

NATIONAL BISON RANGE

Moiese, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1994

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEWS AND APPROVALS

NATIONAL BISON RANGE

Moiese, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1994

<u>Dennis Waseman</u>	<u>5/8/96</u>	<u>Ly Berry</u>	<u>5-21-96</u>
Refuge Manager	Date	Refuge Supervisor Review	Date

<u>Paul E. Smith</u>	<u>5/22/96</u>
Regional Office Approval	Date

This Narrative is Dedicated to:



JON MALCOLM

Refuge Manger
1981 to 1994

INTRODUCTION

The National Bison Range, located in Sanders and Lake Counties, Montana, near Moiese, includes an area of 18,497 acres. It was established by Acts of Congress of May 23, 1908, primarily for the preservation of a representative herd of plains bison, or buffalo, under reasonably natural conditions and to ensure the preservation of the species for continued public enjoyment.

Since establishment, however, other big game animals have been introduced onto the area and current management emphasis includes species diversity. Other big game animals currently inhabiting the area include Rocky Mountain elk, bighorn sheep, mule deer, white-tailed deer, pronghorn antelope, and mountain goats.

Range elevation varies from 2,585 feet at headquarters to 4,885 feet at High Point on Red Sleep Mountain, the highest point on the Range.

The portion of the Flathead Valley in which the Range is located has a microclimate usually characterized by relatively mild winter temperatures and little wind. Snow cover melts quickly at lower elevations. Sub-zero weather is uncommon. Summer temperatures seldom exceed 100 degrees. Precipitation averages 12.63 inches annually at Range headquarters with slightly more at higher elevations. The growing season averages 90-110 days. Freezing conditions generally occur from late November through March.

The Range is essentially a small, low-rolling mountain connected to the Mission Mountain Range by a gradually descending spur. Much of the Range was once surrounded by prehistoric Lake Missoula which was formed by a glacial dam on the Clark Fork River. The lake attained a maximum elevation of 4,200 feet. Old beach lines are still evident on north-facing slopes.

Topsoil on the Range is generally shallow and mostly underlain with sedimentary rock which is exposed in many areas, forming ledges and talus slopes. Soils over the major portion of the Range were developed from materials weathered from strongly folded pre-Cambrian quartzite and argillite bedrock. These soils are well drained, steep, and Range from very shallow to moderately deep in parent material. They have a loamy surface horizon with near neutral pH, high organic matter content, and varying degrees of rock fragment. Except for surface soils, lower horizons have a loamy texture with rock fragment dispersals. Water percolation rates are high, thus soil erosion rates are minimal.

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Information Packet.....(Inside back cover)

A. HIGHLIGHTS

Fire & drought were the dominant theme for the year. Fire danger was extreme and the Range operated under emergency suppression level 3 for most of the summer and into the fall. The Red Sleep Mountain Drive was closed for safety and fire prevention from July into October. NBR fire fighters assisted on one of the three major fires in the area. These fires burned thousands of acres filling the valley with smoke and ash fall. Two small lightning caused fires occurred on NBR in spite of the extra precautions taken (Section F).

The Confederated Salish and Kootenai Tribes began compacting plans to take over the operation of the Bison Range under the new Indian Self-governance Act. This law authorizes Tribes to apply for management of some government operations, other than BIA functions, if they can prove a geographical, cultural or historical connection. Our first indication of these plans was an item in the local newspaper.

A May visit by Director Mollie Beatty and Regional Director Ralph Morgenweck was a special highlight. The Director flew over much of the Mission Valley and toured the Bison Range along with other FWS and Tribal personnel. Confederated Salish and Kootenai Tribal Councilwoman, Rhonda Swaney presented Director Beatty with a letter of Tribal concerns and these issues dominated the discussion. The opportunity to host these two directors was greatly appreciated.

Jon Malcolm retired at the end of April. He was manager of the National Bison Range since 1981, the first year that the Visitor Center was occupied. He was a working manager who rode with the crew to move bison and was highly respected by all who worked with him. Asst. Manager Bill West served as Acting Manager through the rest of the year. In December, David S. Wiseman of Flint Hills NWR was selected as the new manager. He is scheduled to come on duty in early March.

Wildlife and Biodiversity showed some unusual movements due to the drought. Many pronghorns left the open grasslands and sought forbes and browse along the creeks. Two mountain lions established resident territories in lowland areas on the Range. There were also over 40 reported sightings of bears, including several with cubs, which concentrated along creeks in search of berries. One bison was killed by lightning during one of the many dry lightning storms (Section G).

Volunteers continued as a key part of the operation, as 319 individuals donated 4,400 hours of work (Section E-4).

Bio Control - Emphasis on biological controls for noxious weeds continued with 16 bio-control agents now employed on the Range. NBR is a major biological-control test site (Section F-10).

Bison sale - The overall average price of bison in the annual sealed bid sale of surplus animals increased to \$1,273, up \$207 from 1993 (Section G-13).

Visitors - Visitation totalled 206,000 making this the second busiest season after 1993. Outdoor Education Workshops were continued for teachers. School groups, ranging from pre-school to University level, brought over 6,000 students (Section H-3).

The Field Guide to the National Bison Range was completed and provides a color guide to the Range's habitats and wildlife (Section G-5).

B. CLIMATIC CONDITIONS

This year will be remembered for its extremely high temperatures and low precipitation resulting in extreme fire danger for much of the summer season. During the months of June through September, there were 37 days over 90 degrees and 4 days over 100 with the highest being 103 reached on July 26th. And yet August was the only month that didn't reach freezing at least one night. Only 2.44 inches of precipitation fell during this period of time as compared to the 44-year average of 5.26 (only 46%). July had .07 inches of precipitation which fell over 3 days. This represents all the precipitation for a 7-week period covering most of June and July.

The year started out mild and dry with snow levels very low. Only 2" of snow fell by the end of January with another 5" falling in February, ending the snow year. Although the low for February was -28 degrees, highs for the first 2 months of the year were 59 and 60.

March, April, and May continued warm with highs in the 70s and 80s. April had 2.13 inches of rain (213% above the 44-year average of 1.00 inch). This was encouraging but rainfall was below average for most of the rest of the year resulting in extremely dry conditions.

Temperatures began to drop in September bringing snow to the top of the Mission Mountains on September 4. But it was October that brought cooler weather to the valley with most temperatures in the 50s and 60s. Much needed precipitation also came in October with 2.37 inches falling (275% above the average of .86 inches). However, November and December brought only .27 inches of precipitation (far below the 44-year average of 1.53), 5 inches in snow. The Range received 9.45 inches of precipitation for 1994, 75% of the 44-year average of 12.61 inches. Temperatures remained cool for the rest of the year.

Table 1. 1994 Weather Conditions

MONTH	TEMPERATURE		PRECIPITATION		SNOW
	High	Low	1994	44-YR. AVG.	
JANUARY	59	6	.27	.82	2.0
FEBRUARY	60	-28	.30	.58	5.0
MARCH	71	10	.17	.75	
APRIL	83	20	2.13	1.00	
MAY	88	31	1.50	1.81	
JUNE	93	32	1.85	2.01	
JULY	103	32	.07	1.05	
AUGUST	100	35	.18	1.10	
SEPTEMBER	96	27	.34	1.10	
OCTOBER	79	15	2.37	.86	
NOVEMBER	55	2	.04	.77	1.0
DECEMBER	57	7	.23	.76	4.0
TOTALS			9.45	12.61	12.0

D. PLANNING

2. Management Plan

Public Use Minimum Standards were completed by Matt Gay of the Regional Office. A new Public Use Plan is to be written whenever his results are compiled. Environmental Assessments were completed covering all public use on NBR and Satellites. This will also serve as a guideline for a public use planning document.

3. Public Participation

A group of local citizens met with the intention of starting a Friends of the Bison Range. The initial intent was to promote a much needed addition to the Visitor Center and parking areas to handle the volume of visitors that come to the Range. This goal was expanded to include everything from participation in interpretive programs to the Ninepipe Conservation Easement program and much time was spent creating a very general Mission Statement. The Confederated Salish and Kootenai Tribes announced, via the local newspapers, their intention to take over the operation of the Bison Range. The Friends group immediately became divided on this issue and the organization died for lack of consensus.

4. Compliance With Environmental and Cultural Resource Mandates (CECRA).

The National Bison Range was listed by the EPA as a Super Fund site because of 50 bushels of arsenic-treated bran which were reportedly buried near the bison corrals in the 1950's. The burial site was reported to be in tight clay soils in an area unlikely to affect surface or groundwater.

A 1992 preliminary assessment noted that in 1988 the agency sampled fish and sediments in Mission Creek below the site and did not find arsenic levels elevated above typical background values. The site was ranked a low priority. Various contacts stated they were not sure if the exact burial site could be located.

Patricia Corry, Montana Department of Health and Environmental Science Environmental Specialist, CECRA Program, contacted NBR for access to the site to make tests to determine if the site required further action or if it could be de-listed. Babe May, who was maintenance foreman when the burial occurred, was contacted for the exact location of the burial site and Ms. Corry inspected the site on May 24. Samples were taken from drainages and creeks along the sides, below and at the site to determine the inert condition of the clay soil and the possibility of any contamination. Test samples were also taken from above the site for base line data.

An inspection report dated November 25 stated that due to the test results the site's status had been changed from "Low Priority" to "No Further Action" which means that they require no remedial action unless new information indicates a need. CECRA currently has no formal mechanism for de-listing but that "No Further Action" sites will be candidates when procedures are in place.

5. Research and Investigations

The Conservation of Genetic Resources in Bighorn Sheep - John T. Hogg, Craighead Wildlife-Wildlands Institute, Inc., Missoula, MT.

Initial objectives as initiated in 1988 were to:

1. Determine whether reduced genetic variation generates detectable deleterious effects in current environments and in natural populations of bighorn sheep.
2. Provide managers with the means for identifying those herds that are vulnerable to the erosion of their genetic resources.
3. Provide managers with guidelines for using population size enhancement and artificial migration as tools for

preventing loss of variation in those herds determined to be at risk.

This research program addresses the issue of genetic viability in populations of large, polygynous mammals generally and bighorn sheep specifically. The research now has two major facets:

1. The development of empirically sound, general principles of genetic management in bighorn sheep and related species of large mammals. Principles that may then be incorporated into each and every facet of a population, regional or species-wide management plan. Effective genetic management requires a regional rather than a population-specific approach. Consequently, this work promises to encourage a more ecosystem approach in which all relevant considerations (habitat, genetics, disease etc.) are addressed simultaneously with an increased level of cooperation among the various managing agencies and parties in the private sector.
2. The first application of these principles to the design of a specific program of genetic management in the complex of native bighorn herds inhabiting the East Front of the Rocky Mountains from Waterton Park (Canada) south to Rogers Pass in western Montana.

As of June 27 there were 4 lambs (2 male & 2 female) remaining of the 9 born (44%). At this time they were 5 to 8 weeks old with good chance for survival. Nine of the ten transplants, including 6 ewes, are alive, well and traveling with resident sheep. The dart-injured ewe continues to improve. If all yearling ewes breed and there are no surprise mortalities, there could be as many as 8 lambs born next year. Fifteen is the minimum desired annual recruitment. It will still be a struggle to get 40 or so adult ewes on the Range, particularly if it must be done entirely by recruitment.

The researcher feels it would be a good idea genetically and in terms of maintaining the demographic momentum to continue to trickle in, say, 1 male and 3 female transplants each year for the next several years. Wildhorse Island (or Thompson Falls as a back-up) would be a good source since it should continue to produce a surplus of animals and is nearby. Justification would be: (1) recruitment on the Range approximates replacement but not sufficient to increase the herd over its chronic crisis, (2) once a target of 40 ewes is reached, the herd should require only periodic management intervention or transplant for genetic management and (3) that the herd has a state-wide value in terms of generating public interest in and support for bighorn sheep.

Consequences of Natural Variation in Early Experience in Pronghorns - John A. Byers, University of Idaho.

This long term study was originated in 1981 and has been carried out by John Byers and his assistants. This basic behavioral study relates the experiences of pronghorn fawns during early development to their social organization, dominance and reproductive success during their adult life. It has been concluded that the first born fawns each year become dominant in the pronghorn social structure throughout their lives. Also monitored were longevity, birth and survival rates which are of value for management purposes.

Results of census and the fawn count show the population is currently skewed toward older ages with high probability of over-winter mortality. Six fawns (5 males & 1 female) born to five mothers, survived until October, apparently the consequence of the very dry summer. Two of the five mothers were in obviously poor condition. One that raised twins disappeared in mid-September. All animals appeared in fairly rough condition due to loss of forbs, their dominant forage, to drought. This was the first year since 1981 when pronghorn have matched the "poor" condition indices used for African ungulates: outlines of ribs, pelvis and vertebrae visible under the skin.

Generally over the last five years, at least one male per year has been killed or mortally wounded by rut related activity. The spatial distribution of females during the rut was quite different from the pattern in all previous years. Essentially no rutting took place in Alexander Basis. Does concentrated on the north side of NBR, close to Mission Creek. As a result, males that were unsuccessful in previous years acquired the majority of matings this year.

One 4 year-old male was immobilized with Carfentanil on 30 September. A dose of .002 mg/kg was sufficient to induce sternal recumbence, but the animal thrashed when approached. Another half-dose was injected by hand, and this was sufficient to allow the animal to be handled. After injection of the reversal agent (Naltrexone: 100 x the Carfentanil dose, 75% subcutaneous, 25% IV) the animal stood within 30 seconds. It ran away in about 10 minutes, then appeared to regain normal breathing. Slight ataxia was detected in the first 15 minutes after reversal. Thereafter, gait appeared normal.

Grasshopper Population Studies - Gary Belovsky and Jennifer Slade, Utah State University.

Long-term studies of grasshopper population dynamics continued on NBR and surrounding areas. Funding is through USDA/APHIS and is to continue at least through 1995. Two new sets of studies were initiated to investigate the effects of grasshoppers on nitrogen cycling and the effects of cattle/wildlife grazing on

grasshoppers. Cages established in the summer of 1993 were used.

Drought conditions made some factors difficult to determine. However, preliminary findings indicate that grasshoppers can exert a positive effect on rangeland production by increasing nutrient cycling. It appears that there is a potential for grasshopper densities to be differentially impacted by cattle versus bison.

Ancestral Bison Genetics and Inbreeding based on Mitochondrial DNA Analysis - Karen Chambers, Pennsylvania State University.

This study proposes to combine archaeology and genetics, using the latest methods of DNA extraction from skeletal material several thousand years old with a genetic survey of modern bison populations to draw a comparison between genetic variation in modern bison and those which pre-date the severe depletion of herds. The D-loop region of the mitochondrial DNA will be analyzed to ascertain effects of bottlenecks and founding events on bison populations. Mitochondrial DNA is inherited only from the female, not equally from both parents as in nuclear DNA. Mitochondrial DNA will be extracted from four modern bison populations and from four archaeological bison populations. Tests will be made from archaeological sites in Kentucky, Nebraska and Wyoming. Modern sites will include the National Bison Range herd among others.

Researcher drew blood from calves in the fall of 1993. Some spoilage or contamination problem occurred and only 31 samples survived to be tested. No formal report has been received but Chambers stated by phone that one animal of the 31 tested, bull #3033 born in 1993, showed evidence of cow genes. She somehow projected a probable 3 for every 90 animals from this small sample and states that removing this animal would make no difference since mitochondrial DNA is not transmitted by the male. She compared this with 6 in 90 (her apparent sample size) in the Fort Niobrara herd. Chambers stated that this gene introduction probably occurred in the 1800's and this incidence is unusually low compared to other herds. She also stated that the NBR herd has "way better" genetic variation than most. No attempt was made to test molecular DNA which would show the rest of the gene structure for these samples.

Incidence of Brown-headed Cowbird Parasitism on Lazuli Buntings in Relation to Habitat and Landscape Characteristics - Erick Greene, Division of Biological Sciences, University of Montana.

This study was conducted at four sites in addition to NBR. On NBR, Lazuli bunting populations were found primarily in the Indian Springs area and in Pauline and Trisky Creek. A yearling male Indigo Bunting was discovered breeding at Indian Springs. This is a first breeding record for the state. Female may be

Lazuli or Indigo but seemed to have some intermediate plumage characteristics and may be a hybrid.

Objectives:

1. What is the incidence of cowbird parasitism in a variety of habitats and at different distances from areas of high densities of cowbirds?
2. Long-term monitoring of brown-headed cowbird numbers and parasitism rates.
3. Have cowbirds begun to associate with wild ungulates in remote areas?
4. Reanalysis of BBS data set.

Cowbird parasitism was found to be very high with wild ungulate association well established. Parasitism rate was 100% (3) on the east side where bison were present and 2% (17) on the west where bison were absent. Not only was the incidence of cowbird parasitism extremely high in some areas, but the number of cowbird eggs per nest was also surprisingly high (up to 5 in a single bunting nest).

Amphibian and Reptile Survey of the Flathead Indian Reservation, Montana - J. Kirwin Werner, Research Association, Salish Kootenai College.

Increasing concern about diminishing populations of amphibians worldwide has prompted a number of agencies to inventory local species. Such is the case on the Flathead Indian Reservation where concern has grown about the declining populations of leopard frog, spotted frog, western toad and various salamanders. A two year survey was requested by the Confederated Salish and Kootenai Tribal Wildlife Division and this is the first comprehensive survey to be undertaken. The study encompassed all suitable habitat on the Flathead Reservation including sites on NBR and other Refuges and Federal Lands.

The following amphibians and reptiles were located on the National Bison Range: long-toed salamander, 4 sites; pacific tree frog, 3 sites; spotted frog, 3 sites; western painted turtle, 3 sites; rubber boa, 2 sites; common garter snake, 5 sites; western garter snake, 3 sites; yellow-bellied racer, 3 sites; and bullsnake, 3 sites. NBR had a sizable population of western rattlesnakes and the areas of three hibernacula were located. The leopard frog which historically has been found on the National Bison Range and throughout the Mission Valley, was not found anywhere despite extensive searches. No evidence of the western toad, formerly found on the Bison Range, was located.

Reptile species found throughout the Reservation included garter snakes, painted turtle, prairie rattlesnake, bullsnake, racer and rubber boa.

E. ADMINISTRATION

1. Personnel

1. Jon Malcolm, Refuge Manager, GM-13, PFT, Ret. 4/29/94
2. William West, Assistant/Acting Manager, GS-11, PFT
3. Marcella Bishop, Outdoor Rec. Planner, GS-9, PFT
4. Joan Krantz, Office Assistant, GS-7, PFT
6. Robert King, Maintenance Foreman, WS-7, PFT
7. Loren Clary, Maintenance Worker, WG-8, PFT
8. Darren Thomas, Maintenance Worker, WG-6, Career Seasonal
9. Lynn Clark, Biological Technician, GS-7, Career Seasonal
10. Tony Pinelli, Law Enforcement Officer, GS-5, TFT
11. Timothy Driscoll, Animal Caretaker, WG-5, TFT
12. Delbert (Skip) Palmer, Animal Caretaker, WG-5, TFT
13. Brent Woodger, Animal Caretaker, WG-5, TFT
14. Patricia Jamieson, Park Ranger (Reception), GS-4, TFT
15. Terri Middlemist, Park Ranger (Reception), GS-4, TPT
16. Dean M. Vaughan, Bio. Tech. (Private Lands), GS-6, PFT
17. Jennifer Palmer-Chisholm, Social Services Aid, GS-3, TFT
18. Emily Miwa, Student Trainee, GS-3

Youth Programs

24. Chantelle Begay, YCC, 6/6/94-6/26/94
25. Kip Christensen, YCC, 6/6/94-8/12/94
26. Rance Gerdes, YCC, 6/6/94-8/12/94
27. Jennifer Hurley-Rodgers, YCC, 6/6/94-8/19/94
28. Steven W. VandenBos, YCC, 6/6/94-8/19/94
29. Melissa Marmon, Montana Human Resources, 7/1/94-8/20/94
30. Jim Sykes, Montana Human Resources, 6/13/94-8/19/94

Volunteers

31. Tana Novak
32. Lonnie Trunko
33. Mike Larson
34. Charles Keller
35. Shirley Keller
36. Lori Colomeda

Lake County Employee

37. Rachael Sykes



3 4 7 2 6 16 9

← Dan Vaughn ← Lynn Clark



12 15 11 14 13

Del Palmer

Terry Middleton

Brant Wood

PAT T

Tom Dwyer

Jon Malcolm, Refuge Manager for the Bison Range since August, 1981, retired April 29, 1994. Assistant Manager Bill West became Acting Manager. In December, David S. Wiseman, of Flint Hills NWR, was selected as the new manager of the Range. He is scheduled to come on duty in early March of 1995.

Acting Manager Bill West received an on-the-spot award for conducting and preparing the tour for Fish and Wildlife Service Director Mollie Beatty in May.

Pat Jamieson, Visitor Center Staff, received an on-the-spot award in October for superior service to the U.S. Fish and Wildlife Service.

The Glacier Natural History Association presented an award to Marcy Bishop at he Annual Membership Meeting in appreciation for 10 years of cooperative effort.

Table 2. Five year comparison of NBR personnel.

	Permanent Full-time	Career-Seas.	Temporary
1994	7	2	7
1993	7	2	7
1992	6	2	7
1991	7	2	6
1990	5	6	2

The above table does not include 1 PFT and 1 temporary position at the Creston Substation for management of Swan River NWR and Flathead County WPA's.

2. Youth Programs

The youth programs again had 5 enrollees in the YCC program and 2 under the Montana Human Resources program. Kip Christensen, returning for his second summer, was Youth Leader. Melissa Marmon (Human Resources) worked in the Visitor Center full time assisting the public. Jennifer Hurley-Rodgers (YCC) and Chantelle Begay (YCC) were scheduled to work in the Visitor Center but didn't finish the summer. Kip, Rance Gerdes (YCC), Steven VandenBos (YCC), and Jim Sykes (Human Resources) assisted the maintenance crew on various projects including grounds maintenance, painting, fencing, haying, noxious weed control, and duck banding.

The YCC enrollers worked a total of 1,080 hours. The Human Resources employees put in 640 hours. The total value to the Refuge of this work was \$8,990. The cost of the program was 8,142 for a savings to the Refuge of only \$848. This was due to the fact that one YCC worker left after a week of work and another didn't finish the summer because of health problems.



YCC enrollees - 28 25 26 27 24

4. Volunteer Program

The volunteer program continued to be an important source of supplemental manpower for Bison Range activities. A total of 319 individuals put in 4,400 volunteer hours on the Refuge this year. Some of these worked on more than one activity but most volunteered for favorite projects. Lonnie Trunko and Tana Novak put in 200 and 250 hours respectively providing interpretation and assistance to visitors. Charles and Shirley Keller of Indianapolis, Indiana worked 160 hours on bird censuses. University Resource classes (42 students) and a Lutheran Youth Volunteer Group (54 individuals) put in 640 hours brushing out trails for moving bison and thinning second growth ladder fuels.

Table 3. Volunteers and volunteer hours for 1994.

Activity	Number of Volunteers	Volunteer Hours
Wildlife census	96	927
Bison roundup & pasture moves	43	705
Education program	11	73
Habitat improvement	115	1038
Antler collection	40	822
Visitor center	6	593
Bluebird houses & banding	3	90
Predator Control	1	120
First Aid & CPR Training	4	32
	319	4,400

5. Funding

Table 4 lists funding for the Complex which includes the National Bison Range, Ninepipe, Pablo, and Swan River NWR's, and the Northwest Montana Wetlands Management District.

Table 4. A five-year comparison of funding for the NBR Complex.

FY	1261-2 Base	6860	Other & 1262 FLEX	O & M Total	8610	YCC
94	555,050	34,700	130,925	764,675	8,000	8,500
93	464,200	42,000	178,000	684,200	7,800	11,400
92	413,500	42,000	165,400	620,900	9,100	8,400
91	428,000	42,000	76,000	546,000	10,500	6,500
90	436,000	41,300	30,000	507,300	8,600	6,000

There were \$4,550 for Bird Surveys, \$10,300 Challenge Grant, \$7,5800 in Entrance Fees, \$21,075 Fire Management, \$30,000 in Drought Relief and \$69,000 MMS Flex funds in the FY94 "other" category. However, these funds were not included in the Base and there is no guarantee they will be available in future years.

6. Safety

Safety remained a priority consideration on all jobs and at all times this year. Safety meetings were held periodically throughout the year with safety themes generally reflecting seasonal work activities. Safety films were shown when applicable.

Staff safety meetings attended by all staff are listed below. Informal on-site safety meetings were held in the field as necessary.



First Aid Training with Jennifer Palmer.

- | | |
|----------|---|
| February | General safety guidelines for returning temporary maintenance crew. Chain saw safety specifically stressed. |
| March | Safety factors for the annual Game Count were covered especially walking conditions and ticks. |
| March | Showed video originally aired on TNN concerning hunting issues and public use on refuges. Discussed a memo covering computer use and proper sitting, something office personnel should be aware of when using a computer all day. Improving safety on tree cutting projects and piling brush under steep, slick conditions was discussed. Clearing of some of the forest areas was discussed. Staff felt it to be a safety factor because of the fire hazard. Burning was discussed as a possible solution with emphasis on wearing fire clothing and hard hats. Improvement on the elk chute was discussed for those few times when there are many bull elk confined (20 at one time this year). |
| May | Appointing a safety officer in the near future was discussed. Spraying by helicopter for the Range and outlying WPA's was discussed. Tim Driscoll is the licensed applicator. Lynn Clark presented a safety |

check list for such fire situations as fire shelters, leg protection, chain saw safety.

June CPR Recertification and First Aid training.
Fire safety debriefing was held the day after a lightening-caused fire was extinguished. First Aid on the fireline was discussed. Staff viewed a video "It Always Happens to the Other Guy" which covered operating equipment safely.

July A video on All Terrain Vehicle safety was viewed.

Outdoor Recreation Planner Bishop completed 32 hours of Emergency Medical Continuing Education classes for recertification. Jennifer Palmer, summer Visitor Center Staff, completed requirements as an Emergency Medical Technician.

There were six reportable accidents in 1993, 4 involving staff and 2 with visitors.

A unique emergency in July involved a girl who got her leg stuck in a theater chair and had to have it soaped to release it.

On July 26, Skip Palmer suffered a sprained ankle as he stepped from a pickup bed to an irrigation pump platform while fueling the diesel-powered pump. He was able to return to work after his ankle was taped.

Tim Driscoll suffered a severe rash on his arms after exposure to stagnate pond water. He was pumping water from a pothole on October 20.

In September, medical aid was given to a lady who cut her head on the mirror in her motor home.

During the Bison Roundup on October 3, Skip Palmer was riding a horse at full speed during a bison cut when his horse became irritated and bucked, throwing him to the ground. He landed on his head and rolled, pulling several muscles and bruising his back and legs. After a time, he was able to get up and walk. He was treated at the hospital and released.

On November 17, Brent Woodger was feeding a board through an old jointer that hadn't been operated in some time and was listed as surplus. He started it up to see if it would work and the board flipped sideways cutting the end of his left ring finger to the bone. He was taken to the hospital where he was treated for lacerations and had a partial amputation of the finger. The diagnosis was that this finger would be sensitive but that Brent would be able to return to normal duties at the first of the year.

There were 3 incidents which occurred off Refuge land in 1995. On June 18, Range staff assisted at an all-terrain vehicle accident just outside the front gate. The seriously injured

victim was airlifted by helicopter ambulance from the Visitor Center parking lot. Another off-range assistance occurred in July when staff responded to a vehicle which missed a turn and got stuck on the railroad track just outside the front gate. The railroad was alerted to stop any train traffic. Once again in August, Range Law Enforcement Officers responded to an auto accident just off the Range on Dublin Gulch Road. They notified authorities and assisted with traffic control throughout the incident.

Corrective and preventive safety measures in 1994 included:

- (1) In May, Bill West set up a schedule so Law Enforcement Officers on duty from 8:00 p.m. until Range closure would have a person to contact by radio in case of emergencies or needed help.
- (2) First aid supplies for shop, visitor center, and vehicle bags were checked, updated, and purchased in June and September. Safety glasses for Law Enforcement were purchased.
- (3) New radios were purchased and added for use by law enforcement, maintenance, and other staff.
- (4) Missoula Fire Equipment serviced fire extinguishers in May.
- (5) Big Sky Security performed monthly alarm service and did its annual alarm check in February.
- (6) Smoke detectors for quarters were purchased.
- (7) Some replacement fire equipment was purchased. Also, staff built an enclosed, heated garage stall for the fire truck.
- (8) In August, Bill West and Marcy Bishop met with Gary Larson from the Montana Department of Transportation and Bob Smith of Lake County Roads to discuss safety modifications for the Range's front entrance.
- (9) Bob King was fitted for a hantavirus respirator.
- (10) Jim Spence, from the Charles M. Russell NWR, conducted an asbestos inspection of all buildings on the Range in March.



Construction of heated garage stall for fire truck.

7. Technical Assistance

We again responded to numerous telephone and written requests from individuals, organizations, and agencies for information on bison management, husbandry, facilities, sources of meat, breeding stock, by-products and sale prices. Continued nationwide publicity on the health benefits of bison meat, along with promotion by the National Buffalo Association and American Bison Association have kept the inquiries at a high level.

Bill West provided technical assistance on Integrated Pest Management weed control, with emphasis on biological controls of weeds, to the staff of the Confederated Salish and Kootenai Tribes in March. In September, he presented a half-hour program on biological weed control on the local PBS television station. West presented an update to the BPA Wildlife Mitigation Advisory Board relative to purple loosestrife funding from the Trust Fund. Lake County Purple Loosestrife Control received part of its funding from this group (\$13,500 for 1993 and 1994). West also represented the Service in reviewing a video on exotic plants being developed by land management agencies in the Northern Rockies. Its target audience is the U.S. Congress.

Marcy Bishop provided a tour and information on ungulate management and resource use to two biologists from China.

Stephen Andree arranged for a video on the Range and its management to be shown in China to promote possible bison reintroduction to that country.

In addition to her ORP duties, Marcy Bishop continued providing technical assistance to all wildlife interests in the area as a bird rehabilitator. This year, Marcy checked, evaluated and/or assisted in the treatment in 31 cases of bird injury. This involved 10 hawks and owls along with 2 game birds and 19 non-game birds which included 2 sets of nestlings.

Other technical assistance was provided for several colleges, universities and groups of foreign natural resource managers as described in Section H. Assistance on Environmental Education was provided to area teachers and educators on numerous occasions in addition to the Teacher Workshops. Bishop served on the Salish Kootenai College Science Curriculum Board and attended a planning session and course review in October. She provided EE materials on grasslands and wetlands to Sheldon-Hart Mountain Refuges and to the Science Research Center and Teller Wildlife Refuge. She also represented Montana refuges on the task force for revision of the state's Wildlife Viewing Guide.

A local fire crew bus driver did a training run over the Range's tour road with two new bus drivers to prepare them for driving fire fighters to remote mountain areas.

Information on accessible restroom construction was provided to Benton Lake NWR.

8. Other

Director Beatty and Regional Director Morgenweck visited in May. The Director flew over much of the Mission Valley and viewed Pablo and Ninepipe PFW projects. She also toured the Bison Range along with Morgenweck and other Fish and Wildlife Service and Tribal personnel. The Confederated Salish and Kootenai Tribe councilwoman Rhonda Swaney presented Director Beatty with a letter of Tribal concerns and these issues dominated the discussion, although Fish and Wildlife Service issues were also covered.



Mollie Beatty enjoying a break during her tour of the National Bison Range and surrounding areas.

In December, Bill West and Ray Washtak met with the staff from various Fish and Wildlife Service programs at the Creston Office with regard to complexing under Ecological Services.

Jon Malcolm paid a brief personal visit to Senator Conrad Burns during a campaign pie social in Polson.

Malcolm and West attended a Montana Project Leaders meeting in January and West participated in another Project Leaders meeting in Bozeman at the end of November. West attended the Endangered Species hearings called by Senator Max Baucus in Ronan in July.

Revenue sharing checks were delivered in April to County officials in Lake County (\$25,296) for NBR, Swan River NWR and Lake County WPA's, and in Sanders County (\$7,744) for NBR. Both checks were down 5% from last year.

Total receipts, as shown in Table 5, were up considerably from 1993 due to a significant increase in the number of surplus bison sold.

Table 5. Receipts collected at NBR in 1994 for deposit to the National Wildlife Refuge Fund.

Item/Activity	Receipts
Bison Sales	\$117,130.00
Entrance Fees	23,547.00
Antler Collection Fee (Boy Scouts)	312.22
Other Special Use Permits	125.00
Total	\$141,114.22

The Range hosted the March meeting of the Flathead Reservation Fish and Wildlife Board.

Joan Krantz and Darren Thomas covered the FWS booth at the State Fair in Great Falls for a day in August. Pat Jamieson judged 4-H exhibits in forestry, Range management and wildlife at the Lake County Fair.

Joan Krantz, Loren Clary and Dean Vaughan participated in Workforce Diversity Training in Great Falls. Vaughan attended new employee orientation in Denver. West and Vaughan attended a presentation on wildlife and livestock at the Tribal Complex in Pablo in October.

In July, Ted Gutzke and the entire Medicine Lake crew spent a day working with their counterparts on the Range and shared a staff picnic.

Lynn Clark attended the Grassland Ecology and Ecosystem Management seminar in Valentine, Nebraska in August.

Mike Hedrick and Susan Baker visited in September to discuss Region 6's Columbia River Ecosystem Management WAGS. They were supplied with ideas on ecosystem management activities that the Bison Range could and should take the lead on in FY95. West attended the Ecosystem meetings in Bozeman in early November to insure Columbia River refuges were represented in the planning and funding allocations.

In November, Barney Schranck brought Dale Henry on his first visit to the Bison Range. It was Barney's last visit in an official capacity.

F. HABITAT MANAGEMENT

2. Wetlands

Oxbow wetlands along Mission Creek, ponds in the Nature Trail Education Area, the Ravalli potholes, Looper Pond and other natural and artificial wetlands along Trisky and Pauline Creeks

provided habitat for ducks and a variety of other marsh and water birds.

All of the Ravalli Ponds in the southeast corner of the Range were completely dry by late June. These ponds occasionally go dry late in the season but are recharged by snowpack and spring runoff. With no snowpack and less than an inch of winter precipitation, even a short period of fairly good spring rains could not refill these units.

Private lands technician Dean Vaughan worked out of the NBR office on many Partners for Wildlife wetland projects in Northwest Montana. These are reported in the Northwest Montana Wetland District Narrative Report.

3. Forests

Areas of second-growth and mixed second-growth/old growth Douglas-fir are of concern due to the wildfire hazard they present not only to those types, but to the old growth stands. Douglas-fir types occur on the north slopes, with most second-growth stands situated down slope from mixed or old growth stands. They have the potential to create fire ladders resulting in crown fires in the old growth. In addition, the thick second-growth creates problems when rounding up or moving bison and reduces forage for ungulates.

To date, woody vegetation control has involved mechanical clearing of second growth fir followed by piling and burning the slash after fire danger is past. Clearing and piling projects were aided this year by 42 University of Montana Resource Students and 54 Lutheran Youth Group Volunteers who spent 640 hours on these projects. Slash was piled but not burned this year due to the extreme fire danger that prevailed this season. Rehabilitation consists of reseeding slash burn areas.

5. Grasslands

Precipitation during most of the growing season for the cool season grassland community was close to normal. Grass growth was average but with the moisture drop off in early June it did not head out well. Many of the native forbs, primary forage of pronghorn and bighorn sheep, were the first to become desiccated by the drought. Seven critical weeks in June and July had only .7 of an inch of precipitation. Drying effects were augmented by cloudless skies and fairly continuous high winds.

Many noxious exotic plants were similarly affected. However, goatweed, a plant for all seasons, expanded with unusual rapidity. Cyclic control by the beetle Chrysolina hyperici and other agents has been affected to some extent. The plant began a rebuilding cycle in 1993 and this year should have been a recovery season for the beetle. However, the bio-control agent

does not do well in dry seasons and climatic conditions delayed beetle recruitment.

Although goatweed mapping was not done this year, it was obvious that the extent and density of stands increased in Upper North, Alexander Basin, Upper West and Upper South Units. There was some expansion of the sulphur cinquefoil encroachment from private lands in the southeast corner of the Range. Dalmatian toadflax increase was somewhat stabilized by the drought.



The extent of goatweed is very obvious in the fall when the plants turn a deep red-brown.

Parker 3-Step vegetation monitoring transects were completed in July on 5 Range units last run in 1992. Data from the transects was converted to a score based on the relative plant composition, density and vigor recorded along each transect. The highest possible score being 25. Plans are to alternate reading of transects with 5 or 6 being read every other year. Results of 1994 transects are as follows:

<u>Unit</u>	<u>Transect</u>	<u>Score</u>	<u>Previous Score</u>
Upper West	CO-2	15	17 - 1992
" "	CO-5	14	16 - 1992
Lower West	CO-11	11	20 - 1992
North Side	CO-13	16.5	16 - 1992
Lower West	CO-23	18	19 - 1992

The summary rating was down on all transects except the Northside Unit. This riparian unit was up only .5 from 1992. Factors affecting transect results this season included the extreme drought and the random bison grazing due to fence deterioration.

7. Grazing

The bison grazing rotation plan broke down fairly completely following major fence destruction by bison in mid-1993. Once animals discovered they could tear them down, they seemed to lose all respect for any interior fencing in general. Gates were finally opened and bison allowed to move at will to avoid further destruction. The origin of this problem is the extreme fence degeneration resulting from many seasons of insufficient funding allocations to provide for the maintenance of fences in a condition adequate to contain bison. Some funding in 1994 allowed for fence upgrading. As lines were completed around specific units they were supported by electrification to re-educate the bison to fences. The Northside Unit and the south fence of the Alexander Basin Unit were strung with high-tensile wire carrying 6,000 to 10,000 volts from Gallagher chargers. The entire herd was moved into these units as they were completed.

Due to this breakdown in the rotational grazing patterns AUM allocation to specific units was difficult if not impossible to ascertain. Overall AUM's utilized by Bison are estimated to be approximately 3,400 units. Foraging by other big game species utilized an estimated 1,500 additional AUM's for a total removed of approximately 4,900 AUM's.

8. Haying

There was no hay cut in 1994 due to lack of adequate grass production. It was necessary to purchase hay for the Range horse herd and Exhibition Pasture buffalo.

9. Fire Management

Fire management became an all consuming activity from early June through October. Extreme fire conditions sent visitor use to "hoot owl" hours in July where use was limited to morning hours. All visitor tour drives were closed to comply with the Governor's shut down of all recreational activity in the State from August 16 until it finally rained on October 9.

A step-up plan for emergency fire suppression was initiated and remained at level 3 for much of the summer season. A special account was put in place to keep an initial attack crew on around-the-clock standby during the almost nightly dry lightening storms and during high burning index days. The area-wide fire plan was to "get it while it is small." Area

Fire Control began using slurry bombers as a first attack on fires that could not be immediately or properly manned and NBR was authorized to call in a retardant drop if warranted.

Two fire pumpers, a D-4 dozer and a grader were kept on stand by. All equipment was maintained in a constant state of readiness with fire trucks and back tanks filled and all supplies, tools and clothing stocked on trucks ready to go.

MDFWP brought a disk to the Range from their Ninepipe Unit and left it in case we needed it to protect our buildings during the McDonald Fire. The fire jumped the Flathead River and came within 2 miles of the west boundary during a period of high winds.

Bison Range staff are fire trained but usually serve as a first response unit with BIA crews as back up for larger fires. With all fire crews in the west involved in major blazes and some fires in the area remaining unmanned because of lack of firefighters it was imperative that the NBR crew be prepared to handle even major involvement. In July wildfires burned throughout the area leaving a heavy pall of smoke and ash dispersed throughout the valley. There were three major fires in the immediate area. Two of these required over 2,000 fire fighters. Three short-term fire fighters were detailed from CMR at the height of this fire involvement to supplement Range staff.

NBR crews responded to the following fires:

- June 22-28. The Elk Creek Fire on NBR was a 10 acre fire that burned for three days, defying both staff fire fighters and BIA crews. The fire burned deep in duff surrounded by rocks and eventually required water dumps from a helicopter to extinguish.
- July 12-13. The Headquarters Ridge Fire on NBR burned .5 acres during the night of July 12-13.
- August 3. The Crow Dam Road Fire burned 2 acres near Johnson WPA.
- August 13. The Strawbale Fire burned 5 acres in the Moiese Valley about 1 mile northwest of NBR.
- August 15-22. The McDonald Fire fanned by canyon winds along the Flathead River burned 8,000 acres directly across the River to the west of NBR. This fire jumped the river during high winds and at one point was within two miles of the NBR boundary. NBR crews supported Area Fire Control on this fire with manpower and equipment and two 4x4

ATV's were supplied with drivers Clary and Thomas, for several days for pulling hose.



Elk Creek Fire. DV-6/94



Bison Range and BIA crews on Elk Creeks Fire.
DV-6/94



Aftermath of McDonald Fire, view from behind headquarters.

10. Pest Control

Control of noxious weeds continued as a high priority management challenge. These efforts consumed a good share of our manpower and funding resources. We again had an integrated program including use of herbicides, mowing, grubbing and biological controls. Emphasis on the introduction of insects continued. Releases on the Range this year included 2 species of insects released at 4 different sites including the release of a new species, Brachypteralus pulicarius, the sixteenth to be released. In an effort to spread the use and effect of biological control, 2 species of insects were released on 3 sites off the Range, one on tribal land, 2 on private lands. The various noxious weeds and control efforts included the following:

Goatweed - Hypericum perforatum - The Chrysolina beetles seems to have recovered slightly from their low numbers of last summer but still had little impact on goatweed stands. The impact of these beetles on the weed has been cyclic. The root-mining weevil Agrillus hyperici was noted in some goatweed plants. A third release of 300 moths (Aplocera plagiata) whose inchworm larvae eat goatweed leaves was made in 3 areas on the Range (lower Pauline, Tower Two Road, Mission Creek).

Spotted Knapweed - Centaurea maculosa - We continued an integrated program of control on this weed. The five-year control plan is to keep the weeds at low levels until biological agents can maintain tolerable weed densities. Careful pulling of this plant does afford adequate to excellent control. Strategies for herbicide use will include an annual application of 2,4-D and in some cases a one-time in three years application of Tordon.

Dalmation toadflax - Linaria dalmatica - Despite years of intensive effort to halt the spread of this weed, it is still a major concern. The Bison Range staff has devoted more time and money to control this weed than all others combined over the last 13 years. There are only a few large patches of this plant due to the intensity of past efforts but there are still countless single plants and small patches to occupy about a total of 200 acres. A two-year aerial spraying plan was started this year to prevent the constant spread to other parts of the Range. A total of 110 acres in Lower Pauline and on Headquarters Ridge were sprayed with Tordon 22K (used at 1 lb. AE/acre) in June. Another 40 acres in the West Loop were sprayed with Tordon using a truck sprayer and handgun. Two pastures per year will be selected to be sprayed so no one area will be sprayed more than once in four years.

A seed-head beetle, Brachypteralus pulicarius, became the sixteenth biological control released on the Range. Two hundred were released in the Headquarters Ridge area in June. Another 200 were released on tribal land just to the west of the Range release site.



Brachypteralus pulicarius beetle on Dalmation toadflax. This is the 16th biological control to be released on the Bison Range. BW-94

Sulphur Cinquefoil - Potentilla recta - This weed is one of the newest noxious weed threats here, and its spread continued. This weed has no known biological control agents and is very closely related to strawberry, making it a poor candidate for control by insects. It is very susceptible to small amounts of Tordon and 2,4-D and a five-year plan is to continue herbicide applications on all infestations encountered. The Range entered a cooperative weed project with several adjacent landowners (Northeast Jocko Valley Weed District) and an aerial spray proposal of Tordon is part of that project. Any spraying of Tordon for dalmation toadflax hopefully will also impact sulphur cinquefoil.

Canada thistle - Cirsium arvense - Biological control of this weed shows promise of success, as the stem mining weevil Ceutorhynchus litura, first released in 1988, has spread throughout the area and is stressing the thistles. In addition, the gall fly Urophora cardui and the flowerhead weevil Larinus planus are relatively new additional stresses to the weed. Mowing appears to give adequate control of Canada thistle on larger sites so spraying would only be needed in problem areas where there is no access for mowing machines.

In July, private lands biological technician Dean Vaughan released 200 weevils, Larinus planus on 2 private land sites as part of his Partners for Wildlife project.

Musk Thistle - Carduus nutans - Biological control of this weed by the seedhead weevil Rhinocyllus conicus has been successful in stopping its spread. In addition, another weevil, Trichosiromus horridus, is used to help in continued control of musk thistle. At the end of the year, assistant manager West completed the paperwork and permits for a third insect, Urophora stylata (a fly), to be received in March of 1995. This would be the seventeenth biological control agent for the Range.

Assistant manager West presented a program on the biological control of weeds to the staff of the Confederated Salish and Kootenai Tribe in March. In August he discussed the weed problems on public lands with Galen Rowell, a writer with National Geographic. And in September, he talked with writers and photographers from USDA-ARS for a feature article on the Bison Range weed control program for their principle monthly magazine.

G. WILDLIFE

1. Wildlife Diversity

The National Bison Range has a wide inherent diversity of habitat types and wildlife species. Special measures taken to increase diversity over the years include control of non-native

plants, the development and maintenance of watering troughs and ponds, the installation of nesting structures for Canada geese along Mission Creek and the maintenance of 60 bluebird nesting boxes with volunteer help. There has been special concern and monitoring of neotropical migrant bird nesting areas. Such diversity is enjoyed by visitors who come to see the large animals and also have the opportunity to observe the smaller wildlife of this palouse prairie ecosystem.

2. Endangered and/or Threatened Species

Bald eagles were seen flying and perching along Mission Creek and the Jocko River throughout the year. Six adult and three juvenile bald eagles spent the winter along Mission Creek. A grasshopper researcher spotted a peregrine falcon near a research plot along the northeast section of the tour road.

3. Waterfowl

a. Ducks

There were 768 mallards counted on Mission Creek during the January Mid-Winter Waterfowl Census. Duck numbers vary drastically on the Range by season and wetland conditions in the valley.

The first mallard brood was noted on April 19. Breeding pair counts of ducks were made in May on Mission Creek, Pauline Creek, and at Ravalli Ponds. The count on Mission Creek was down roughly 10%, while Ravalli Ponds were down 59%. See Table 6 for numbers.

Production estimates were calculated using 48.5% nest success, average brood size of 4.47 and a duckling survival rate of 70%. Production estimates were calculated based on nest success data at two Lake County sites where predators have not been removed, as there was no control of nest predators on the Range.

Table 6. 1994 NBR breeding duck pairs and estimated production on the National Bison Range.

Species	Number Breeding Pairs	Estimated Production
Mission Creek		
Mallard	42	63.84
Cinnamon Teal	13	19.76
Wood Duck	1	1.52
Gadwall	5	7.60
<u>Common Merganser</u>	<u>1</u>	<u>1.52</u>
Subtotal	62	94.24
Pauline Creek		
<u>Mallard</u>	<u>1</u>	<u>1.52</u>
Subtotal	1	1.52
Ravalli Ponds		
Mallard	14	21.28
Gadwall	7	10.64
Northern Shoveler	4	6.08
Green-winged Teal	2	3.04
<u>American Wigeon</u>	<u>1</u>	<u>1.52</u>
Subtotal	28	42.56
TOTAL	91	138.32

A new concern occurred on July 14 when the Montana Waterfowl Foundation of Ronan, a private breeder under Federal Permit, had to kill all the birds in one of their ponds due to avian tuberculosis.

b. Geese

There were only 40 Canada geese recorded on Mission Creek during the January aerial census. The aerial breeding pair count in April revealed 23 pairs, and 38 goslings observed on the aerial goose brood census. An additional goose with 6 goslings was on the Nature Ponds in April.



Canada geese and goslings in Horse Pasture. 4/94

4. Marsh and Water Birds

Great blue herons were observed along Mission Creek and the Nature Ponds throughout the year. There were six double-crested cormorants tallied during the duck pair count in May and a few birds made feeding flights from Ninepipe NWR to Mission Creek throughout the summer. Belted kingfishers were common residents on Mission Creek.

5. Shorebirds, Gulls, Terns and Allied Species

Common snipe and killdeer nested in and around oxbows and wet meadows along Mission Creek and in riparian draws higher on the Range. They were often seen and heard around the display pasture and environmental education pond. American avocets nested at Ravalli Ponds with one nest observed having three eggs. Phalaropes and avocets were also seen in Pauline Creek. Visitors and staff spotted a Sora rail with chicks in Pauline Creek at various times in July.

6. Raptors

Common nesting species included great-horned owls, red-tailed hawks, northern harriers and American kestrels. Osprey frequently flew around the Nature Ponds and Mission Creek with one being seen in May during the duck pair count. A prairie

falcon was sighted over the West Loop in January and one was in the housing area in October.

Golden eagles usually nest on the range and a pair was seen sitting on the power poles in Alexander Basin in late April. Golden eagles were also seen on the Breeding Bird Surveys. Personnel heard a barred owl in the housing area in September and a barred owl with young were seen along Mission Creek the same month. Short-eared owls were seen several times in the northern part of the Range, and the Range biologist found a long-eared owl nest in the Indian Springs area. Visitors and staff saw great-horned owls and their two young in the picnic area throughout the spring.

7. Other Migratory Birds

No Range personnel participated in the lower Flathead Valley 1994 Audubon Christmas Bird Count. Consequently, no numbers are available for the Bison Range portion of the count area.

Efforts to survey neotropical migrants birds were increased this year. The six original roadside breeding bird-surveys set up in 1992 were run twice during the 1994 breeding season. In addition, the three intensive surveys which were set up in 1993 were run three times during the 1994 season. These surveys consisted of 10, 11, and 14 plots each and were run at Indian Springs, Mission Creek and Pablo NWR. For information on the Pablo breeding bird survey see the 1993 Pablo NWR narrative report. Two additional variable plot transects were established in 1994. One ran through some of the forested lands and the other included the Ravalli Ponds area and more of the Jocko River. Volunteers ran these surveys twice during the season. In November and December, Lynn Clark presented outlines for the 1995 neotropical bird surveys to Stephani Jones. Clark also provided computer printouts of the 1994 migratory bird surveys.

A total of 5,913 bird observations including 121 separate species were made on all the surveys. Table 7 summarizes the survey results. It does not include the two new routes.

Table 7. A summary of 1994 breeding bird survey transect results on the National Bison Range.

Transect	Times Surveyed 1994	Habitat	No.	No.
			Species	Observations
T1	2	Narrow Riparian	47	630
		Pauline Creek		
T2	2	Grassland/Forest	41	439
		High Point Area		
T3	2	Open Grasslands	43	682
		Lower West Unit		
T4	2	Narrow Riparian	62	631
		Trisky Creek		
T5	2	Open Grassland	30	631
		Alexander Basin		
T6	2	Wide Riparian	47	854
		Mission Creek		
T5 INT	3	Indian Springs	33	485
T6 INT	3	Mission Creek	47	736

There were 20 species that were tallied over 100 times on the surveys. These, with the number of observations for each, included:

Western Meadowlark - 811	Eastern Kingbird - 166
American Robin - 405	Tree Swallow - 149
Red-winged Blackbird - 387	Yellow Warbler - 145
Brown-headed Cowbird - 340	Brewer's Blackbird - 127
Black-billed Magpie - 280	Mourning Dove - 122
Vesper Sparrow - 248	Northern Oriole - 122
House Wren - 205	Common Yellowthroat - 111
Willow Flycatcher - 198	Grasshopper Sparrow - 109
Rufous-sided Towhee - 194	Ring-necked Pheasant - 105
European Starling - 175	Western Wood Peewee - 100

The Bison Range participated in project Tanager for the first time in the 1994 season. Volunteers Charles and Shirley Keller surveyed 8 sites and found western tanagers on 7 sites with evidence nesting on 5 of the sites.

Mary Mitchell of the University of Montana spent two weeks here in May on a migratory bird project. She conducted 60 point counts on the Bison Range. Range data was offered but techniques were different enough to warrant separate surveys.

Ervin Davis and his wife, Irene, again volunteered to service and check bluebird boxes. Over 100 mountain bluebirds fledged and Erv banded 36 bluebird females and young (see section 16, Marking and Banding, for details). Several local fledglings visited headquarters, perching outside office windows.



Three mountain bluebird fledglings outside headquarter windows. Over 100 bluebirds fledged on the Range in 1994.

8. Game Mammals

a. Bison

The year began with 372 bison on the Range. Grazing use throughout the year is covered in Section F-7.

Winter mortality included a 4-year-old bull found in January in Amphitheater Basin. A crippled 3-year-old cow was put down in April and was donated to the Confederated Salish and Kootenai Tribe. An unusual death occurred on May 26 when a 5-year-old bull bison was struck by lightning during an evening storm. Scorch marks could be seen running from the hump down both front legs.

The first calf of the year was born on April 12. There were 102 calves tallied from 129 breeding age cows for a 79% calving rate, down 8% from the long-term average. We had 5 calves die from May to early July. Tests performed showed signs of pasteurella, also known as shipping fever.

The rut began in late July and lasted through August. Breeding season mortality included 3 bulls (8 years old). One was found dead in Pauline Creek and 2 had severe enough injuries to warrant being put down. In addition, a 12-year-old bull was put down in late September.

Range personnel rode all the units to gather bison in late September, moving the animals into the Sheep Pasture and then into Elk Lane just prior to the roundup corral work. They started a full week before the corral work because bison were well scattered on the Range. This may have been in response to the extremely dry conditions present. A total of seven bulls were known to elude the riders and were left on the Range.



Range personnel and Range horses bringing in a group of bison for corral work during Roundup 1994. 10/94

Buffalo were worked through the corrals on Oct. 3 and 4. The new corrals worked well, with work completed by early afternoon the second day. Calves were branded with a 4 on the right hip and heifer calves were vaccinated for brucellosis. All bison were given an annual 5-way booster vaccination for leptospirosis. Blood samples were taken from 82 animals and tested for blood selenium and plasma copper by the Cooperative Extension at the University of California. The animals tested appeared were adequate in terms of selenium but the plasma copper concentrations were very low.

Nearly all bison were weighed, and the results are summarized in Table 8. The heaviest animal weighed was an 8-year old bull that registered 2,025 lbs.

Table 8. Bison weights at the 1994 NBR roundup.

Age	Males			Females		
	Weight Range	Number Weighed	Average Weight	Weight Range	Number Weighed	Average Weight
Yrlg	510-810	54	668	480-725	47	610
2	880-1110	22	968	660-990	37	845
3	1075-1370	19	1281	775-1075	25	917
4	1320-1565	13	1468	835-1070	22	972
5	1505-1655	9	1574	775-1105	18	992
6	1480-1915	5	1728	905-1080	16	970
7	1760-1975	4	1888	860-1135	12	1033
8	1850-2025	4	1929	880-1080	7	994
9	1755-1960	3	1847	1010-1160	6	1083
10+	1745-1890	4	1825	790-1100	25	995

There were 17 special-branded buffalo identified during this year's roundup as shown in Table 9.

Table 9. Special-branded bison identified at 1994 NBR roundup.

Special Brand	Age	Sex	Weights			Comments
			1992	1993	1994	
Bar Over 1	3	Bull	845	1145	1335	Kansas Mother
Bar Under 1	3	Heifer	675	905	---	Kansas Mother
Bar Over 0	4	Bull	---	1330	1490	Kansas Mother
Bar Under 9	5	Bull	---	---	1555	Kansas Mother
19	5	Bull	1205	1515	---	Kansas Mother
91	5	Cow	1040	1015	1015	Kansas Mother
18	6	Bull	1310	1470	---	Kansas Mother
Bar Over 8	6	Cow	---	935	915	Kansas Mother
7 Left 8 Right	7	Cow	880	870	1125	Non-Vaccinate
Bar Over 7	7	Bull	1650	1825	1760	Kansas Mother
Bar Under 5	9	Bull	1775	---	1755	Kansas Mother
Bar Over 4	10	Cow	1070	1050	1000	From Kansas
Bar Over 4	10	Cow	1010	975	950	From Kansas
Bar Over 4	10	Cow	850	875	790	From Kansas
Bar Over 4	10	Cow	990	---	955	From Kansas
Bar Under 4	10	Cow	1040	1070	1015	
1 Left 4 Right	13	Cow	1010	1025	1020	
1 Left X Right	13	Cow	955	950	930	
1 Left T Right	13	Cow	---	955	935	
Bar Under 7	17	Cow	---	1110	1035	White Eyelash

Cows brought here as calves from the Maxwell State Game Refuge in Kansas in 1984 are special-branded. Their offspring, when identifiable, have been special-branded since 1987 in order to insure keeping the new blood in the herd. Other animals have been special-branded as a means of keeping individual weight and longevity records. They are not removed from the herd in the annual sales and are allowed to live out their natural lives.

At year's end there were 374 bison in the herd. For 1994 there will be 140 breeding age cows. The overall sex composition of the herds was 59% females and 41% males.

The following table does not include 1 bull, 2 cows (3 years) and 1 cow (20 years) in the Exhibition Pasture.

Table 10. Composition of NBR bison herds on December 31, 1993.

Age	Male	Female	Total
Calf	54	48	102
1	26	35	61
2	17	28	45
3	14	20	34
4	10	17	27
5	7	16	23
6	7	16	23
7	5	10	15
8	3	7	10
9	3	6	9
10	3	5	8
11	0	2	2
12	2	4	6
13	0	4	4
14	0	1	1
15	1	2	3
16	0	0	0
17	0	1	1



Bison herd.

b. Annual Winter Big Game Drive Census

The big game drive census was postponed until March 5 due to foggy weather in February. A total of 87 volunteers helped with the count. Results are shown below:

Table 11. Results of the 1994 NBR annual winter big game drive census.

Unit	Number Counted					
	Elk	Mule Deer	White-tailed Deer	Pronghorn	Bighorn Sheep	Mountain Goat
1	15	--	102	--	--	--
2	14	57	25	9	--	--
3	22	15	--	57	--	--
4	--	26	--	--	6	29
5	18	34	--	--	23	2
6	1	31	--	2	24	4
7	54	58	7	2	--	--
8	3	--	18	31	--	--
ALL	127	221	152	101	53	35

Other species recorded on the count included 12 coyotes, 7 red-tailed hawks, 22 grouse, 13 gray partridge, 3 ring-necked pheasants, 1 golden eagle, 1 prairie falcon, 1 ermine, and 2 great-horned owls.

c. Elk

There were an estimated 150 head of elk on the Range at the end of 1993. Compared with an estimate of 168 for the end of 1994, the elk population was up 11%.

Six elk were found dead this year on the Bison Range. In mid-January, a dead elk calf was found near the East Loop cattleguard. A bull was found dead in upper Pauline Creek in March. A sheep researcher found a cow carcass covered with grass in Trisky Creek. It appeared to be a mountain lion kill. One cow elk was found dead in June along the East Loop and another cow found up Tower Three in August. A mostly-consumed dead spike bull was found in the south fork of Pauline Creek in August.

Fall composition counts indicated the adult population was 46% cows with a ratio of 54 calves/100 cows. The estimated population for year's end follows:

Table 12. 1994 NBR year-end elk population estimates.

Classification	Number
Adult Bull	36
Yearling Bull	15
Cow	76
Calf	41
Total	168

Twenty surplus bull elk were trapped in February. See details under section 13, Surplus.

d. Mule Deer

The 1993 year-end mule deer estimate was 139 animals while 221 were counted in the March drive census. No deer were removed in late 1993/early 1994 based on the lower estimate.



Mule deer buck. PJ-10/94

Fall sex and age composition counts revealed an adult population of 65% does, 33% bucks and 1% yearling bucks. Fawn/doe ratio was 62/100, for an estimated 99 fawns produced. Year-end population was estimated at 296, as shown in the following table.

Table 13. 1994 NBR mule deer year-end population estimates.

Classification	Number
Buck	67
Doe	130
Fawn	99
Total	296

The fall estimate was higher than the herd objective of 200. Staff removed 18 mule deer in early December and donated the meat to the school lunch program.

e. White-tailed Deer

Last year's final estimate for white-tail deer was 158 animals. The March big game count found 152 deer, a very close match to the estimate.

Fall composition counts included 107 animals tallied along Mission Creek. Ratios were 58% does, 11% adult bucks and 2% yearling bucks. Fawn/doe ratio was 33/100, well below the previous 13-year mean of 45/100.

Sheep researchers came across the carcass of a large, 6x7 white-tail buck that was taken by a mountain lion in Trisky Creek. Since lions seem to be taking mature animals, it is probably safe to assume our low fawn recruitment could also be from predation by mountain lions and possibly coyotes.

Table 14. 1994 NBR white-tailed deer year-end population estimates.

Classification	Number
Adult Buck	24
Yearling Buck	4
Doe	124
Fawn	67
Total	219

Although the fall population estimate was above the base herd objective of 175, no animals were removed in 1994.

f. Pronghorn

The 1993 year ended with an estimated 95 pronghorn. Observers during the March game census counted 101 animals. Only six fawns survived until October, a low number but still higher than the last three years (one fawn survival in 1993, three in 1992, four in 1991). Apparently as a consequence of the very dry summer, two of the five mothers were in obviously poor condition. According to researcher John Byers, the mother of the surviving twins disappeared in mid-September and probably died. Also, an injured male that was put down in September was checked and had essentially no subcutaneous fat stored for the winter. There is concern for the survival of the pronghorn this winter because of their poor pre-winter condition.

Table 15. 1994 year-end pronghorn population on NBR.

Age	Male	Female	Total
Fawn	5	1	6
1	0	1	1
2	1	3	4
3	1	4	5
4	13	8	21
5	2	3	5
6+	12	33	45
TOTAL	34	53	87

We are hopeful that continued coyote control will help alleviate heavy fawn mortality. Receiving such population data from John Byers is helpful in determining the success of such management practices. If predator control is not effective, the pronghorn population will not be able to be maintained unless artificially augmented.

g. Bighorn Sheep

The population was augmented in April with the introduction of three yearling ewes from the Thompson Falls herd. Sheep Research Biologist Jack Hogg of the Craighead Wildlife/Wildlands Research Institute (Missoula) obtained these animals for the Range. There were 9 lambs born in the spring, with 4 surviving to year's end, one less lamb than 1993.

In early May, 10 bighorn ewes escaped the Range. They were herded back within a few hours. A total of 4 adult sheep died, 2 females and 2 males.

Jack Hogg reported the year-end population at 44 sheep as follows:

Table 16. 1994 NBR year-end bighorn sheep population.

Sex	Age												Total
	Lamb	1	2	3	4	5	6	7	8	9	10	11+	
Male	2	4	2	6	1	2	4	1	1	-	-	1	24
Female	2	4	3	3	-	1	4	3	-	-	-	-	20
Total	4	8	5	9	1	3	8	4	1	-	-	1	44

As Hogg's research has shown, continued introductions of new animals will be needed to bring the population up to self-sustainable levels and prevent loss of genetic diversity through inbreeding depression and genetic drift. A total of 13 sheep have been brought in over the past two years from the Wild Horse Island and Thompson Falls herds.

h. Mountain Goats

Mountain goats continued as the most difficult big game species to census. There were 53 mountain goats counted in the March big game drive census. Although not normally seen from the tour road, a small group of goats, including one kid, was seen along Headquarters Ridge in the middle of the summer. In late December, three groups of goats totalling 27 animals were seen in the Elk Pass and Trisky Creek areas.

10. Other Resident Wildlife

a. Black Bear

This seemed to be a good year for staff and visitors to observe black bears on the Range. There were over 40 reported sightings from the period between May 21 and October 8. A few sightings were of multiple bears. One female seen with two yearlings was the first reported on May 21 near High Point. A female with a new cub was seen near the Bitterroot Trail in July and a sow with three cubs was spotted in Elk Lane in August. There was also a pair of bears, one black and one brown, seen together throughout the summer. While most sightings were along Pauline Creek and near High Point, a few bears were spotted along Mission Creek and even on Headquarters Ridge. The drought may have concentrated the bears along the creeks in search of the abundant berries growing there.

A large male black bear worked the area around the front gate on August 16. This was the day the Range was completely closed during the critical period of the nearby McDonald Fire. In

September, a black bear, marked with a bright blue ear tag, refused to leave the picnic area despite efforts on part of Range Law Enforcement. It finally left and was later killed by Tribal wardens for creating problems off the Range. Fire and drought may have been responsible for these bears being near populated areas.



The black bear that refused to leave the picnic area in September. Notice the bright blue ear tag. TP-9/94

b. Mountain Lion

Mountain lion sightings were up this year. One animal was photographed along the Red Sleep Mountain Drive just below High Point. It was visible from the road for quite a while. A mountain lion had been frequenting the Bison Range fishing access along Mission Creek again this year. A cautionary message was posted at access points, along with proper defense procedures if confronted by a lion.

Although mountain lions and their tracks have been reported before, we believe they were transient lions. With a general increase in lion populations in western Montana, it appears that some have established resident territories here. As long as lions are here, we may not have any more surpluses of several big game species.

c. Coyotes

Only 12 coyotes were recorded on the winter big game count, close to the numbers counted in the past few years (12 in 1992

and 10 last year). This compares to 30 counted in 1991. However, coyote predation appeared to limit recruitment into the pronghorn, bighorn sheep and, to some extent, the deer populations.

A total of ten coyotes (five male, five female) were taken in October and November. These animals were authorized in the EA under the control program.

d. Weasels

Visitors reported seeing four otters in the Nature Trail area in late September. Staff saw a young mink along the Canal Road. And a badger was seen near the Display Pasture in October.

e. Grouse

Adult blue grouse were commonly seen along the auto tour route in the spring. A female with three chicks were seen near the Bitterroot Trail. During the Neotropical Migratory Bird Survey, one blue grouse was recorded. Biologists also observed one ruffed grouse during this survey. People saw 22 grouse during the Big Game Census in March.

f. Gray Partridge

General observations indicated production and populations of gray partridge was normal this year despite the drought. Five observations were made during the Neotropical Migratory Bird Survey with 13 birds seen during the Big Game Census in March.

g. Ring-necked Pheasant

Pheasants were commonly seen in the brushy riparian habitat along Mission Creek, Pauline Creek and Sabine Creek. During the Neotropical Migratory Bird Survey, 105 pheasants were observed.

h. Rabbits

Cottontail rabbits have been on the increase the past few years, and were commonly seen along the Auto Tour and at cattle guards near headquarters this year. One family continued to reside under the woodsheds behind the Office/Visitor Center.

A few snowshoe hares inhabit timbered areas in higher parts of the Range, but aren't seen very often. No observations were recorded this year.

11. Fisheries Resources

Mission Creek continued to support populations of rainbow trout, brown trout, squawfish, whitefish and suckers. Anglers used the fishing access near the picnic area and along portions of the

creek east of the Display Pastures. The warm temperatures and low water levels reduced fishing success.

13. Surplus Animal Disposal

a. Live Bison

Bid sheets for the annual sealed bid sale of live bison were issued August 4 and bids were due back in by September 7. There were 92 surplus bison animals offered. Also offered during this sale were two heifer calves sold for the Corps of Engineers at Fort Peck, Montana and a heifer calf sold for Charles M. Russell NWR.

Results of the sale are shown in Table 17. There were 40 bidders participating this year, almost twice as many as the 24 last year. Successful bidders numbered 10 this year, compared to 11 last year. The overall average price of \$1,273.15 was up \$207 from last year's average.

Table 17. Summary of 1994 NBR sealed bid bison sale results.

Group	Number Sold	Successful Bids			Total Revenue
		High	Low	Average	
Yrlg. Heifers	12	\$1,351.00	\$1,311.00	\$1,321.43	\$15,852.00
2 Yr. Cows	10	1,600.00	1,411.00	1,429.00	14,299.00
3 Yr. Cows	5	1,509.00	1,357.00	1,417.00	7,089.00
4 Yr. Cows	5	1,501.00	1,311.00	1,387.00	6,935.00
5 Yr. Cows	2	1,303.00	1,303.00	1,303.00	2,606.00
6 Yr. Cows	3	1,303.00	1,303.00	1,303.00	3,909.00
7 Yr. Cows	2	1,277.00	1,277.00	1,277.00	2,554.00
10+ Yr. Cows	6	1,019.00	1,019.00	1,019.00	6,114.00
Yrlg. Bulls	28	1,101.00	1,052.00	1,053.75	29,505.00
2 Yr. Bulls	5	1,161.00	1,161.00	1,161.00	5,805.00
3 Yr. Bulls	4	1,379.00	1,351.00	1,365.00	5,460.00
4 Yr. Bulls	4	1,478.00	1,478.00	1,478.00	5,912.00
5 Yr. Bull	1	1,605.00	1,605.00	1,605.00	1,605.00
6 Yr. Bull	1	1,738.00	1,738.00	1,738.00	1,738.00
8 Yr. Bulls	2	1,923.00	1,923.00	1,923.00	3,846.00
10+ Yr. Bulls	2	2,100.00	1,801.00	1,950.00	3,901.00
TOTAL					117,130.00

Table 18 shows disposition of the buffalo sold this year. Largest buyer this year was the Money Creek Buffalo Ranch of Houston, Texas which bought 27 yearling bulls and five 2-year-old bulls. Other major buyers were Blue Mountain Bison of Lyons, Colorado which purchased nine female yearlings, nine 2-year-old females, and three 6-year-old cows, Ken-Mar Buffalo Ranch of New Rockford, North Dakota which bought ten females (3,

5, 6, and 7 years of age), and M&S Meats of Rollins, Montana which bought ten males of varying ages.

Table 18. Disposition of 1994 NBR sale buffalo.

State	Breeding	Slaughter/Feedlot	Total	%
Texas	32	0	32	35%
Colorado	21	0	21	23%
Montana	3	17	20	22%
North Dakota	10	0	10	11%
South Dakota	5	0	5	5%
Michigan	4	0	4	4%
Total	75	17	92	100%

The proportion of bison purchased for breeding purposes increased to 82% this year, compared to 63% in 1993.

b. Elk

Staff were able to trap 20 bull elk in the Sheep Pasture in February so a helicopter was not needed for this year's elk trapping. The elk stayed in the cutting pen at the corrals until health tested for brucellosis and tuberculosis. They also had their antlers removed for safety in moving. One elk jumped out of the corral and escaped while two others died of injuries sustained in the corrals. In early March, the remaining 17 were transplanted to the Thompson River area through the Montana Department of Fish, Wildlife and Parks and the Flathead Wildlife Club.



Surplus bull elk in corral. 02/94

c. Deer

The fall estimate was higher than the herd objective of 200. Staff removed 18 mule deer in early December and donated the meat to the school lunch program.

15. Animal Control

a. Coyote

A total of 10 coyotes (5 male, 5 female) were taken in October and November partly is an attempt to promote survival of pronghorn young. These animals were authorized in the EA under the control program.

16. Marking and Banding

Ervin Davis and his wife, Irene, again volunteered to service and check bluebird boxes. Over 100 mountain bluebirds fledged and Erv banded 36 bluebirds. Four of the banded birds were adult females and 32 were young of unknown sex.

17. Disease Prevention and Control

The practice of vaccinating bison heifer calves for brucellosis was continued at roundup this year. We also continued giving bison of all ages an annual booster shot of 5-way leptospirosis vaccine.

Testing was done at roundup on 77 of the sale animals for brucellosis and tuberculosis and 29 animals were tested for anaplasmosis. The tests were all negative.

H. PUBLIC USE

1. General

Early season visitation exceeded all previous years. However, it dropped off slightly in mid-summer due to fire closures on tour roads. Annual visitor totals still reached 206,100 which is the second highest visitation to date, exceeded only by the 1993 record year of 217,200. Visitors through the front gate totaled 168,200 with an additional 37,900 using the Ravalli Hill viewing site. July 3rd had 1,500 people in the Visitor Center, which exceeded previous records by over 400 people and included over 300 individuals within a one-hour period. Surveys done when the Center opened in 1981 considered the building to be overcrowded at 50 people. The 4th of July weekend was also a record with 4,700 visitors. Foreign visitor numbers dropped dramatically from a high of 15% the year "Dances With Wolves" came out to only about 1% this season.

Of special interest this year was the birth of a white female bison calf on a private ranch in Janesville, Wisconsin on August 20th. We received a lot of questions about the calf as it made national news. Large numbers of people visited the ranch to see the calf, including many Native Americans. This event also generated renewed interest in Big Medicine, the white bison that lived on the Range from 1933 to 1959.

Entrance fees were charged again this season with a \$4 per car Day Pass and all Golden Passes and the Federal Duck Stamp accepted for admission. There were separate rates for commercial buses and vans, with senior citizens groups exempted. Fees were previously charged during the 1988 and 1989 seasons with a \$2 per car admission. Fees were charged from the time the long tour opened May 15 through October 21 and were suspended during fire closures when facilities were partially closed.

Fee collections for the season were as follows:

Day passes	\$27,840	
Tour Groups	412	
Golden Eagle Pass	6,525	
Golden Age Pass	2,160	
Duck Stamps	690	
Golden Access Pass		(Free - 58 Issued)
	<u>\$37,627</u>	

The Refuge's 30% share equals \$11,080. This was reduced by a deficit of \$3,500 caused by a GPO underquote in 1990. It was agreed at that time that the RO would cover this loss. It was charged to our inactive no-year fee account in 1993 during the period we were not doing fees and showed up as a debit when we resumed collections. This leaves our usable balance at \$7,500 which about covers cost of collection.

Over 6,000 school children visited the Range, this year taxing Visitor Center facilities and bus parking sites especially during May and June. The Visitor Center has no air conditioning and July's heat wave brought temperatures up to 108 degrees inside the building. People complained and left the theater saying they feared heat stroke. Fans provided only slight relief. In spite of all, this visitors continued to arrive according to their vacation plans, even when smoke from 3 major nearby fires filled the air and blocked out the view of the mountains and even the wildlife. They frequently stayed only a short time, however, casting wary eyes at the ash fall filtering down on their car hoods.

Organized tours brought 3,450 visitors in 92 groups, only slightly lower than last year. Established tour companies, such as Allied, Saga, Grand Circle and Globetrotters continued to

bring about a third of the tour groups. Native-Edventures, educational tours conducted by the Confederated Salish and Kootenai Tribes (CS&KT) Peoples Center were regular visitors and foreign groups accounted for 381 of these structured visits. A number of organizations held meetings at the Range including the Flathead Reservation Fish and Wildlife Board.

Special events visitors included 3,200 for Roundup, 300 riders for the annual Mission Rangers Saddle Club Ride, 213 in the ACCESS program for people with disabilities and 755 in summer Day Camp programs. Holiday numbers were down from previous years with visitation as follows: Mothers Day, 1,450; Memorial Day, 3,800; Father's Day, 1,800; Fourth of July, 4,700; and Labor Day, 2,839.



Lewis and Clark Trail Convention tour with 200 people. MB-8/3/96

Scout activities on the Range included special activities for wildlife badges, a Boy Scout court of Honor, Cub Scout Day Camps, Girl Scout activities and the area Boy Scout Antler Pickup Project. In all, 125 Scouts participated in activities on the Range.

The Bison Range was selected as one of the six pilot Customer Service Refuges. We continue to provide the best possible interpretation, education and information to our visitors in spite of the constraints of our limited facilities and staff. A fine group of volunteers assisted us, some of them putting in almost full time without pay.

Matt Gay, RO, EVS Specialist visited in July and did the Public Use Minimum Standards Survey. The only recommendations were some accessibility improvements, which await funding. He will send us his findings which are supposed to give us all the basics for updating the Public Use Plan.

2. Outdoor Classrooms - Students

Major emphasis on education continued. School groups had over 6,000 participants and spent approximately 19,500 hours in learning activities on the Bison Range. Schools were scheduled at both the Visitor Center and the ponds and other outdoor education sites to give them exclusive use of these areas during their visit. All groups received special programs presented by staff. The four habitat types and a wide range of wildlife provide for a broad based education program.

Collections of skulls, skins and plant materials are continually expanding and provide for hands-on sessions on mammals, birds, grasslands and the unique geology of the Range. Many of these items are on loan. New additions to these include the carnivore skin collection of Harold Knapp and a museum quality cast of a Bison priscus skull on loan from Robert Petty. B. priscus was one of the giant bison and was the first bison species to cross the land bridge. This head has a 45-inch horn span with a tip-to-tip measurement along the arc of 70 inches. All such loans are secured with loan agreements. A full wall glass display case was completed by the maintenance staff with Challenge Grant funds to display skulls and other natural materials for interpretation to the general public and for use in presenting educational programs for schools groups and workshops.

Many refuges target elementary grades or even specific grades. The Bison Range caters to all grade and ability levels from head start and developmentally disabled through graduate students. Of the 168 school groups visiting the Range this year 1279 students in 48 groups were in University Classes and 15 foreign student groups had 546 students.

Information was provided for many student research papers and projects covering bison, genetics, population dynamics, behavior and management as well as other topics ranging from spotted frogs, teeth, various birds and native grasslands.

3. Outdoor Classrooms - Teachers

Some 667 teachers spent 2,670 activity hours on the Bison Range participating in outdoor education activities with their students or at the fall Teacher Workshop. No spring workshop was held because ORP Bishop had knee surgery in April and there was no other public use staff available to prepare one. The fall workshop hosted 43 teachers. It featured a number of live endangered species including a wolf, eagles, peregrine falcon,

various reptiles and even an endangered frog. Also included was the endangered species Cargo for Conservation Trunk from the FWS Forensics Lab in Ashland.

The outdoor education lending library of lesson plans and other resource materials for field trips and classroom activities continued to be popular. About 100 folders sent out on two week loan. The display collection of hands-on teaching aids, including skulls, study skins, nests and other natural materials were used by almost every visiting school class.

A poster paper was presented at the Montana Environmental Education Association annual meeting. Educational materials and information on starting EE programs were shared with a number of other refuges, agencies and educational institutions. These included; Spokane Community College, Sheldon and Benton Lake NWR's, CS&KT's Native Edventures, Teller Wildlife Refuge, the Science Resource Center.

4. Interpretive Foot Trails

The Nature Trails located in the day use area were heavily used by school groups for outdoor education activities. In addition approximately 36,500 visitors walked and viewed wildlife along the ponds and in the riparian habitat traversed by these trails. Portions of the Teacher Workshops and Summer Day Camps were conducted in this area and interpretive signs enhanced public understanding. The accessible fishing bridge has now been completed and paved trails provide good access for people with disabilities.

The Bitterroot and Highpoint Trails accessed from the Red Sleep Mountain Drive, provided short walks to view the bitterroots in the spring and other wildflowers and to reach the highest point of the Range at 4,884 ft.

5. Interpretive Tour Routes

There are four different interpretive tour routes. The 19-mile Red Sleep Mountain Drive gains 2,100 feet in elevation and is closed during the winter months. It opened for the season on May 15. We went to "hoot owl" hours on July 29, closing the tour at 11 a.m. with visitors to be off by 1 p.m. The long drive was closed down completely from August 16 to October 5 to conform with the State- and Reservation-wide ban on all outdoor recreational activity. The entire refuge was closed on one day when an active fire was burning on the refuge and a another major fire was within two miles of the Range and had already jumped the river. The long tour closed for the season on October 21.

The shorter Prairie Drive and West Loop were the only routes available during fire closures and were heavily used during this

time. A few deer, elk, pronghorn, and bison were usually visible. Fire closures did not greatly affect tour groups because they are pretty well committed to the shorter drives by bus size.



Visitors enjoying bison viewing along road near Visitor Center. In late summer, this was one of the few areas open due to fire closures.

The Winter Drive offered a two-way 10-mile round trip when the upper reaches of the long tour were closed for the winter. It also provided excellent viewing for school buses, giving them early and late season viewing without traveling the winding Red Sleep Drive.

Traffic counters showed that approximately 150,000 people used Bison Range tour roads in 1994 with only 40,000 traveling the 19-mile Red Sleep Mountain Drive which was closed under fire conditions for much of the heaviest tourist season. The balance used the shorter Prairie Drive and West Loop or the seasonal Winter Drive.

Guided tours were given to 173 people including a group of Chinese biologists, the National Assn. of Biological Station Directors and participants in the AOU, WOS and COS Ornithological Society joint meetings held at the University of Montana in Missoula.

About 30,000 visitors used the new Field Guide to the National Bison Range, a color leaflet developed with the assistance of our Natural History Association. This leaflet describes the wildlife and habitats on the Range. It includes a map which is color coded to show accessible trails and other sites and provides a self-guiding tour, keyed to numbered signs.

6. Interpretive Exhibits/Demonstrations

Fees were payable at the Visitor Center and this brought a higher percentage of visitors into the building. Once there, they viewed the displays on bison, bison history and other wildlife materials. Approximately 40,000 saw interpretive videos. An interpreter was always on duty to provide visitor information and to answer questions about the wildlife and habitats on the Range. The center was open daily from 8 a.m. to 8 p.m. from mid-May through October 21, and from 8 a.m. to 4:30 p.m. on weekdays for the balance of the year.

An interpretive kiosk in the Visitor Center parking area provided information about the refuge and visitor safety. Built by Range staff in 1993, displays were installed for the 1994 visitor season.



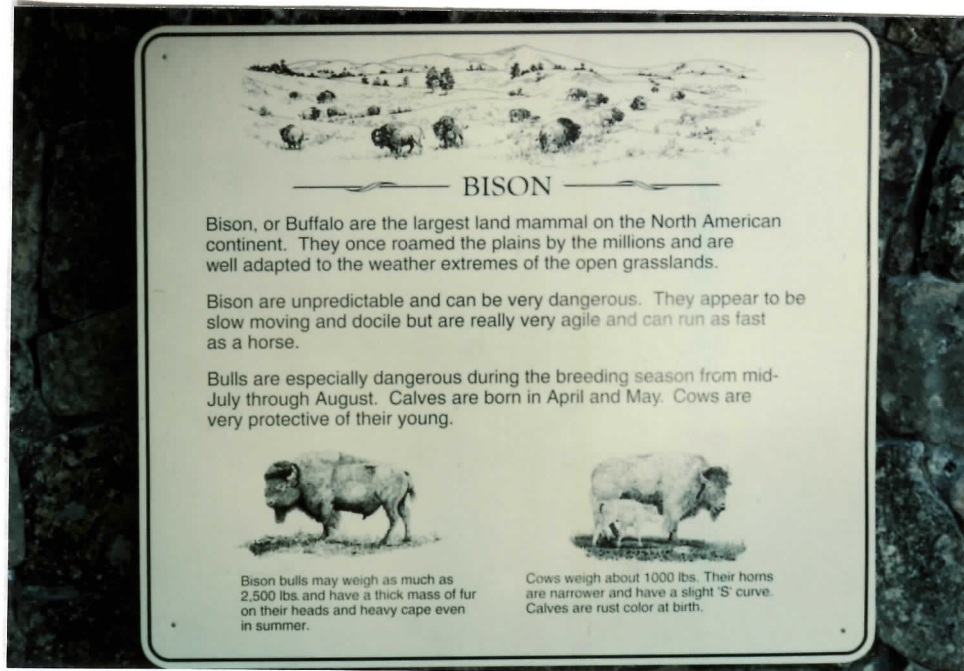
The new Interpretive Kiosk. This was built by Range maintenance staff with rock work done by Skip Palmer.



Interpretive Kiosk - left information panel.



Interpretive Kiosk - center information panel.



Interpretive Kiosk - right information panel.

Outreach activities included off-refuge talks and programs presented to about approximately 800 people. Recipients included civic, resource and sportsmen's groups and Career Days programs throughout western Montana. Assistant manager West gave numerous presentations on Biological Weed Control Programs, the Five Valleys Project and the conservation easement program to preserve the Ninepipe Wetland Ecosystem. Private lands biological technician Vaughan spoke at several wetland and conservation meetings.

Media coverage was high as usual. The Bison Range was featured on several television specials including one on a Travel Channel and there were several items on purple loosestrife and bio-control of weeds on KPAX-TV. High coverage in national magazines continued and there were numerous local newspaper articles and letters to the editor featuring the proposed takeover of the Range by CS&KT.

9. Fishing

Fishing is allowed in accordance with state, tribal and refuge regulations along portions of Mission Creek and the Jocko River that lie within the boundaries of the Bison Range. A joint State and Tribal license and fishing stamp is required. An

estimated 150 individuals fished in Mission Creek, down considerably from previous years due primarily to the fire closures in effect from August to October. The accessible fishing bridge in the Nature Trail area was completed and ready for summer use.

11. Wildlife Observation

Visitors spent an estimated 150,000 activity hours observing wildlife along the Bison Range scenic drives and nature trails. Most often observed were bison, elk, pronghorn and deer. Bighorn rams, usually observed along the long drive, were rare this summer. Forbs, the sheep's main food source, were the first plants affected by the drought. Sheep were forced into different foraging areas in search of food. Birds and other wildlife were plentiful but were more concentrated in areas near water. There were occasional mountain lion and river otter sightings along Mission Creek.

12. Other Wildlife Oriented-Recreation

Visitors to roundup this year totalled 3,200 and we continued to use horse-mounted volunteers for parking cars. Visitors included 900 students and teachers as part of 25 school groups. New corrals provided more space and convenience for viewing groups and full accessibility to wheelchairs. Classes were still limited to students from grades 4 and above for safety reasons due to the press of crowds. Younger students and those requiring special assistance were given an option of viewing loading operations later in the week. A Roundup Leaflet and video programs at the corrals provided schools and other visitors with information about the roundup. The Visitor Center carried special hands on displays and films on bison biology. New schools received preparatory information packets.

13. Camping

Camp grounds for the general public are not provided on the Bison Range. The Environmental Education Campsite was used by 22 university students during a small mammal projects, nine teachers during a two day workshop and a few days by area scouts and leaders during antler pickup.

14. Picnicking

School groups use the shaded picnic area as a study and staging area. This site was also welcomed by visitors since there are few visitor services within miles and roads were often hot and dusty. Accessible tables, restrooms and nature trail are also available from this site.

17. Law Enforcement

Law enforcement programs are requiring more manpower and expertise each year as visitor numbers and job complexity increase. Law enforcement personnel responded to a large number of motorist assists including disabled vehicles where tow trucks were needed, locked cars, dead batteries. Much of the program was handled by seasonal Park Ranger Tony Pinelli. He worked full time from May 8 to October 24. He also worked intermittent shifts when needed throughout the winter and spring. Biological Technician Lynn Clark acted as the primary LE officer in the absence of Officer Pinelli and did active law enforcement two days a week from May until late October. Assistant Manager/Acting Manager Bill West provided backup when needed, responded to after hour emergencies and supervised the LE program. All officers worked at Ninepipe NWR and on the WPA's during the duck, goose and pheasant hunting seasons. Further information on law enforcement activities for these areas can be found in the narratives on Ninepipe and Pablo NWR's and the Northwest Montana Wetland Management District.



Tony Pinelli, Seasonal Law Enforcement Officer.

The Range had law enforcement assistance through a series of personnel detailed from a variety of refuges (see Table 19). The extreme fire danger of the summer forced road closures and reduced visitation, greatly reducing the public assistance work load during this time. Detailed officers helped with other Range activities and duties.

Table 19. Detailed Law Enforcement for 1994.

Matt DeRosier, Fish Springs NWR (7/18/94-8/1/94)
 Ann Timberman, LaCreek NWR (8/2/94-8/15/94)
 Harris Hoisted, Arrowwood NWR (8/18/94-8/28/94)
 Calvin Henry, Lee Metcalf NWR (8/29/94-9/5/94)
 Kevin Painter, National Elk Refuge (9/6/94-9/12/94)

Table 20. Violation notices issued on NBR in 1994.

Violation	# of Cases	Bond	Disposition
Wrong Way on 1-Way	6	\$ 450	Posted Bond
Wrong Way on 1-Way	1	\$ 75	Pending
Driving in Closed Area	1	\$ 85	Posted Bond
Driving without License	1	\$ 50	Posted Bond
Hiking Away from Vehicle	10	\$1000	Posted Bond
Fishing in Closed Area	1	\$ 50	Posted Bond
Fishing in Closed Area	1	\$ 50	Pending
Animal Trespass	1	\$ 100	Posted Bond
Taking Animal	1	\$ 750	Posted Bond
Failure to Comply to Special Regulations	1	\$ 50	Posted Bond
Failure to Comply to Special Regulations	2	\$ 200	Posted Bond
Totals	26	\$2860	24 Posted Bond 2 Pending

Table 20 lists the violation notices issued and their disposition. Issuance increased dramatically in numbers (from only 8 in 1993) and in variety (1993 notices only included Wrong Way and Driving in Closed Areas).

Two cases are of special interest. One involved the shooting and killing of a mule deer buck on the refuge in mid-November. The incident occurred near Highway 93 and was reported by a citizen who got the license number. Lynn Clark located the carcass and she and Bill West gathered the initial evidence. Special Agent Rick Branzell assisted in successfully prosecuting this case.

In October, a person was charged with 3 felonies in connection with the poaching of a mule deer from the Range in November of 1992. He had been charged seven times for other wildlife violations but had never been convicted. Arraignment was in December with trial scheduled for January.

Another incident involved a party which was issued citations under "failure to comply with special regulations" for being in a closed area (closed due to fire and wildlife hazards). One of the party filed a law suit for injuries he said he sustained while being transported from the closed area to the party's vehicle. The claim was denied with the ruling that there was no negligence on the part of the U.S. Federal employee involved and so there was no legal case.

Law enforcement staff dealt with a number of lost and/or abandoned pets in October. Grasshopper researchers caught and turned in a black lab but were unable to catch two other dogs. The owner was contacted and picked up the dog. Two cats were found on the Range. One was returned to its owner, the other was adopted.

There were a variety of incidents on the Complex that did not involve Notice of Violation citations. LE staff responded to 3 vehicle accidents, including 2 on Highway 212 outside the Bison Range (see Safety, section 6 under Administration for details).

Visitors learn about refuge regulations by brochures, personal contacts and a video theater presentation at the Visitor Center. There is extensive signing on the auto tour roads, and an AM radio channel that broadcasts refuge information.

Law enforcement expenditures in 1994 included the purchase of a gun case, ammunition, 4 new radios, radio repair and batteries along with a variety of small items and supplies.

18. Cooperating Associations

Sales of books and wildlife prints through the Glacier Natural History Association book outlet totaled \$30,010, down slightly

from last year, reflecting the reduced time visitors spent in the area because of the wildfires. The Association donation percentages were reduced recently from 15% to 13% in 1993 and to 11% for 1994. They say this will be temporary due to one-time building expenses incurred by the Association. We have some concern that once this has been done it may become a habit. Donations for 1994 based on our 1993 sales were \$4,794. Approved donations for 1995 are \$3,893. They held over 1992, 1993, and 1994 donations making it possible for us to design, set up and print the color Field Guide to the National Bison Range so we could work directly with a local artist. They have been very good about supplying book titles of our choice and in general we have maintained an excellent working relationship.

I. EQUIPMENT AND FACILITIES

1. New Construction

Animal caretaker Brent Woodger built 3 very nice glass-fronted display cases for skulls, skins and educational specimens for the Visitor Center. They provide an attractive display for visitors and a very convenient teaching station for school programs.



Maintenance staff also completed the accessible fishing bridge and platform, located along Mission Creek in the Nature Trail area.

Work began in March on remodeling the fire truck garage into a heated winter storage facility. Range staff poured a concrete floor, erected walls and installed garage doors. The electrical hookup was completed in September.

2. Rehabilitation

MMS flex funding of \$20,000 had been allocated in FY94 to complete the new corrals with much of the final work being done through the winter. The old wooden bison corrals were replaced with new metal corrals. Most of the work (90%) was complete in 1993. The new corrals are as functional, sturdy and professionally built as any in the country.

Electric fences were installed on side brackets on existing interior fences at the corrals and around the Northside Range Unit, and tested to see if the hot fence would hold the bison. In May, staff completed putting electric fence around the 2,000-acre Alexander Basin pasture. Bison were moved into the Basin unit and the fence continued to be effective in containing the bison. The Upper West pasture was electrified in July with one hot wire instead of the two used on the other pastures to see if it as effective.

A post pounder was rehabilitated and adapted to the new D4 Cat.



Darren Thomas, Maintenance Worker, with new D4 Cat.

In October, new septic tanks were installed at the slaughter house and the drain field upgraded. Staff worked on the water system, installing a new pump and pressure tank in the shop. A pressure tank was ordered for the Visitor Center. A washer and dryer set was installed in the old headquarters for use by volunteer and seasonal staff.

3. Major Maintenance

Major items included frequent checking and repair of boundary and interior fences, blading and spot graveling of the tour roads and patrol trails as needed, maintenance of vehicles and equipment, repainting and posting of signs and shoeing and care of the horse string. Mowing, trimming and sprinkling of the Picnic Area and headquarters grounds also took a good share of the summer maintenance time.

May's water tests for the Visitor Center came up positive for coliform bacteria and involved a rather lengthy chlorination process. The restrooms were closed during this process. Tests again came up positive two weeks after chlorination. A consultant was called in and a chlorination shock was completed again. The consultant suggested this process be repeated several more times. Later tests came back with 3 negative and 2 positive from samples taken at the same time from the same tap with the same sanitary procedures and under the direction of the consultant. Weekly monitoring continued throughout the summer with contradicting results.

The front walk to the Visitor Center, put in last fall, had a tar bleeding problem causing tracking on the Center's floors and rugs. It was resealed in August, solving the problem.

Staff spent time rebuilding the sidewalk in front of the manager's residence. The old sidewalk was completely removed and a new cement one was poured.

4. Equipment Utilization and Replacement

A new pickup was purchased and obtained in May. Vehicle replacement occurs regularly as the bison take quite a toll when Range staff use the trucks to herd the animals to new pastures. During roundup this year, a bison bull completely totaled a pickup, denting all sides and putting a horn through the radiator.

The Range received an irrigation pump from Lewistown in May and sprinkler pipe from Kennewick, Washington. A surplus front-end loader was picked up in Brighton City, Utah in June.

Because of the extreme hot weather, summer temperatures in the Visitor Center were excessive. Visitors complained of the heat,

especially while watching films in the small theater. The Center has no built in cooling system. Electricians and refrigeration specialists finally got a surplused air conditioner hooked up and functioning at the end of August, just when the weather turned cooler. This unit will make working in the west-facing portions of the office bearable during extreme heat conditions.

Upkeep of the Range horse string included the purchase and trading of a large number of horses. Two geldings were bought outright with 3 older horses being sold off directly. The Range obtained 3 geldings through the trading of 4 older Range horses.

5. Communications Systems

Fire funds were used to purchase 2 Bendix-King portable, 5-watt, 16 channel programmable radios to complement the communications system.

The office phone system was updated through the purchase of a Panasonic digital telephone base with 8 extension phones from Blackfoot Technologies. Some features include a changeable informational phone message for incoming calls, conference calling, and number programming.

6. Computer Systems

Computer equipment purchased with year-end funds from the Regional Office included a 486 Castle computer with 8 MB RAM, CD-ROM, and monitor. Also purchased were 2 Triplite battery backups, a Panasonic CD-ROM drive, a Cannon bubble jet printer, a Hewlett-Packard laserjet printer and a Scanjet scanner. Software purchases included Wordscan 3.0 Windows and Corel Draw.

J. OTHER ITEMS

1. Cooperative Programs

West and Malcolm provided tours for Missoula Conservation Realtor Bruce Bugby and for Henry Little and David Sutherland of the Conservation Fund in support of the Ninepipe Protection Project. In January, Senator Conrad Burns called for information on the Ninepipe Wetlands Protection Project and expressed his support. Contacts with land owners were begun in April. For more details, see the Northwest Montana Wetland Management District Narrative for 1994.

Permission was continued for hydrologists of the Confederated Salish and Kootenai Tribes to maintain a stream gauging station on Mission Creek.

The cooperative antler salvage effort with the Charlo Boy Scout Troop and the Glacier National History Association continued for the tenth year. This year, 20 scouts and 6 leaders spent parts of 12 work days totalling 807 work hours collecting and selling 797 pounds of elk and deer antlers. Dropped elk antlers from the current year averaged about \$9.05. The sale grossed \$6,174, with a permit fee of \$312.22 going to the Service, a donation of \$3,998.91 going to GNHA and the Boy Scouts getting \$1,833.35 for their treasury.

With donations from the Charlo Garden Club, Bison Range staff was able to purchase native shrubs to revegetate along the new walk in front of the Visitor Center. The YCC enrollers built wire cages to protect the young plants from browsing deer.



Planting native shrubs along front walk to Visitor Center. 04/94

Other cooperative programs we were active in this year included:

- Colonial Nesting Bird Survey - Bishop and Clark
- Mourning Dove Coo Counts - Clark
- Soil Conservation Service Soil Monitoring Sites
- Breeding Bird Census - Arlee, St. Regis and Polson Routes - Bishop, Clark and Jamieson
- Resident Bird Count at The Nature Conservancy's Safe Harbor Marsh - Bishop

3. Items of Interest

Other Staff Activities and Participation

Activities of staff members not covered in other sections of the report were as follows:

Jon Malcolm

Was an active member of the Charlo Lions Club.

Was active in the Montana Chapter of the Wildlife Society, National Buffalo Association, American Bison Association, Rocky Mountain Elk Foundation, Pheasants Forever and Ducks Unlimited.

Marcy Bishop

Was a licensed Bird Rehabilitator and Master Bird Bander with sub-permitees on both permits.

Was an active member of the Wildlife Society, the American Ornithologist's Union, Cooper Ornithological Society, Wilson Ornithological Society, Society of Field Ornithologists, and the Colonial Waterbird Society. Also a member of the Glacier Natural History Association, Soroptomist International, Western Bird Banding Association, the National Association for Interpretation and the Montana Environmental Education Association.

Bob King and Skip Palmer

Were active members of the Charlo Fire Department and responded to several fires and accidents throughout the year.

Loren Clary

Was an active member of the Charlo Lions Club.

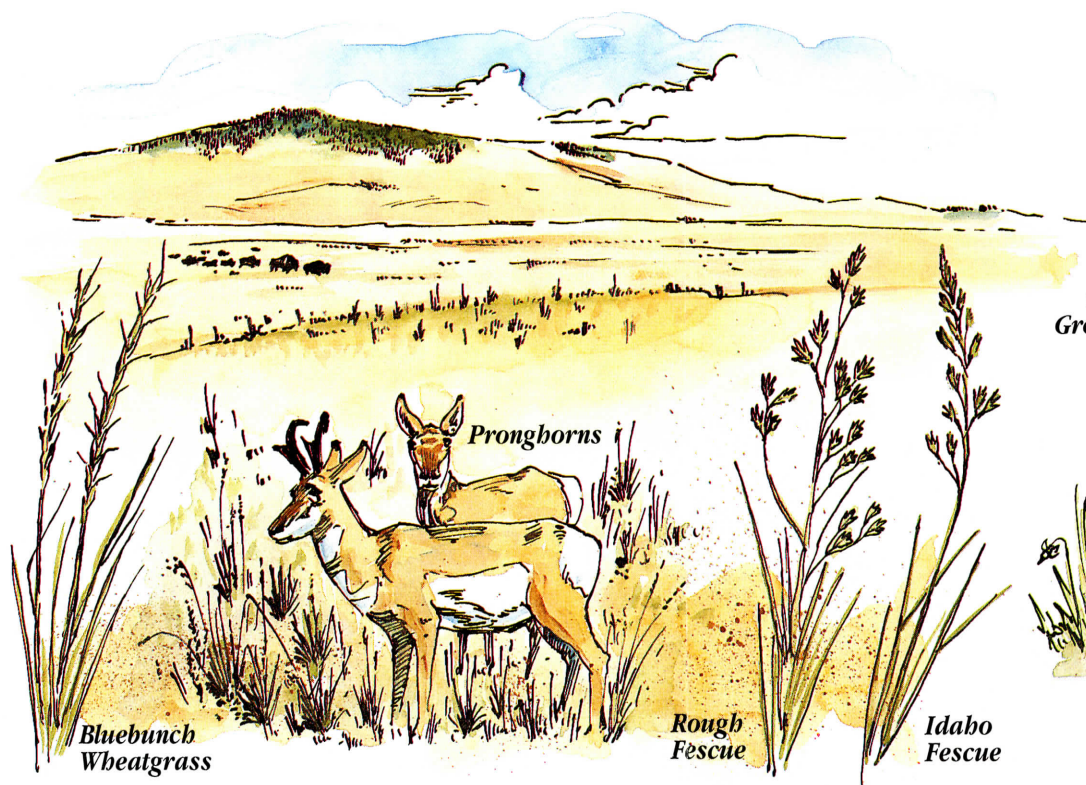
4. Credits

Marcy Bishop	- Sections A; D; E4; F1-9; H.
Pat Jamieson	- Sections B; E1-2, 5-8; F10; G; H17; I; J.
Joan Krantz	- Word Processing and Assembly.

K. FEEDBACK

Staffing problems continue to plague the refuge with Temporary positions the only ones being approved to fill Career Seasonal positions that have occurred year after year for many seasons. Some of these have replaced Permanent Part-time positions that were in place for years. This has occurred with a 120% increase in visitor use with its attendant increase in maintenance and at the same time NBR was designated as a Customer Service Pilot Refuge.

Habitats and



GRASSLANDS OF THE BISON RANGE

Though grasslands appear as wasteland, they form a rich ecosystem of specially adapted plants and animals. The grasslands of the National Bison Range are native Palouse Prairie. The primary grasses here are Idaho Fescue, Rough Fescue and Bluebunch Wheatgrass. These native bunch grasses grow in clumps with the crown shading their roots. They are specially adapted to dry land conditions. While most plants grow from the tips of their branches or stems, the growth area of grasses is at the base of the stem so that they can continue to grow after their tops have been grazed off.

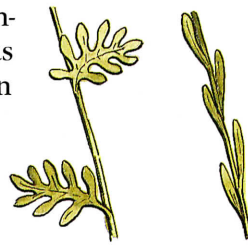
Grasses are well adapted to the harsh, unsheltered environment of the open prairie which ranges from the driving, icy blast of winter storms to the oppressive heat and searing wind of summer. Leaves die back and the dense crowns protect the root in winter. In summer the long, slender, vertical leaves present less surface to the sun's rays and prevent overheating.

Palouse Prairie grasslands also contain other broader leaved plants called forbs, usually noted as wildflowers, which also have defenses against the weather extremes. Many are perennials and winter under the snow as tiny flat rosettes of green leaves. In summer their leaves are small, have deeply indented margins to minimize their surface, or curl to reflect the heat. Some are covered with insulating hairs.

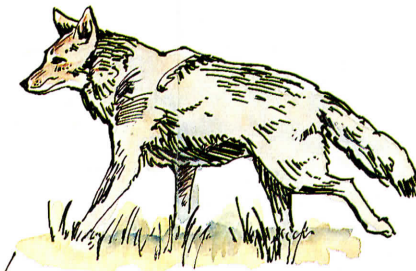
Meadowlark



The grassland ecosystem is completed with native grazers such as bison and pronghorn and a variety of birds, rodents and predators like the coyote. Grassland birds are usually plentiful but consist of fewer species than would be found in wetter areas. The birds too, are specially adapted to this environment of extremes. Their backs are streaked so they can nest unseen on the ground in the shade of an overhanging grass clump. They can be seen defending their own patch of turf by singing from song perches, usually tall weeds, around their territorial boundaries.



Columbian Ground Squirrel

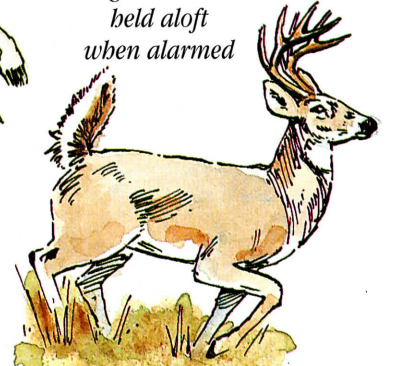


Coyote

Yellow-bellied Marmot



large white tail held aloft when alarmed



White-tail Deer

Elk or Wapiti (*Cervus elaphus*)

This large deer is brown to buff with a light rump patch. Bulls have long, swept back antlers. As with most deer, only the males have antlers and these are shed and regrown each year. Bulls round up harems for the fall breeding season. Spotted calves are born in June. Frequent grassland or forest.

White-tailed Deer (*Odocoileus virginianus*)

This deer's large, heart-shaped brown tail becomes a waving white flag when alarmed. White face markings and a browner coat help distinguish it from the mule deer. Antlers have a main beam with upward tines. Breed in November and have spotted fawns in May or June. Prefer river bottom woodlands.

Mule Deer (*Odocoileus hemionus*)

Easily confused as a white-tail because of its white rump patch and black tipped white tail. Tail is not flagged when they run. Coat is grayer and it has no other white. Antlers fork and then fork again. Bucks have a dark forehead patch. Breed in November and fawns are born in June. Most often found on brushy hillsides.

Pronghorn or Antelope (*Antilocapra americana*)

Russet-tan with white markings, pronghorns are animals of the open range. Unlike other animals with horns, which are usually permanent, pronghorns shed just the outside sheath. Females also have small horns. Breed in September with twin fawns born in May and June.

Bighorn Sheep (*Ovis canadensis*)

Bighorns live in high rocky places. Their light rump patches are similar to those of mule deer from a distance. The ram's heavy curled horns show a little wrinkle for every winter they have lived. Ewes also have small horns. Breed in November and lambs are born in May and June.

Mountain Goat (*Oreamnos americanus*)

Shaggy, white coats protect the goats from chill winds and serve as camouflage on winter snows in the high crags. Both sexes have slender, knife like horns. Breed in November and December and kids are born in April or May. Are best seen on the rocky slides.

Black Bear (*Ursus americanus*)

Black bears come in colors ranging from black to brown to buff. Up to 6 or 8 bears inhabit the Range, mostly in wooded areas. Two females usually raise young here. A large brown male has been mistaken for a grizzly but we have had no confirmed grizzly sightings.

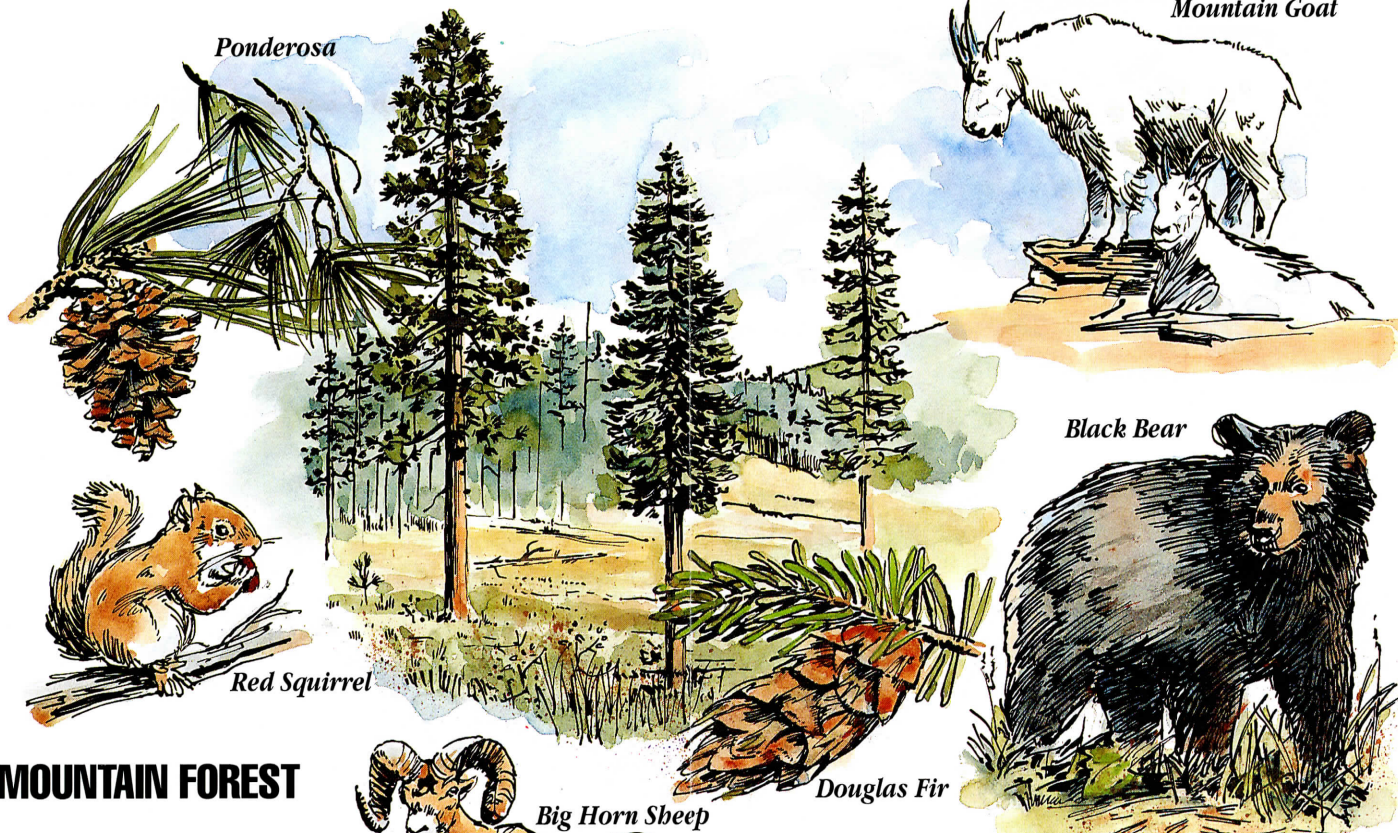
Coyote (*Canis latrans*)

This is a medium sized dog-like animal with pointed nose and mottled gray coat. The tail is bushier than most dogs. They hunt in pairs and feed on mostly small animals. Mainly nocturnal. Both parents care for pups raised in a ground den.

Mountain Lion (*Felis Concolor*)

Bobcat (*Lynx rufus*)

These cats do live on the Range but are rarely seen because they are nocturnal and because they prefer areas with good cover to hide in.



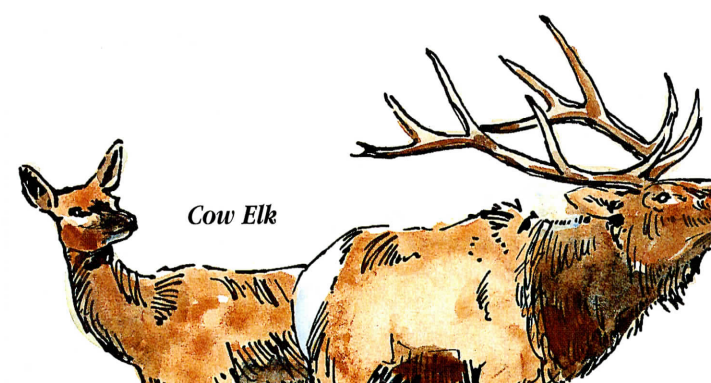
MOUNTAIN FOREST

Mountain forest of Douglas fir and Ponderosa pine covers the tops of the hills of the Bison Range and surrounding area. Forests are complex ecosystems. The type of trees that make up the forest provide a special environment that affects the kinds of other plants and animals that can live there.

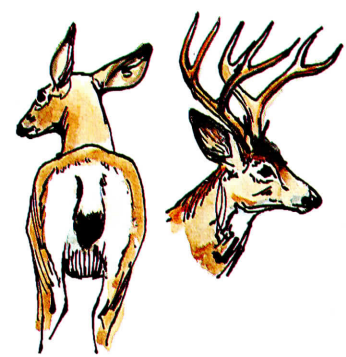
Most forests can develop wherever there is an average temperature greater than 50 degrees in the warmest months and where there is an annual rainfall of about 13 inches. This area is on the edge of forest survival. Moisture levels have created the

Spend some time looking closely at trees in the forest. Leaves act as solar collectors, using the heat of the sun to process their food through photosynthesis. The conifer trees of this mountain forest are tiered with the upper branches shorter so that the sun may reach all their branches. Since these trees are evergreen and keep their leaves all year, their leaves are slender needles with a tight waxy surface to retain moisture through dry periods and long winter months when water is frozen.

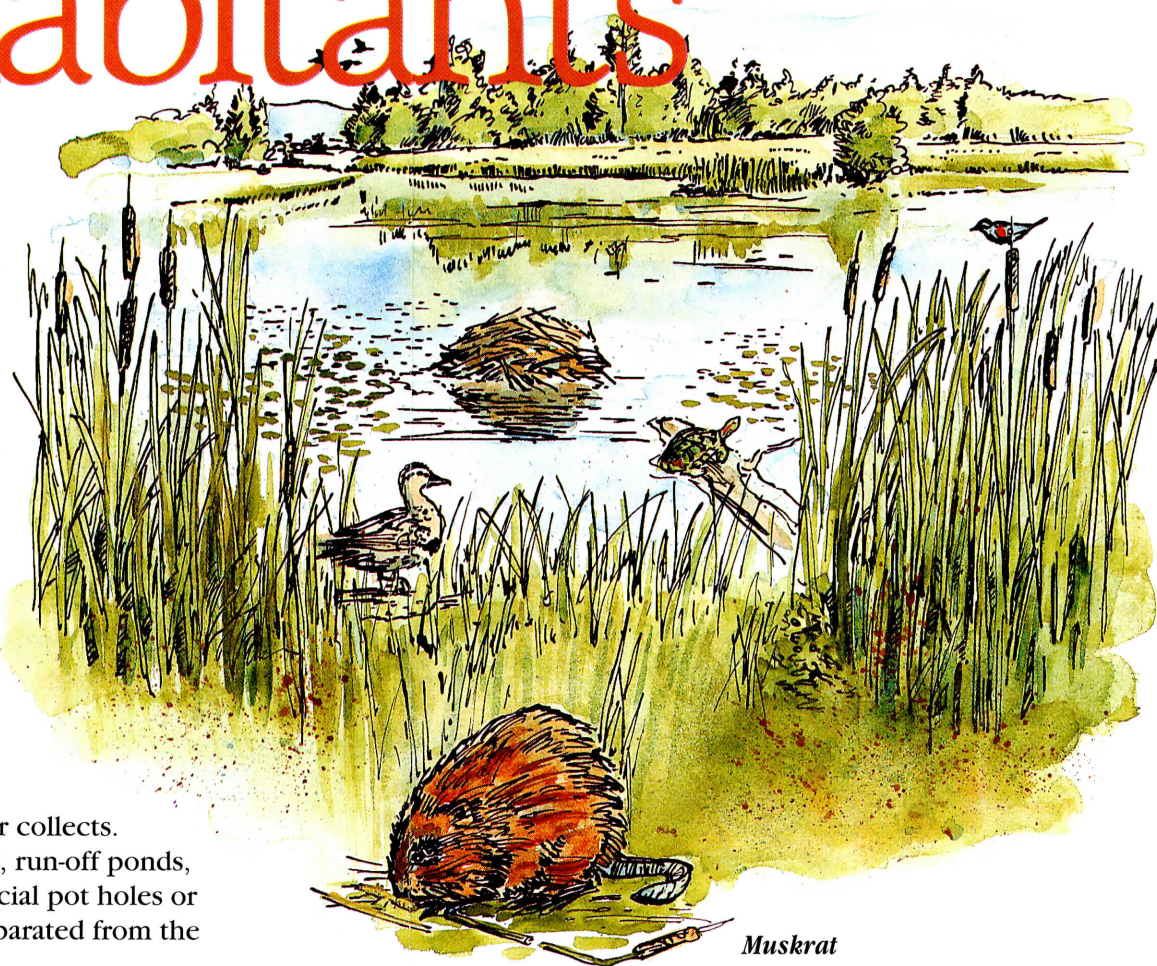
Birds of the conifer forest are adapted to food sources found here. They eat the pine nuts from cones, new tree buds, seeds and berries plus insects that live in bark or burrow into the wood. Since most of these things are available all year,



Inhabitants



Mule Deer



Muskrat

WETLANDS

Wetlands form in any depression where water collects. They may be spring fed, run-off ponds, bays or backwaters, glacial pot holes or old river bends now separated from the main stream.

Wetlands are very important for many reasons. They hold water on the land so it can seep down and recharge the aquifer. They are important in flood control and they filter out contaminants and sediment. Wetlands produce the greatest food biomass of any environment and provide habitat for waterfowl and many other kinds of wildlife.

Large numbers of insect larvae develop in water then crawl up the stems of aquatic vegetation and emerge as flying adults. These larvae provide abundant food for growing ducklings, turtles, fish and many other water creatures. Numerous species of birds, not normally considered water birds, nest near wetlands because of the wonderful supply of insect foods for their young. Watch for

swallows swooping over the water catching flying insects.

Like streams, wetlands usually have lush sub-irrigated plant life along their shores. Aquatic vegetation can get a foothold directly in the still waters and includes plants with a variety of strategies. Cattails and rushes, called emergents, are rooted near shores and grow up out of the water. Water weeds are mostly under water with their roots in the silt at the bottom of the pond and their blooms on the water surface. Plants such as duck weed float on the surface with roots that hang down, drawing all their nutrients from the water alone. These tiny leaved plants are the green vegetative cover you see on the ponds.

WHAT HAPPENS IN WINTER?

Winter puts a whole new edge on survival in the wild. Many food sources have dried up or are buried under the snow blanket. Wildlife must deal with getting about in deep snow and freezing weather. Animals of the Bison Range handle this season in a variety of ways: they migrate, hibernate, adapt or endure.

Some wildlife can continue to find their usual foods such as seeds or browse. Meadow voles and their predators, live in tunnels under the snow and forage as always. Some animals adapt to different foods in winter, finding browse or berries and seeds that stay above the snow. Small animals such as rabbits find the snow raises them to new levels and new bushes to browse on. Hoofed animals paw through the snow for grasses or the succulent winter rosettes of perennial plants.

Those creatures who cannot find winter foods must migrate or hibernate. Ground squirrels are hibernators. This requires locating or digging a suitable den and concentrating on putting on a fat layer to sustain them throughout the winter. A long cold winter might severely tax their ability to survive. Migrants,

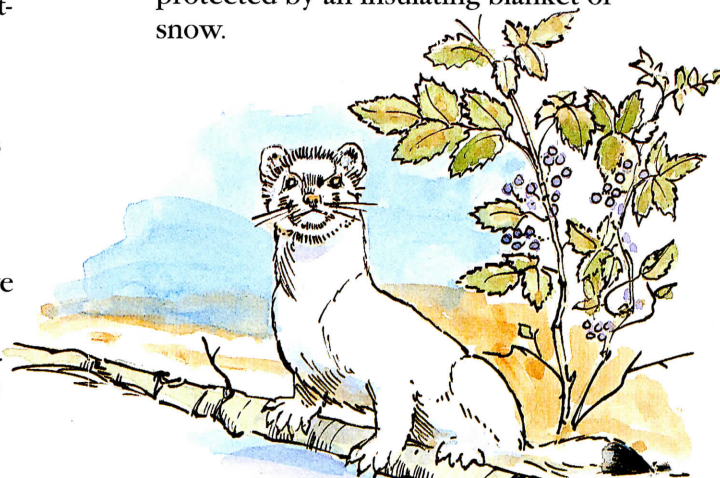


primarily birds, must also acquire fat reserves for the long trip to their wintering grounds.

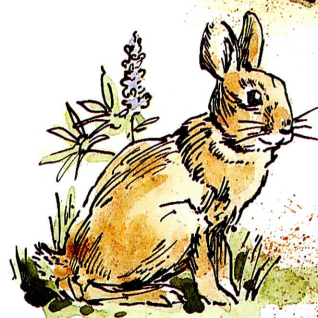
Energy demands are high in winter. Even though wildlife seek cover where possible, they require a sizeable supply of heat-producing foods just to keep warm. Moving about in deep snow increases the energy demand—small animals must leap from place to place. When food sources are marginal and wildlife is already stressed, any disturbance causing them to flee, or even keep on alert because of an intrusion, can threaten their survival.

Animals' physical adaptations to winter include heavier winter coats and fat layers and in some cases, a protective change of color.

Plants, too, are stressed by winter and must adapt to deal with it. Loss of moisture is a major problem, since, much of their water source is locked in snow and ice. Many trees lose their leaves to avoid evaporative water loss. Some plants over-winter as seeds. Others are protected by an insulating blanket of snow.



Mink



Mountain Cottontail

STREAMSIDE THICKETS

The lush vegetation along watercourses is produced by the extra moisture seeping out from streams to supply sub-irrigation for plant growth along their banks. These streamside thickets, or riparian zones, have an appearance and a microclimate very different from the surrounding rangelands. In addition to much heavier vegetation, there is more shade and higher humidity and increased air movement.

To live in shade, leaves of trees and other plants are broad and flat and are spread on wide branches to maximize collection of the sun's rays.

The water for this unique environment comes from rainfall draining from the surrounding hills and from the mountains to the east. These hills and mountains are called a watershed. Water follows the ravines and low spots gradually making its way to the stream.



Black Cottonwood

little vegetation to hold the moisture.

In flat areas, streams wander and bend, creating little marshes. Stream banks erode at the outside of turns and silt in on the inside, constantly changing the course of the stream. The speed of flowing water varies with the steepness of the terrain and the main current roams from bank to bank. Currents and eddies can create deep holes in otherwise shallow streams so there can be holes and drop-offs in any stream of flowing water.

Fish and insects and other creatures that live in flowing water are rapid swimmers or they are specially adapted to cling to, or hide under rocks. Insect life in streams is more abundant, but made up of fewer different species than live in still water. Little aquatic vegetation grows in swift

REGULATIONS

- Remain at your car and on the road. If you are near bison do not get out of your vehicle.
- Hiking is permitted only on designated footpaths.
- Trailers and other towed units are not allowed on the Red Sleep Mountain Drive.
- Motorcycles and bicycles are permitted only on the paved drives below the cattle guards.
- Firearms are prohibited.
- All pets must be on a leash.
- All regulations are strictly enforced.
- Our patrol staff is friendly and willing to answer your questions about the range and its wildlife.

CAUTIONS

- Bison can be very dangerous. Keep your distance.
- All wildlife will defend their young and can hurt you.
- Rattlesnakes are not aggressive but will strike if threatened. Watch where you step and do not go out into the grasslands.
- The Red Sleep Mountain Drive is a one-way mountain road. It gains 2000 feet in elevation and averages a 10% downgrade for about 2 miles. Be sure of your braking power.
- Watch out for children on roadways especially in the picnic area and at popular viewpoints.
- Refuge staff are trained in first aid and can assist you. Contact them in an emergency.

ADMINISTRATION

The National Bison Range is administered by the U.S. Fish and Wildlife Service as a part of the National Wildlife Refuge System. Further information can be obtained from the Refuge Manager, National Bison Range, 132 Bison Range Road, Moiese, Montana 59824. (406) 644-2211.

U.S. FISH AND WILDLIFE SERVICE
Department of Interior

Design & Illustrations: Artmill, Missoula, Montana



Printed August 1994

A FIELD GUIDE to the NATIONAL BISON RANGE



Where to Start?

The best place to start your visit to the Bison Range is the Visitor Center. Here you will find informative displays on the bison, its history and its habitat. Helpful staff will answer your questions, direct you to areas where you are most apt to see wildlife and assist you in emergencies.

History of the Bison Range

The history of the bison, or buffalo, in the Flathead Valley began in about 1873 when Walking Coyote, a Pend d' Oreille Indian, returned from Blackfeet Country on the plains with five orphaned calves. When he had about 13 buffalo, he sold them to two ranchers, Michael Pablo and Charles Allard. At that time, of the 30 to 70 million bison that once roamed the plains, less than 100 remained in the wild and there were fewer than 1,000 left. The Pablo/Allard herd had become the largest herd in existence. Allard's heirs sold his portion of the herd to Charles Conrad in Kalispell and animals from the Conrad herd formed the nucleus of the Bison Range stock.

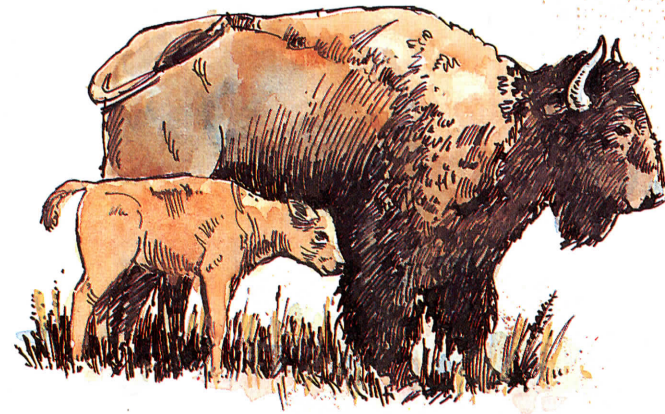
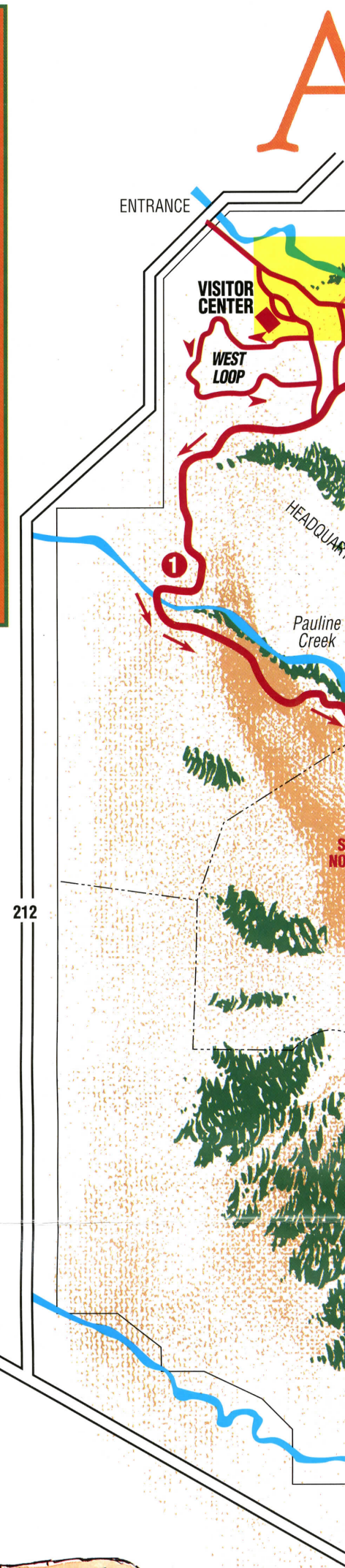
As the valley became settled, Pablo realized that his large herd of free-roaming buffalo would not be very welcome, and he attempted to sell them to the United States Government. When he received little response, he sold the herd to Canada. The sale of this last, large herd out of the country produced a huge public outcry, which led to the formation of the American Bison Society. Through the efforts of William Hornaday of the Smithsonian Institution, President Theodore Roosevelt and congress were persuaded to set aside lands for the preservation of the American Bison. Three reserves were established between 1907 and 1909 to save bison from extinction.

The National Bison Range was one of these, and was established in 1908. Today bison are no longer in danger of extinction and there are more than 140,000 in North America. A large percentage of these are in private herds.

Currently, some 350 to 500 bison roam the 18,500 acres of the Bison Range, which is a part of the National Wildlife Refuge System. The Range is made up primarily of native Palouse prairie grasslands, but also includes mountain forest, wetlands and river bottom woodlands. In addition to bison, these diverse habitats provide a home for some 50 different wildlife and over 200 bird species.

Bison Management

The Bison Range is intensively managed for species diversity. Rotational grazing and weed control programs maintain the grasslands. Where possible, biological weed control uses insects which feed only on specific noxious plants. A vaccination and



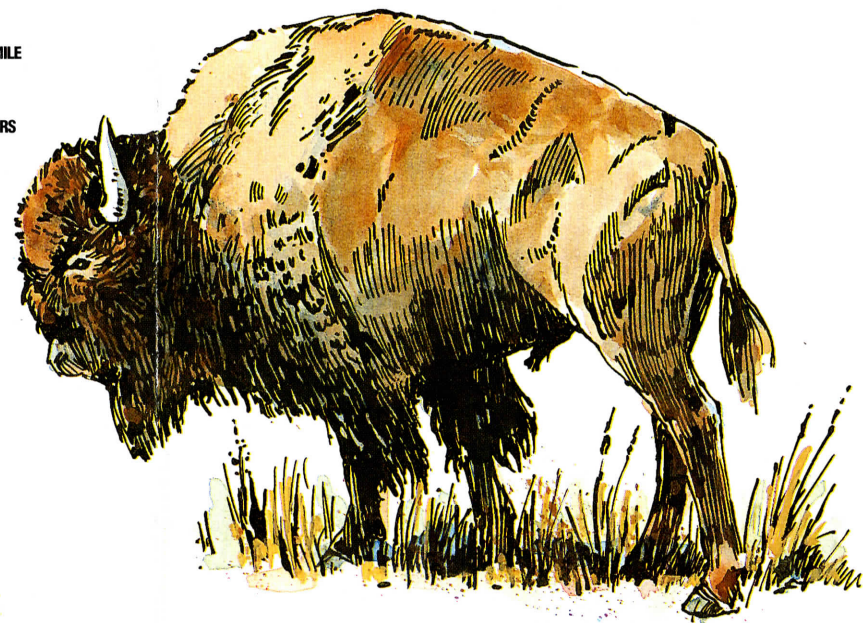
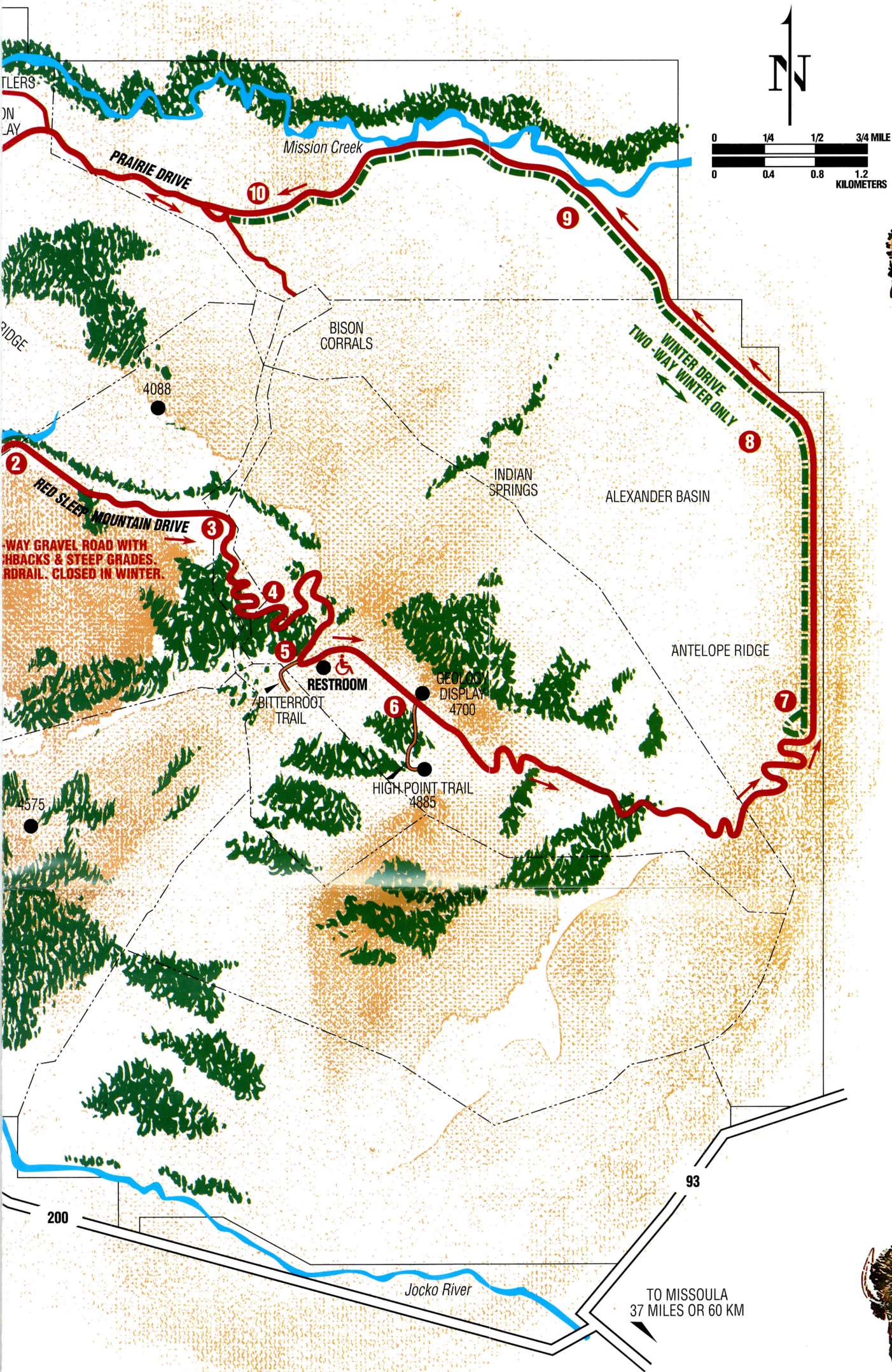
Red Sleep Mountain Drive Self-Guided Tour

Follow the numbered signs for information

1 These grasslands are made up of a combination of native bunchgrasses and broad leaved plants called forbs. The plants are dry land adapted and can survive the Bison Range's average rainfall of only 13 inches per year. Some bird species nest only in these bunchgrasses.

2 Pauline Creek is an intermittent stream with several small impoundments that supply water for wildlife. The stream-side thickets are supported by water seeping out from the creek. Watch for some of the many song birds that use this area. In fall, bears frequently search here for berries.

Place of Discovery



Bison and Bison Facts

While true buffalo are the Cape buffalo of Africa or the water buffalo of Asia, the American Bison has been called "buffalo" for so long that we now use the names interchangeably. The bison's only relatives are remnants of another bison species, called the wisent, which survives in small numbers on reserves in Europe.

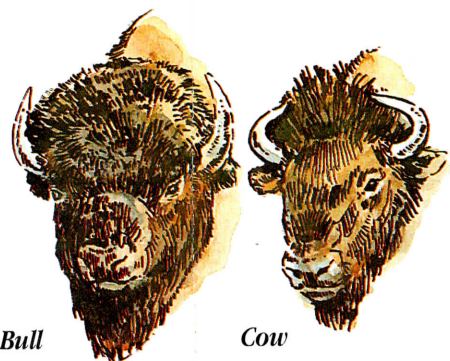
Bison are well adapted to life on the open grasslands. Their heavy coats protect them from both summer sun and winter winds. Their thick winter coat is so well insulated that snow can lay on their backs without melting.

They are strong, hardy beasts who suffer few diseases in the wild. The brucellosis attributed to bison herds today is really a cattle disease which was transmitted to bison in some areas. The Bison Range herd is vaccinated against this and other cattle diseases, and is certified brucellosis-free.

Bison are unpredictable and can be very dangerous. They appear slow and docile but really are quite agile and can run as fast as a horse; so don't plan to outrun one. A bison's tail is often a handy warning flag. When it hangs down and is switching naturally, the animal usually is unperturbed. If it extends out straight and droops at the end, he/she is becoming mildly agitated. If the tail is sticking straight up, they are ready to charge and you should be somewhere else...but do not run!

Bison bulls weigh about 2,000 pounds and have heavy horns and a large hump of muscle which supports their enormous head and thick skull. They have a thick mass of fur on their heads and a heavy cape of fur even in summer. This enhances their size and protects them when fighting. They are especially ill-tempered and roar and battle during the breeding season from mid-July through August.

Cows weigh about half as much as bulls. Their horns are narrower and are slightly curved. Horns on older females almost meet above their heads. Cows have smaller humps and a smoother summer coat. Calves are born from mid-April through May and are a bright rust red color for the first month or so. Cows are very protective of their young and can be even more dangerous than a bull when they have a calf at their side.



Bull

Cow

on habitat and natural features.

4 Edge habitats are excellent places to view wildlife, especially birds. Each habitat has its own complement of wildlife species. The edge between two habitats will harbor species from both and some are just creatures of the edge. Some birds nest in forests and forage in grasslands.

5 Forest communities thrive at the higher elevations, on the cooler north sides of hills and in moist draws and depressions. Douglas fir grow on the north sides where their seedlings can get a foothold. Ponderosa Pine are found on the dryer warmer south side.

7 Grasslands have evolved along with grazers. Bison, elk and pronghorn use this prairie resource. Grasses grow from the base of the stem so they may be grazed and still continue to grow. Different animals eat different kinds or parts of plants at different growth stages to minimize competition.

8 Buffalo wallows are dry dust beds, often found in clay banks. Bison roll here to rid themselves of insects and also display dominance by displacing lower ranked animals from the wallow.

9 River bottom woodlands of Cottonwood and Juniper are sub-