

BRANCH OF WILDLIFE REFUGES
Narrative Report Routing Slip

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~~Mr. Ackerman~~ DA

Mr. Crawford ~~_____~~

Administrative Services

~~Miss Baum~~

Operations

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~~Mr. Ragan~~ WJR

Public Use

~~Mr. Dwyer~~ PDW

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~~Mr. Stollberg~~ CS

Resource Management

~~Dr. Morley~~ LCM

Mr. Hickok _____

Wildlife Management

Mr. Banko _____

Mr. Stiles S

Mr. Goldman _____

Refuge NATIONAL BISON

Period Sept.-Dec. 1959

NATIONAL BISON RANGE

Refuge Narrative Report

September 1 to December 31, 1959

PERSONNEL

Cordia J. Henry, Refuge Manager
Robert R. Prather, Ass't. Refuge Manager
Victor B. May, Acting Foreman
Grant Hogge, Maintenceman
Ernest W. Kraft, Maintenceman
Gladys C. Young, Clerk-Typist
Guy E. Connolly, Student-Trainee (Biology)
(Furloughed September 24)

Temporary

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George S. Coleman, Laborer
Lyle W. Dilworth, Laborer
Edward G. Krantz, Maintenceman
Forest L. Largent, Maintenceman
Louis A. Largent, Laborer
Alvin W. McCrea, Laborer
Keith H. Rankin, Laborer
Emerson L. Rowley, Laborer
Louis L. Spevak, Maintenceman
Wm. G. Therriault, Laborer
Edmond G. Priddy, Maintenceman
Lawrence Drilcoll, Laborer
Paul L. Gardner, Maintenceman
W. J. Bryan Melton, Maintenceman
Hiram R. ZeBarth, Maintenceman
Henry J. Helgeson, Butcher-Foreman

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N A T I O N A L B I S O N R A N G E

Refuge Narrative Report

September 1 to December 31, 1959

I. GENERAL

A. Weather Conditions

1959

	<u>Snowfall</u>	<u>Precipitation</u>	<u>Extreme Temps.</u>		<u>Mean Temps.</u>		<u>Average</u>
			<u>Max.</u>	<u>Min.</u>	<u>Max.</u>	<u>Min.</u>	<u>Temps.</u>
September		2.80	89	28	68	41	55
October		1.40	77	21	59	33	46
November	26.0"	1.93	71	-33	38	15	27
December	<u>4.0"</u>	<u>.34</u>	57	10	38	21	30
	30.0"	6.47					

1958

September		1.52	91	27	73	42	57
October		.65	83	17	61	29	45
November	3.0"	1.69	60	7	45	25	35
December	<u>9.5"</u>	<u>1.47</u>	59	8	38	22	30
	12.5"	5.33					

1957

September		.46	94	32	79	39	59
October	5.0"	3.15	79	21	51	34	42
November	2.0"	.09	56	11	43	24	34
December	<u>1.0"</u>	<u>.77</u>	64	9	44	27	36
	8.0"	4.47					

This period was marked by extremes in both precipitation and temperatures. The temperature for September was slightly lower than normal. The precipitation amounted to 2.80 inches, which set a new record for this month. This is approximately 1.8 inches more than normal. The weather bureau in Missoula reported it as the second wettest September on record.

Temperatures in October were normal, as was precipitation. From previous records, it appears that the precipitation for October is extremely variable.

The weather during November was wet and very cold. The precipitation was about an inch above normal, and the average temperature was 7 degrees below the normal temperature. A low of minus 33 degrees was experienced on November 16. A total of 26 inches of snow fell in

November, with most of this coming during the stormy period from the 10th through the 18th. This was quite a change from the 71 degrees on November 2. According to the weather bureau in Missoula, this was the second coldest November on record.

Most of the precipitation in December occurred in the last few days of the month. The precipitation was .4 inches below the ten-year mean, with the temperature being near normal but slightly lower than the ten-year mean.

Total precipitation for the year amounted to 14.80 inches, as compared to 14.92 inches last year and the ten-year mean of 12.92 inches. July was the driest month receiving only .01 inches, while November was the wettest month. The weather recording service of the Flathead Irrigation project in St. Ignatius reports that the total precipitation for the year 1959 was 21.61 inches, and that it was the third highest in the 51 years of recording. This would indicate that the precipitation on the east side of the refuge was undoubtedly quite a bit higher than here at headquarters.

B. Habitat Conditions

1. Water

There has been an abundance of water during the period. The Jocko River and Mission Creek had periods of high water, due to melting snows in late November.

All of the springs have functioned properly and most of the water holes have filled to capacity. All of the water holes were frozen at the end of the period, but there was still plenty of running water to take care of the needs of the animals.

2. Food and Cover

The very wet fall period resulted in excellent basal growth of all grasses, providing abundant forage. The heavy snow cover in mid-November hampered grazing for a brief period, but this melted off rapidly.

Browse species have received good use without being over-browsed. A series of plots were run through typical stands of brush to get an idea as to what the actual use was. The results are reported in Section V, Field Investigations or Applied Research.

St. Johnswort, Hypericum perforatum, has flourished and increased this year. There was very little control by the Chrysolina beetles. Although there was an abundance of eggs last winter, something happened to the beetles. Again this winter a goatweed plant cannot be found that does not have beetle eggs on it. It has been noticed by Mr. Beed that a few eggs have hatched and larvae are present and alive. It was previously unknown that any hatching took place in the fall.

II. WILDLIFE

A. Migratory Birds

Heavy waterfowl use of Mission Creek occurred during and following the waterfowl hunting season. Peak populations were established at 6,000. The vast majority of the ducks present were mallards, with a few pintail, widgeon, American golden-eye, green-winged teal and blue-winged teal. Hooded mergansers and common mergansers were observed commonly, but not in large numbers. By the end of the period the number of ducks remaining had dwindled to around 150 birds.

Conditions in the Flathead Valley were favorable, with high water levels and an abundance of unharvested grain. The cold spell in November had an adverse effect on waterfowl, as some of those shot a few days after the heavy snow were noticeably thin. It is unknown just how many of these were sub-normal birds. With the melting of the snow, field feeding was resumed and no known losses from lack of food were observed.

The refuge goose flock was reduced somewhat as a result of the cold spell. Apparently some wing-clipped birds got through a flood gate on Mission Creek and were shot off of the refuge. About 10 or 12 were lost, but some of these could have migrated as they were not all wing-clipped. Twenty-three geese of this flock were trapped at refuge headquarters on October 13 in order that Dr. John Craighead could leg and neck band the birds of the year and check some of the old bands. During the mid-November cold snap, the Jesse-knot neck-bands again gathered ice balls (as happened in previous years). These were again removed with a .22 rifle.

B. Upland Game Birds

Ring-necked Pheasant. With the opening of hunting season on October 24, there was a noticeable increase in the number of pheasants along Mission Creek. It was also noted that some of the young cocks did not have their full plumage, testifying to the fact that there was an exceptionally late hatch. In general, we believe that numbers are about normal or slightly lower than last year.

Chukar Partridge. The chukars remain at a high population level and are abundant on the steep, rocky slopes throughout the refuge. Elk and Triski Creeks seem to provide habitat for the largest numbers. Because of the abundance of these birds, there is undoubtedly a considerable amount of predation which takes place. The chief predators appear to be golden eagles, horned owls, hawks, bobcats and coyotes.

Gray Partridge. These birds have had a very good year with a high production of young. Like the chukars, there has been quite a bit of predation on the "hunkies". Predation along Mission Creek has been especially noticeable. The remains of several have been

seen that were apparently killed by feral house cats. Their numbers appear normal or slightly above.

Dusky Grouse. Not many sight records have been made in the latter part of the period. On September 9 a flock of 8 was observed which appeared to be a family group. The population level appears to be about normal.

Ruffed Grouse. More sight records have been made of this bird than is usual. A flock of four were seen October 17 along Mission Creek and two sightings were made along the Jocko River.

C. Big-game Animals

1. Buffalo

The buffalo have done very well during the period with only one short period of extremely cold weather and heavy snowfall. Basal growth of grasses has been good and at the close of the period green grass was still available. Distribution of the animals over the range was good. It was noted that they made good usage of some areas that are ordinarily seldom used. Some of these slopes have excellent native bunchgrasses and we have noted a strong tendency toward selective grazing. The plant most eagerly sought was rough fescue (*Festuca scabrella*).

The annual roundup began on October 5th. Five extra riders were hired to assist in this activity, making a total of 11 riders in all. With only six good Government-owned horses, we suffered an acute shortage. It was necessary for some of us to ride sub-standard animals, which made a hazardous operation downright risky. Fortunately the only riders that were charged by buffalo were on the better experienced mounts. None of the men were injured, although two of the best horses received minor injuries, as usually happens, which further aggravated the severe shortage of suitable mounts.

During the first day of the roundup, the riders swept the west pasture, cleaning out all buffalo except three bulls that were in a rebellious mood.

The second day was spent in the south pasture. Operations were hampered by a dense fog which blanketed the high portions of the range all day. There was only a small number of bulls in this area, and it was estimated that four of these were lost in the fog.

On the third day, the buffalo were concentrated in the high part of the Alexander pasture, making it a relatively easy matter to push them into the Elk Lane and thence down to the corrals. So far as we know, we were able to clear Alexander pasture except for one recalcitrant bull. The roundup was completed shortly after noon.

Immediately after lunch the sorting of the animals was begun. This consisted of the inspection of each animal for good lines, for condition, and for age and sex. Each animal was recorded on a tally sheet. The animals were distributed according to the individual in-

spection of each. Sixty of the animals were selected to make up the butcher herd, about 25 yearlings were selected for live sales, while the balance went back into the range herd. The calves were branded "9" on rear of right hip, tattooed "V-9" in left ear, and vaccinated for Brucellosis.

The roundup tally of animals totaled 425. Of these, 83 animals were disposed of; 22 yearlings were sold alive and 61 animals were butchered. This leaves us with a herd of 342 animals at the end of the period. The sex and age classes of the range herd are as follows:

<u>Age Group</u>	<u>Males</u>	<u>Females</u>
10 years and older	2	3
4 to 9 years	34	54
3 years	20	25
2 years	21	15
Yearlings	38	39
Calves	<u>37</u>	<u>54</u>
Totals	152	190
Grand Total		342

The sex ratio of animals of breeding age returned to the range was 97 female and 77 male.

With a total of 92 calves tallied, we had a production of 90 percent from the 102 cows of breeding age. The sex ratio of calves was very uneven, with 37 males and 55 females. This is the second year in a row that heifers have outnumbered bulls.

A representative sample of weights of live buffalo were taken again this year. These weights have been taken since 1957 and a fairly adequate sample of the younger age classes has been obtained. Additional weights of older animals are needed to secure reliable averages for these larger animals. The data gathered so far follows:

<u>Age</u>	<u>Sex</u>	<u>No. Animals Weighed</u>	<u>Average Weight (pounds)</u>	<u>Extremes</u>	
				<u>Largest Animal</u>	<u>Smallest Animal</u>
Calf	M	111	333	460	110
1½	M	43	691	860	520
2½	M	37	1026	1400	660
3½	M	18	1273	1380	1185
4½	M	12	1470	1800	1310
5½	M	13	1636	1810	1415
6½	M	14	1700	1930	1224
7½	M	7	1750	1900	1560
8½	M	4	1671	1860	1540
9½	M	5	1824	1980	1670
10½	M	1	1920	1920	-

<u>Age</u>	<u>Sex</u>	<u>No. Animals Average Weight</u>		<u>Extremes</u>	
		<u>Weighed</u>	<u>(pounds)</u>	<u>Largest Animal</u>	<u>Smallest Animal</u>
Calf	F	118	320	420	140
1 ¹ / ₂	F	20	613	715	460
2 ¹ / ₂	F	23	811	980	650
3 ¹ / ₂	F	25	878	1020	740
4 ¹ / ₂	F	21	950	1110	800
5 ¹ / ₂	F	10	915	995	825
6 ¹ / ₂	F	13	987	1127	880
7 ¹ / ₂	F	13	1025	1160	915
8 ¹ / ₂	F	4	1065	1180	1000
9 ¹ / ₂	F	5	995	1060	930

An interesting observation on weights of our larger bulls is that the two 7-year old bulls, which were obtained from Fort Niobrara as long-yearlings, weigh about 300 pounds less than our other bulls of the same age. They are also darker colored and seem to have a worse disposition than the bulls raised here.

Butchering operations began on November 30 and took six days to complete. It was planned to butcher 60 head, but a calf was gored by a bull in the corrals and had to be disposed of. This was butchered and sold for the best price obtainable.

A considerable amount of data was collected during butchering. Pregnancy data on the 19 cows butchered in 1959, and the data gathered from 182 cows butchered since 1951 is as follows:

<u>Age Class</u>	<u>Number Examined</u>	<u>Percent Pregnant</u>	<u>Percent Lactating</u>
<u>1959 Record</u>			
2 & 3 years	2	50	0
4 to 9 years	15	93	73
10 years	<u>2</u>	100	100
Total	19		
<u>1951-59 Record</u>			
Yearling	1	100	0
2 & 3 years	24	87	46
4 to 9 years	73	90	72
10 to 14 years	38	94	66
15 and over	<u>46</u>	50	60
Total	182		

In addition, weights and measurements of butchered animals were taken and are presented in the following tables:

Buffalo Measurements-1959 (in inches)

<u>Age</u>	<u>Sex</u>	<u>No. Animals Represented</u>	<u>Total Length</u>	<u>Height at Shoulders</u>	<u>Length of Hind Foot</u>	<u>Length of Tail</u>	<u>Length of Ear</u>
2	M	16	117.1	59.1	22.0	15.4	5.6
3	M	1	113.0	64.0	23.0	15.0	5.5
4	M	3	126.0	66.5	22.8	14.0	5.5
5	M	4	128.6	65.5	22.6	16.9	6.0
6	M	1	137.5	68.0	22.5	17.0	5.5
7	M	1	132.0	69.0	24.0	18.5	6.0
8	M	2	144.0	68.7	24.0	17.2	6.0
9	M	1	141.0	70.0	22.5	15.0	6.0
2	F	1	99.0	52.0	20.5	15.0	5.0
3	F	1	108.0	57.0	21.0	14.0	5.5
4	F	3	112.3	58.5	21.5	15.0	5.6
5	F	0					
6	F	2	109.2	58.5	21.3	14.5	5.7
7	F	1	107.0	56.5	21.0	14.0	5.5
8	F	4	117.0	55.0	21.6	15.3	5.5
9	F	4	120.2	59.0	21.0	16.4	5.5
10	F	2	113.7	58.5	21.5	14.5	5.5

Buffalo Weight Relationships - 1959

<u>Age</u>	<u>Sex</u>	<u>No. Animals Weighed</u>	<u>Average Live Weight</u>	<u>Average Dressed Weight</u>	<u>Average Dressed Weight Percent of Total Weight</u>
2	M	18	975.5	511.1	52.4
3	M	2	1125.0	528.0	46.9
4	M	3	1426.3	767.3	53.8
5	M	4	1477.3	771.0	52.2
6	M	1	1660.0	888.0	53.5
7	M	1	1840.0	940.0	51.1
8	M	2	1790.0	908.5	50.8
9	M	1	1775.0	961.0	54.1

Average for 32 bulls 52.1 percent

2	F	1	495.0*	248.0	50.1
3	F	1	890.0	505.0	56.7
4	F	3	941.6	516.3	54.8
6	F	2	925.0	507.0	54.8
7	F	1	900.0	493.0	54.8
8	F	4	1057.6	550.5	52.1
9	F	5	976.0	497.0	50.9
10	F	2	935.0	481.0	51.4

Average for 19 cows 52.7 percent

* This is sub-standard animal and below normal weight.

During the fall, two bulls have been found which were probably killed in breeding-season fights, or other natural causes. If we add to this the loss of Big Medicine, and the bull found dead in Alexander Basin in August, we have a loss of four animals by natural causes for the calendar year 1959.

It was necessary to butcher one large bull on the range October 9 because he was too lame to be driven to the slaughter house. Also he was in an unthrifty condition with possible skin disease, so it was considered advisable to remove him to avoid infecting other animals. He was sold for the best price obtainable, and tallied in the butcher herd of 61 animals. For some reason the fighting among the bulls during the last breeding season seemed a bit more vigorous than usual and extended well into September.

Preparations have been made to ship a pair of yearling buffalo to the new zoo in Manila, Philippine Islands. A few extra yearlings were brought in during roundup and put in the exhibition pasture to hold them for this shipment. Because of the food supply, all but two of these were released when the exhibition herd was turned back on the range. At a later date, while handling these animals in a chute for T.B. testing, the heifer broke a horn making her unsuitable for shipment. It was then necessary to round up a small herd in order to secure another heifer. At present we are still holding these yearlings and expect to deliver two of them, "Moiese Belle" and "Moiese Oswald", to Seattle in January. From Seattle they will proceed by ship to Manila in specially built crates. A ton of home grown hay will be shipped with them for feeding enroute to Manila. This shipment has been hanging fire for almost a year, resulting in a great deal of lost motion and extra work.

The headquarters exhibition herd was released to the range on September 14, with the exception of the two large bulls, the orphan calf and the yearlings held for shipment to the Philippines. The orphan calf, "Bull", is still being fed by bucket, but has been cut down to one feeding a day--this being warm water mixed with rolled barley and 20 percent protein pellets. It is estimated that he now weighs about 450 pounds.

"Big Medicine's" hide is still in the hands of the taxidermist in Browning, Montana. A full mount is being made to be placed in the State Historical Museum in Helena, Montana.

2. Elk

With the elk staying in the steep, timbered parts of the range, it is difficult to report on their numbers and activities because of the limited observations made. During the disposal a herd of 46 was seen; five of these were shot filling our quota for disposal. Sticking to our estimate of 70 animals last period, a reduction of five leaves us with 65 head. It is felt that the herd could still be built up to a slightly higher level, especially as an aid in the reduction of the encroachment of evergreens.

During the breeding season a huge bull with only one antler, but with a harem, was noted several times. It is not so surprising to see a bull with one antler, but it does make one wonder how he managed to defend a harem. We were unable to determine how the antler was lost.

All observations of animals in the field, as well as those taken during the disposal program, indicate that they are in excellent condition.

The elk held at headquarters for exhibition purposes have done well, but seem to be completely upset in their reproduction. The group consists of two old cows, an old bull and a yearling cow. None of these cows had calves until October 21 when one gave birth to a calf. Although the calf has been exposed to sub-zero temperatures and heavy snows, it was alive and active at the close of the period.

The reason for these cows having late calves is, without doubt, the result of an experiment carried out in the years 1954, 55 and 56 when they were exposed to a vasectomized bull during the normal breeding season to study the estrus periods. At the conclusion of the study period each year, they were placed back in the pasture with a normal bull and came into heat again and were bred. Since that they have had late calves, which have usually not survived the winter. For this reason it appears that it would be desirable to capture a new group of elk for exhibition purposes and dispose of these old, abnormal animals during the 1960 disposal program.

3. Mule Deer

The period was begun with an estimated population of 325. During the disposal program in late October and November, a total of 57 mule deer was removed. The estimated population at the end of this period is 260. The total kill was 33 bucks and 24 does. The district of kills was as follows:

Tower No. 3	1
Pauline Creek	3
Elk Creek	13
Firehole Canyon	4
Elk Pass	7
Triski Creek	18
Jocko River	7
Sub-station	1
Headquarters ridge	2
Tower No. 2	<u>1</u>
Total	57

Weights were taken on as many deer as possible during the disposal and the table appears on the following page, together with a consolidation of data gathered since 1952.

WEIGHTS AND WEIGHT RELATIONSHIPS OF 36 ROCKY MOUNTAIN MULE DEER

Killed during November and December 1959

Age Class	Sex	No. samples Represented	Average Whole Weight	Average Hog-dressed Weight	Average Dressed Weight	Average Visceral Weight	Percent of Total Weight		
							Hog-dressed	Dressed	Visceral
1½-2½ Yrs.	Male	8	129.8	101.1	79.3	28.7	78.7	61.1	22.1
1½-2½ Yrs.	Female	4	126.2	93.7	73.0	32.5	74.2	57.9	25.7
3½-4½ Yrs.	Male	8	191.2	158.7	123.0	32.5	83.0	64.3	16.9
3½-4½ Yrs.	Female	7	139.7	101.5	80.6	38.2	72.7	57.6	27.4
5½-10 Yrs.	Male	6	249.0	208.3	168.3	40.7	82.1	67.5	16.3
5½-10 Yrs.	Female	<u>3</u>	140.0	101.6	81.6	38.4	72.6	58.2	27.4
Total Samples		36							

WEIGHTS AND WEIGHT RELATIONSHIPS OF 470 ROCKY MOUNTAIN MULE DEER

Killed during 1952 and 1954-59 disposal seasons

1½-2½ Yrs.	Male	140	141.5	106.0	84.9	35.3	75.6	60.0	24.8
1½-2½ Yrs.	Female	97	127.9	97.4	79.7	31.2	76.1	62.3	24.3
3½-4½ Yrs.	Male	96	190.3	150.0	119.3	40.1	79.8	62.6	21.1
3½-4½ Yrs.	Female	89	140.5	104.8	84.7	35.5	74.5	60.3	25.3
5½-10 Yrs.	Male	28	217.8	171.1	136.9	46.4	78.0	62.6	21.4
5½-10 Yrs.	Female	<u>20</u>	147.4	105.7	86.4	39.7	71.7	58.6	26.9
Total Samples		470							

The largest mule deer bucks taken this year weighed 269, 265 and 240 pounds. The antlers of two of these bucks were scored by a Boone & Crocket Club scorer and both are large enough to be put in the record books. This may be a reflection of the excellent forage condition present and the sound management practiced during the past few years.

Several cases of predation were noted; these being dog or coyote kills in the southwest corner of the range and in the headquarters area. On October 25 a large mule deer doe was found dead near the boundary fence on the Ravalli Hill. It had been shot, probably from the nearby highway, and left. It had been dead about three or four days.

One tame mule deer fawn was added to the headquarters herd during the period. However, this fawn, along with another fawn and its mother, have disappeared and are presumed dead. The remains of one of the fawns was found, apparently a victim of coyotes. Another tame doe died in October and cause of death is unknown.

4. White-tailed Deer

With the removal of 45 white-tails during the disposal in November and December, the population estimate is now about 150. It is believed that this is a very conservative estimate, but due to the wary nature of the animal and dense cover, an accurate estimate is very difficult to obtain.

It is believed that a considerable number of white-tails leave the refuge by going under the boundary fence. Without doubt, many enter the refuge in the same manner. As many as four deer have been seen outside of the fence at once where Mission Creek enters the refuge. It is surprising that they last long because they are fair game for the Indians at any time of the year.

During disposal operations, it was noted that all deer were in good condition. Live weights, field-dressed weights and dressed weights were also recorded for most of the white-tails taken in the disposal program. These are presented on the following page.

In the previous narrative report, it was stated that one of the white-tailed does had lost the skin from its tail--probably the result of an encounter with a dog or coyote. Since that writing it has been learned from a witness that while in the picnic grounds, a tourist grabbed the doe by the tail and held on until the skin slipped off. This doe is doing well, but just has the dry bone left for a tail.

Another instance of an encounter with a tourist was the loss of "Susie", a particularly tame doe. It is suspected that she choked to death on a piece of licorice candy given her by a tourist.

WEIGHTS AND WEIGHT RELATIONSHIPS OF 33 WHITE-TAILED DEER

Killed during November and December 1959

Age Class	Sex	No. Samples Represented	Average Whole Weight	Average Hog-dressed Weight	Average Dressed Weight	Average Visceral Weight	Percent of Total Weight		
							Hog-dressed	Dressed	Visceral
1½-2½ Yrs.	Male	10	130.0	99.0	80.0	31.0	76.2	61.5	23.8
1½-2½ Yrs.	Female	11	125.0	85.2	69.9	39.8	70.4	55.9	31.8
3½-4½ Yrs.	Male	5	176.0	145.0	111.0	31.0	82.4	63.1	17.6
3½-4½ Yrs.	Female	3	125.0	90.0	72.0	35.0	72.0	57.6	28.0
5½-10 Yrs.	Male	1	225.0	195.0	160.0	30.0	86.7	71.1	13.3
5½-10 Yrs.	Female	<u>3</u>	146.6	113.3	92.3	33.3	77.3	70.0	22.7
Total Samples		33							

WEIGHTS AND WEIGHT RELATIONSHIPS OF 136 WHITE-TAILED DEER

Killed during 1955-59 disposal seasons

1½-2½ Yrs.	Male	41	133.0	100.3	80.7	32.7	75.4	60.6	24.5
1½-2½ Yrs.	Female	35	117.7	84.6	69.1	33.1	72.7	58.7	28.0
3½-4½ Yrs.	Male	26	170.7	136.9	111.6	31.9	77.0	65.4	19.5
3½-4½ Yrs.	Female	18	157.6	93.0	76.3	36.4	71.8	58.9	28.1
5½-10 Yrs.	Male	9	190.1	153.5	122.7	36.6	80.6	64.3	19.3
5½-10 Yrs.	Female	<u>7</u>	129.1	95.0	78.1	34.3	73.1	63.2	26.9
Total Samples		136							

Altogether this year, there have been five tame deer lost--some of these have never been found. It would be very easy for a person to drive into the picnic grounds, knock a tame deer in the head, load it and take it home. Significantly it was always the tamest animal that disappeared. A closer watch on the deer is being kept in headquarters to reduce these possibilities.

5. Bighorn Sheep

No reductions in the sheep population have been made through disposal. However, the skeleton of a ram was found during roundup. This leaves the population at approximately 73 animals. Forage conditions for these animals have been very good due to the heavy basal growth of grasses this fall.

No sheep have been seen in a position where we might drive them into the sheep pasture for trapping. We will continue to check on them this winter in an attempt to capture a few more animals for transplanting to Fort Peck, and for the National Zoological Park.

Breeding activity was noticed during December, but there were no reports of fighting among the rams. A band of 38 was observed in Triski Creek in early December, among these were several large rams. On September 8 a band of 48 was seen along the Jocko; this included 10 lambs, while the rest were ewes and yearlings.

The sheep still are favoring the south and southwest portions of the range and have not been seen on the north slopes since last summer when a few rams wandered over.

6. Antelope

The antelope continue to do very well and their numbers are estimated at about 65. During the rough weather in early November, they were banded together, but have since dispersed into smaller groups. No accurate count has been made yet because of unfavorable conditions.

On October 9, Dr. Philip Wright of the University of Montana collected a mature buck antelope. The University is going to trade this skin with Russia for a Russian hoofed mammal study skin.

"Dinky", the tame antelope doe which went "wild" this spring and was not seen all summer, returned early in October to the headquarters area and picked up where she left off, scrounging from tourists.

It is felt by some people that antelope do not thrive in an area lacking sagebrush. Since we do not have any sagebrush, it might be worthwhile to get an idea as to what their food habits are on this type of range. It is planned to make observations on the kinds of food selected as time permits.

7. Longhorn Steers

The two longhorn steers have been moved from their summer exhibition pasture to the horse pasture in order that they may have access to the hay rack. The steers stay at the rack most of the time and are given plenty of room by the horses. It is estimated that they weigh in the vicinity of 1,800 pounds each.

8. Black Bear

This fall, when the thorn apples were ripe, there was at least one and possibly two bears on the refuge. Although bear were never seen, their droppings were quite common along the Pauline Creek road. On September 14, bear sign was found near the elk exhibition pasture at headquarters. Since the berry crop has gone, no more evidence of bear activity has been found. They have probably moved back off of the refuge for the winter.

D. Fur Animals, Predators, Rodents and other Mammals

Coyotes. It is not unusual to find coyote sign any place on the refuge. No heavy predation has been observed, although they probably take their share of game. Sightings have been made in Alexander Basin, Pauline Creek, Elk Creek and Triski Creek. It is believed that these are different families and the population may soon become excessive. Only one coyote was shot during the period, although several sight records were made.

Dogs. Dogs are probably more effective predators of big-game animals than coyotes. A deer kill, suspected to have been made by dogs, was found in the southwest corner of the refuge where it had been chased into the fence. These dogs come from neighboring ranches and homes.

Feral house cats. House cats are fairly common along Mission Creek and probably take a heavy toll of the bird population. Their boldness is attested to by the fact that one large cat was seen to spring at a great blue heron. The heron flapped out of the way and the cat landed in the middle of the stream and swam ashore. If a cat will attack a heron, it would probably also go after ducks and geese. Three cats were shot along Mission Creek during the period.

Badgers. One sight record of badgers was made. These animals are not very numerous, although their diggings are noted occasionally --especially in the roads. By the end of the period they had become less active.

Mink. Two sight records of these animals were made along Mission Creek near headquarters.

Weasel. A sight record was made in October of a weasel running across a talus slide with a Peromyscus in its mouth. Tracks were seen commonly in fresh snow.

Skunks. Two skunks were killed at the entrance gate and others have been seen around headquarters a few times. They are fairly common on the refuge and abundant enough in the Flathead Valley to cause some concern to farmers. During late summer, the favorite pastime of the local young men was to go night "skunk hunting". They would drive up and down the county roads and seldom, if ever, fail to score.

Beaver. One sight record was made in Mission Creek in early December. A large beaver was seen swimming leisurely downstream. Eventually he dove under and was not seen again although there was little cover where he dove. No evidence of a lodge could be found nor were there any fresh cuttings nearby. It would seem that Mission Creek would provide good beaver habitat, but they are rarely seen there. Fresh cuttings were noted along the Jocko River off of the refuge.

Porcupines. About five were killed during the period. These rodents are fairly numerous as is evidenced by tracks found in the fresh snow. They do considerable damage to timber, especially Ponderosa pine.

Red squirrels. Fairly common in Douglas fir-ponderosa pine cover types.

Chipmunks. Very common in timbered and brushy areas and talus slopes.

Pocket gophers. Quite common. Much sign of activity was seen after the first heavy snow melted.

Mice. In a low year of their four-year cycle. The commonest mice are Peromyscus and Microtus.

Columbian ground squirrels. None observed during the period probably because of cold weather.

Mountain cottontail. Fairly common in brush patches.

Snowshoe hare. Not seen often but present in timbered north slopes below Highpoint. One predator kill was found near Highpoint on September 2.

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

Commonly observed hawks were the sparrow hawk, sharp-shinned hawk, marsh hawk, American rough-legged hawk, western red-tailed hawk and prairie falcon. By the close of the period, most of the sparrow hawks had migrated. Marsh hawks are the most abundant hawk, other than sparrow hawks, and are commonly seen hunting over the open grasslands.

Golden eagles are commonly seen throughout the range. No sightings of bald eagles were made on or near the refuge.

The great horned owl and short-eared owl are fairly common. Two sight records of the pygmy owl were made, one of these in the horse barn.

A few crows have been seen along Mission Creek, but they are not common. Magpies are very numerous and some control measures may be necessary.

F. Other Birds

Stellar's jays were occasionally seen during late September and most of October, mostly along Mission Creek near headquarters.

A flock of Redpolls of very frosty appearance was noted near the slaughter house on November 27. They were approached closely by five of us on horseback and everyone was interested in the light coloration. Under the circumstances no specimen could be taken, but we feel that there is no doubt that they were the Hoary Redpoll.

Dowitchers were noted on Ravalli Ponds on September 23. An Eared Grebe was observed on the largest of the Ravalli Ponds on September 29.

G. Fish

H. Reptiles

One rattlesnake was killed during roundup on October 5--the last record of the year.

I. Disease

One of the tame mule deer does died during the period of unknown causes. The symptoms were general unthriftiness, loss of weight and, in the final stages, scours. Dr. Clyde Senger, the parasitologist from the University, suspects the cause was roundworms. Conditions for roundworms are very favorable in the tame deer as they are concentrated and feed mostly on grasses and anything they can scrounge from people.

The buffalo previously reported as having outgrown hooves was butchered and the feet have been saved for examination by Dr. Richard Taber of the University. It appears that she was double-jointed in the fetlock joints causing her to walk on her heels. Since the toes received no wear, they grew abnormally long and became a hindrance to the animal.

The injured bull buffalo which was shot on the range after roundup appeared to have a skin disease, as the hair was gone from parts of the hide and it had a scabby appearance. This has not been noted in any of the other animals.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Jocko Floodgate Repair

This emergency repair job was completed (except for heavy rip-rap) during the period. The job, begun last period, was necessitated by the exceptionally high water during spring run-off which cut a new channel south of the flood gate. Repair consisted of removal of debris, pouring of 9 cubic yards of cement under the base of the pier which had the wooden pilings exposed, and dozing of a 400 foot gravel dike to close off the new channel and guide the water back into its proper course. The old channel was also deepened. The construction of the dike was a time consuming job, as we only had one large tractor, this being a TD-18A loaned to us by the Ruby Lakes Refuge. A smaller TD-9 was used during the latter phase to work up gravel for the TD-18A to push onto the dike. Most of the work accomplished on this project during the period consisted of replacing lost fill, constructing the dike, and replacing about 100 feet of big-game fence. A total of 6,500 cubic yards of rock and gravel were pushed in to replace lost material and construct the dike.

When the job was in the final stages of completion, the TD-18A slid down into the backwater and became stuck in the mud. It took the combined efforts of a D-6 and a Hyster winch with two sets of blocks to pull the machine back on dry land. It was then necessary to pull all of the plugs to let it drain (see photo section).

Upon completion the structure looks very sound. By the end of the period, however, a new gravel bar was forming at the upstream end of the dike. The real test will come this spring during the runoff. With a record snowpack in the mountains for this time of the year, the spring runoff may be especially heavy. The steep gradient of this stream makes any permanent bank stabilization work an impossibility.

2. Boundary Fence

The bulk of this year's boundary fence work was done last period and is described in the previous narrative report. Fifty-two steel posts, 6 wooden posts and 2 "H" braces were set this period before the job had to be suspended due to lack of materials. In all, about 3-3/4 miles of fence were replaced. Three thousand 10' steel posts and a fair supply of wooden posts and poles have since been purchased and are on hand for next spring's work.

3. Repairs to Corrals

In preparation for the annual roundup, it was necessary to replace a few broken or rotted posts in the corrals. A portion of wire fence had to be replaced, which had been removed the previous period in order that fill could be dozed in on the new culvert which had been placed in the creek as a SAFETY measure (see photos). After

the completion of roundup, the riders agreed that this had been a great improvement and made the job much easier and safer for both horses and riders.

4. Annual Buffalo Roundup

The annual roundup, as described in Section II, C. Big-Game, was completed during the week of October 5-9. The oldtimers agreed that this had been an unusually easy roundup. No accidents involving men or animals occurred in spite of the hazards involved. The only difficulties were the shortage of good horses and the dense fog on the second day of the drive. It is known that at least four bulls were left behind because of this fog.

Gathering of the buffalo began on Monday, October 5, and the animals were in the corrals by noon of the 7th. Immediately after noon, the sorting, branding and vaccinating was started and this was completed by close of work on Thursday, October 8th. Loading of 22 live buffalo into the purchasers' trucks was also accomplished during these last two days. The following morning the butcher herd was driven to the sheep pasture where they were held until November 27.

We are still holding two long-yearling buffalo for shipment to Manila in the Philippine Islands. In accordance with latest instructions, this transfer will be accomplished around the middle of January. These animals are being donated to the Manila Municipal Zoo through our State Department. This donation, plus the 22 animals mentioned above, will bring our total live buffalo disposal to 24 animals.

5. Buffalo Butchering

The butcher herd was brought to the slaughter house from the sheep pasture on Friday, November 27, and butchering was begun on November 30. A total of 60 buffalo was butchered during this period, including a female calf that was gored by a bull in the corrals and had to be shot. Added to this number is the crippled bull killed on October 9 (see Section II, C. Big-Game), bringing the total animals butchered to 61. All regular personnel, plus five temporary men, were required for this project. Actual butchering was completed in six days, when the temporary men were terminated. Our own crew spent three more days at the slaughter house, however, wrapping and shipping the meat and making the final cleanup of the buildings.

6. Deer and Elk Disposal

Deer and elk disposal took place during the latter part of October and the month of November. A total of 5 elk, 57 mule deer and 45 white-tails were disposed of. All of the meat obtained during this disposal was sold to the State Department of Public Instruction for use in school lunch programs, with the exception of one elk which went to the Ronan 4-H Club. With the aid of .243 caliber rifles, equipped with 6X scopes enabling us to make head and neck shots, and our slaughter house facilities, this meat is delivered to the purchaser clean and well taken care of and with a minimum of waste from being "shot up".

7. Assistance at Ninepipe

Personnel from the Bison Range helped install an oil-burning space heater in the refuge office building and an underground oil storage tank for the residence; changed wiring in the service building and assisted with installation of the new gasoline pump. We also burned holes in 200 steel fence posts for attaching boundary signs.

8. Miscellaneous

Construction of two duck traps.
 Cleanup Highpoint lookout area.
 Grading roads and trails.
 Shoeing and exercising horses.
 Telephone line repairs.
 Gathered apples for tame deer at headquarters.
 Constructed two shipping crates for shipment of buffalo to Manila.
 Made and installed new door for office basement.
 Dug up and replaced water shut-off valves at Quarters 7 and 8.
 Posting of refuge boundary.
 Plowing snow from refuge entrance road, slaughter house road and service area.
 Drained irrigation pump and stored sprinkler pipe.
 Daily feeding of headquarters and exhibition animals.
 Wrapping and shipping hides and skulls.
 Replaced rotted bridge railing on Mission Creek headquarters bridge.
 Reshingled roof of Quarters 2.
 Installed underground oil storage tanks at Quarters 2 and 3-3.
 Cleaned garbage pit.
 Unloaded carload of 3,000 ten-foot steel fence posts; weight 41 tons.
 Usual maintenance and repair of all Government-owned vehicles.
 Hauled and stored barley and oats purchased from neighboring ranchers.
 Trips to Columbia Refuge to return two dump trucks; to Great Falls to deliver stake-dump truck for use on the Benton Lake Project and pick up 7½ tons of wheat on second truck; and two trips to Columbia Falls, Montana for wooden fence posts and poles.

B. Plantings

None

C. Collections

A number of small mammals have been collected in connection with the small mammal study described under Section V, Field Investigation and Applied Research.

One adult male antelope was collected by Dr. Philip L. Wright of Montana State University to be used in a mammal specimen exchange with the Russian Museum at Leningrad, as explained in Section II, C-Big-Game Animals.

D. Control of Vegetation

1. St. Johnswort, Hypericum perforatum

Goatweed has flourished this year and heavy basal growth has occurred this fall due to the wet condition. No plants have been found which do not have Chrysolina beetle eggs on them. Mr. Watson E. Beed, Regional Biologist, found that some of the eggs had hatched at the end of the period and live larvae were present in small numbers. This is the first time they have been noted in the winter.

← Not enough to record

2. Annual Spraying Summary

<u>Total Acreage Treated:</u>	Canada thistle, <u>Cirsium arvense</u> , 121 acres. Balsamroot, <u>Balsamorhiza sagittata</u> , 38 acres																														
<u>Growth Stage:</u>	Canada thistle - in bud Balsamroot - 1/3 to full bloom																														
<u>Treatment Dates:</u>	Canada thistle - May 28 to June 30, 1959 Balsamroot - May 4, 5 and 12, 1959																														
<u>Chemical:</u>	Canada thistle: 2,4-D Amine salt in water at a mixture of 80 to 1. No wetting agent used. Balsamroot: 2,4-D Amine salt in water at a mixture of 80 to 1. Wetting agent added at rate of 1200 to 1.																														
<u>Rate of Application:</u>	Canada thistle - 2 pounds per acre of acid-equivalent. Balsamroot - same as thistles.																														
<u>Method of Application:</u>	Canada thistle - Bean sprayer mounted on Dodge power wagon. Balsamroot - Sprayer mounted on "22" Caterpillar tractor.																														
<u>Cost Analysis:</u>	<table border="0"> <tbody> <tr> <td>Canada thistle:</td> <td>Materials</td> <td>\$198.60</td> </tr> <tr> <td></td> <td>Wages</td> <td>519.40</td> </tr> <tr> <td></td> <td>Equipment</td> <td><u>142.50</u></td> </tr> <tr> <td></td> <td>Total</td> <td>\$960.50</td> </tr> <tr> <td></td> <td>Cost per acre:</td> <td>7.93</td> </tr> <tr> <td>Balsamroot:</td> <td>Materials</td> <td>37.77</td> </tr> <tr> <td></td> <td>Wages</td> <td>92.84</td> </tr> <tr> <td></td> <td>Equipment</td> <td><u>24.50</u></td> </tr> <tr> <td></td> <td>Total</td> <td>\$155.11</td> </tr> <tr> <td></td> <td>Cost per acre:</td> <td>3.30</td> </tr> </tbody> </table>	Canada thistle:	Materials	\$198.60		Wages	519.40		Equipment	<u>142.50</u>		Total	\$960.50		Cost per acre:	7.93	Balsamroot:	Materials	37.77		Wages	92.84		Equipment	<u>24.50</u>		Total	\$155.11		Cost per acre:	3.30
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	Cost per acre:	3.30																													
<u>Results of Control:</u>	Canada thistle - 75-80 percent kill (there was a considerable amount of basal growth that occurred after spraying) Balsamroot - Estimated 95 percent kill.																														

Recorded
J.B.S.

3. Spotted Knapweed, Centaurea maculosa

Efforts were made to completely eliminate this weed from refuge lands. The two small known infestations were sprayed repeatedly with 2,4-D Amine with a hand sprayer, and individual plants were hoed or pulled out. Checks were made during the summer and new plants were removed as fast as they appeared. At the end of the growing season, no knapweed plants were present. Undoubtedly more sprouting from latent seeds will occur next spring and further control measures will be necessary. This is a common weed on lands adjoining the west boundary of the refuge but, by keeping an eye open for invasions, nearly complete control has been obtained on refuge lands. Outside of the small cost of the chemical used, no funds were expended on this project as the work was accomplished during routine inspection trips over the range.

E. Planned Burning

None

*Recorded
by B S*

F. Fires

No fires occurred. The Indian Service lookout on Highpoint was discontinued as of September 1.

IV. RESOURCE MANAGEMENT

A. Surplus Buffalo Disposal Program

1. Live Sales

A total of 22 live buffalo were sold this year, 8 bulls and 14 cows. Eight separate transactions were involved with the animals going to the states of Wisconsin, Idaho, Washington, Oregon and Montana. Listed below is the essential information concerning each sale:

<u>Consignee</u>	<u>Species</u>	<u>Number</u>	<u>Sex</u>	<u>Age</u>
Elwyn West Waupaca, Wisconsin	Buffalo	4	Heifers	Long-yearlings
Lester H. Pattee Cataldo, Idaho	Buffalo	1 2	Bull Heifers	Long-yearlings
Mrs. O. E. Gault Wenatchee, Wash.	Buffalo	1 2	Bull Heifers	Long-yearlings
John Day Central Point, Oregon	Buffalo	1 5	Bull Heifers	Long-yearlings
Emmette H. Spraker Pocatello, Idaho	Buffalo	1	Bull	Long-yearling

Robert L. Pugsley Chester	Buffalo	2	Bulls	Long-yearlings
Robert Schall Arlee, Montana	Buffalo	1	Bull	2-years old
		1	Bull	Long-yearling
Chas. Hinderager Great Falls, Mont.	Buffalo	1	Heifer	Long-yearling

2. Meat Sales

Sixty-one buffalo were butchered this year. These include the crippled bull butchered on October 9 and the calf which was gored in the corrals during butchering. The sex and age composition of the butchered animals is given below:

<u>Age Groups</u>	<u>Number</u>
Bulls, 10-years	3
Bulls, 4-9 years	12
Bulls, 2 and 3 years	25
Cows, 10 years	2
Cows, 4-9 years	16
Cows, 2 and 3 years	2
Heifer calf	<u>1</u>
Total	61

As in previous years, a drawing was held to determine which of the applicants would be entitled to purchase meat. Messrs. Robert T. Crawford and Charles E. Faulkner of the Flathead Indian Agency and Mr. E. J. Wamsley, Moiese Postmaster and Storekeeper, conducted the drawing on October 13. For the first time in several years, it was necessary to have a drawing in the Clubs and Commercial Establishments category also. The percentage of meat set aside for sales to this group has been adequate in former years to fill all the applications received. This year, however, the applications far exceeded the quota. In all, 61 applications were received in this category, as compared to 40 last year. An even greater increase in individual applications occurred, however, when 625 applications were received, compared with 377 in 1958. Of the 625 individual applications, we were only able to fill 136 or less than 22 percent. The Clubs and Commercial group fared much better than this as we eventually filled all but four of the orders. This average wouldn't have been so favorable though had it not been for the release of the three animals reserved for disposal by the Regional Office.

For the most part, one-half carcass was sold to clubs, restaurants and meat markets, while individual purchasers were limited to one-quarter carcass each. The one exception to this occurred when the entire carcass of the sub-standard bull butchered in October was sold to the John R. Daily Meat Company in Missoula. Three animals were donated to the Indians for distribution to schools having Indian children in attendance.

The animals butchered this year were in excellent condition, as one would expect after two years of above-average rainfall resulting in an abundance of forage on the range. We did butcher one sub-standard cow (besides the bull mentioned above), however, and that was the animal with the outgrown hooves described in the section on "Disease".

3. Sale of Buffalo Hides and Skulls

There has been an extraordinary demand for buffalo hides this fall and, as a result, we are going to be unable to fill all the orders we have on file. To date, we have sold and shipped 41 of the 60 hides from our December slaughter program. Total amount received from these sales was \$745.00, or an average of \$18.17 per hide. Other orders are pending.

We had one order from East St. Louis, Illinois covering 20 hides and 28 skulls for a total of \$374.00. We understand that an Indian Lore group intended to construct an Indian Tepee Village for a local celebration during the coming summer and these items were needed for authenticity.

Due to the above order, plus other smaller orders, buffalo skulls are also at a premium and we find it necessary to turn down applicants almost daily. Altogether during this period we have sold 42 buffalo skulls for a total of \$125.50.

B. Surplus Deer and Elk Disposal

A total of 102 deer (57 mule and 45 white-tailed) and 5 elk were removed from the refuge during November and December. As in past years, the meat was sold to the School Lunch Program and more orders were received than we were able to fill. A handling charge of \$5.00 for the deer and \$25.00 for the elk was assessed, resulting in an income of \$625.00.

C. Proceeds of Sales

Listed below are the proceeds of sales for the period September 1 through December 31, 1959:

Sale of live buffalo	\$3,110.00
Sale of buffalo meat	9,113.50
Sale of elk and deer meat	625.00
Buffalo skulls	125.50
Deer hides	7.00
Buffalo hides	745.00
Sale of used fence posts	<u>223.10</u>
Total Receipts	\$13,949.10

If we add to this the \$1,395.81 received during the first eight months, we come up with a total of \$15,344.91 for the calendar year 1959.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Bighorn Sheep Study

A summary of this study by Drs. Philip Wright, Barbara Howell and Clyde Senger reports the following:

"The twelfth and final bighorn ram was collected in April. Four of the twelve rams showed mild lungworm infections, Protostrongylus stilesii. All of the rams harbored intestinal worms, most of which were Nematodirus spathiger or a closely related species. No adult tapeworms were noted, but 9 of the 12 harbored from 1-5 bladderworms or cysticerci. These appear to be the larvae of Taenia hydatige. Ticks, both Dermacentor Andersoni and D. albipictus were encountered on 3 and 2 animals. No other ectoparasites were found.

"Gross, hog-dressed and dressed weights appeared to reach a peak in August and September and a low in March. Hog-dressed weights averaged 73 percent of whole weight and dressed weight 55 percent of whole weight. The kidney fat index reached a peak of 3.01 in October and a low of 1.4 in February and March."

B. Small Mammal Study

As a continuation of the study begun by Mr. Guy Connolly, Student-Trainee this past summer, further trapping has been carried on. A method suggested by Dr. Richard D. Taber of sinking #10 tin cans flush with the ground was tried but, as yet, has not proven very successful. Snap-trapping yielded catches of the usual Peromyscus maniculatus, Microtus mantanus and Sorex vagrans. Further trapping with standard mouse and rat snap-traps will be done in various habitats in an attempt to compile a complete mammal list.

C. Browse Survey

In an effort to determine the degree of utilization of the most important browse species, a series of 100 foot line-point plots were run through areas of typical browse. At each one foot point the species was noted and the percent of the plant available and percent of use or percent of available leaders browsed was estimated. These plots were run on October 20 and 21 and measure spring and summer use only. It would seem advisable to run the plots again in March to measure winter use. The results obtained are shown in the following table:

<u>Species</u>	<u>Number of Samples</u>	<u>Average percent of use of available leaders</u>
Snowberry, <u>Symphoricarpos alba</u>	304	29.8
Rose, <u>Rosa sp.</u>	124	55.4
Chokecherry, <u>Prunus virginiana</u>	19	67.4
Black hawthorne, <u>Crataegus douglasii</u>	21	95.3
Oregon grape, <u>Berberis repens</u>	28	0
Alder, <u>Alnus tenuifolia</u>	5	70.0
Smooth sumac, <u>Rhus glabra</u>	28	21.7
Mock orange, <u>Philadelphus lewisii</u>	74	1.7*

* Receives heavy use in winter months.

0. Duck Banding

Duck banding operations began on September 3 and were ended on October 2 due to the opening of the hunting season. The purpose was to determine annual mortality rates and vulnerability to shooting. One trap was set up on the Bison Range on the Ravalli pot-holes and one was set up at Ninepipe and was run by Bison Range personnel. Trapping success was poor, with only a total of 285 ducks banded. This was undoubtedly due to the short notice we had, the limited amount of baiting done beforehand and difficulty in purchasing suitable wire. In the last three days of banding, 113 ducks were taken indicating the length of time needed for the birds to learn where the grain was being fed. The birds banded are listed by species and age below:

<u>Species</u>	<u>Adult</u>	<u>Immature</u>	<u>Total</u>
Mallards	98	85	183
Pintails	14	17	31
Green-winged teal	4	50	54
Blue-winged/cinnamon teal	2	14	16
Redheads	—	<u>1</u>	<u>1</u>
Totals	118	167	285

To date five returns have been received, four local and one from Lewiston, Idaho.

VI. PUBLIC RELATIONS

A. Recreational Uses

Because of adverse weather conditions, visitor pressure dropped off considerably this fall. As noted under Section I, Weather, this was one of the wettest, coolest autumns on record. On the rare nice weekends, the usual number of people came in to drive around the exhibition pasture, use the picnic area and feed the tame deer around the headquarters grounds.

Total visitor use during 1959 was estimated at 28,000. This was a drop of 7,000 from the all-time high of 35,000 for 1958. This is believed to be due mainly to three reasons; unfavorable weather, road construction work, and "let-down" from 50th Anniversary activities of the previous year.

B. Refuge Visitors

- Sept. 1 Mr. and Mrs. Cleveland P. Grant, Mineral Point, Wisconsin (Courtesy visit)
- Sept. 13 Flathead Pioneers held annual picnic at headquarters picnic area.
- Sept. 14 Mr. Holsworth, Canadian Wildlife Student (study of buffalo ecology)
- Sept. 16 Dr. DuWayne Goodwin, Professor Box and Range Management Class Utah State University (tour of range)

- Oct. 4 Kalispell Camera Club (tour of range and photography)
- Oct. 7&8 Mr. and Mrs. George T. Foley, Spokane, Wash. (photography)
- Oct. 13 Messrs. Robert T. Crawford and Charles E. Faulkner, Flathead Indian Agency and E. J. Wamsley, Moiese (buffalo meat drawing)
- Oct. 13 Messrs. Jack Schmautz, Forest Service Missoula; W. Leslie Robinette, F&WS Research Lab., Denver, Colo.; and Curtis W. Halvorson, F&WS Research Center, Missoula (range inspection)
- Oct. 19 Mr. & Mrs. Fred Chapman, Los Angeles, Cal. (photography)
- Oct. 20 Mr. Jim Bond, Author-Photographer, Portland, Oregon (elk & 21 pictures)
- Oct. 21 Mr. Eugene Grand, P&RC, Billings (arrangements for butchering horses)
- Oct. 26 Dr. Clyde Senger and Mr. Forrester, MSU, Missoula (deer specimen studies)
- Oct. 28 Mr. Howell, University of Alaska and Dr. R. D. Taber, MSU (deer specimen studies)
- Nov. 3 Mr. Elmo See, Regional Office, Portland (Wamsley concession)
- Nov. 9 Messrs. Watson Beed, Regional Office; Nate Snyder, USFS and Curtis Halvorson, F&WS, Missoula (range inspection)
- Nov. 10 Messrs. Faye Couey, S. D. Stockstad, Nels Thoreson, Dale Witt, Boyd Opheim and Bob Lambeth, Montana Fish & Game Dept. (regulations for fishing on Ninepipe, Pablo, et al)
- Nov. 30 Mr. Les Pengelly, MSU, Missoula (to borrow slides)
- Nov. 30 Mr. Charles Spencer, Flathead Agency, Dixon (distribution list for meat donated to Agency for schools)
- Dec. 1 Charlo High School (visit to slaughter house to watch buffalo butchering)
- Dec. 1 John T. Shanklin, Technical Staff, Office of the Secretary, Interior, Wash. D.C.; Clyde W. Pensoneau, Bur. Indian Affairs, Wash., D.C.; Milton A. Johnson, Ass't. Area Director, Bureau Indian Affairs, Billings and Nicholas Welter, Area Forester, Bur. Indian Affairs, Billings (short tour and visit)
- Dec. 3 Dixon High School (visit to slaughter house to watch buffalo butchering)

The following are occasional to frequent visitors:

Mr. Robert Dusenberry, Range Management, Indian Agency, Dixon, Montana
 Dr. John Craighead, Montana State University Research Unit, Missoula
 Dr. Philip Wright, Montana State University, Dept. of Zoology, Missoula
 Dr. Richard D. Taber, Montana State University, Forestry Dept. Missoula
 Mr. Wm. Gusey, Predator & Rodent Control, Missoula
 Mr. Roy Guffey, Predator & Rodent Control, Hot Springs
 Mr. Robert Lambeth, State Fish and Game Dept., Polson, Montana
 Mr. Wesley Woodgerd, MSU Research Unit, Missoula
 Mr. John Boyd, Roads Foreman, Indian Agency, Dixon, Montana
 Dr. John Corcoran, Disease Eradication Service, St. Ignatius, Montana
 Drs. Read and Keyser, Veterinarians, Ronan, Montana

C. Refuge Participation

- Sept. 2 Henry attended a special meeting in Missoula of Western Montana Fish and Game Ass'n. to discuss regulations.
- Sept. 3 Henry attended noon meeting of Executive Committee of Western Montana Fish and Game Ass'n.
- Sept. 22 Henry attended meeting of Tourism Committee, Lake County Rural Development Program.
- Nov. 16 Henry attended meeting of Federal Business Men's Ass'n. in Missoula.
- Nov. 18 Henry attended meeting of Tourism Committee, Lake County Rural Development Program.
- Dec. 2 Prather attended meeting of Tourism Committee, Lake County Rural Development Program.
- Dec. 10 Henry, Nelson and Prather met with group of State Fish and Game officials on regulations pertaining to satellite refuges.
- Dec. 13 Henry attended meeting of National Federation of Federal employees.
- Dec. 15 Prather and Nelson attended Senate hearing at Montana State University on Paradise and Knowles Dams.
- Dec. 15 Henry gave slide-talk to Ronan Lions, in Ronan, Montana.
- Dec. 16 Henry attended meeting of Tourism Committee, Lake County Rural Development Program.
- Dec. 21 Henry attended meeting of Federal Business Men's Ass'n. in Missoula.

D. Hunting

There is no public hunting on the National Bison Range.

Our observations on hunting in the surrounding area indicated that hunting of upland game birds was a little below recent averages. On the other hand, the hunting on waterfowl was generally felt to be a bit better than usual. The severe cold snap in mid-November pushed out a lot of the birds, but there was some recovery with the chinook that followed.

E. Violations

To our knowledge there were no violations on the Bison Range with the exception of the deer found shot just inside the boundary fence along U.S. Highway 93. There were no clues.

In patrolling the surrounding area, one case was made. This was by Victor B. May who apprehended Kenneth Esterby shooting pheasants out of season on October 24th. Esterby was fined \$50.00 plus court costs of \$2.50.

VII. OTHER ITEMS

A. Items of Interest

1. Pieces of Outgoing Mail for 1959

We have at times been appalled by the amount of mail necessary

to run this small office. As a matter of curiosity, we figured up the number of pieces mailed out during 1959 and found it to come to a total of 2,704. We wonder how this stacks up with the average?

2. SAFETY

The most important SAFETY accomplishment of the year has been the elimination of a dangerous situation in Slaughterhouse Creek. Each band of buffalo brought into the corrals by the riders must be cut out from the herd and driven on the run through a downhill lane which is crossed by the above mentioned creek. The banks of the creek were steep and the bottom muddy and full of rocks. Most of the riders hated and feared this spot. To correct the situation, we cleaned out the creek bottom, installed 130 feet of concrete culvert, and then dozed in a large quantity of fill. This can best be illustrated by the before and after pictures in the photo section.

Another SAFETY accomplishment was the elimination of the oil storage tank from the basement of the office building. At the best, this old wooden structure is a fire hazard, but with the oil tank fully exposed it could almost be termed a "fire trap". This tank was replaced by a larger tank, buried underground outside the building.

Monthly SAFETY meetings were held on September 8, October 13, November 10 and December 14, and the quarterly fire drill was held on November 14. A special fire drill, called by the Regional Office, was held here on October 7.

The SAFETY committee investigated two minor accidents, one involving a motor vehicle and the other an eye injury to the butcher foreman employed during the surplus buffalo disposal. No lost-time resulted from either of these accidents.

We have just succeeded in breaking this station's record for the number of days without any lost-time accidents. On December 31 this figure had reached 964 days, compared with our previous record of 925 days.

3. Death of E. J. Wamsley

The village of Moiese consists of a single building, a combination residence, store and Postoffice, owned and operated by the Wamsley family. This building is on refuge land and under a concession in favor of the Wamsleys. The head of the household was Joe Wamsley, one of the most highly respected and best liked men in Western Montana. It was a terrible shock to the entire area when Mr. Wamsley was killed in an automobile accident on the night of December 23rd. This is the kind of a loss from which a community never fully recovers.

4. Illness of Robert V. Bruce

Many of you will remember Bob, as he was clerk at the Bison Range for several years during the 1940's. He came to us from the

Little Pend Oreille Refuge in Washington in 1942. In 1949, Bob transferred to the Forest Service and during the past few years has been stationed in Missoula at the Regional Office as Administrative Officer. On December 4, Mr. Bruce suffered a coronary heart attack and was hospitalized until New Year's Day, when he was allowed to return to his home. We are glad to report that Bob has made a good recovery and is feeling fine at this writing. The doctor in charge has said it may be 90 days before he will be allowed to return to work, but we have our doubts if Bob will stay idle that long as he is already showing signs of restlessness.

B. Acknowledgements

Sections I, II, III and V by Robert R. Prather; Section IV by Mrs. Young; Section VI and VII by C. J. Henry. All sections were edited by Henry.

C. Photographs

Photographs will be found following the NR forms.

Respectfully submitted,

Robert R. Prather

Robert R. Prather
Refuge Manager

January 15, 1960

Approved:

C. J. Henry
C. J. Henry
Refuge Manager

Approved:

Richard E. Griffith
for Regional Director

Done

FORM NR-1 NOT APPLICABLE TO THE BISON RANGE

DISCONTINUANCE AUTHORIZED IN MR. GRIFFITH'S MEMORANDUM OF APRIL 18, 1946.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge National Bison Range

Months of September to December, 19 59

(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.
Dusky Grouse	3,000 A. pine, fir & coulee bottoms	46							65	
Ruffed Grouse	300 Acres brushy creek bottoms	30							10	
Chukar Partridge	16,000 Acres mixed cover	32							500	
Gray Partridge	" "	35							450	
Ring-necked Pheasant	5,000 Acres grass- land & bottoms	33							150	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

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

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge National Bison Range Calendar Year 1959

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions	(7) Estimated Total Refuge Population		(8) Sex Ratio	
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter-Natural Loss	Number	Source	At period of Greatest use	As of Dec. 31	
Buffalo	15,121 A. bunchgrass, fescues, bluegrass, etc.	92			83				4			428	342	8-10
Elk	2,518 A. Pine & fir; 309 A. Juniper; 40 A. cottonwood;	15			5			1				70	65	
Mule Deer	61 A. browse.	105			57		7	1		1	Donation	325	260	
White-tailed Deer		50			45		1			1	Donation	200	150	
Mountain Sheep		15		13		4						73	73	
Antelope		28				1						65	64	
Texas Long-horned steers		XXX										2	2	2-0

Remarks:

Reported by

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: 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 total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

116000

PUBLIC USE

Refuge National Bison Range

Calendar Year 1959

Total Use Visitor-Days	Hunting Use	Fishing Use	Miscellaneous Use
28,000	0	0	28,000

Where practical, by means of occasional spot checks, or other methods, show by percent and visitor-days the breakdown of the above figures and other related information:

Hunting (on refuge lands):	Percent	Visitor-Days	Acres	Miscellaneous:	Percent	Visitor-Days
Waterfowl				Recreation *	98	27,440
Upland Game				Official	1	280
Big Game				Economic Use	1	280
Supervised by refuge		by State	No. of blinds	Other		

Hunting (off
refuge lands): Estimated man-days of hunting on lands
adjacent to the refuge 1,000 (These figures
should not be included in hunting-use totals above).

Fishing:

Acres of ponds or lakes _____ and miles of streams
_____ open to fishing.

Comments:

Use is predominately range tours and viewing
wildlife with picnicing and photography the
principal secondary objectives.

*(including picnicking, swimming, boating,
camping, viewing wildlife, and photographing)

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge National Bison Range Year 19459

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
<u>Bitterbrush, Purshia tridentata</u>	High, open portions of range.		2 x Acres	5 pounds	Sept. & Oct.			Seed scattered at random during roundup, etc.
Sand Cherry	Qrts. 2, 6, 8 & 9 & Elk Cr. waterhole			50 seedlings	May & June	50%		
Wild Plum	" "			50 seedlings	"	25%		
Douglas fir	Qrts. 2			50 seedlings	"	0		
Juniper	"			50 seedlings	"	75%		
Cut leaf birch	Qrts. 6			3 seedlings	"	100%		
Pfitzer Juniper	Qrts. 8			2 seedlings	"	100%		
Royal Anne Cherry	Qrts. 6			1 seedling	"	100%		
Snowball Shrub	Qrts. 6			1 seedling	"	100%		
Willow	Elk Cr. Waterhole			25 cuttings	June	10%		

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches.....
Food strips, food patches.....
Forest plantings.....

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

REFUGE GRAIN REPORT

Refuge National Bison Range

Months of September through December, 1959

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Oats	65	137	202			55		147		147	
Barley	85	75	160			70		90		90	
Wheat	75	0	75			40		35		35	

(8) Indicate shipping or collection points Oats and Barley purchased locally.

(9) Grain is stored at Bison Range grainary and barn

(10) Remarks _____

*See instructions on back.

REFUGE GRAIN REPORT

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

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

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.



Goose banding. Removing a goose from trap--Henry with goose, Hogge holding gate.



Why bands get lost--an old band opened almost wide enough to fall off.



Dr. John Craighead putting on experimental type of clinching band.



An attempt is made to keep the headquarters' experimental flock clipped in order to study bands, both leg and neck.

Photos by May



Hypnotized goose. Photo by Henry.



Roof repairs--Quarters No. 2. Photo by May.



Elk calf born October 21st. Photo taken December 4th.



"Tommy", a 14-year old bull.

Photos by Henry



"Nibs, a tame mule deer doe. December 4, 1959.

Photos by Henry





"Dinky", a tame antelope doe. Photo by Henry.



Habitat scene in the Douglas fir-ponderosa pine belt.
Photo by Connolly.



The end of "Big Medicine", the famous white buffalo;
died August 25, 1959.

Photos by Connolly.





A timbered slope in the "Sheep Pasture" showing encroachment of evergreen reproduction.



"High Point", the highest point on the refuge; note cabin and lookout tower.

Photos by Henry.



SAFETY. Correcting an unsafe condition in Slaughterhouse Creek. See text, Section VII, Other Items. Before photo (top) by Prather. After photo by Henry.





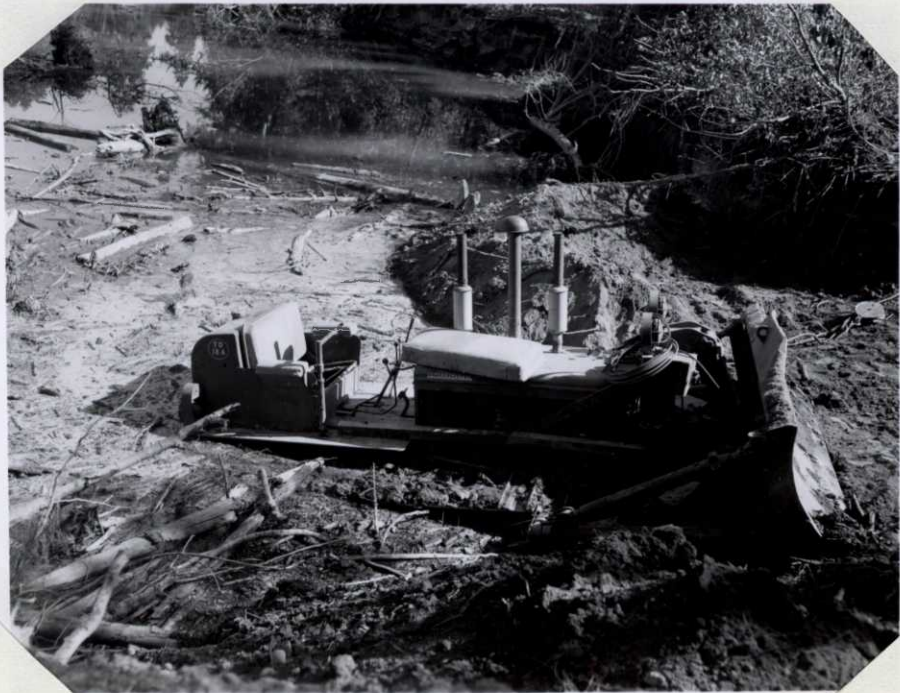
SAFETY. Another view of correction on preceding page.
Before photo (top) by Prather. After photo by Henry.





Trouble. A stuck TD-18 tractor on the Jocko River repair job.

Photos by May





Aerial: looking up Triski Coulee, U.S. 10-A in foreground, Highpoint upper left. Flathead Valley and Mission Range in background.



Proposed Ravalli Exhibition Pasture. Note junction U.S. 10-A and U.S. 93.

Photos by Henry



Two aerals of Bison Range Headquarters. Upper looking south; lower looking east.

Photos by Henry





Buffalo crates constructed to ship buffalo to
Philippine Islands.

Photos by May





Aerial view of slaughterhouse and corrals.

By Henry.