

Narrative Report Routing Slip

Mr. Salyer _____

Mr. Ackerknecht _____ *Lates*

Mr. Crawford _____

Administrative Services

~~Miss Baum~~ *MM* _____

Operations

~~Mr. Bernonich~~ *est* _____

~~Mr. Regan~~ *RR* _____

Public Use

Mr. DeMont *PAD* _____

Mr. Kubichek _____

~~Mr. Stollberg~~ *ST* _____

Resource Management

~~Dr. Kerley~~ *Lam* _____

Mr. Hickok *Dmd* _____

Wildlife Management

Mr. Banko _____

Mr. Stiles _____

Mr. Goldman _____

Refuge LACREEK, BEAR BUTTE, and
BELLE FOURCHE

Period May - August 1960

LACREEK NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY, JUNE, JULY, and AUGUST, 1960

P E R S O N N E L

Permanent

Charles A. Hughlett - - - - - Refuge Manager - In Charge

Edward J. Collins - - - - - Refuge Manager - Trainee

Forrest W. Brooks - - - - - Operator General

William W. Ireland - - - - - Clerk-Typist

Temporary

Peter H. Momsen - - - - Student Assistant - Wildlife Aid

Leland S. Key - - - - - Laborer - W.A.E.

Ira "Red" S. Wallingford - - - - - Laborer - W.A.E.

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LACREEK NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY, JUNE, JULY, and AUGUST, 1960

I. GENERAL

A. Weather Conditions.

	<u>Snowfall</u>	<u>Precipitation</u>		<u>Max.</u>	<u>Min.</u>
		<u>This Month</u>	<u>Normal</u>	<u>Temp.</u>	<u>Temp.</u>
May	0	4.18	2.5407	88	28
June	0	3.96	3.3121	95	44
July	0	1.71	1.6964	103	50
August	0	4.28	2.3557	105	46
Total	0	14.13	9.9049	Extremes 105	28

Precipitation data in the above table were obtained from the official recorder located at refuge headquarters. Temperature readings were taken from the official weather station located in Martin about 14 miles northwest of the refuge.

May continued the cool rather moist conditions prevalent at the end of April. Maximum temperatures did not exceed 71 degrees until the 12th of the month when the first really warm day of the spring brought a temperature reading of 85 degrees. Highest readings for the month were 88 degrees on the 13th and the 31st. Precipitation was abundant and well spread over the entire month. Grasses and cultivated crops made excellent growth.

June was also a cool month with slightly above normal precipitation. Low temperatures of 45 degrees were recorded as late as the 21st and the 23rd. The mercury exceeded 90 degrees only on the 26th when the maximum for the month of 95 degrees was reached. Pasture grasses and small grain crops made excellent growth during the cool moist weather. The last rain of the month was on the 20th.

July was hot. Maximum temperatures exceeded 100 degrees only three times but readings in the high 90's were the rule on most days. The precipitation was almost normal but was so well spaced that most of the small grain harvest was completed without halting for rain showers to pass.

The hot weather continued into August without a let up. High temperatures of 100 degrees or over were recorded on five days during the month. The maximum for the period of 105 degrees occurred on the 4th. Even the old residents in the county complained of the sustained heat. Maximum temperatures were over 90 degrees on 14 days out of the 31. Precipitation was far above normal for the month. Ranges began to green up and the prospects for next year's small grain crop is excellent.

Total precipitation for the four month period was 14.13 inches. This is 4.21 inches above normal and 8.89 inches more than rainfall for the same period in 1959. The drought appears to be broken in the area surrounding the refuge although it is still extremely dry west and north of here.

B. Habitat Conditions.

1. Water. All pools were held at approved levels at the beginning of the period. Pools 1 through 6, and 9 and 10 were at maximum levels to flood as much shoreline as possible. This created extensive areas of shallow water interspersed with low islands of dry ground. Puddle ducks find these areas extremely attractive both during migration and during the early part of the nesting period.

Pool 7 was flooded with about 18 inches of water (4.20 on the gauge) and held at that level with only minor fluctuations during the entire period. The submerged and emergent aquatics made excellent growth again this year.

Pool 8 was again in draw-down status to permit aeration and revegetation of the pool bottom. We hope to construct nesting islands in this pool during the next period.

The pool at the Little White River Recreational area was maintained at maximum capacity to permit the greatest amount of boating and water skiing. The abundant rainfall during the summer kept the water fresh and cool for swimmers. This pool will be drained early in September to facilitate the removal of rough fish.

The new pool just north of dike no. 9 in Wild Land Unit W-1 was very attractive to puddle ducks this summer. Following the nesting and brood season, the pool was permitted to dry out.

It will be flooded again next spring. The late summer drying period seems to be one of the main factors in the continued productiveness of the marshes at Lacreek.

The smaller pools have been allowed to recede during the latter part of the period. Pool 2 has been drained to permit repair of a broken headwall and control gate. Pools 6 and 9 are receding rapidly to provide easier access to dike no. 6 which separates the two pools. This dike is badly riddled by muskrat burrows and beaver dens. Long sections of the 6 mile dike must be almost completely rebuilt.

The volume of water entering the refuge from both Cedar and Lake Creeks seems to be greater than is normal for this time of the year. We feel that the three dams on the Brown ranch south and west of the refuge that broke on June 3 may be the reason for the abnormally high water. These three dams usually impound the flow from large springs. Much of the flow is lost by evaporation and seepage. Since the dams are no longer functioning, all of the flow from the springs enters the creeks and eventually reaches the refuge.

2. Food and Cover. The excellent growing conditions this year resulted in lush stands of range grasses and tame hay. Bumper crops of small grains were common this year. The good growth of upland vegetation and small grains provides abundant food for many species of wildlife. Upland game birds and deer are often seen in grain stubble fields with several thousand mallards and pintails. The field-feeding species of ducks seem to prefer barley stubble over either wheat or rye. Rank growth of grasses on lowland areas have been mowed and stacked or windrowed. New growth on the meadows is succulent and should be attractive to any geese that migrate through here this fall.

The second year of draw-down for pool 8 resulted in a much different vegetative growth than last year. The smartweeds that were dominant in the moist soil have been largely replaced by softstem bulrush, arrowhead, and a few cattails. Sago pondweed is seen in scattered stands where some water is standing in a sump area.

The vegetative transects established in pools 7 and 8 last year were checked by student assistant Peter Momsen and Junior Manager Edward Collins. The history of plant succession in these two pools should be of great value in determining the length of draw-down in pools 9 and 10. Pool 7 was dry for one year and pool 8 has been dry through two growing seasons.

The brushy trees in lowland areas of the refuge harbor most of the refuge population of white-tailed and mule deer. Pheasants and sharp-tailed grouse also use the thickets in stormy weather. Most of the cover needed by these birds and by the wintering mallards is provided by tall emergents along the edges of the pools.

II. WILDLIFE

A. Migratory Birds.

1. Waterfowl. The breeding population of species that normally nest at Lacreek was greatly reduced from last year but was slightly higher than in 1958. The annual breeding pair counts were delayed until the last days in May and the first 4 days of June this year because of adverse weather. We feel that the birds present here at that time were either definite nesters or were non-breeders just loafing. Small flocks of male redheads, scaup, and ruddy ducks were in the latter category. A total of 1,501 pairs of puddle ducks and 53 pairs of diving ducks were counted by the crew comprised of the refuge staff and Refuge Manager (Biologist) Harvey Miller from the Lake Andes Refuge. A tabulation of breeding pair counts for the past five years follows. Except for 1959, the number of breeding pairs counted annually is roughly comparable.

Breeding Pair Counts, 1956 - 1960

Species	1956	1957	1958	1959	1960
Mallard	285	328	338	488	369
Gadwall	198	66	67	133	87
Baldpate	2	19	2	12	1
Pintail	32	37	108	126	43
B.W. Teal	808	1000	583	1213	914
Cinn. Teal	-	-	-	1	-
G.W. Teal	30	5	2	32	5
Shoveller	120	78	102	261	82
Wood duck	2	-	-	-	-
Unid. Dabblers	6	3	-	8	-
Redhead	18	52	36	56	26
Canvasback	14	5	1	2	1
Scaup	65	5	15	97	18
Ring-necked duck	3	-	-	-	-
Ruddy	1	63	6	16	6
Goldeneye	-	-	-	2	-
Est. pairs missed	150	50	50	100	-
	<u>1,634</u>	<u>1,711</u>	<u>1,315</u>	<u>2,557</u>	<u>1,553</u>

The flock of 32 Canada geese released on the refuge in early February remained in a loose flock until the middle of May. We had hoped to raise some goslings from the three-year-old geese but only one pair separated from the main flock. After a few days spent inspecting the nesting hummocks in pool 7 and the natural islands in pool 9, these birds rejoined the flock. All of the geese disappeared after the middle of May. This is the second year that released captive geese have disappeared after the middle of May. All of the birds in the 1960 release wore green plastic bands in addition to the regular band.

The student assistant made a special study of the artificial potholes on the north shores of pool 5. Once again the potholes were heavily used by breeding pairs of ducks. Brood use of the area was not as prolonged as it was last year. A detailed report will be submitted before the student returns to college next period.

One major brood count was made this year, followed by a check of some of the more important areas later. The major counts indicated a reduction in blue-winged teal broods. Later transects showed that a normal number of teal broods were reared on the refuge but were not seen on the major count. It is probable that all species except blue-winged teal were observed in somewhat near their true numbers. Broods of the later nesters were difficult to find in the extremely rank shoreline vegetation until the young grew larger and ventured farther from shore.

In spite of a greatly reduced breeding population, the broods produced this year ^{ARE} quite comparable to those produced in 1959. The following table gives a comparison between broods produced in 1958, a normal year, those produced in 1959, an abnormal year, and those produced this year.

Estimated brood production by species 1958, 1959, & 1960

Species	1958	1959	1960
Mallard	298	162	245
Gadwall	35	16	30
Baldpate	2	0	0
Pintail	45	45	47
G.W. Teal	5	0	0
B.W. Teal	458	455	380
Shoveller	22	8	30
Redhead	15	17	3
Canvasback	10	0	0
Ruddy	2	0	0
	<u>960</u>	<u>703</u>	<u>735</u>

Coots remained on the refuge all summer although production of young was limited. Only about 300 coot were present this year compared to over 850 last year. The habitat in pools 9 and 10 seems ideal for this species but few of the "white-bills" spent the summer here.

The usual late summer influx of locally reared ducks began in the second week of August. A definite migration of mallards and blue-winged teal was observed during the third week of the month. These two species continued to build up during the last week of the period. Both coot and blue-winged teal usually depart for the south during late August but both species remained here this year through the end of the period.

2. Other Waterbirds. The double-crested cormorants and white pelicans were successful in rearing many young on the two islands in pool 9. The nesting population did not reach the record highs of last year. We estimate 200 young of each species attained flight stage.

Pied billed grebes nested in subtidal habitat on most pools of the refuge. Their numbers were far below those seen last year. About 70 broods were counted this year. A few eared grebes were present at the beginning of the period but none remained to nest. Western grebes were seen during the summer and a few young were produced.

Great blue herons do not nest at Lacreek. A few adults fish here all during the summer and are joined by immature birds in late August. We do not know where the herons nest. About 10 of the long-legged fishermen could be seen during the latter part of the period. Black-crowned night herons are common again this year although their numbers are far below last year. Their favored nesting area is in the tall emergents in pool 9. We believe that about 100 young were raised in this rookery.

Several American bitterns have been seen stalking along the marsh edges. The species is never abundant here although their calls can be heard from several locations in the marsh. About 30 birds including young, are present.

The lone sandhill crane reported last period remained on and near the refuge until about May 20. This bird appeared healthy and could fly very well. It is not known why it stayed so late in the spring.

3. Shorebirds, Gulls, and Terns. The killdeer was, as usual, the most abundant species among the shorebirds. Their nests were scattered over dikes and trails across the refuge. One pair successfully reared two young in a nest at the edge of the headquarters courtyard. Willetts and Wilson's phalarope also nested here. Only a few pairs of Willets were seen but the phalaropes were common at the edges of most of the pools. Wilson's snipe, dowitchers, and greater yellowlegs passed through in small numbers in the spring migration. Lesser yellowlegs, avocets, and long-billed curlews stayed with us all summer but no young were actually seen. The lesser yellowlegs' fall migration began in early August. A few pairs ^{of} upland plovers nested successfully. Forster's and black terns nest on the refuge. The latter species is far more abundant than the former. About 100 black terns were raised here.

The ring-billed gull is an erratic summer resident. Flocks of up to 200 gulls wander in, stay for a few days or a few weeks, and then wander out again. No herring gulls were seen during the period.

4. Doves. The mourning dove nesting population built up rapidly after the first week in May. Many of the first nests were destroyed by windstorms. Quite a few nests with young in them were seen in the middle of June. A few fledglings were banded. Large flocks of doves were noted in early August but most of the birds had migrated before the end of the month. The largest concentration on the refuge occurred on about August 25 when one flock estimated at 1,200 birds was seen just west of the headquarters.

B. Upland Game Birds.

The ring-necked pheasant again had a very successful nesting season on the refuge. Survival of young was high and we approach the hunting season with an excellent population of birds. The refuge will not be open to hunting but we expect the usually large number of boundary hunters. South Dakota has established a season starting October 22 and extending through November 20 for this area. The bag limit is three cock birds with a possession limit of 12 birds.

No sharp-tailed grouse have been seen on the refuge during the period. Good sharp-tail range exists about 30 miles north of here.

C. Big Game Animals.

Several mule deer and white-tailed does with fawn have been observed during the summer months. Most of the does seen have had twin fawns with them. Quite a few deer have been reported in the sandhills to the south of the refuge. Ranchers there post their lands to protect the deer. A few animals will no doubt be shot during the five-day bucks-only season established for this county by the state game dept. This harvest tends to keep the herd within balance with the small amount of wintering habitat available on the refuge. All of the deer seen have been in very good condition.

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

Muskrats are now seen regularly in good habitat and appear to be recovering from the epizootic that decimated the population last winter. The fur harvest recommendations will be delayed until after house building begins in October to permit a more reliable estimate of the rats.

Mink have been seen more often this summer than in past years. We feel that a heavy harvest of this species will be needed this winter to keep their numbers within bounds. A few long-tailed and least weasels are present on the refuge although they are rarely seen. Some of these small predators are usually taken in mink sets.

The trap-wise beavers that escaped our fur trapper last spring are causing trouble by blocking water control structures. Several willow trees have been dropped across dike trails during the summer by the beaver. These small engineers rank high on our list of undesirable

characters. We plan an intensive removal program during the winter.

Only a few skunks have been seen this summer. The poisoned egg program has evidently resulted in good control of this species. Quite a few raccoon tracks are noted in the mud at marsh edges. 'This masked bandit does not seem to be as susceptible to the poisoned eggs as is the skunk. Raccoon are feeding heavily upon wild plums at this time. Their droppings are composed almost entirely of plum pits. We intend to trap and poison as many 'cooms as possible around the new trumpeter swan enclosure just before the swans are received.

A few badger have been seen although their diggings would indicate a much higher population than we know exists. One animal dug a large hole in the refuge road north of headquarters. He then excavated a half dozen holes in the borrow ditch bank and watched from these sites as the refuge staff bounced across his traffic trap.

Cottontails remain at a very high population level. Quite a few of the bunnies inhabiting the headquarters area were shot during the summer months. These animals girdle and kill shrubs and small trees during periods of heavy snow cover. White-tailed jack rabbits are common but no black-tailed jacks were seen during the period. The jacks are kept under control by off-refuge hunters during the winter.

Thirteen-lined ground squirrels seem slightly less abundant than last year. The small rodents are still plentiful. Pocket gopher mounds are noted occasionally, especially in the more sandy areas of the refuge. One prairie dog was seen just north of headquarters this period. Several dog towns exist off the refuge but this is the first observation of a dog on the refuge for some time.

Meadow mice, white-footed deer mice, and jumping mice are seen during the course of field work. They appear to be somewhat less common than last year. One bat and one shrew were taken during the period. These are quite unusual. The bat has been identified as a Little Brown Myotis lucifugus. The shrew appears to be a Masked Shrew Sorex cinereus.

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

Marsh hawks are permanent residents at Lacreek. The wintering population of about 10 hawks were joined by a few more to bring the nesting population up to about 15 birds. Several young were raised. These graceful birds can be seen coursing over the marshes and fields on mouse hunts during most hours of the day.

Two sparrow hawks spent the summer months with us but were not known to nest. The Swainson's hawk departed early in May. Occasionally these birds remain all summer. The red-tailed hawk usually spends some time here during the late summer. Only one of these buteos was noted this year. One rough-legged hawk returned in late August.

These birds spend the winter here.

The first golden eagle was seen on August 28. Usually about 7 to 9 birds of this species winter here.

Small numbers of crows and magpies are permanent residents at Lacreek. The magpies are not known to nest. Several pairs of crows raised young in the tree groves scattered around the refuge. Populations of these two species does not seem to increase. More magpies will arrive during the next period to spend the winter here.

Great horned owls are seen regularly. They seem to favor the trees around the display pool and the trees along dike no. 6. About 16 of these birds are year-round residents. Some of the owls using the display pool trees may have to be controlled when the trumpeter swans arrive. The swan enclosure will include the display pool and its trees.

One pair of burrowing owls were seen about $\frac{1}{2}$ mile west of headquarters. We do not know whether these birds reared young. The short-eared owls that were so common two years ago have disappeared. We can think of no reason why all of these small owls should desert us.

F. Other Birds.

The revised Lacreek Refuge Bird List, including six species identified since the original list was published, was received during the period. We already have a new species to add to the revised list. A red-breasted nuthatch was seen and positively identified by Operator General Forrest Brooks and Junior Manager Edward Collins. noted
PAJ

G. Fish.

Bass fishing at the dike 10 fishing area was the best for many years. The large-mouthed bass began biting in early May. Limits of 10 fish were the rule rather than the exception until late June. The bass continued to bite sporadically throughout the summer. Usually fishing is quite poor after the first week in July. Most of the bass taken were in the 2 to 3 pound class although both larger and smaller fish were caught. A very few medium sized perch were caught by the bass fishermen and for the first time in several years a few large bullheads were noted in the strings of fish.

A few bullheads were caught by bank fishermen at the Little White River pool. We intend to drain this pool after the Labor Day weekend. The rough fish will be poisoned with rotenone during the first week in October. We hope to stock the pool with large bass trapped when we drain pool 9 in mid-November. Additional fish will be stocked next summer from the Crawford, Nebraska National Fish Hatchery. We hope to have a good sport fishing lake established at Little White River before the drainage of pool 10 on the refuge.

H. Reptiles.

The plains garter snake is the most common reptile here. The brightly marked snakes are seen regularly on every trip to the edge of the marshes. A few rattlesnakes were seen in the early part of the summer.

The western painted turtle is very abundant. This small turtle seems to have no adverse effect upon waterfowl. The commercial turtle trapper who worked at Lacreek last summer returned this spring. He removed 265 snapping turtles which averaged over 20 pounds. He trapped all pools of the refuge except pool 10 which was kept as a control area. Including the 510 turtles taken last fall, the trapper removed 775 snappers from the refuge. Fourteen female snapping turtles were taken by refuge personnel in connection with other duties. All of these turtles were picked up on the road adjacent to pool 10 when the females came up to lay eggs. One large male was caught late in the summer. Autopsy revealed the remains of an adult drake mallard in the turtle's stomach.

Leopard frogs and American toads are common on the refuge. The bullfrogs so frequently seen are the descendents of frogs originally stocked in pools west of the refuge on Lake Creek. The frogs escaped and made their way downstream to refuge pools. The adults do not reach the size of the bullfrogs seen in Illinois, but are at least 15 inches long when stretched out. No fishing or hunting of the frogs is permitted.

I. Disease.

No disease of any kind has been observed on the refuge this period.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development.

One big item in our work program for this period was the dismantling of the portion of the old frame shop still standing. This job was made much easier by the willing and able assistance of crews from the Valentine and Fort Niobrara Refuges. The entire building was torn down and the lumber piled in one day (see photo section). The regular refuge staff then removed old concrete foundation walls, chimney, and debris. The grease pit was filled in and crushed rock spread between the concrete floor slab and the new steel storage building. Nails will be pulled from the salvaged lumber as time permits during the next period.

An informal contract was awarded for the installation of lights and electrical outlets in the new steel storage building. Both 110 and 220 volt circuits are available in the building. This storage area has long been needed. We now have a modern shop, new gasoling storage tank and pump, and the steel equipment storage building at head-

quarters (see photo section). The old frame-stucco oil house must be replaced before we can have adequate fire-proof storage for the flammable materials.

The kitchen in quarters no. 2 was remodelled during this period. All existing cupboards and counters were removed. A wall into a closet was removed to give additional space. New floor tile, cupboards, double sink, wall oven and counter top burners, were installed. The wall oven was used to take advantage of wall space above the basement stairs. A new light fixture and ventilating fan completed renovation of what had formerly been just a dark, cramped work area. The house was still torn up when the new junior manager and his family arrived. All of the painting and tile laying was done by Mr. Collins during his spare time.

A new well for drinking water was drilled at this quarters. The new pump has been tested but is not yet installed permanently. Replacement of the plumbing and sewage disposal systems in this quarters and in quarters no. 3 will be completed during the early part of the next period.

A new submersible pump was installed in the well in the basement of the refuge manager's residence. This well supplies the entire headquarters area. We found an 8 inch cased well when we removed the old pump. The new pipe extends 80 feet into the well.

A contract has been awarded for the replacement of the furnace and all ductwork in the refuge manager's residence. This old furnace was originally coal-fired but had an oil conversion unit in it. The passage of time had made this furnace a definite fire hazard and we are anxiously awaiting its replacement. The furnace and ductwork have been delivered but the actual installation will be completed early in the next period.

Sewer, water, and electrical lines were run to the site chosen for Mr. Brooks's house trailer. This site is near the fire tower where the utilities could be connected with a minimum expenditure. A septic tank for the trailer was made from an old 750 gallon hot water tank that had served for over 20 years as an underground gasoline storage tank. Pipe connections were drilled and tapped in the tank. Hours of cleaning with the steam cleaner failed to remove all the gasoline fumes and a welding torch could not be used.

The construction of an enclosure for the trumpeter swan transplant necessitated a major effort by all personnel during August. Two temporary laborers were hired to assist in this job. The site chosen for the pen included the display pool and the brush and trees surrounding it. All brush was removed and all trees pruned to 6 feet above the ground. Many leaning trees were also removed. We received the loan of a chain saw from the Upper Mississippi Refuge to assist in this job.

As the period ends we have most of the brushing completed and all fencing materials on hand. It will be necessary to repair one existing water control structure and construct another to properly control water levels.

The usual maintenance tasks were performed as necessary. The press of development projects outlined above, plus a heavy schedule of biological work put a severe strain on all equipment. It was necessary to take time out to make adjustments on only a few vehicles. The one exception was the 1958 Dodge 4-wheel drive pickup, which has been a serious problem since its purchase. This time the bearings in the transfer case had to be replaced because the seals leaked and allowed water to enter the transfer case. All shock absorbers were replaced and the motor tuned up. This truck has cost us over \$750.00 in parts alone in the 2½ years it has been assigned here. The truck has only 13,500 miles on it.

Refuge personnel, aided by Biologist Harvey Miller of the Lake Andes Refuge, serviced and transferred four 1952 GMC trucks from Camp Rapid (National Guard) Rapid City, South Dakota to Lacreek Refuge. Two of the trucks remained here while one each was transferred to Des Lacs and Horicon Refuges. These hydramatic drive vehicles were in practically new condition and were put to work immediately. The side racks on the trucks were built up so they can now carry 8½ tons of crushed rock. It is a pleasure to have a truck that can be relied upon to carry a load over our rough roads and dikes. These trucks replace a 1949 Reo and a 1951 IHC dump truck.

B. Plantings.

1. Aquatics and Marsh Plants. None this period.
2. Trees and Shrubs. Twenty five hybrid elm seedlings and 25 ponderosa pine 2-2 transplants were (purchased) from the Bennett County Soil Conservation District. The trees were planted at the headquarters and the two sub-headquarters sites. Survival at headquarters has been almost nil. The pines at the other two locations have done poorly but most of the elms are still alive. All trees were planted carefully and watered frequently.
3. Upland Herbaceous Plants. None this period. The crested wheat-grass planted last period made little if any growth. We hope it is just a slow starting species as many of our grasses are. We should know more about that by next spring. The red clover seeded in sub-irrigated hay meadows has done well. It has not been checked since the meadows were mowed in mid-August.
4. Cultivated Crops. The winter rye and winter barley planted last fall on summer-fallowed land produced an excellent crop. Much of the rye yielded 35 bushels to the acre. The winter barley did not do quite so well. Spring-planted barley also produced

well but most corn fields are very poor. Some food for wild-life will be available in corn fields that are too poor for the farmers to pick. The refuge share of winter barley was swathed and left in the fields. Mallards and pintails, with pheasants and deer, have almost completely consumed the grain by the end of the period. The refuge share of rye, 350 bushels, is stored in the granary at quarters no. 2 and is available for transfer. The refuge share of spring barley is to be fed to the captive geese and to the trumpeter swans.

C. Collections and Receipts.

1. Seed and other Propagules. None this period.
2. Specimens. One little brown bat Myotis lucifugus, and one masked shrew Sorex cinereus were collected during routine operations this period. Both will be added to our collection of specimens in our display case.

D. Control of Vegetation.

A severe infestation of pennycress Thlaspi arvense developed just inside the refuge boundary near headquarters this spring. Seed evidently spread from private lands infested with the weed. Forty acres of grazing land were sprayed with 2,4-D in water at the rate of 3/4 pound active ingredient per acre on May 20. Excellent kill was obtained. An additional 12 acres at the edge of an alfalfa field were mowed with the rotary mower. The pennycress is an early spring plant and the mowing retarded growth until the alfalfa could take over and crowd out many of the plants.

The same strength herbicide was applied by aircraft to 280 acres of perennial sow thistle Sonchus arvensis in late June and early July. Good top growth kill was obtained but final results can not be evaluated until next spring. We find that cattle relish the sow thistle after herbicide has been applied. They usually nip it off close to the ground. Several years of spraying and grazing may be needed to control the pest plants. A complete report on herbicide application will be included in the September-December narrative.

E. Planned Burning.

None this period.

F. Fires.

None this period. The fire hazard was extremely high for a month in July but recent rains have lessened the danger. The period after a killing frost will be especially dangerous due to the tall grass and emergents this year.

IV. RESOURCE MANAGEMENT

A. Grazing.

All summer-grazed units were utilized during the period. Cattle were not admitted until May 20 due to the late spring. The lush growth during the spring was in marked contrast to last year when all growth seemed to stop after June 1. This year the pastures continued to grow until the middle of July. Cattle are all fat and sleek at the end of the period and much of the current year's growth remains for wildlife cover. The cattle are now feeding almost entirely on the new growth brought on by the rains during August. All cattle will be removed from summer units on October 15.

Ranchers with winter grazing units are permitted to windrow or stack the grasses close to the marsh. This hay is fed back to the cattle during the winter. A wide strip of unmowed vegetation on the slopes above the marsh edge is left uncut for nesting cover. This area can be grazed. Good quality and quantity of wild hay was cut on grazing units G-4 and G-6. Cattle will not be turned into these units until after September 1.

The cattle in grazing unit G-9 succeeded in opening up much of the heavy shoreline vegetation. This is the first year that cattle have been confined to the shorelines early in the season in this unit. Trampling on the shorelines plus a limited amount of grazing on the course vegetation provided openings needed by loafing waterfowl.

B. Haying.

The mixed alfalfa and grasses on hay unit H-1 was not mowed this year. Seed from the alfalfa will be combined during the next period.

C. Fur Harvest.

None this period.

D. Timber Removal.

None.

E. Commercial Fishing.

None.

F. Other Uses.

The permit issued to Mr. Doyle Fullerton of Cody, Nebraska to keep up to 100 colonies of bees on the refuge stipulated that the bees must be accompanied by a certificate of health from the South Dakota Department of Agriculture. This certificate was furnished by Mr. Fullerton.

He purchased new bees and had all of his equipment sterilized to remove the last traces of American Foul Brood. The bees have not done well this year due to the dry period in July. A charge of \$0.20 per hive is made.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report.

1. Predator Control. The poisoned egg predator reduction program was initiated this year on May 9. This program is designed to keep skunk and raccoon numbers within reasonable limits. Skunks take the eggs readily but the raccoons either do not take the eggs or are not as susceptible to them. Quite a few 'coon tracks are noted at the edges of the marshes. We are certain that nesting success has increased since the poisoned egg program was started.
2. Shoreline Grazing. This study was started to see if increased nesting pair use would occur if an overgrown shoreline was opened by intensive grazing. Cattle are confined to the shorelines by fences during the early part of the growing season. The results to date indicate that many more ducks are using the shores for loafing and/or waiting sites than before it was grazed heavily. This study will be terminated this year. The student assistant's report will include this summer's observations. A final report on the entire study will be made this winter.
3. Artificial Potholes. Mr. Momsen made weekly census trips through the pothole area as long as broods were observed. A breeding pair census in early June indicated an average of one pair per pothole. Brood use was not as heavy or as extended as last year. A full report on this project will be included in the student's final report.
4. Vegetative Transects. The established transects in pool 7 and 8 were checked by Mr. Momsen and Mr. Collins. Dominant and sub-dominant vegetation is recorded at 100 foot stations on the line transects. Information obtained from the transects will be of great value in determining the length of draw-down for pools 9 and 10.
5. Effects of Human Disturbance on Waterfowl Activity. Twelve pairs of ducks were counted on the Little White River pool on June 1 during the regular breeding pair counts. This was before the boating and water skiing began. No waterfowl of any kind could be found during the brood counts on July 14. The observations this year bear out the findings of the past two years. Waterfowl will not tolerate the disturbance created by high-powered motor-boats and water skiers.

6. Snapping turtle predation. This study was never really started this year. The commercial turtle trapper wanted his cargo alive upon delivery in Minnesota. We could not spare the manpower necessary to collect turtles from pool 10 during the brood season because of the rush job necessary on the swan enclosure. One large male turtle taken had the remains of an adult mallard drake in its stomach. We hope to give more attention to this study next year. Survival of young appeared better this year than in the past. After the removal of 775 turtles, survival should be better!

VI. PUBLIC RELATIONS

A. Recreational Use.

End-of-the-School-year picnics were held at the Little White River Recreational Area by many of the schools in the county. Quite a few community picnics were held there and at Dike 10 during the early part of the summer. The Bennett County Co-operative picnic, with about 350 people in attendance, was held at Little White River on July 3.

Boating, water skiing, and swimming attracted many people to the Little White River Recreational Area. Up to 120 cars could be counted in the parking areas at one time. Fourteen to eighteen boats pulling skiers were usually present on Sundays. Weekday use was heavier again this year because of the crowded conditions on Sundays. We estimate at least 9,000 visitor days of use at this area during the period.

Bass fishing was the big attraction at the dike 10 public use area. Limit strings of bass weighting 2 to 5 pounds were taken during May and June. Fishing was good all during the period.

The local sport club contributed funds and most of the labor to build a concrete boat launching ramp and a shelter known locally as a "squaw cooler" at the Little White River area. These two improvements were badly needed. The shelter is located near the swimming beach where mothers can sit in the shade to watch their offspring cavort in the water.

B. Refuge Visitors.

A list of official visitors follows. In addition many sight-seers and tourists stopped at the headquarters for information. Permittees were fairly regular visitors.

<u>Date</u>	<u>Name</u>	<u>Organization or Address</u>	<u>Purpose</u>
5-4-60	Nelius Nelson	Ref. Mgr. Valentine Refuge	Pick up grassland drill.
5-5-60	Orville Sandall	FWS P&RC	Predator control.

<u>Date</u>	<u>Name</u>	<u>Organization or Address</u>	<u>Purpose</u>
5/5-6/60	Harvey Nelson	Ass't Ref. Supervisor -Mpls.	Inspection.
5/9/60	Orville Sandall	FWS P&RC	Predator Control.
5/14/60	Richard Hurd	U.S.F.S. Rapid City, S.Dak.	Bird watching.
5/20-6/6/60	Glen Geyer	Commercial turtle trapper	trap snapping turtles.
5/22-26	Harvey Miller	FWS Biologist, Lake Andes, South Dakota	Breeding pair counts
5/26/60	Bert Popowski	Outdoor Writer, Custer S.D.	Info. on snapping turtles.
6/3/60	Peter Momsen & family	Utah State College, Logan, Utah	Info. on quarters for Student Ass't
6/8/60	Robert Russel & family	Refuge Manager, Tule Lake Refuge	Courtesy visit.
6/13/60	Peter Momsen	Student Assistant	Report for duty.
6/17/60	Melius Nelson	Ref. Mgr. Valentine Refuge	Tear down old shop building.
6/17/60	Duane Koss	Refuge Aid. " "	" " "
6/17/60	Mel Becker	Refuge Clerk " "	" " "
6/17/60	Howard Woon	Ref. Mgr. Ft. Niobrara Ref.	" " "
6/17/60	Joe Tinkler	Maint. Man " " "	" " "
6/17/60	Jim Vaughn	Laborer " " "	" " "
6/22-25/60	Peter Peterson & party	Iowa Nat. Hist. Museum, Davenport, Iowa	Bird watching.
6/27/60	George Heath	Neighboring Rancher	Flooded Hay
7/12-14/60	Harvey Miller	FWS Biologist, Lake Andes	Brood Counts.
7/17/60	Edward Collins	Junior Manager	Report for duty.
7/19-20/60	Richard S. Rodgers	Ref. Mgr. Crescent Lake Ref. Ellsworth, Nebraska	Deliver tires, & obtain rye.
7/25-27/60	Dr. Ray Erickson	FWS, Washington, D.C.	Inspect habitat for trumpeter swan transplant.

<u>Date</u>	<u>Name</u>	<u>Organization or Address</u>	<u>Purpose</u>
7/26-27/60	Dr. William Green	Biologist, Upper Miss. Ref.	Inspect habitat for trumpeter swan transplant.
7/26-27/60	Mr. Harvey Nelson	Ass't Ref. Supervisor-Mpls.	" " "
7/26-27/60	Mr. Robert Ballon	FWS Biologist, Monte Vista, Colorado	" " "
7/26-27/60	Mr. Winston Banko	FWS, Washington, D.C.	" " "
7/26-27/60	Harvey Miller	FWS Biologist, Lake Andes, South Dakota	" " "
7/31/60	Homer Bradley	Ref. Mgr. Des Lacs Refuge	Pick up truck.
8/1/60	Jack Dean	FWS Fisheries Mgmt. Biologist	Rough fish removal.
8/11/60	Douglas West	District Game Manager S.D. Game Dept. Lemmon, S.D.	Info on sharp-tailed grouse.
8/20/60	George Wiseman & Family	Ref. Mgr. Stillwater Refuge	Courtesy visit.
Frequently	Tony Engelbert	S.D. Game Warden, Martin	Enforcement, etc.

C. Refuge Participation.

5/2/60 Hughlett presented a slide-talk to members of the B.E.O. Federated Womens Club in Martin, South Dakota.

5/13/60 Hughlett attended meeting of Martin Sports Club and discussed boat safety regulations and improvements needed at Little White River Recreational Area.

5/19/60 Hughlett conducted SCS Area Conservationist, County Agent, and area ministers on a tour of the refuge as a part of the Soil Stewardship Week activities.

5/27-30/60 Hughlett attended annual meeting of S.D. Ornithologists Union and was elected vice president of the organization for 1960-61.

5/31/60 Hughlett conducted 7 members of S.D.O.U. on a partial tour of the refuge.

8/14/60 Hughlett conducted 30 4-H club members on a trail ride on the refuge.

8/18/60 Hughlett and Collins participated in a recreational use inspection of Belle Fourche Refuge with personnel from the Bureau of Reclamation, National Park Service, and Missouri River Basin

8/29/60 Hughlett attended the meeting of the Central Mountains & Plains Section of the Wildlife Society in Centennial, Wyoming while on annual leave.

D. Hunting.

None this period.

E. Violations.

None this period. The new boat safety regulations were explained to all boaters using the Little White River pool. Each boat was checked for compliance with South Dakota registration laws. State Warden Tony Engelbert spent much time assisting refuge personnel in this task, and in enforcing water safety. Several boaters were warned but no court cases were made.

VII. OTHER ITEMS

A. Items of Interest.

The refuge safety record of 1,124 days without an injury requiring medical attention was broken on July 8, 1960. Mr. Ireland was burned severely in an accident that occurred while the dragline was being refueled. He suffered 3rd degree burns on his left leg and 1st and 2nd degree burns on his face and left arm. He was hospitalized for over two weeks and worked part time for another two weeks. He is now back to full duty but has to be careful not to strike the tender new skin on his leg. This accident was caused indirectly by improper placement of the battery on the dragline. The battery has been moved to a new location well away from the gasoline filler pipe.

Mr. Edward J. Collins reported for duty as Junior Manager (trainee) on July 17. Ed has a year's experience as an appraiser with the branch of realty in Minneapolis. He is a graduate of the University of Michigan with a B.S. in Wildlife Management. He has become well acquainted with the refuge program in his short tenure here, and is already contributing much to our progress.

The first annual "Sobraska" picnic was held at Lacreek on June 5. All personnel from refuges in South Dakota and Nebraska were invited. A total of 45 persons including 21 children enjoyed the day in spite of a rather uncooperative rain shower. This picnic will become a regular event and will be held at either Valentine or Fort Niobrara Refuge next year.

B. Photographs.

Several pictures taken by the refuge manager with his personal camera are appended. A Yashica Mat camera was recently purchased for the refuge so we hope the quality of the pictures in our reports will improve. A series of color slides of refuge operations were taken with

the refuge manager's camera and government film. These slides were added to the refuge collection.

C. Acknowledgements.

Mr. Ireland prepared the weather data, and typed the report from rough copy. Mr. Collins assisted in the preparation of the N. R. forms.

SIGNATURE PAGE

Submitted by:

Charles A. Hughlett
(Signature)

Charles A. Hughlett

Date: October 5, 1960Refuge Manager
(Title)

Approved, Regional Office:

Date: 10-12-60[Signature]
(Signature)

Regional Refuge Supervisor

AUG • 60



July 13, 1960 7:00 AM Hughlett returning from brood counts on "Red". Use of a horse on certain transects saves much walking and permits closer approach to broods before they seek cover



09 • 90V

July, 1960 Three of the four dump trucks obtained from Army surplus this period. Two trucks are being retained at Lacreek. One each was transferred to the Des Lacs and Horicon Refuges. These 2½ ton trucks are in practically new condition and should be ideal for the heavy duty on dike repairs.



July 10, 1960 Refuge Manager Hughlett's children feeding corn flakes to a mule deer fawn picked up by a local farmer. The fawn thrived on a diet of baby formula and corn flakes. It was turned over to the state Game department for experimental work on diets of mule deer.

AUG • 60



June 17, 1960 Destruction of old shop with aid of crews from Valentine and Fort Niobrara Refuges. Stripping shingles from the roof. Left to right, Momsen, Tinkler, Brooks, and Nelson. Woon on the truck



AUG • 60

June 17, 1960 Old shop razed. Cleanup of salvageable lumber and scrap. Not-pot-bellied stove next to the chimney. This was the source of heat in the old shop.

AUG • 60



June 22, 1960 Loading concrete from old shop foundation with the boom constructed by Mr. Brooks.

• AUG • 60

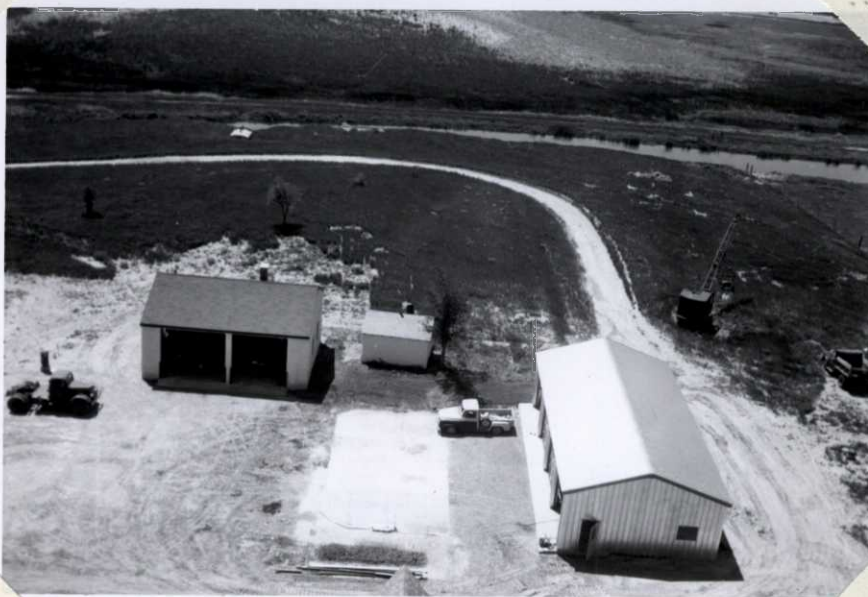


June 29, 1960 Old Pit is dead! The grease pit in the old shop was fill with clay and tamped. None of the personnel who had to use the pit mourned the passing of this hole!

• AUG • 60



June 30, 1960 Old shop removed exposing the new equipment storage building



• AUG • 60

June 30, 1960 View from the tower showing the west end of the courtyard with two new buildings completed and the old shop removed. The ancient oil house will be removed when funds are available to build a new oil storage structure.

W A T E R F O W L

REFUGE Lar Creek National Wildlife Refuge

MONTHS OF May TO September, 19 60

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling Trumpeter										
Geese:										
Canada	73	73	61	61	65	65	65	65	65	65
Cackling Brant										
White-fronted Snow										
Blue Other										
Ducks:										
Mallard	2000	700	700	700	700	800	800	850	900	950
Black										
Gadwall	1000	350	250	250	250	175	175	200	220	250
Baldpate	300	70	50	10	10	10	10	15	15	20
Pintail	500	250	250	200	150	100	100	120	140	150
Green-winged teal	400	100	50	20	20	20	20	20	25	30
Blue-winged teal	1400	1800	2000	2000	2000	1850	1850	1900	2000	2200
Cinnamon teal			2	2	2					
Shoveler	1200	200	100	100	100	170	170	170	180	200
Wood										
Redhead	200	60	40	40	40	80	100	100	100	100
Ring-necked	100	80	40	10						
Canvasback	60	30	30	10	10	10	20	20	20	20
Scaup	1000	150	100	100	30	75	75	30	30	30
Goldeneye	2	2								
Bufflehead	300	80	40	10						
Ruddy	100	60	10	100	100	60	60	60	60	60
Other										
Coot:										
	4000	2000	1000	1000	200	250	250	250	250	300

3 -1750a

Cont. NR-1

(Rev. March 1953)

20

WATERFOWL (Continuation Sheet)

REFUGE Lacreek National Wildlife RefugeMONTHS OF May TO September, 19 60

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	65	55	55	55	55	55	55	55	7,563	0	0
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	1500	1500	1500	1500	1700	3000	3400	5000	182,400	41	1,470
Black											
Gadwall	250	250	250	250	300	300	200	200	35,240	4	180
Baldpate	20	20	20	20	20	20	20	100	4,950	0	0
Pintail	300	300	300	300	350	500	300	300	31,370	7	282
Green-winged teal	30	30	30	30	30	100	30	100	7,295	0	0
Blue-winged teal	2200	2400	2400	2400	2800	4000	5300	6000	307,500	36	2,280
Cinnamon teal											
Shoveler	200	200	200	200	250	300	100	100	28,680	0	0
Wood										2	180
Redhead	120	120	120	120	120	120	100	100	12,160	1	18
Ring-necked									1,610	0	0
Canvasback	20	20	20	20	20	20	50	50	3,000	0	0
Scaup	30	30	30	30	30	30			12,600	0	0
Goldeneye									28	0	0
Bufflehead									3,010	0	0
Ruddy	30	30	30	30	30	30			5,950	0	0
Other											
Coot:	300	300	300	300	300	300	300	300	82,400	10	250

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	—	—	—
Geese	7,500	75	—
Ducks	695,835	11,990	4,410
Coots	82,400	4,000	250

SUMMARY

Principal feeding areas Pools # 2,3,7,9 and 10. Some
use of off refuge grain stubble fields.

Principal nesting areas Pools # 2,3,7,9 and 10.

Reported by Charles A. Hughlett
C.A. Hughlett

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).

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge Lacreek National Wildlife Refuge Months of May to September 1956

(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. <u>Water and Marsh Birds:</u>										
Eared Grebe	last period		10	5/1-10	10	5/10	-	-	-	10
Pied-billed Grebe	"	"	200	7/15-8/31	still present		-	70	140	200
Western Grebe	30	5/9	60	5/20	"	"	-	3	6	60
White Pelican	last period		800	7/20-8/31	"	"	2	180	200	800
D.C. Cormorant	"	"	600	"	"	"	2	100	200	600
Great blue Heron	"	"	10	8/20-30	"	"	-	-	-	10
B.C. Heron	"	"	200	8/1-31	"	"	-	50	100	200
American Bittern	"	"	30	"	"	"	-	6	15	30
Sandhill Crane	"	"	1	5/1-20	1	5/20	-	-	-	1
II. <u>Shorebirds, Gulls and Terns:</u>										
Killdeer	last period		800	8/1-15	Still present		-	200	400	800
Long-billed curlew	"	"	20	"	4	8/21	-	-	-	20
Willet	"	"	30	5/1-30	still present		-	5	10	30
Wilson's snipe	"	"	6	5/1-10	2	5/10	-	-	-	10
Dowitcher	"	"	200	"	200	"	-	-	-	200
Avocet	2	5/10	10	8/1-15	still present		-	-	-	10
Wilson's Phalarope	2	5/6	500	5/13-20	summer resident		-	100	200	500
Forsters tern	2	5/10	30	8/1-15	still present		-	5	10	30
Black tern	6	5/13	200	"	"	"	-	30	100	200
Greater Yellowlegs	10	"	10	5/13-20	10	5/20	-	-	-	10
Lesser Yellowlegs	12	5/10	50	"	20	still present	-	-	-	50
Ring-billed gull	30	5/14	200	6/5-6/8	20	"	-	-	-	200

(over)

(1)	(2)		(3)		(4)		(5)		(6)	
III. <u>Doves and Pigeons:</u>										
Mourning dove	last period		2000	8/25-30	20	still present	-	100	200	2000
White-winged dove										
IV. <u>Predaceous Birds:</u>										
Golden eagle	1	8/28	1	8/28-30	1	still present	-	-	-	1
Duck hawk										
Horned owl	16 perm. resid.		20	5/10-8/1	16	"	"	7	8	20
Magpie	1-3 "	"	1-3					-	-	3
Raven										
Crow	30 "	"	50	6/1-8/15	30	"	"	10	20	50
Marsh Hawk	10 "									
Rough-legged Hawk	1	8/28	1	8/28-31	1	"	"	-	-	1
Sparrow Hawk	2 summer resid.		2	5/1-8/31	2	"	"	-	-	2
Red-tail Hawk	1	8/28	1	8/28-31	1	"	"	-	-	1
Swainson's Hawk	1 last period		1	5/1-10	1		5/10	-	-	1
Burrowing Owl	1	5/12	2	5/15	2	still present	-	-	-	2
Reported by							Charles A. Hughlett C.A. Hughlett			

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 Gruiformes)
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.

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Lacreek For 12-month period ending August 31, 1960

Reported by Charles G. Hughlett Title Refuge Manager
C.A. Hughlett

(1) Area or Unit Designation	(2) Habitat			(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage				
UNIT 1	Crops	0	Ducks	4,136	32	0
	Upland	239	Geese	7	0	0
	Marsh	42	Swans	0	0	0
	Water	4	Coots	0	0	0
	Total	285	Total	4,143	32	0
UNIT 2	Crops	0	Ducks	128,827	166	84
	Upland	332	Geese	0	0	0
	Marsh	37	Swans	0	0	0
	Water	48	Coots	4,984	4	0
	Total	416	Total	33,811	70	84
UNIT 3	Crops	0	Ducks	70,674	170	48
	Upland	158	Geese	0	0	0
	Marsh	19	Swans	0	0	0
	Water	46	Coots	1,400	0	0
	Total	223	Total	73,074	170	48
UNIT 4	Crops	0	Ducks	157,607	26	0
	Upland	170	Geese	0	0	0
	Marsh	52	Swans	0	0	0
	Water	18	Coots	86	0	0
	Total	240	Total	157,693	26	0
UNIT 5	Crops	0	Ducks	101,289	282	372
	Upland	210	Geese	8,944	0	0
	Marsh	147	Swans	0	0	0
	Water	71	Coots	147	10	0
	Total	428	Total	110,380	292	372
UNIT 6	Crops	0	Ducks	259,004	446	372
	Upland	631	Geese	294	0	0
	Marsh	203	Swans	0	0	0
	Water	49	Coots	3,050	30	0
	Total	887	Total	262,348	476	372
UNIT 7	Crops	0	Ducks	586,869	125	744
	Upland	7	Geese	1,610	0	0
	Marsh	283	Swans	0	0	0
	Water	446	Coots	138,607	32	72
	Total	741	Total	727,086	157	816

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.
- (5) **Production:** Estimated total number of young raised to flight age.

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Lacreek For 12-month period ending August 31, 19⁶⁰
Reported by C.A. Hughlett Title Refuge manager

(1) Area or Unit Designation	(2) Habitat Type Acreage	(3) Use-days	(4) Breeding Population	(5) Production
UNIT 8	Crops	Ducks	436	0
	Upland	Geese	0	0
	Marsh	Swans	0	0
	Water	Coots	20	0
	Total	Total	456	0
UNIT 9	Crops	Ducks	262	990
	Upland	Geese	0	0
	Marsh	Swans	0	0
	Water	Coots	42	80
	Total	Total	304	1070
UNIT 10	Crops	Ducks	484	1260
	Upland	Geese	0	0
	Marsh	Swans	0	0
	Water	Coots	112	100
	Total	Total	596	1360
UNIT 11	Crops	Ducks	24	0
	Upland	Geese	0	0
	Marsh	Swans	0	0
	Water	Coots	0	0
	Total	Total	24	0
	Crops	Ducks		
	Upland	Geese		
	Marsh	Swans		
	Water	Coots		
	Total	Total		
	Crops	Ducks		
	Upland	Geese		
	Marsh	Swans		
	Water	Coots		
	Total	Total		
	Crops	Ducks		
	Upland	Geese		
	Marsh	Swans		
	Water	Coots		
	Total	Total		

(over)

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- (4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.
- (5) **Production:** Estimated total number of young raised to flight age.

3-1752
Form NR-2
(April 1946)

32

UPLAND GAME BIRDS

Refuge Lacreek National Wildlife Refuge Months of May to September, 1960

(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'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	5,000 acres of marsh edge, upland, meadows, and bushy cover	0.6	120 4000	1M:1F	-	-	-	8000	Good nesting success and high survival of young

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.

BEAR BUTTE NATIONAL WILDLIFE REFUGE

STURGIS, SOUTH DAKOTA

BEAR BUTTE NATIONAL WILDLIFE REFUGE

STURGIS, SOUTH DAKOTA

This refuge was visited for the first time this period on May 30. Very few ducks and coots could be seen. About 100 black terns were noted hovering over the water. A few fishermen and 2 parties of campers were seen. About 80 head of angus cattle and 2 horses were grazing on the south and east shores of the lake. These animals no doubt belonged to Mr. Hoel.

A waterfowl brood count was made on July 22 by manager Hughlett. Fourteen broods of ducks and 1 brood of coots were seen. Nine of the broods were blue-winged teal, 4 were mallards and 1 was pintail. Average brood size for all species of ducks was 8.0.

Willetts, killdeer and wilson's phalaropes were numerous. A few pied-billed grebes including 4 half grown young were seen.

Four parties of campers and two cars of fishermen were using the refuge. The water levels were low, reflecting the extended dry period. Mr. Hoel's cattle were in their summer pasture in the Black Hills.

All buildings in the recreational area had been freshly painted. The swimming pool had been receiving its usually heavy use according to the caretaker. A new cattle guard had been delivered by the county but was not yet installed.

Mr. George Millin was contacted on August 18 by refuge managers Hughlett and Collins regarding the water taps he is authorized in the pipeline serving the refuge. Mr. Millin stated that a recent land survey indicated that one of his water taps was on his neighbor's land. He was given verbal permission to move the tap. He then stated that the man who owned land adjacent to him wished to use water from his tap for a house he was going to build. Mr. Millin was informed that this might lead to a problem with future owners of the adjoining land. The new owner of the land may request permission to install a tap on the Bear Butte pipeline. This request will be denied since little enough water now reaches the lake from the artesian well.



09 • 90V

August 17, 1960 The informational marker on highway #24 about $1\frac{1}{2}$ miles south of Bear Butte.



09 • 9nv

May 30, 1960 A luxuriant stand of water cress on the edge of Bear Butte Lake where the pipeline delivers water to the lake.



09 • 9nv

May 30, 1960 Headwall and apron at the end of the $1\frac{1}{2}$ miles of underground pipeline from the artesian well to the lake. Fishermen have installed a pipe to provide a supply of drinking water.

BELLE FOURCHE NATIONAL WILDLIFE REFUGE

BELLE FOURCHE, SOUTH DAKOTA

Belle
Fourche

BELLE FOURCHE NATIONAL WILDLIFE REFUGE

BELLE FOURCHE, SOUTH DAKOTA

No ducks or geese were seen on the Belle Fourche Refuge during the short inspection on May 30. Ten boats pulling water skiers were noted. One tent was observed on the east shore of the reservoir.

Attempted brood counts were abandoned on July 22 when no ducks could be found. Only 5 mallards were seen on the entire reservoir. Four white pelicans and four blue herons made up the waterbird population. The pelicans are unusual summer visitors.

A recreational use inspection of the refuge was made on August 18 by Messrs. James Coatts, MRBS Billings, Montana, Russ McGowan, NPS, Omaha, Nebraska, Martin Olson, Bureau of Reclamation, Huron, South Dakota, Duffy Murray, Bureau of Reclamation, Millings, Montana and refuge managers Hughlett and Collins of the Lacreek Refuge. All agreed that there was a definite need for toilets, water supply, picnic area, etc. but the method of financing and administering the area could not be resolved. It was finally decided that the irrigation district, which administers the economic use, would be requested to furnish and maintain minimum facilities.

Water levels were extremely low at the end of the period. Early in September the pool reached dead storage level. Several years of above average precipitation will be needed to bring the reservoir to normal operating levels.