salt Lake in Utah, to reach the basin. Millions of pintail ducks that nest on the prairies of Alberta and Saskatchewan make their fall rendezvous at the two refuges. Ornithologists long have recognized the Klamath Basin as the funnel

through which passes a large part of the Pacific flyway's ducks and geese at least twice yearly. And the materials from which that funnel is made are the Tule Lake and Lower Klamath National Wildlife Refuges.

Basin's Wetlands Drained

Mere remnants of the million-acre expanse of shallow lakes and marshes that once flooded the Klamath Basin, the refuges are administered by the United States Fish and Wildlife Service. Most of the basin's wetlands have been drained during the past fifty years, and now are the basis for a prosperous irrigated-agriculture economy. The refuges occupy sumps that are a part of the system for collecting and controlling excess irrigation water. The extensive modification of the basin marshland has not altered the age-old migrational habits of the waterfowl, however, and they continue to fly the historic routes and crowd into the marshlands that remain.

This creates both problems and benefits. The problems arise chiefly from the fact that the refuges encompass a few acres of arable land that some persons ultimately hope to force into private ownership. This locally intense feeling seemingly stems more from an aversion to the dedication of land in public ownership for public benefit than it does from any substantial gain in the number of homesteads the refuges would accommodate.

The primary beneficiaries of the refuges are the ducks and geese and the tremendous variety of other species of wading and marsh birds that find food and cover there. Hundreds of thousands of persons up and down the Pacific Coast States who find pleasure in observing, photographing, and studying the birds—and in hunting waterfowl—benefit markedly from these wildlife refuges.

The refuges have another group of beneficiaries who are not widely known. They are the rice and lettuce farmers of Central California. Tule Lake and Lower Klamath Refuges are the last important stopping places for the birds on their way to historic wintering marshes in California and beyond. Natural marsh habitat is restricted, for the most part, south of the Klamath Basin, and planted fields now flourish in the San Joaquin and Sacramento River Valleys. Reclamation has put many natural marshes out of business, and flooded rice fields form attractive gathering places for the waterfowl in some areas. Crop losses mount whenever the feathered travelers "pull up a chair" in farm fields in large numbers.

Wildlife experts say that the Klamath refuges are the pivots, the balancing points, that help equalize waterfowl production on the breeding grounds in the north with the limited wintering marshes in the south of the Pacific flyway. The conflict between ducks and crops in Central California becomes more severe as additional marshlands are drained. Its solution, of course, rests neither on extermination of the birds nor on arbitrary agricultural limitations. The public rightfully demands and expects to receive a certain amount of each. The principal solution for the depredations difficulty depends on delaying waterfowl migrations into Central California until most of the crops susceptible to hungry birds are harvested. In this regard, the Klamath Basin refuges are an important—and sometimes overlooked—ally of the Golden State's farmers.

Weather Controls Migration

How fast the ducks and geese move from the Klamath Basin into Central California depends largely on two factors—weather and food supplies. The first cannot be controlled, and low temperatures and early freezing can prompt the birds into quitting the basin in mighty flocks. Food can, and is, being regulated to a large degree. The refuges produce a tremendous quantity of usable, high-quality marsh vegetation. Tillable refuge areas are farmed, and federal personnel and lessees put available acreage into oats, barley and wheat. The ripened grain is deliberately harvested in alternate swaths so that stands are left as sizable "dining tables" for the ducks and geese.

C. J. Henry, U.S. Fish and Wildlife Service

Among the larger waterfowl migrants that make use of the Tule and Lower Klamath Lakes are Canada geese. Above, a goose and nest.

Lower Klamath National Wildlife Refuge is one of the first areas ever placed under government jurisdiction for waterfowl preservation. Now containing about 30,000 acres—partly in Oregon, but mostly in California—the refuge was established by an executive order in August, 1908. Initially it comprised more than 80,000 acres with miles of tule-bordered shore line, myriad small islands, and many hundreds of food-producing swamps.

Market hunters took wagon-loads of ducks and geese from Lower Klamath to city counters, and the millinery trade that sought the feathers of terns, grebes and other birds were supplied by plume hunters. Mink, otter and other furbearers were parted from their skins by trappers, who spread out across the vast marsh to partake of its natural wealth.

Lower Klamath's sustaining connection with the Klamath River was cut off in the late 'teens, and within four years the lake bed was dry, subject to peat fires, and shrouded with clouds of ashen, alkaline dust. It was not until many years later, with extensive development and diking, that water was returned to a significant part of the lake bed, and its waterfowl value gradually restored.

Tule Lake Refuge was established by

Daniel A. Poole is editor of publications for the Wildlife Management Institute, widely-known conservation organization of Washington, D.C.

Robert W. Hines, U.S. Fish and Wildlife Service

C. J. Henry, U.S. Fish and Wildlife Service

The Tule Lake Refuge is habitat for mammals as well as waterfowl. Above, a band of Rocky Mountain mule deer stare curiously at the photographer, while at left, the plumage of a nesting gadwall blends perfectly with marshland grass and reeds.

executive order twenty years later, in 1929, when 11,000 acres inundated by excess irrigation water were set aside as a haven for waterfowl. Two subsequent withdrawals increased the refuge to slightly more than 37,000 acres, which include practically all the lands that are being farmed under lease in the old lake bed. Part of the refuge is in natural vegetative cover; some of it is farmed by the U.S. Fish and Wildlife Service, and part by lessees under Bureau of Reclamation leases. Farming plans require that some of the grain grown on the refuge be left standing for the mallards, pintails and other grain-eating birds. By augmenting the natural food supply, the refuge helps attract and hold birds, so that only minimal damage results locally from depredations. This lush supply of food also encourages the birds to remain longer in the Klamath Basin, and provides opportunity for Central California farmers to harvest their crops ahead of the migrants' fall return.

Human Threat Remains

Man remains the predominant threat to the future of the Tule Lake and Lower Klamath Refuges. The very human and relentless drive for more and more land has acted against the refuges over past years, and its present-day counterpart is found in the number of persons, particularly in the vicinity of Tule Lake refuge, who are not reluctant to urge that much more of the refuge be turned over to private hands for homesteading.

Paradoxically, the greatest danger to the refuges rests in the manner by which they were created. Simply put, they were created by the stroke of a pen. They were withdrawn from other uses by the simple declaration that they were required for national waterfowl purposes. This means that despite their success and widely admitted value as refuges, despite their contribution to the welfare of waterfowl in the entire Pacific flyway, and despite the investment of large amounts of time and money in developing dikes, ditches, plantings, refuge buildings, and roads and facilities, the areas technically could be eviscerated or abolished by the same easy stroke of the pen that first created them.

The purpose of this article is not to say that such an event will or will not happen; its purposes is to emphasize that it *could* happen. There is ample reason to be apprehensive. As recently as 1960 an attempt was made to disrupt irrigation water pumping schedules at Tule Lake Refuge so as to raise the marsh level in the spring and flood out nesting sites, and to lower it in the fall and expose hundreds of acres of mud flats. This would, of course, hinder hunting access and minimize the refuge's value as a haven for migrating waterfowl. In fact, the pumping controversy has all the earmarks of being just one more effort by a few organized groups in the vicinity of Tule Lake to impair and discredit the refuge.

This latest difficulty has its roots in a repayment contract signed by the Federal Government and the Tulelake Irrigation District, under which specific works and irrigation facilities of the Klamath Federal Reclamation Project were transferred to the local group for operation and maintenance. According to operating regulations issued under the 1956 contract, the irrigation district agreed to maintain specified objective water levels in the Tule Lake refuge sump to comply with the U. S. Fish and Wildlife Service's year-around wildlife management plan for the area. The levels are controlled by a pumping plant that moves excess irrigation wat water from the Tule Lake sump, through a tunnel in an intervening ridge, to nearby Lower Klamath Refuge.

On December 11, 1959, the Department of the Interior notified the ir-

rigation district that it intended to resume operation of the pumping plant within sixty-five days. Interior said it was determined that the pumps were to be operated so as to "fully meet wildlife conservation objectives while serving their primary purpose of protecting agricultural lands."

Refusal to Co-operate

A departmental memo rundown on the situation noted: "The entire sump level operations since the district took over the operation in January of 1957 have been marked by district refusal to maintain sump levels and contending and threatening that it would operate sump levels to best accommodate the irrigation interests without regard to the wildlife interests. I think it fair to say that the 1958 regulations are quite rigid and exacting by reason of the one-half inch monthly adjustment of sump levels prescribed. However, the October-November deviation of some six inches below prescribed levels has all of the aspect of an open challenge of the regulations and to the wildlife management operations of the sump."

Interior's ultimatum was followed by a joint meeting of departmental wildlife and reclamation bureau personnel with the Tulelake irrigation interest. The then under-Secretary, Elmer F. Bennett, opened the meeting by stating that: "The action of the department in giving the 'take back' notice of December 11, 1959, was based on (a) the unequivocal advice of the Bureau of Reclamation and the Bureau of Sport Fisheries and Wildlife that district operation of the Tule Lake sump regarding the maintenance of water levels for wildlife purposes was in violation of the repayment contract and the operating regulations thereunder for critical portions of the 1959 season; (b) clear advice from the Bureau of Sports Fisheries and Wildlife that such violation was detrimental to the wildlife management functions of the Tule Lake sump; (c) equally clear advice from the Bureau of Reclamation that operation of the sump to meet objective levels in keeping with the contract and regulations would not be incompatible with the irrigation and flood protection operations of the irrigation project; and (d) the Solicitor of the department has advised the Secretary that the regulations governing the operation of the sump are within the authority of this department under its contract with the district."

Notice of Compliance

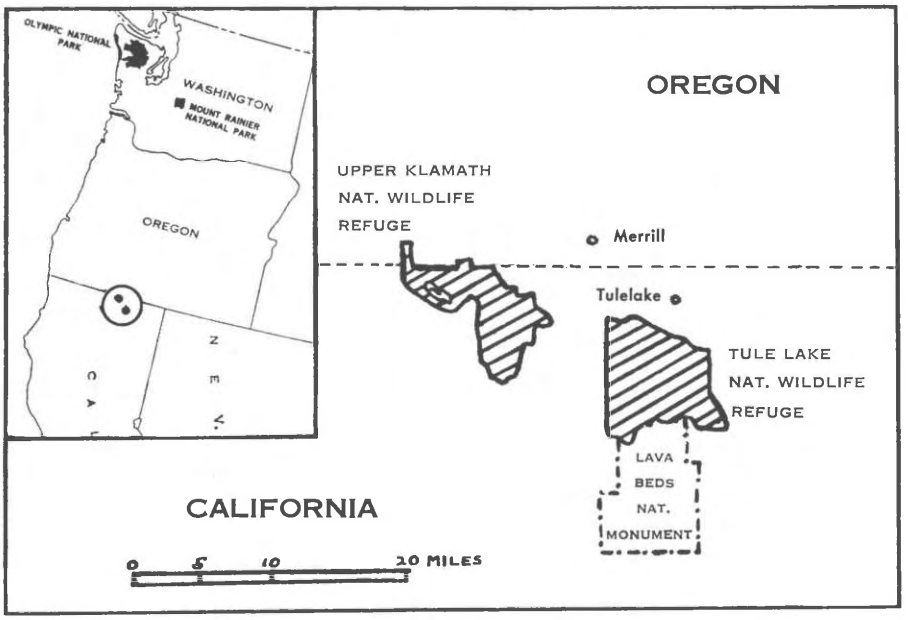
The meeting resulted in a slight modification of some of the objective sump water levels that wildlife and reclamation bureau spokesmen believed would not be inimical to the dual purposes of the wildlife refuge sump. The Tulelake Irrigation District notified the Interior Department of its intent to comply with the established regulations, and the "take-back" order was rescinded. The irrigation district continues to man the pumping facilities and a late check indicates that it is adhering to the agreed target water levels. Past experience would indicate, however, that the district most likely can be expected to renew its campaign against the refuge before many more months pass.

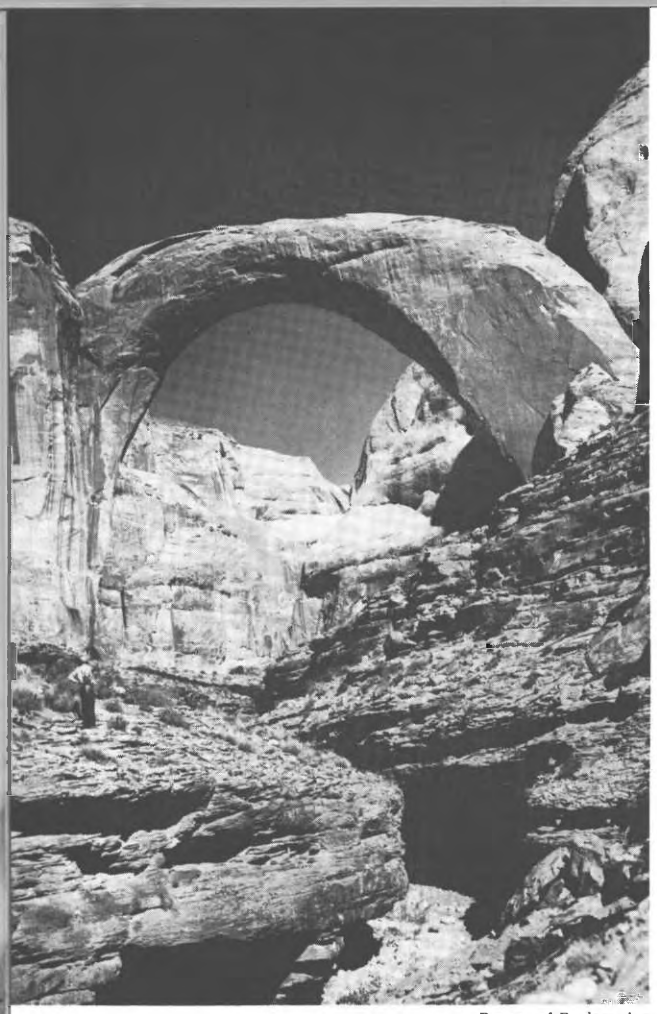
Biological checks last summer show that the water levels specified by the U.S. Fish and Wildlife Service—and adhered to by the irrigation district for the first time in two years—definitely are beneficial to waterfowl using the refuge. The production of young diving ducks went up fifty-seven percent in 1960 over 1958 and 1959. The irrigation interests held the water levels below those specified in the repayment contract during those years.

Low water during the summer of 1959 contributed to the loss of 3500 ducks to botulism, a form of food poisoning known commonly as "western duck sickness." Less than two hundred afflicted ducks were found by refuge personnel in the past year. The maintenance of specified water levels is credited with the past year's low mortality to the dread sickness.

Both areas are so vital to perpetuation of waterfowl on the Pacific flyway that many conservationists feel Congress should enact legislation specifically setting out the refuges under law, and dedicating them permanently as units of the national waterfowl refuge system in the public interest. Such action would eliminate the hazard of an administrative action which could abolish, modify or so alter the remaining marshland with the refuges as to make it of but little value for waterfowl purposes. Congressional recognition of the refuges would change a situation that serves mostly as a catalyst for moves against the remaining refuge lands. Indications are now that conservationist support for such protection is considerable, and that it will continue to grow. ■

The Upper Klamath and Tule Lake Wildlife Refuges, remnants of a million acres of shallow lakes and marshes that once floored the Klamath Basin, are part of an irrigation-water control system.





Bureau of Reclamation

Rainbow Bridge, a great monolith in the wild canyon country of southern Utah, is remarkable both scenically and as a geological phenomenon. It stands some 309 feet above the floor of Bridge Canyon, is 278 feet long, and is commonly believed to be the largest natural bridge in the world.

Construction of the Glen Canyon Dam may mean

The End of the

LIKE A HUGE, DARK DOME on the horizon, Navajo Mountain looms as a massive landmark to dominate the solitude of the Arizona-Utah border from the Colorado River to the Four Corners. Revered by many generations of Navajo Indians as the home of their war gods, the 10,416-foot forest-crowned laccolith stands guard over America's largest and most inaccessible wasteland, the ten-thousand-square-mile Escalante Wilderness.

Carved and sculptured by torrents that spring to sudden life after each storm to form ephemeral tributaries of the San Juan and the Colorado, the massive, sloping layers of sandstone radiating from the mountain's base have been cut into a maze of deep ravines and gorges. Scoured, rounded, and smoothed by forces of weathering, the mountainous rock buttresses between canyons have accumulated soil only in protected locations and rise bare and smooth as sandblasted "slickrock baldheads," perilous footing for man and horse.

Deep within this labyrinth of clefts and canyons northwest of Navajo Mountain is the "sandstone rainbow," the world's largest recorded natural bridge. The *Nonnezoshi* of the Navajo and *Barohoini* of the Paiutes was first seen by white men on August 14, 1909. They were guided to it by the Paiute, Noscha (or Nasja) Begay.

In the half-century that has elapsed since its "discovery," Rainbow Bridge, although considered a world wonder, has been reached by fewer than 12,000 people. Hundreds of miles from heavily-traveled routes, and hidden in the trackless wilderness of slickrock and canyon, Rainbow Bridge, with 160 surrounding acres, was proclaimed a national monument by President Taft on May 30, 1910. For a decade it remained too isolated to be reached by even the most hardy.

In 1920 an enthusiastic and determined explorer, Charles Bernheimer, with a well-equipped pack outfit, endeavored to reach the great arch by crossing Navajo Mountain. But the indescribably rugged terrain—which he reported as "the most appalling rock jumbles on this continent"—proved an impassable obstacle, and he was forced to turn back. Swinging around the trackless northern base of Navajo Mountain, the Bernheimer party picked its way among the scrubby pinyons and junipers of the mesa tops, struggled across rugged canyons leading north to the San Juan, and, led by an Indian guide, finally entered upper Bridge Canyon and followed its scarred and boulder-strewn floor to the foot of the stone rainbow.

Returning in the summer of 1921, Bernheimer approached the slickrock wilderness from the southwest side of Navajo Mountains, following Forbidding Canyon (shown as Forbidden Canyon on modern maps) which traverses the 111th meridian northward, and empties as Aztec Creek into the turbulent Colorado. Bridge Canyon joins Forbidding Canyon from the east about four miles from its junction with the Colorado.

Canyon Too "Snarly"

But Forbidding Canyon proved impassable for pack animals; it was too rugged and snarly, and was blocked by steep shelves that the animals could not negotiate. "Besides," wrote Bernheimer, "Forbidding Canyon had a way of abruptly closing up, its streamlet in the meantime forming an underground passage with sudden ghastly pothole vents or crowded polished throats to one side of a high, steep shelf which blocked all travel except for a man on all fours and with the aid of a rope." Completely hemmed in after forcing its way to within an estimated seven or eight miles of the great bridge, the expedition reluctantly turned back.

But Bernheimer was not to be denied; in the summer of 1922, equipped