

ROUTING SLIP

DIVISION OF WILDLIFE REFUGES

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REMARKS:

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February - April 1942Return to: Div. Files



Lacreek National Wildlife Refuge
Quarterly Narrative Report
February - March
April
1942

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United States Department of the Interior
Fish and Wildlife Service
Martin, South Dakota.

(Submitted by E.E. Crawford)

TRANSMITTED BY REGIONAL OFFICE 5/19/42 ✓

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February - March - April
1942
Quarterly Narrative Report

I. GENERAL

Weather Conditions - The refuge has experienced such a variety of weather that it has made the planning of set field activity and projects difficult. We have experienced a summer heat wave that soared the temperature to a maximum of 85°, a cold wave that sent the thermometer tumbling to a minus 9° and as filler in-between cloud bursts and snow storms of damaging force.

Following is a summary of the recorded weather, for the three month period, as furnished by the U. S. Weather Bureau Station, at Martin, South Dakota, 14 miles northwest of the refuge.

Month	Precipitation		Maximum Temperature		Minimum Temp.	
	1941	1942	1941	1942	1941	1942
February	.55	.32	55	51	0	-9
March	.48	5.66*	68	61	2	14
April	2.56	6.61	72	85	23	22
Totals	3.59	12.59	72	Extremes 85	0	-9

*In the form of measurable snowfall

Water Conditions - We entered the quarter with water conditions on the refuge normal. A mid-January thaw had brought some open water to the units but early February saw another general freeze-down of the units with very little open water.

The general freeze-up of the units continued until the first week in March when with warming weather and high winds the ice pack started cracking and going out on us. By the 12th of March all the ice on the units was out and except for nightly freezing of ice along the shore lines we were free of ice.

On the afternoon of March 25, the weather turned and we experienced our most severe blizzard of the year. Snowdrifts four to six feet deep ^{now} found around the buildings, across the roads and the units froze over almost solid. A good deal of moisture was held in this snow and personnel were kept busy the next week letting water down through the refuge and bringing the units back to normal.

Water conditions remained normal for a spell and we thought we had everything under control but on the afternoon of April 23, it started raining and we are beginning to think that the Old Man up above has forgotten how to turn it off - cause it is still raining, hailing, sleeting and snowing (May 5).

The weather station at Martin recorded 5.71 inches of rainfall between April 23 and April 30. We don't have the precipitation measurements from May 1 to the present but assume it is comparable.

We wish we might record no damage but despite our day and night patrol and efforts to let water through the refuge as fast as it is humanly and safely possible some damage has been done.

Starting at upper refuge the waters spread out over the flats to the west of the refuge and finally had to gain its release by breaking across Dike 2-B. Then the open spillway Dike 2 had to handle this release of water and though cut down to bed clay has been our savior in the upper units. Spillway 7 is managing to carry the waters, but we estimate we have lost 5 to 10 feet of Dike 7 from wind action on the frost heaved ground along this dike.

Spilling over the spillway on Dike 7 is such a volume of water that the waters have covered the dike approach under a foot of water and are safely spreading out over the flats in upper Unit 8. Unit 8, with addition of flood waters from Elm Creek is holding well and the spillway is carrying the load nicely - but again we are losing about 10 feet of our dike from wind action.

Unit 5 through which all upper waters must pass - is quite a lake but with the open spillways on either end of the unit carrying the major share of the flood waters, the dike is holding.

Unit 6 - we have learned from this experience that what is needed on 6, is additional open spillways or a 20 foot stop log control in its west central position. At present all six Calco's on six are open, the open spillway on the northwest end of 6 is carrying a head of water 2 feet and 20 feet across, we have cut an opening in the dike in its northeast end some 15 feet wide and carrying water to a depth of 4 feet, a 20 foot section of dike in the west half of Section 15 has gone out and still the dike is on the verge of submerging. Unit 6 is catching all the waters

should be 100'

from upper refuge plus a flow from Grinden Creek that took out a section of the dike boundary road on the east fence line.

Unit 9, is carrying a full load but handling it nicely and with no ill effects to date.

Below Unit 9, the volume of water going over the spillway plus the high waters of 10 which are backed up to Dike 9 in one place have put our travel road under 2 feet of water just west of the spillway.

Unit 10, as stated above, is high on water but is holding well. With a foot of water going over the spillway and with gates open since the night of April 30, we have made no gain on her but have put the boundary road below the spillway under water.

Little White River recreational impoundment has been a problem all through this high water period. We have held our own in keeping it in control but the past few days she has been gaining on us. At present the control gate is open 18 inches, about all that the down stream flow will handle and there is an 8 inch wall of water going over the open spillway. The waters going over the open spillway have done considerable cutting below the baffle wall but we are watching it closely and doing all we can. Wind action has taken 15 feet of the main dike on this reservoir and the control box for the gate now stands in water.

Refuge water readings for the period and for the corresponding period of a year ago, are as follows; we are including the figures for May 2 to give bearing to our words above:-

Month	Unit Number	Spillway Readings	
		1941	1942
February	7	plus 1"	plus 1½"
	8	plus 1¼"	plus 2"
	9	plus 1½"	plus 1½"
	10	-22	plus 2"
March	7	plus 3"	plus 3"
	8	plus 3½"	plus 4"
	9	plus 4"	plus 3"
	10	-13"	plus 5"
April	7	plus 2½"	plus 4"
	8	plus 2½"	plus 4"
	9	plus 3"	plus 3"
	10	-2"	plus 4"
May	7		plus 11"
	8		plus 12½"
	9		plus 11"
	10		plus 10"

Watermaster Dougall arrived the evening of April 29, to reset our automatic gauge recorders - otherwise they have been inactive during the winter months. On May 1st. Dougall estimated a better than 300 second flow in Lake Creek above refuge.

Month	Gauge	Gauge Readings			
		1941		1942	
		High	Low	High	Low
February	Above Refuge	1.76	1.64	----	----
	Elm Creek	1.90	1.77	2.32	2.12
	Below Refuge	2.54	1.98	----	----
March	Above Refuge	1.72	1.56	----	----
	Elm Creek	1.80	1.78	2.34	2.00
	Below Refuge	2.66	2.50	----	----
April	Above Refuge	3.26	1.42	----	----
	Elm Creek	1.82	1.80	2.36	2.00
	Below Refuge	2.74	1.76	----	----

It has been brought to us that this refuge cannot stand

having its units held at as near crest level as possible, the policy which seems to have been set up and in practice previously. Such a policy leaves us a very slim margin of safety from pending floods.

With the experience we have had and are having it is necessary that some change be made in policy as to what levels our units will hold and stand. The writer of this narrative is rather reluctant to recommend too definite a policy to be followed as he has yet to see the refuge in summer condition and hence the possible biological effect, but will attempt to relay his ideas from observations made to date.

1. A possible alleviation of the spring run-off problem in years of heavy rainfall, such as this year, would be the retention of Units 8,9 and 10 as near spillway level as possible, with Units 1,2,3,4,5 and 6 being handled accordingly - but to hold Unit 7 at a point approximately 2 feet below spillway level. By holding 7 at such a point we would have a ready check on any marked rise in water level and have ample time to draw the lower units down to a point where they could more safely handle flood waters. (This was the problem this time, all the units were crest level and we didn't have the means or the time to draw the lower units down sufficiently before the high waters hit.)
2. Should the Service still desire to carry all units at crest level at all times some definite protective measures shall have to be taken to cut down wind action on all and portions of some of the dikes. If present wind and frost action is continued on Dikes 7 and 8 they will be not much longer than some of our laterals in another five years. As a protective means, such work being out of the question during the present emergency, consideration should be given the stone rip-rapping or the installation of a log float break water off shore of the dikes.
3. The remaining recommendation is one of rather marked

measures but from observations to date the writer feels would be of material advantage to the refuge, both biologically and from a maintenance protective measure. The recommendation in this instance would be regulation of the water as follows:-

- to pool also - 89?*
- a. Unit 1, hold to a maximum level for summer feeding of Units 7 and 4.
 - b. Unit 2, hold to a maximum level for summer feeding of Units 7 and 3.
 - c. Unit 7, hold at 2 feet below spillway.
 - d. Unit 3, hold to a flow level, enough to allow a supply of water to be fed to the show pond.
 - e. Unit 4, hold one foot below spillway to give additional nest and hay ground and still be assured of a water supply for filling from Elm Creek and Unit 1.
 - f. Unit 8, hold at spillway level to start season and draw on for feeding of Units 5 and 6.
 - g. Unit 5, hold at a level 6 inches below the open spillway levels.
 - h. Unit 6, hold at 30 inch free board on southwest Calco gate.
 - i. Unit 9, hold at spillway level to start season and draw on for feeding Unit 10.
 - j. Unit 10, hold at 2 feet below spillway.

Letter written to D.O. over this

Such water regulation to start with the break-up in the spring and so putting the refuge in shape to stand the spring rains. Biologically, we believe, the plan would work to the advantage of the refuge's objective. It would pull the water low enough in the spring to allow much needed light penetration to the growing system of aquatic plants, so stimulating and bettering our aquatic fare for our waterfowl. With additional aquatic marsh growth it might attract our muskrats from the dikes back to the marsh habitat. Then to encourage fall migrants to rest and feed with us the plan would call for building our water levels back up, commencing September 1. Maybe we are wrong but we think the plan will work and yield the refuge a better stand of aquatics, a more constant and marketable revenue of muskrats and a general reduction in refuge dike maintenance.

Fires - Despite much burning off of refuge lands to be farmed this spring - all burning was kept under control and no unwanted fires were had.

II. WILDLIFE

Waterbirds - Following is a summary of the population trends and behavior amongst our waterbird residents and visitors:-

Eared Grebe - The eared grebes have arrived in no numbers yet but one lone male was observed on April 24.

Pied-billed Grebe - Pied-bills were first noted on March 30 and by April 16 there were some six or seven hundred of the species present on the refuge.

White Pelican - Our trips in the field have been made both interesting and amusing at the antics of the pelicans. On April 6, 42 were observed on the refuge in Unit 10. By the 24th an estimated 1000 individuals of the species were making use of refuge waters. No definite unit seems preferred by the pelicans as they have been observed on every unit and have chosen a definite evening flight route over the headquarters residence, in flying from Unit 9 to 8 and 7.

Double-crested Cormorant - The first "shags" came in on April 10, 70 of them. About 150 are now resident on the refuge. The nest island, in Unit 9, used last year by the Cormorants, suffered the ravages of ice and wind and is no more.

Great Blue Heron - On the first of April a pair of great blues put in their appearance on the refuge and by the 16th of the month the usual resident numbers were in evidence.

Eastern Green Heron - One lone "little heron" was observed feeding at one of the Calco controls on Dike 6, on April 25.

Black-crowned Night Heron - This beautiful member of the Heron group was first observed in the form of 8 individuals on April 7 and has steadily increased until it is now very common - probably some 200 individuals on the refuge.

American Bittern - This homely and gawky member of the family arrived on April 1 and is in its usual resident numbers at this writing.

Common Canada Goose - Canadian honkers started arriving on the refuge on March 10, with a vanguard of 150 birds. By the 27th of March, 1000 were using the refuge and on the

4th of April, our last record for the species, 2000 individuals were estimated. The spring habits of the species were comparable to their fall habits - using the refuge for a night rest area and spending the days and feeding hours in the wheat and barley stubble fields south and east of the refuge.

Hutchin's Goose - Only one record was made of this species this spring and that was of a flock of 300 that spent the day and night of March 7 on the refuge.

White-fronted Goose - Five white-fronts that dropped into the refuge on April 15, comprised our spring record for this species.

Common Mallard - At the end of the last report quarter we were wintering some 1800 "green-heads". Mid-February saw an estimated 800 individuals of the species on the refuge, most of the birds having moved into the upper springs in the sand hills. The 17th of March saw the mallards returning from the sand hills and northern migrants coming into the refuge. By the 25th of March, when our blizzard struck there were an estimated 15,000 mallards on the refuge, weathering out the storm. Check counts on the 4th of April estimated 20,000 mallards using the refuge and about that number are still with us. The first mallard nests of the season were found on April 25 and 26, with 2 and 7 eggs respectively.

Common Black Duck - A rare visitor in this vicinity but a pair were definitely identified on April 18.

Gadwall - No observations were recorded for this species during February, but on March 13, 40 were observed and by the 6th of April an estimated population of 5000 "grey ducks" were on the ponds and the major portion have remained with us.

Baldpate - 150 baldpates were recorded on March 13. On April 2, an estimated 3000 were to be observed on the refuge but at the present writing, it is believed, not over 100 pair remain with us.

American Pintail - The first "sprigs" were accounted for on March 3, when 8 arrived. By March 16th 2000 were on the marsh and by the 4th of April 4000 were present. We estimate a resident population of approximately 800 pintails with us. On April 28, a hen sprig was found setting a clutch of 10 eggs.

Green-winged Teal - 60 green-wings arrived on the 13th of March and with steadily increasing numbers reached a peak concentration of 10,000 on April 16, but after this date the numbers declined until a present estimated population of some 1000 individuals.

Blue-winged Teal - The first blue wings, 300 in number, were recorded on April 6. By April 16, this number had been augmented by several thousand individuals and we estimate 5000 blue-wings

on the refuge at the present writing.

Shoveler - "Spoonies" making their appearance on March 15, with a representative pair of the species, increased in numbers to the figure of 10,000 individuals on April 16. The species ranks second in number of our present residents.

Redhead - Redheads have been showing up well on the refuge this spring and there is promise of a probable 1000 pairs using the refuge for nesting. On March 9, the first 60 arrivals appeared and by April 4, 4000 individuals were making use of refuge ponds.

Ring-necked Duck - This species reported only at rare intervals on this refuge has been observed more or less regularly since Mid-April. It is estimated that some 15 to 20 pair are making use of the refuge.

Canvas-back - 75 "cans" showed on March 9, for the first spring arrivals for the species, increasing in numbers to an estimated 3000 individuals on April 4. An estimated 300 remain with us at this writing.

Lesser Scaup Duck - March 4 dated the arrival of 140 "blue-bills", 2000 were on the refuge on April 4, with a remaining population of some 500 pairs of birds.

American Golden-eye - The golden-eyes dropped off in numbers to a recorded 8 individuals in mid-February but by mid-March 200 were with us and on April 4 an estimated 1500 were on the refuge. Of the April 4th figure, some 100 remain with us.

Buffle-head - March 11, 4 "butter-balls" arrived. April 2, 1200 were on the waters of the refuge with probably 300 still remaining.

Hooded Merganser - A pair were observed in the Elm Creek pool on April 6.

American Merganser - The "fish ducks" that wintered with us remained constant in numbers until March 11, when a noticeable increase to 300 individuals was noted. On April 4, 1000 of them were fishing refuge waters. Estimate 200 still liking our fishing.

Red-breasted Merganser - On April 6, 14 paired birds were observed fishing below spillway 7.

American Coot - The first coots put in their appearance on March 6, by April 4 there were an estimated 3000 and a present estimated population of 5000 coots.

Waterbird Groups in General - Grebes - The grebe family is represented by two species at present - the eared and the pied-

billed. We are surprised by the absence to date of the western species. Hérons and Bitterns - arrived on schedule and in usual numbers. The great blues are in scattered pairs over the whole of the refuge. The black-crowns have taken up a stand below spillway 9 in Unit 10 and below spillway 7. The "shite-pokes" are not localized but scattered throughout the marsh and noted mostly by their thunder-pumping. Pelicans - the species has found good fishing over the entire pond system. Cormorants - "shags" have not appeared in any greater numbers but due to loss of their nesting island in Unit 9 have divided their time searching for a nesting site - giving Units 8 and 9 probable preference. Geese - our goose flight was far below expectations but the few that did visit us seemed to fare well on our offerings. Ducks - taking all species as a group there has been no marked increase or decrease in our webfoot visitors. Increases in mallards, green-wings and shovelers about balanced the noted decrease in blue-wings, bald-pates and pintails. Cranes - a flight of sandhills through the refuge during April 3 to 5, was claimed to surpass by some numbers previous crane flights through this vicinity. Refuge personnel estimated 500 birds in a flight on the 5th but local cooperators reported a flight of 3000 on the 4th. Shorebirds - Kildeer in the usual numbers arrived the 23rd of March and were nesting by the 25th of April. One long-billed curlew was observed on April 8. Western Willets arrived the 22 of April and were common by the 28th. Greater Yellow-legs, appearing first on April 6, increased to an estimated 300 on the 16th. The smaller addition to the species arrived

the 16 of April, 28 strong. Gulls - Herring and ring-bills arrived on the 13th and 27th of March, respectively and both have reached their usual numbers. Franklin's arriving the 8th of April and increasing to the present peak of probably 2000 have caused the usual interest in the species during our farming operations. Terns - The common, arriving April 21, are the only member of this family in evidence to date.

Food and Cover - Our spring waterfowl visitors had shown little interest in the available upland food on the refuge - due no doubt to the abundance of sprouting aquatic vegetation in the high water on the marsh flats and our spring burning activities in the old grain fields. During the last portion of the period, with rains filling all depressions and pot holes over the entire area, the birds were noted taking more advantage of the flooded upland feeding.

Although the heavy rains made available additional feed ground on the upland it put the aquatics beyond the depth reach of the birds, in the marshes. Also, the rains had, we will probably find, a definite limiting effect on available nesting cover. Although only three duck nests have been found to date, two mallard and one pintail, we estimate that 20% of our resident duck population is already nesting and no doubt 50% to 60% of the nests now made will be found destroyed by the high waters and rains.

In our routine patrol and trips over the refuge, special note has been made of the use of the winter burned marsh area in Unit 6. Although, the burned area showed profuse sprouting and greening-up much before others in marsh areas, we can not truth-

fully record any preferred use of the site by the waterfowl. With our heavy rains the burnt area went under water and still no noted use of the area. We shall continue our periodic observations of the area.

Disease - Only one known case of disease amongst our waterfowl has been noted - and we can not, after an autopsy of the bird, determine the cause of the death in this instance. On April 10, the manager, while on a routine patrol of Dike 6, came across an immature male American golden-eye duck, setting on the dike toe. The bird was still alive but was too weak to escape or raise its head. The bird was brought to headquarters and placed in a tub of fresh water but passed away before the day's end.

An autopsy, upon making a skin of the bird, showed no lesions in the body, no sign of lead poisoning but the proventriculus, gizzard and intestines were heavily lined and coated with a white mucous.

In checking the food in the bird the following was found:-

In the proventriculus:-

- 73 - gastropods of Lymnae spp. family
- 104 - insects of the Corixidae spp. family
- 17 - insects of the Notonectidae spp. family
- 2% - unidentified plant material.

In the gizzard:-

- 40% - gravel and grit in one form or another
- 30% - unidentified remains of Lymnae spp.
- 25% - unidentified insect remains of Corixidae spp., Notonectidae spp. and Gerridae spp. ?
- 5% - unidentified plant and animal remains.

We were confident that any and all diseased or weakened waterfowl would succumb to our blizzard of March 25 and 26, but an

all day check in the field on the 27th revealed not a single duck, goose or waterbird loss.

Upland Game Birds - Only two upland game bird species were observed on the refuge during this report period.

China Pheasant - "Chinks" remain in their previously reported numbers. It was to be expected that the natural increase from this year's hatch will bring this species far above our desired carrying capacity.

Mother Nature through the medium of the weather, is apparently is going to put a control of her own devices on this natural increase. By mid-April a fair portion of our chinks were starting their nests and laying their clutch of eggs. Observations of setting hens were made on the 28th of April, during the mid-portion of our rains, hail and snow storms. We feel safe in estimating that 70% of the early nests are destined to be destroyed by flooding, chilling and the elements forcing the hen to desert her nest.

Prairie Sharp-tailed Grouse - Observations of this species on the refuge, during the report period, have been erratic and to coincide with our storms, which seems to bring the species into the refuge confines. Records, during the period, for the species were as follows:- February 13, 4; March 27, 5; April 2, 1.

Stocking and Removal - No restocking or removal of any of the upland game bird species has been attempted during the quarter.

Fur Bearing Animals, Predators, Rodents and Other Animals -

Fur Bearers - The fur bearers found on the refuge were under share trap control for a portion of the quarter and figures as to take will be found recorded under "Economic Uses of Refuge." A brief summary of the present estimated fur bearer population follows:

Muskrat - The well organized and efficient share trapping of muskrats that was carried on this winter reduced our winter resident rat population to an estimated 500 muskrat - but with the coming of break-up and the migration of up-river rats into the refuge we estimate we again have a resident population of 1000 to 1500 muskrats back on our marsh.

Again we wish to point out that, though our winter share trapping well reduces our winter resident population of muskrats,

it is the spring migration of muskrats into the refuge coupled with our retention of units at crest level that causes the bulk of our worries and maintenance. Why, because with the high water levels topped by flood waters, such as we have experienced this spring, the muskrats are driven from the houses into the dikes, and accompanying this movement is the necessity of the rats tunneling higher and further into the dikes to escape the flood waters.

Mink - Our resident mink population is as near zero as we can get it but we are confident that the figure is not zero and will require control where damage is noted.

Skunk and Civet - With the short fall trap that was allowed the trappers, before hibernation of the species, we reduced our population of these species materially, but individuals are still observed in the field travels of personnel.

Raccoon - The estimated coon population on the refuge at the end of the quarter is a total of probably six animals.

Weasel - Localized take and control of this species will no doubt be necessary over portions of the refuge. On the evening of April 29, a weasel was observed at secondary headquarters.

Beaver - During the field investigations of muskrat houses on the refuge during early March, a previously unreported beaver lodge, and active colony was discovered in the heart of the willow thicket in the south central portion of Unit 7. As the colony and lodge is so situated as to cause little or no damage to refuge properties it has not been disturbed, but we shall keep a periodic check on the colony for possible damaging activities.

Coyote - The coyote population both migrant and resident has been zero during the quarter.

Cotton-tail and Jack Rabbits - The first offspring for the year, for both species, have been observed during the month of April. Hawks and owls have been observed keeping the increase under control.

It might be noted that in our field observations this spring we have recorded both the white-tailed jack rabbit - Lepus townsendii campanius and the black-tailed jack rabbit - Lepus californicus melanotis, with the white-tail predominant.

Rodents - The usual number of rodentiae appear over the refuge promising a good bill of fare for our hawks and owls.

Winged Predators - The hawk group has been represented, during the quarter, by the following species:- sharp-shinned hawk (1), eastern redtailed hawk (few), Swainson's hawk (few), American

rough-legged hawk (common), golden eagle (few), marsh hawk (very common), prairie falcon (common), duck hawk (few), and sparrow hawk (few).

The owl group has been represented by; Montana horned owl (4), western burrowing owl (2) and short-eared owl (very common).

In connection with the Montana horned owl, we wish to report the third seasons use by the pair of owls that have nested in the refuge dump yard. The pair are again using the old crows nest in the cotton wood grove and we have been attempting nest checks on the family when in that vicinity. Our notes summarized to date:-

March 25 - Nest found, female setting two eggs, male guard in nearby cotton wood.

April 6 - One egg pipped.

April 7 - One young hatched out, other egg shows no sign of pipping. Food in nest:-
1- right hind leg of Sylvilagus
3- Microtus

April 8 - Other egg hatched - 2 young in nest. Food in nest:-
2 - Microtus

April 16 - Both young have eyes open. Food in nest:-
2 - Microtus

April 17 to 29 - Nest visited on four separate days. Young well feathered on wings on 29th and snapping bills at intrusion. Food during period:-
9 - Microtus
1 - Head of male Dafila acuta tzitzihoa
1-- Adult male Phasianus torquatus
1 - Young Sylvilagus

Snakes - The snakes came out of hibernation during mid-April and were commonly seen up until our cold rains at the last part of the month. Garter, bull and rattle-snakes have been observed.

Control - Measures effecting control of our furred predators have been confined to our share trapping activities which will be found reported under "Economic Use of Refuge".

On April 29, one adult rattlesnake was killed by refuge personnel.

Fish - The amphibious residents of the refuge waters have been making themselves heard by the croakings of the frogs and seen by the schooling of minnows and adult fish below the spillways. All of our fish-eating birds have found good fishing on the refuge.

As mentioned in our last quarterly, refuge personnel designed and constructed from salvage materials a fish ladder for installation in the stop log control on Dike 2 at Unit 7's west end. On April 2, the ladder was put in place and we are rightfully proud of its acceptance by the fish, operating efficiency and the general good compliments we have received from the local public. Three days after installation the public informed us of a passing of adult trout up Lake Creek. Refuge personnel have also observed its use and effectiveness in letting minnow life up the stream.

III. - REFUGE DEVELOPMENT AND MAINTENANCE

Physical Development - The following physical development and maintenance work was accomplished during the quarter.

New Development - With a WPA working force starting the quarter with 28 men and dropping off until at the end of the quarter we had 14 men; no clerk, 10 laborers, 3 intermediates and 1 skilled laborer, the following work was accomplished on Federal Project No. 105-3-74-182:-

Trenching and filling back with brule clay 4236 lineal feet of core wall on Dikes 4 and 5.

Trenching, placing and back filling on 310 lineal feet of woven poultry wire core wall.

Hauling of 1606 cubic yards of brule clay for the core wall filling.

Hauling of 130 cubic yards of brule clay for filling of dug out rat runs.

Under our WPA Project we have completed the placement of experimental core walls in the upstream faces of both Dikes 4 and 5.

A summary of the project progress to date is as follows:-

Type of Core	Lineal Feet
Dike No. 4	
Brule clay	2601
Dike No. 5	
Woven wire	1695
Wood wall	588
"Blow sand"	1050
Brule clay	1635
Total	7569

Maintenance - With the assistance of one or two WPA laborers where needed the following maintenance items were handled during the quarter by refuge personnel:-

The duck boat and two clinker built row boats were painted and put in shape for the coming season.

One of the outboard (launch type) boats was cradled, crated and shipped to the Santee National Wildlife Refuge.

The three 42" culverts that were not in use and such an eye-sore on the Little White River project were hauled into headquarters.

Two of the 42" culverts were set in place, to replace the broken down and dangerous bridge crossing, on the approach to Spillway 7.

All main spillway gate screens, which have never been used, were hauled into headquarters, scraped free of rust and stored in the barn.

A fish ladder for the stop log control on Dike 2 was constructed and installed.

The new door and side boards on the headquarters grainary were given a coat of matching paint.

The sub-secondary barn was remodeled to the extent of tearing out all stall partitions, reinforcing the rafters and cross studding for storage of some items up above. This change will allow sufficient space for storage of practically all of our farming equipment at this site so giving us some much needed storage space at headquarters.

Two additional windows were added to the irrigation pump house - giving us, we believe, sufficient cross ventilation to keep the Continental from overheating.

Personnel living at both secondary and sub-secondary have both done much in the general clean-up of their living sites and dressing up of lawn and shrub plantings.

As directed, all the dynamite in storage plus the caps were destroyed - the dynamite by burning and the caps by submersion in a borrow pit in Unit 3.

Some additional clean-up was made in the refuge dump yard and an underplanting was made of shrubs.

The gate post on the south gate, at Elm Creek, which was knocked out of place last fall by a hay truck, was reset.

The bottom strand of wire was removed from the whole of the east line fence of the refuge in an effort to cut down on tumbleweed removal.

As requested by the telephone company a change in our phone line was made where it connects in town, raising and cutting down on the span from our line to the city hook-up.

The usual routine servicing, maintenance and repair of equipment was carried on.

Vehicles USDI-790, 793 and the new International Pick-up truck were washed, serviced, had their tires removed and were placed up on blocks in the service building.

All farm machinery was serviced and put in operating condition for the spring and summers work.

Final collection of all scrap metal on refuge, hauling of same to Merriman, Nebraska and sale of 17,720 pounds of scrap, realizing \$71.00.

Plantings - No plantings of aquatics on marsh plants were made during the quarter.

Cultivated Crops - Since mid-April we have been busy preparing our fields for spring grain sowing. Our crops this year are to be wheat and barley. Approval was granted for the elimination of corn and milo crops to cut down on the necessary summer cultivation expense incurred in correspondence to the yield in the past.

A total of 150 acres have been put under cultivation and we have 76 acres of barley and 74 acres of spring wheat in. Our farming has been made difficult due to our having to work the fields between showers so to save as much time as possible we have been following the plan of dragging our fields with the Case and five section harrow, followed by the "40" Caterpillar pulling a tandem disc and grain drill. Seed to date has been sown in that portion of the refuge lying between secondary and sub-secondary headquarters.

Trees and Shrubs - Our nursery stock from the Lower Souris refuge arrived April 27 and a crew was put busy setting it out. Following is a tabulation of nursery stock received and planted:-

Species	Amount Received	Amount Planted	Location of Planting
High-bush Cranberry	10	4	Refuge headquarters
		3	Secondary headquarters
		3	Sub-secondary headquarters
	10	10	
Juniper	15	9	Refuge headquarters
		3	Secondary headquarters
		3	Sub-secondary headquarters
	15	15	

Red-osier		20	Refuge headquarters
Dogwood	2000	40	Secondary headquarters
		40	Sub-secondary headquarters
		700	Little White River Project
		400	Show Pond at Refuge headquarters
		400	Shore line Long's Pond
		200	South shore line Unit 10
		200	Draw in Section 9, T36N, R36W
	2000	2000 /	
Tartarian		40	Refuge headquarters
Honeysuckle	2000	60	Secondary headquarters
		100	Sub-secondary headquarters
		300	Little White River Project
		100	Refuge dump
		300	Show Pond
		100	Hancock Place
		200	Jacobs Place
		200	Eskimo Place
		200	Around bird shelters in Unit 6
		200	Around bird shelters in South Refuge
		100	Refuge entrance as sign background
		100	Grinden Creek draw
	2000	2000 /	

Grasses - No seeding of grasses has been attempted but it has been noted that we are going to have many newly sodded areas on the refuge this coming season.

Distribution of Seed and Nursery Stock - The following distribution of seed and receipt of nursery stock was made during the quarter:

Received:-

Species	Amount Received	From	On Hand
High-bush			
Cranberry	20	Lower Souris Refuge	0
Juniper	15	Lower Souris Refuge	0
Red-osier			
Dogwood	2000	Lower Souris Refuge	0
Tartarian			
Honeysuckle	2000	Lower Souris Refuge	0

Distributed:-

Species	Amount Shipped	To	On Hand
<u>Sagittaria spp.</u>	✓ 26 lbs. ✓	Havasu N. W. Refuge	
	✓ 26 lbs. ✓	Imperial N. W. Refuge	
	✓ 24 lbs. ✓	Salt Plains N. W. Refuge	
	✓ 10 lbs. ✓	Boulder Canyon N. W. Refuge	
	✓ 10 lbs. ✓	Bosquedel Apache N. W. Refuge	
	✓ 24 lbs. ✓	Lower Klamath N. W. Refuge	
	120 lbs.		10 lbs.
<u>Polygonum spp.</u>	25 lbs. ✓	Ruby Lake N. W. Refuge	
	25 lbs. ✓	Big Lake N. W. Refuge	
	66 lbs. ✓	Boulder Canyon N. W. Refuge	
	116 lbs		0

IV. PUBLIC RELATIONS

Recreational Uses - Little, if any, recreational use was made of the refuge on the Little White River area during this quarter.

Fishing - Refuge personnel have observed some splendid piscines specimens in both the refuge and Little White River reservoir and promises are of some might good local fishing this season.

✓ The State of South Dakota again made application and was issued a permit for the seining of pan fish and minnow life from refuge waters for transplanting into the Little White River reservoir and adjacent State waters. To date, rains and high waters have prohibited their starting activities.

Visitors - Following are all official and important visitors calling at the refuge during the quarter.

Name	Title	Representing	Date	Hrs. On Refuge
F.C.Gillett	Refuge Inspector	Service	3-21-'42	12
H. Axlund	St.Game Warden	South Dakota	4-19-'42	5 $\frac{1}{2}$
G.H.Crawford	Refuge Manager	Service	4-28-'42	1 $\frac{1}{2}$
R.W.Dougall	Watermaster	Service	4-29-'42	1

Violations - No apprehensions have been made of violations on the refuge although personnel were given a merry chase on the night of April 15 by a well organized group of fishermen on Unit 9, apparently seining fish for the market. A weather eye was kept for the return of the violators but we fear that such a scare was given them that they will not give a repeat performance very soon.

V.* ECONOMIC USES OF REFUGE

The only economic use that has been made of the refuge during this quarter has been the harvest of our fur crop by share trapping.

Fur Harvest - The controlled share trapping of our surplus fur, as carried on by permittee C. L. Hancock, was brought to a conclusion on March 21, with the closing of the open fur season.

We feel that we had a very successful take for the season and that Mr. Hancock conducted his trapping activities in a very commendable manner. The total take was materially increased by a temporary break-up that came ten days before the close of the season and then the elements closed in and froze us over four days after the close of the season.

Following, presented in tabular form, are the results of our seasons fur harvest:-

Table of fur take on next page.

Species	Fur Animals Taken:- By Sex and Month										Total Take
	Nov.		Dec.		Jan.		Feb.		Mar.		
	M:	F:	M	F	M	F	M	F	M	F	
Muskrat	-	-	391	332*	312	239	318	226	659	568	3045
Mink	7	3	14	7	2	1	2	4	1	-	41
Weasel	4	-	10	2	1	-	-	-	-	-	17
Skunk	5	3	5	9	-	-	-	-	-	-	22
Civet	4	1	3	1	-	-	-	-	-	-	8
Raccoon	7	4	1	2	1	-	1	1	-	-	16
Coyote	-	2	-	-	-	-	-	-	-	-	2

* Correction of figure 334 in last quarterly

Species	Division of Fur and Net Returns				Total Return Both Parties
	Gov't Share	Gross Return	Hancock's Share	Gross Return	
Muskrat	1519	\$1867.38*	1526	\$2215.45	\$4032.83
Mink	21	166.50	20	159.00	225.50
Weasel	9	7.05	8	5.00	12.05
Skunk	11	28.05	11	18.50	46.55
Civet	4	3.80	4	2.50	6.30
Raccoon	8	26.50	8	30.50	57.00
Coyote	1	.50	1	2.00	2.50
Total	1573	\$2099.78	1578	\$2432.95	\$4432.73

* - 396 of the government's muskrats remain unsold

VI. - FIELD INVESTIGATION

The following approved field investigations were under way.

Muskrat Reproductive Studies - In connection with the directed re-productive tract and pelt study of muskrats by the Service, twenty muskrats were taken, ten each during the months of February and March.

Muskrat Biological Studies - As directed by the Regional Office, to lay the ground work for a biological study of the muskrats of this refuge by a to be assigned biologist, personnel spent a portion of the month of March on such work. Our plan was to make a plane table mapping of all muskrat houses and burrows on the refuge, on a scale of 6 inches to the mile. The late assignment of the project and the break-up of the ice reduced our plans to a mere counting of the houses and runs in individual units.

No letter written to Hancock on March 10

391
332
7 23
312
239
551
318
226
544

659
568
127

Bird Banding - As indicated in our last quarterly we have been making an endeavor to bring together the refuges banding records over the past five years in one accurate compilation. With the assistance of Mr. DuMont, of the Washington office, who noted our plight we just about have our banding ledgers balanced.

Some spring banding has been attempted but weather and the desires of the birds have been against any great catches.

A summary of the refuge banding to date is as follows:-

Species	Total Banded to Jan. 1, 1942	Birds Banded in 1942				Totals To Date
		Jan.	Feb.	Mar.	Apr.	
Common Mallard	2193	31	--	--	8-	2232
Common Black Duck	1	--	--	--	--	1
American Pintail	547	--	--	--	4	551
Blue-winged Teal	388	--	--	--	59	447
Green-winged Teal	9	--	--	--	--	9
Gadwall	43	--	--	--	7	50
Shoveler	2	--	--	--	--	2
Baldpate	14	--	--	--	--	14
Canvasback	1	--	--	--	--	1
Redhead	91	--	--	--	1	92
Scaup	19	--	--	--	--	19
Bufflehead	8	--	--	--	2	10
	3316	31			81	3428

Summary of Returns and Recoveries
on next page.

Summary of Returns and Recoveries

Territory	Mallard	Pintail	Blue-winged Teal	Gadwall	Baldpate	Redhead	Scaup	Total Returns
United States								
Arkansas	19	-	-	-	-	-	-	19
Colorado	24	-	-	-	-	-	-	24
Florida	1	-	-	-	-	-	-	1
Iowa	4	-	-	-	1	-	-	5
Kansas	7	-	2	-	-	2	-	11
Louisiana	14	1	-	-	-	-	-	15
Michigan	1	-	-	-	-	-	-	1
Minnesota	2	3	-	-	-	-	-	5
Missouri	4	-	-	-	-	-	-	4
Montana	1	-	-	-	-	1	-	2
Nebraska	72	-	-	1	-	-	-	73
New Mexico	2	-	-	-	-	-	-	2
North Dakota	5	1	-	-	-	-	1	7
Ohio	1	-	-	-	-	-	-	1
Oklahoma	21	1	1	-	-	1	-	24
South Dakota	9	-	-	-	1	-	-	10
Lacreek Refuge	8	3	4	-	-	-	-	15
Tennessee	2	-	-	-	-	-	-	2
Texas	36	6	-	-	-	1	-	43
Utah	-	1	-	-	-	-	-	1
Washington	1	-	-	-	-	-	-	1
Wyoming	5	-	-	-	-	2	-	7
Canadian Provinces								
Alberta	9	1	-	-	-	-	-	10
Manitoba	2	-	-	-	-	-	-	2
Saskatchewan	5	-	-	1	-	1	-	7
Mackenzie	1	-	-	-	-	-	-	1
Ontario	1	-	-	-	-	-	-	1
Mexican States								
Laguna Larga	-	1	-	-	-	-	-	1
Chihuahua	-	1	-	-	-	-	-	1
Matamoros	-	1	-	-	-	-	-	1
Newfoundland	1	-	-	-	-	-	-	1
British Honduras	-	-	1	-	-	-	-	1
Total Returns	258	20	8	2	2	8	1	299

VII. - OTHER ITEMS

Bear Butte Refuge - The refuge manager inspected this refuge area on April 13 and 14, and a complete report on wildlife, developments, etc. has been made previous to this report.

Belle Fourche Refuge - On April 14 the Belle Fourche Refuge area was visited and a narrative inspection report has been submitted.

Note to accompany photographs - We regret that due to a mechanical failure in the manager's camera the quality of our photographs are not all that is to be desired. Poor development and printing has also added to the general poorness of our plates.



33 #308 4-2-42

Plate No. 308 - Nest site of Montana Horned Owl, on first branch on middle tree of group.



32 #309 4-2-42

Plate No. 309 - Nest and eggs of Montana Horned Owl, as above.



32 # 310 3-27-42

Plate No. 310 - Raccoon that had wandered into trap missed by trappers in their pick-up. Coon had weathered out the two day storm of March 25 and 26, still well and full of fight when released.



33 # 311 4-28-42

Plate No. 311 - Muskrat in duck trap, washing preening itself.



33 #312 4-28-42

Plate No. 312 - Close-up of muskrat
in Plate No. 311.



32 #313 9-15-42

Plate No. 313 - Lower end of Little
White River control - gate open 14
inches.



32 # 314 4-2-42

Plate No. 314 - View of fish ladder in place on Dike #2 stop log control.



32 # 315 4-2-42

Plate No. 315 - Close-up of fish ladder.



32 #316 1-27-42
Plate No. 316 - Mallards rising from feed
 ground on south side of Unit 8, below
 Dike #4 control.



32 #317 3-27-42
Plate No. 317 - Mallards in hole, on Dike
 #9, that they had kept open during the
 blizzard.



32 # 318 3-27-42

Plate No. 318 - Same as 317.



32 # 319 3-27-42

Plate No. 319 - Mallards on the ice
in Unite 9 after the blizzard.



32 # 320 3-27-42

Plate No. 320 - Canada Geese on tundra,
after the blizzard.



33 # 321 4-26-42

Plate No. 321 - White pelicans below spill-
way on Dike #8.



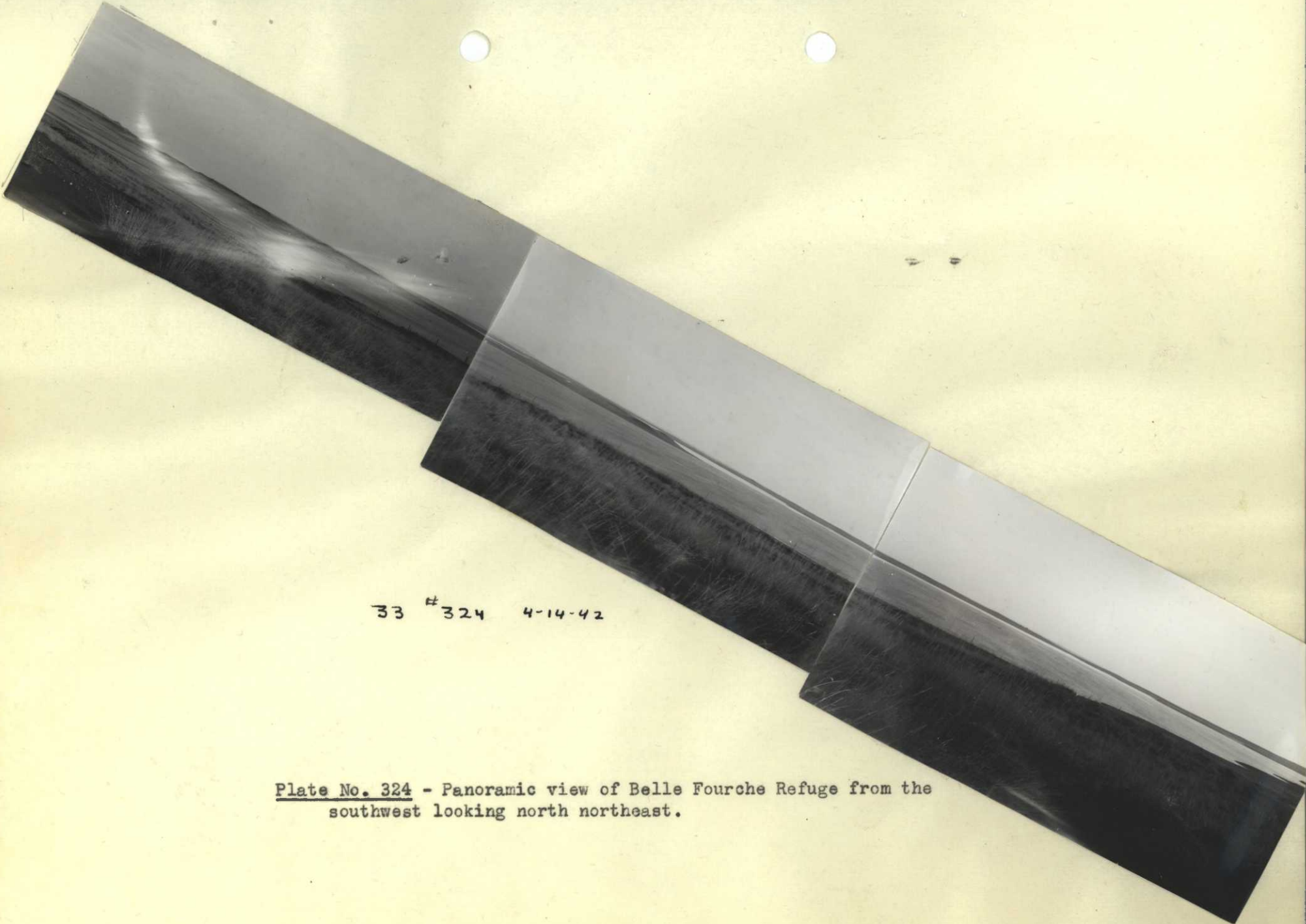
33 4 322 4-26-42

Plate No. 322 - Pelicans below spillway on
Dike #8.



33 4 323 4-26-42

Plate No. 323 - Pelicans rising from water
below spillway on Dike #8.



33 # 324 4-14-42

Plate No. 324 - Panoramic view of Belle Fourche Refuge from the
southwest looking north northeast.

Plate No. 325

33 # 325 4-14-42

Plate No. 325 - Panoramic view of Belle Fourche Refuge
from the north looking west southwest.



Plate No. 326 - Upstream view of washout in
west mid-section of Dike #6.



Plate No. 327 - Downstream view of washout
in west mid-section of Dike #6.



328 5-2-42

Plate No. 328 - Release cut made by personnel in the northeast portion of Dike #6. Note trash line of high waters up in road bed.



329 5-2-42

Plate No. 329 - High waters below spillway on Dike #7. Note two 42 inch culverts, carrying full stream of water and still waters passed over our road.



Plate No. 330 - Same as plate no. 329, but more general view.



Plate No. 331 - Showing volume of water going over spillway on Dike #9, water 11 inches over spillway.



332 5-2-42

Plate No. 332 - Close-up of waters passing over spillway No. 10. Both gates open 15 inches and 10 inches of water going over spillway.



333 5-2-42

Plate No. 333 - General view below spillway on Dike #10.



2420

Plate No. 333 - Close-up of waters passing
over spillway No. 10. Both gates open 15
inches and 10 inches of water going over
spillway.

2410



Plate No. 333 - General view below spill-
way on Dike #10.