PICEANCE BASIN WILDLIFE HABITAT MANAGEMENT PLAN

CO-1WHA-1-PICEANCE BASIN

February 9, 1977
Date

Prepared jointly by the Colorado Division of Wildlife and the Bureau of Land Management in cooperation with the U.S. Forest Service, U.S. Fish and Wildlife Service, and U.S. Geological Survey. Acknowledgement for assistance in plan review is also given to the Department of Fishery and Wildlife Biology, Colorado State University.

The Piceance Basin Wildlife Habitat Management Plan is a dynamic document, which will be updated and revised as new management direction and information becomes available. The Plan serves to prescribe land management and related species population management guidance for the mutual benefit of wildlife and other resources and their uses. It serves as Colorado's prototype plan for Sikes Act implementation and, to this end, we hereby approve of this plan and its distribution for public use.

State Director
Bureau of Land Management

Director
Colorado Division of Wildlife

PICEANCE BASIN HMP

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A. Introduction

The boundaries of the Piceance Basin Habitat Management Plan (HMP) correspond to the Colorado Division of Wildlife's big game management units 21, 22, 23, 24, 32, and 33 (See Figure 1: Location Map). The western boundary is delineated by the Colorado-Utah State line south from the White River to "that portion of Garfield County within the Evacuation Creek Drainage".1/ The southern boundary begins at this point and follows the divide between the White River and Colorado River drainages east to the Parachute Creek drainage where it follows the western edge of this drainage to the Colorado River. The River then constitutes the southern boundary to Canyon Creek. Canyon Creek and the drainages of the south and main fork of the White River form the eastern boundary of the HMP area. The northern boundary is the White River from the Utah State line to Meeker and State Highway 13 from Meeker to Ninemile Gap where the boundary becomes the White River - Williams Fork Divide.

This area encompasses some 2,050,481 acres, 1,157,584 acres (56 percent) of which are administered by the Bureau of Land Management (BLM) and are designated as National Resource Lands (NRL). In addition, 520,980 acres are located within the boundaries of the White River National Forest under the administration of the U.S. Forest Service.

Map definitions of land ownership are given in Fig. 1 and are available in larger scale from the Bureau of Land Management, Meeker Area Office, Colorado.

Extreme differences in elevation, ranging from 5,000 feet on the south and west to over 11,500 feet on the east, coupled with precipitation regimes which vary from 10 inches on the west to 30 inches on the east, create a diverse and complex assortment of wildlife habitats within the area.

The following discussion and summary of wildlife, their habitats and other resource values found in the HMP area has been largely abstracted from the White River and Glenwood Springs Unit Resource Analyses (URA's) unless otherwise

1/ Colorado Division of Wildlife - Law & Regulations HDBK., 1973.

referenced. These two documents are on file at the Bureau of Land Management area offices in Meeker and Glenwood Springs under file code 1605.

1. Wildlife Habitat

The most common habitat type [2/] occurring within the HMP area is the Pinyon-Juniper Woodland, which covers 589,160 acres or 29 percent of the total acreage of the unit. (See Table 1 for acreage breakdown of all habitat types). The Pinyon-juniper type exhibits considerable variability within itself, ranging from sites with little understory vegetation (Photo #1) to others that contain abundant and diverse understory species (Photo #2). Drainge bottoms within the Pinyon-juniper type are generally dominated by big sagebrush (Photo #3) but often greasewood occurs in quantity and frequently achieves dominance (Photo #4). Sagebrush also occupies extensive areas in the Rangely area and is commonly encountered as the dominant species on ridgetops and mesas within the Piceance Basin (Photo #5). On xeric, more alkaline sites in the vicinity of Rangely and Grand Valley, saltbush replaces the sagebrush as the principal plant species (Photo #6).

The high country of the Roan Plateau and Cathedral Bluffs also has extensive sagebrush tracts, but the mountain shrub types (serviceberry, snowberry, oakbrush (Photos #7 and #8) are more in evidence at these intermediate altitudes (6,500-8,000 feet). Northern exposures in this altitude range often result in the creation of small pockets of aspen and Douglas fur, or sub-alpine and white fir (Photo #9).

The most heavily forested areas, however, occur in the eastern portion of the habitat area. Here the gradual uplift of terrain that occurs eastward from the Utah border is greatly accelerated, resulting in sufficient elevation and precipitation to maintain a climax community of the spruce-fir type. Much of the spruce, however, has been beetle-killed and the subsequent reduction in canopy cover has facilitated establishment of an understory that is much more productive than is normally associated with the spruce-fir type (Photo #10). Interspersed throughout the forest are large park-like meadows and scattered to extensive stands of aspen. Lower elevations and southern exposures support an abundance of mountain shrub types.

2/ Habitat types are defined by the dominant vegetative species present.

TABLE 1

WILDLIFE HABITAT TYPES WITHIN HMP AREA

Habitat Type	Dominant Plant Species*	Acreage	Percent Total
Grassland	Brma Agtr-1 Feth	105,360	5.1
Sagebrush	Artr	463,483	22.6
Mountain Shrub	AME Cemo Quga	373,798	18.2
Pinyon-Juniper	Pied Juos	589,160	28.7
Conifer	Psme Pico Pipu	210,118	10.2
Waste		27,321	1.3
Broadleaf	Potr	165,760	8.1
Saltbush	Atco	22,080	1.1
Greasewood	Save-2	19,200	0.9
Halfshrub	Erla	1,638	0.1
Cropland		40,083	2.0
Riverbottom	Sali spp. POPU spp. POA spp.	32,480	1.6
	Total	2,050,481	99.9

* Explanation Of Plant Symbols On Following Page

TABLE 1 (CON'T)

SYMBOL	SPECIES
Brma	= Bromus marginatus: Mountain brome
Agtr-1	= Agropyron trachycaulum: Slender Wheatgrass
Feth	= Festuca thurber: Thurber fescue
Artr	= Artemisia tridentata: Big Sagebrush
AME	= Amelanchier spp.: Serviceberry
Cemo	= Cercocarpus montanus: True Mountain Mahogany
Quga	= Quercus gambelii: Gambel Oak
Pied	= Pinus edulis: Pinyon pine
Juos	= Juniperus osteosperma: Utah juniper
Psme	= Pseudotsuga menziesii: Douglas Fir
Pico	= Pinus contorta: Lodgepole pine
Pipu	= Picea pungens: Blue Spruce
Putr	= Purshia tridentata: Antelope Bitterbrush
Atco	= Atriplex confertifolia: Shadscale
Save-2	= Sarcobatus vermiculatus: Black Greasewood
Eula	= Eurotia lanata: Common Winterfat
Sali spp.	= Salix: Willow
POPU spp.	= Populus spp.: Cottonwood
POA spp.	= Poa spp.: Bluegrass

Photo #1 - Pinyon-Juniper covered ridgetop showing very little browse understory.

Photo #2 - Pinyon-Juniper Woodland with abundant and diverse browse understory.

Photo #3 - Drainage bottom (Greasewood Gulch) dominated by big sagebrush.

Photo #4 - Douglas Creek drainage with greasewood monotype.

Photo #5 - Extensive sagebrush stand on 84 Mesa typical of many mesas and ridges.

Photo #6 - Saltbush type near Rangely in western portion of HMP area.

Photo #7 - Mountain shrub type on Cathedral Bluffs.

Photo #8 - Mountain shrub type interspersed with sagebrush pockets on Roan Plateau.

Photo #9 - Northern exposure on Roan Plateau resulting in aspen - Fir stand.

Photo #10 - Beetle killed spruce stand in White River National Forest on eastern edge of HMP area.

Photo #11 - Hay meadow on upper White River.

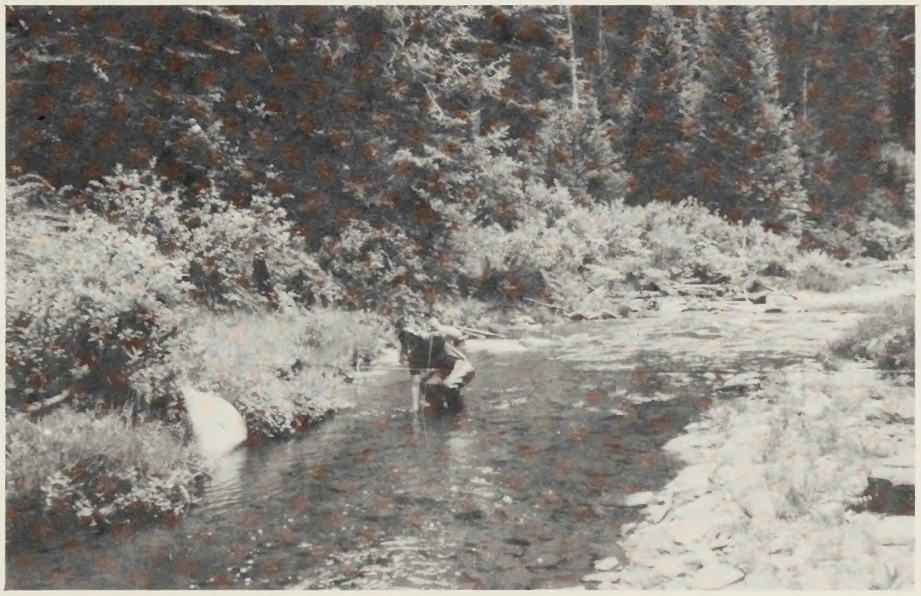

Photo #12 - High quality riparian habitat on East Parachute Creek.

The two major watercourses draining the habitat management area, the Colorado and White Rivers, have had the majority of their surrounding riparian habitat replaced by cultivated fields, but good stands of cottonwood and willows still remain and many of the tributary streams support flourishing riparian communities (Photos #1 and #2).

Map No. 1, Appendix 1, deliniates general vegetative types. More specific information on subtypes and habitat conditions is also available at the Meeker Office (File Code 6610) in the form of two inch to the mile habitat type and condition maps and the individual transect sheets on which the maps are based.

The current distribution and seasonal ranges occupied by major wildlife species in the Basin are depicted on Maps 2-5, Appendix 1.

The economic importance of game species to the region is illustrated by the fact that in 1974, a poor harvest year, the minimal sport harvest value assigned to the take of 12,912 hunters during 77,389 recreation days of hunting was $9.2 million.3/ Mule deer hunters accounted for the bulk of this figure taking 4,833 deer during 48,722 recreation days.4/ Other game species contributing to the above figures include elk, bear, mountain lion, rabbits, sage grouse, blue grouse, and waterfowl. The numerous and abundant species of non-game wildlife present bring the total vertebrate species list (Appendix 2) to over 300. Included in this are the following Federally listed endangered species known to occur in the planning area: American peregrine falcon, whooping crane, and the humpback chub. In addition, the black footed ferret is known to have historically inhabited the area5/ and a recent unconfirmed sighting by a BLM recreation aid in August 1975 suggests that it is still present. Two State listed species, the endangered greater sandhill crane and the threatened Colorado River cutthroat trout, are also found in the wildlife area.

2. Forestry

Table 2 summarizes the forestry resource of the region.

3/ Based on BLM Wildlife Statistical Information.

4/ 1974 Colorado Big Game Harvest - Colorado Division of Wildlife.

5/ Torres, John R., The Future of the Black-Footed Ferret of Colorado in Proceedings of the Black-Footed Ferret & Prairie Dog Workshop Sept. 4-5, 1973, Rapid City, South Dakota 208 p.

TABLE 2

FORESTRY RESOURCES WITHIN HMP AREA

NATIONAL RESOURCE LAND

	Acres
Pinyon-Juniper Woodland	539,430
Pinyon-Juniper Under 40% Slope	315,620
Douglas Fir Productive Forest Lands	6,845
Douglas Fir Non-Productive Forest Lands	9,456
Spruce Fir Productive Forest Lands	3,749
Spruce Fir Non-Productive Forest Lands	1,805
Aspen Productive Forest Lands	17,480
Sub-Total Productive Forest Lands	343,694

WHITE RIVER NATIONAL FOREST

Spruce Fir Productive Lands	126,914
Douglas Fir/White Fir Productive Lands	13,639
Lodgepole Productive Lands	34,728
Aspen Productive Lands	91,596
Sub-Total Productive Lands	266,877
Total Productive Forest Lands	610,571

3. Livestock

Approximately 36,489 cattle and 119,419 sheep make use of the HMP area at various times throughout the year. The pattern of use is such that livestock are generally on private land during the winter months, although significant use is made of certain BLM grazing allotments in the Rangely and Piceance areas through the winter. Forest Service land is used primarily during the summer grazing season, but a slight amount of fall use does occur.

4. Wild Horses

Wild horses occur in two areas within the wildlife habitat plan boundaries. The Piceance herd unit consists of approximately 240 horses occupying the northern third of the Piceance Planning Unit west of Piceance Creek. The second unit, known as the Rangely herd, is confined to the southern half of the eastern two-thirds of the Rangely Planning Unit and consists of approximately 70 horses.

A Wild Horse Management Plan is presently being prepared by the Craig BLM District and will be available to interested parties in the near future. A summary of draft wild horse plan contents is presented later in Section E-5.

5. Recreation

The primary recreation use of the HMP area has historically been big game hunting. Table 3 presents harvest data and recreational use attributed to big game hunting in the HMP area for the past 5 years. Figures for other recreational uses, such as fishing, sightseeing, rockhounding and boating are lacking for the area. It is anticipated that these latter uses will increase as will big game hunting as the population of the area increases in response to energy minerals development.

6. Watershed

Erosion condition in the Rangely Planning Unit is generally classed as moderate (planning unit boundaries may be obtained from Map 6 in Appendix #1). Areas of slight erosion class are confined to the high elevation mountain shrub and conifer types in the extreme southern portion of the unit. Increased

TABLE 3

DEER AND ELK HARVEST FIGURES FOR 1970-1974

UNIT	NUMBER OF HUNTERS 1974	1973	1972	1971	1970	HUNTER DAYS 1974	1973	1972	1971	1970	HARVEST 1974	1973	1972	1971	1970
DEER															
21	2569	2439	3081	2586	3217	12286	11525	12192	8973	3161	973	1241	2303	1528	2070
22	4617	4573	7512	5611	7132	19260	21994	26199	17804	6496	1982	2303	5446	3046	4737
23	1304	2059	1763	1276	2836	4999	8634	5698	3745	2503	672	930	1374	727	1462
24	226	551	382	203	1060	1037	3265	1368	827	855	47	224	185	86	263
32	1317	2159	1918	864	1521	4966	8233	5539	2552	1312	465	1312	1436	469	898
33	1706	2387	2056	832	2277	6174	9244	7375	2811	1977	695	1116	1165	420	976
TOTAL	11739	14168	16712	11372	18043	48722	62895	58371	36712	15304	4834	7128	11909	6266	10406
ELK															
21	34	38	9	70	24	227	138	27	270	0	9	3	0	12	7
22	906	334	173	165	170	4205	1595	861	807	35	209	67	67	12	4
23	3083	2330	1786	1007	1563	13788	13371	8466	4792	2043	1411	917	687	259	624
24	2041	1036	1023	1496	94	9714	6009	5451	7787	2625	1028	471	365	383	736
32	325	192	169	172	500	1227	1005	694	815	18	25	54	40	66	42
33	2586	2220	1434	1296	2351	11973	11297	6560	5795	92	441	433	297	211	149
TOTAL	8975	6450	4594	4206	4702	41134	33415	22059	20266	4813	3123	1945	1456	943	1562

soil disturbing activities in the unit will continue to keep erosion trend on the increase.

The major portion of the Piceance Planning Unit is experiencing slight and moderate erosion. The areas of slight erosion are located in the east and central portions of the unit at the highest elevations. Erosion trend is also on the increase in this unit.

The Meeker Planning Unit generally exhibits slight erosion condition except for the western portion where ratings are usually given as moderate.

Water quality of the White and Colorado Rivers in general meets State Water Quality Standards, but the White River below the confluence of Piceance Creek is of lower quality than that above.

7. Energy/Minerals

The Piceance Basin area has been producing oil and gas for approximately 70 years. Known Geologic Structures (KGS) currently number 23 and in 1973 produced approximately 56,215 barrels of oil and 24,922,182 Mcf of gas.

Coal reserves in the area are estimated by the U.S. Bureau of Mines to exceed 11 billion tons of bituminous and subbituminous coal. Approximately 91 million tons of this coal is believed to be strippable. Currently there are no active mines in the HMP area.

Oil shale reserves of the Eocene Green River formation in the Piceance Basin contain over 900 billion barrels of oil.

Nahcolite and dawsonite are also present in considerable quantities. Four sodium leases have been issued in the area and four other sodium lease applications are now pending. The lessees are currently conducting economic and development studies in the area although there is no development work being done on the leased lands at this time.

8. Other

The necessity and urgency for developing and implementing a wildlife habitat management plan for the Piceance Basin has

been dictated, not by any intrinsic condition of the wildlife estate, but rather by the tremendous public demand for the Basin's wildlife and energy resources. If the United States Government goal of energy independence by 1985 is to be achieved, present energy sources will have to be supplemented by new sources and methods of power generation. One such source is the development of vast oil shale reserves lying under the Piceance Basin. The U.S. Department of the Interior has estimated that 75 percent of the recoverable oil shale reserves in the United States lies within the Piceance Basin.6/ The Bureau of Land Management is responsible for the administration of 80 percent of this oil shale land. Ten thousand acres of this land have been leased to two oil shale development consortia, Federal Tracts Colorado-a (C-a) and Colorado-b (C-b), and pre-development studies are underway on both tracts. In addition, several oil shale projects on private land are in various states of planning (Map 7, Appendix 1) and six tracts of Federal land have been nominated, though only two may be selected, for the development of the in-situ process of oil extraction. Aside from the direct on-site impacts generated by these projects, ancilliary developments, such as roads, residences, off-site disposal areas, pipelines, transmission lines, and the projected three fold population increase to 16,000 people in Rio Blanco County by 1985, will have a widespread effect on the wildlife resource in the Piceance Basin.7/ In addition, development of coal, oil and gas, sodium and uranium deposits in the area are expected to intensify in the next few years, further impacting wildlife populations and habitats.

In order to maintain and enhance Piceance Basin wildlife values in the face of these large scale development projects, a concentrated, cooperative effort on the part of all State and Federal agencies concerned with wildlife and their habitat in the Basin was required to develop a management plan that would be effective in balancing the needs of wildlife with the demands of energy development. Enactment of the Sikes Act Amendment (PL-93-452) on October 18, 1974 added further impetus to the desire to develop such a plan at the earliest possible date. This Act provided broad authority to : "1) Plan and carry out wildlife conservation and habitat rehabilitation programs on national resource lands (NRL) consistent with overall land use plans; 2) Protect significant habitat for threatened or Endangered Species; 3) Enforce regulations to control off-road vehicle traffic (ORV) or other public use of lands subject to conservation and rehabilitation programs conducted under the Act." The Sikes Act also provides a mechanism for the

6/ USDI Final Environmental Statement For The Prototype Oil Shale Leasing Program. 1973.

7/ James M. Bowers and Associates, "Rio Blanco, Meeker, Rangely Projects and Projections", January 1975.

allocation of funds to the annual wildlife budgets of the Federal land management agencies. Through these agencies, a portion of the funds can be channeled to the various state agencies in the form of contracts for research studies and improvement projects. Further details of Sikes Act implementation in Colorado may be found in supplements to the master memorandum of understanding between the Colorado Division of Wildlife and the Bureau of Land Management, Appendix 3.

In response to the urgency of energy development and the opportunity for Sikes Act implementation, a coordination committee, (Colorado Division of Wildlife, U.S. Forest Service, U.S. Geological Survey, and U.S. Fish and Wildlife Service), was formed to guide the preparation and implementation of the Piceance Basin Wildlife Habitat Management Plan. As stated in this committee's report to Agency Management Directors, dated July 8, 1975, the HMP will have as its mission: "To provide for the coordinated achievement of wildlife and habitat management goals and objectives consistent with other resource uses in the Piceance Basin." These goals and objectives have been developed in close cooperation with the Colorado Division of Wildlife and the other Federal agencies involved and were formulated only after thorough analysis of wildlife habitat and population data currently available for the Piceance Basin. Plan objectives are formally defined in Section B. Those dealing with wildlife populations have been formulated and approved by the Colorado Division of Wildlife.

MANAGEMENT OBJECTIVES

B. Management Objectives (Table 9, at the end of the objectives section, summarizes the objectives, methods and evaluations for the HMP. Each objective is identified by a code number; e.g., md-1, P-2, etc.)

1. Mule Deer

The Piceance deer herd, once considered the largest migratory deer herd on the North American Continent, has in recent years suffered a drastic population reduction. This is generally believed to be attributable to a series of severe winters in the early 1970's rather than to any major loss or degradation of mule deer habitat. In the future, however, major changes in habitat are expected to occur on the C-a and C-b oil shale tracts, Colony oil shale site, and eventually on the Superior and in-situ oil shale tracts (Refer to Map 7 and Section E-2-F Energy, for projected habitat loss figures). Additional losses will also result from roads, pipelines, off-site disposal areas, and transmission lines associated with the developments.

Habitat condition inventories conducted by the Bureau of Land Management, Division of Wildlife, and oil shale tract biologists indicate that there are ample opportunities for habitat improvement on non-impacted areas to compensate for areas lost to energy development. The most extensive of these inventories was the Piceance deer winter range survey conducted in 1965-1967 in Game Management Unit 22 (GMU 22) (See Figure 2 For GMU Boundaries) by the Division of Wildlife and the Bureau of Land Management (Map 13).

This survey consisted of 309 browse range condition transects, using techniques described by Baker in 1966.8/ A copy of the transect form and an explanation of the rating system is available in Appendix 4. Table 4 summarizes the results of the survey.9/

8/ Baker, Bertram D., 1966 Browse Transect Analysis and Application P. 56-57. In Game Res. Rep. July 1966, Colo. Game, Fish and Parks.

9/ Reproduced from Baker, Bertram D., 1968, Survey, Inventory, and Analysis of Deer and Elk Winter Ranges. P. 193-202. Game Res. Rep. July 1968, Part 2, Colo. Game, Fish and Parks.

Table 4--Summary of ratings for browse and soil, 309 browse range condition transects, Game Unit 22 (Piceance) big game winter range, 1965-67.

Item	Rating				Overall or Average Rating*
	Low	Medium	High	Total	
Browse Composition					2.16 (Medium+)
No. of Transects	72	115	122	309	
% of Total	23%	37%	40%	100%	
Browse Density					1.48 (Low+)
No. of Transects	172	127	10	309	
% of Total	56%	41%	3%	100%	
Browse Vigor					1.40 (Low+)
No. of Transects	215	65	29	309	
% of Total	70%	21%	9%	100%	
Soil Stability					186 (Medium-)
No. of Transects	66	220	23	309	
% of Total	21%	71%	8%	100%	

* Computed on basis of Low = 1, Medium = 2, and High = 3

As Baker noted in his report, the medium + rating for browse composition gives cause for optimism by indicating that the more highly preferred browse plants occur with regularity throughout the Piceance deer winter range. The fact that browse density is rated midway between low and medium suggests that there is room for improvement of this parameter in the Game Management Unit 22 winter range. The low + rating for browse density is somewhat misleading unless the numerical range for low and medium ratings under this system is considered. A low rating can mean any density up to 15 percent, while medium can be as high as 35 percent which is a very significant amount of browse.

The overall low + vigor for the unit is perhaps the area of greatest concern. The vigor rating of a stand is derived from an assessment of browse stand age and recent past hedging. The results indicate that in 1965 - 1967 stands were relatively

old and had experienced a considerable amount of hedging. If this condition persists or increases the usual result is a dying out of the browse stand. Fortunately, this has not been the case in Unit 22. The reduction of the Piceance deer herd has relieved browsing pressure in the area and allowed a rejuvenation of much of the browse in the unit. Occular estimates and comparison with data collected by Rio Blanco Oil Shale Project (RBOSP) on Tract C-a support this conclusion, but also indicate that considerable improvement is still possible through livestock management and vegetative manipulation. The RBOSP study10/ was conducted during the summer of 1975 by Ecological Consultants Inc., on the 35,269 acres shown on Map 13. Approximately 9,000 acres of the RBOSP study overlapped the joint BLM - DOW survey discussed previously. The transecting method for the 137 transects differed considerably from the BLM - DOW method (See Appendix 4 for transect form and rating criteria). The transects were actually range condition and trend transects that also gathered browse condition information. Ratings of "good", "fair", and "poor" were given for the condition of the area based solely on hedging class, and browse trend was based on the ratio of young plants to old. It should be remembered that these two measurements were used together in determining the vigor ratings given by the BLM - Division of Wildlife survey.

The Rio Blanco Oil Shale Project study determined that browse condition was almost completely (98.4%) in the "good" condition class indicating that hedging of browse plants was much less than that measured by the BLM - Division of Wildlife survey. The fact that 59.7% or 20,756 acres of the study area exhibited a downward trend suggests that decadent and dead plants are still not being adequately replaced by young plants, but examination of the individual transect sheets in the area of overlap leads one to believe that there has been some improvement since the 1965-1967 survey. The downward trend rating is based on the fact that decadent plants still outnumber young, but there are a few static or upward trend ratings in the area of overlap where in 1965-1967 all vigor ratings were given as "low".

10/ Rio Blanco Oil Shale Project (RBOSP) 1976 Second Annual Report, Tract C-a environmental baseline studies. Denver, Colo. 928 Pages.

The Game Management Unit 22 portion of the Piceance Basin will probably never again produce the tremendous deer numbers that were common to the area in the 1950's and 1960's, but sufficient habitat does exist which can be maintained or improved to support considerably more than the 26,000 deer that are currently estimated by the Division of Wildlife to winter in the unit.

The situation in Unit 21 (Douglas) is very similar to that in Unit 22 in that deer numbers have decreased significantly and the habitat has responded to the reduction of browsing pressure. In the summer of 1975 a browse condition inventory was begun by the BLM with 66 transects being run during the first of the three field seasons that will be necessary to complete the study. The transecting method was identical to that used for the 1965 - 1967 survey (See Appendix 4). The data presented in Table 5 from the first 66 transects represents the worst of the Rangely deer winter range since a conscious effort was made to locate these first transects in winter sheep allotments and in the drier portions of the unit.

Table 5--Summary of ratings for browse and soil, 66 browse range condition transects Game Unit 21 (Rangely) big game winter range, 1975

Item	Rating				Overall or Average Rating*
	Low	Med.	High	Total	
Browse Composition					1.7 (Medium-)
No. of Transects	31	24	11	66	
% of Total	47%	36%	17%	100%	
Browse Density					1.3 (Low+)
No. of Transects	52	9	5	66	
% of Total	78%	14%	8%	100%	
Browse Vigor					1.4 (Low+)
No. of Transects	48	10	8	66	
% of Total	73%	15%	12%	100%	
Soil Stability					2.2 (Medium+)
No. of Transects	6	48	17	66	
% of Total	9%	65%	26%	100%	

* Computed on basis of Low = 1, Medium = 2, High = 3

It is anticipated that when transects are run in the more prime areas of deer winter range the overall average ratings for browse condition will improve substantially. Most of the Game Management Unit 22 winter range was typed in 1975 and the overall impression was that browse vigor has been greatly improved by good growing conditions and lessened browsing pressure over the last few years.

The BLM's browse range condition survey of Game Management Units 32 (Parachute) and 33 (Rifle) utilized a transecting method very similar to that described for the 1965 - 1967 survey but the form used differed considerably as did the rating system (See Appendix 4). The ratings have been converted to the system used previously to avoid confusion. Soil data were not collected with this methodology. Table 6 presents the summary results of the 70 transects.

Table 6--Summary of ratings for browse condition, 70 browse range condition transects Game Units 32 (Parachute) and 33 (Rifle), big game winter range, 1973.

Item	Rating				Overall or Average Rating*
	Low	Med.	High	Total	
Browse Composition					1.8 (Medium-)
No. of Transects	38	7	25	70	
% of Total	54%	10%	36%	100%	
Browse Density					1.5 (Low+)
No. of Transects	32	38	0	70	
% of Total	46%	54%	0	100%	
Browse Vigor					1.7 (Medium-)
NO. of Transects	41	11	18	70	
% of Total	58%	16%	26%	100%	

* Computed on basis of Low = 1, Medium = 2, and High = 3

The higher density and vigor ratings obtained in this area speak well for the condition of the range. There is obviously much room for improvement and specific areas have been chosen for mechanical vegetative manipulation, but goals to be met through livestock management will not be formulated until the Glenwood Resource Area Range and Wildlife Specialists have studied the area during the 1976 field season.

Big game habitat condition information for Game Management Units 23 (Miller Creek) and 24 (White River) will be presented under the objectives section for elk since these areas are managed primarily for this species.

By placing a high priority on maintenance and improvement of mule deer winter range while the population is low and before development begins, it is believed by the Division of Wildlife and BLM that the herds can be built up again and sustained without creating a boom or bust situation as has occurred in the past. To accomplish this, the following objectives for mule deer have been jointly agreed upon by the BLM and DOW.

Md 1 - Improve overall browse vigor ratings on 165,000 acres of deer winter range in the Piceance triangle (Map 6a) from a low rating (more than 35% heavily hedged or decadent minus young more than 35%) to a medium rating (less than 35%) by 1990 primarily through livestock management. Maintain average browse cover at its present 33 percent level. (Vigor ratings from 1965 - 1967 survey, cover rating from 1976 range condition transects. (See Range Management section or individual Allotment Management Plan for specifics on each allotment).

Md 2 - Reduce the average precentage of heavily hedged key browse species on 45,320 acres of deer winter range in the Hammond - Barcus key area (Map 6a) from 28 percent to 20 percent primarily through livestock management by 1990. Reduce the percentage of decadent minus young key browse plants from 39 percent to 30 percent of the total. Increase browse "density" (as read by angle gauge) from 12 percent to 16 percent. (Data from 1965 - 1967 survey. Key browse species vary on each transect but generally they are serviceberry, mountain mahogany, bitterbrush and big sage).

Md 3 - Reduce the average percentage of heavily hedged key browse species on 84,480 acres of deer winter range in the Barcus - Ryan key area (Map 6a) from 32 percent to 25 percent by 1990 primarily through livestock management. Reduce the percentage of decadent minus young key browse plants from 49 percent to 34 percent of the total. Increase browse "density" (as read by angle gauge) from 12 percent to 16 percent. (Data from 1965 - 1967 survey).

Md 4 - Maintain the average percentage of heavily hedged key browse species on 44,400 acres of deer winter range in the Ryan-Story key area (Map 6a) at 22 percent. Maintain the percentage of decadent minus young key browse plants at 25 percent of the total. Increase browse "density" (as read by angle gauge) from 7 percent to 16 percent. (Data from 1965 - 1967 survey).

Md5 - Determine browse form and age class, density, and composition (See Appendix 4) on 210,000 acres of mule deer winter and transitional range in Game Management Unit 22 in conjunction with AMP program (See Map 9, Table 14).

Md 6 - Assess the effects of mule deer forage comsumption on the condition of the winter range at various population levels in Game Management Unit 22 (Map 9, Table 14).

Md 7 - Increase and maintain the wintering mule deer population in GMU 22 to the highest level consistent with proper use of key browse species (big sage, mountain mahogany, serviceberry, and bitterbrush) as determined by utilization studies. (The DOW feels that this level is approximately 40,000).

Md 8 - Maintain wintering mule deer population level in GMU's 32 and 33 at current level of 8,000 - 12,000 in each unit.

Md 9 - Maintain wintering mule deer population level in GMU 23 at current level of 5,000 - 6,000.

Md 10- Increase wintering mule deer population of GMU 21 from 3,000 - 5,000 to 10,000 - 12,000.

Md 11- Determine degree of diet overlap of livestock and mule deer on specific allotments within winter range in GMU 22. (See Table 14 Study Schedule).

Md 12- Determine topographical and vegetative characteristics of preferred mule deer winter habitats in Piceance Basin. (Table 14).

Md 13- Determine browse form and age class, density, and composition (See Appendix 4) on 486,400 acres of deer winter range in Game Management Unit 21 (Map 2, Table 14).

Md 14 - Maintain hunter densities at 5.0 or less per square mile in all GMU's.

Md 15 - Improve browse production on 4,595 acres of critical mule deer winter range on sites suitable for mechanical manipulation (Map 8).

2. Peregrine Falcon

The recent sightings11/ of peregrine falcons over Tract C-a during the nesting season suggests that this endangered species does indeed occur in the HMP area, and may possibly nest within the HMP boundaries. The most suitable nesting habitat in the area lies along the cliffs of the Parachute Canyon complex in the southern portion of the unit. Unfortunately, the majority of the suitable cliff nesting habitat and riparian hunting habitat in the drainage are controlled by private land owners, making protection and management of this species and its habitat extremely difficult for the Division of Wildlife and BLM. The difficulty can be alleviated by meeting the following objectives:

P 1 - Determine the extent and condition of current and potential peregrine falcon nesting habitat in the Parachute Canyon region. (Map Nos.5 and 9, Table 14)

P 2 - Preserve a one mile radius buffer zone around any peregrine falcon eyrie identified in objective P-1.

P 3 - Protect 570 acres of riparian habitat on national resource lands in the Parachute Creek drainage that provides habitat for the peregrine falcon's avian prey base (Map 1).

3. Black Footed Ferret

Two unconfirmed reports of black footed ferret sightings in Skull Creek Basin and Dinosaur National Monument in 1975 suggest that the black footed ferret may still be present in northwestern Colorado. Before management recommendations can be formulated and implemented, it is essential that the population status of this endangered species be fully assessed.

11/ RBOSP 1976 Second Annual Report, Tract C-a environmental baseline studies. Denver, Colo. 928 Pages.

Inventory work has begun and will continue throughout the summer of 1976. Thus, at present, only the following objective is proposed:

BBF 1 - Determine the status of the black footed ferret on 17,700 acres of prairie dog range (Maps 4 and 9, Table 5) and assess potentials for reintroduction.

4. Bald Eagle

The White River winter concentration area, delineated on Map 5, supports a bald eagle population of approximately 40-45 birds along a 30 mile stretch of river. The inventory, conducted during the winter of 1975-1976 by a BLM wildlife technician, identified a number of roosting and perching areas that are consistently utilized by the majority of the eagle population. Although these roosts are situated on private land, there are a number of measures that can be taken to partially protect these critical areas. Bald eagle objectives are:

BE 1 - Protect 2170 acres of bald eagle winter habitat along the White River. These areas are plotted on 7½ minute quads on file in the Meeker Office under file code 6610. To accomplish this, it is recommended that no winter construction be conducted and no trees be removed. Right of Way applications across NRL should be examined to insure that river crossings be accomplished in treeless areas or in areas not normally used by eagles.

BE 2 - Identify specific roosting and perching sites within known bald eagle concentration areas along the entire length of the White River (Map 9, Table 14).

5. Sage Grouse

The paucity of seasonal use areas depicted on Map 4 illustrates the lack of knowledge concerning these areas of special biological significance to sage grouse. The main emphasis of this plan concerning sage grouse will be to identify and expand knowledge of these areas and to improve the condition of presently known special use areas. As new sage grouse use areas are located through the BLM's contract research with the Division of Wildlife it will be necessary to appropriate supplemental funds for their protection or improvement. Sage grouse objec-

tives are as follows:

SG 1 - Identify important wintering, brood rearing, and strutting areas on 211,000 acres of sage grouse habitat (Maps 4 and 9, Table 14).

SG 2 - Create 180 acres of wet meadow habitat for sage grouse brood rearing purposes. (See Map 8)

SG 3 - Improve wet meadow habitat on the Roan Plateau by increasing density of succulent grasses and forbs for use by sage grouse broods.

SG 4 - Increase density of fall sage grouse populations in the Magnolia Peak area from 1-5 to 5-10 birds per square mile.

SG 5 - Increase density of fall sage grouse populations in the Stake Springs - Ryan Gulch area from 2-6 to 6-12 birds per square mile.

6. Rocky Mountain Elk

The White River elk herd has been steadily increasing in recent years, and concern is growing that eventually the herd will reach a point where competition with mule deer will occur on the limited winter range. The problem is by no means acute, as shown by Forest Service pellet group trend counts, but the potential does exist and a monitoring program of elk range use will be implemented through the HMP. (See Table 14)

The Division of Wildlife manages the area east of Meeker (Game Management Units 23 and 24) primarily as elk range with the area west of Meeker serving as the principal mule deer winter range for the region. Competition problems between the two species will generally be resolved in favor of elk in GMU's 23 and 24.

The most recent browse condition inventory available for the 181,903 acres of elk winter range in Units 23 and 24 is that conducted between 1961 and 1963 by the Division of Wildlife and Forest Service. The transecting method was the same described for the 1965 - 1967 study (See Appendix 4). The results of the 640 transects run during this study are summarized in Table 7. The transect sheets and maps developed from the inventory are on file at the Forest Service and BLM Office in Meeker. The BLM copies are filed under code 6610.

The summary table indicates that browse condition in the area was much better than that found on the deer winter range two years later (Table 4), but specific problem areas were encountered then and these continue to exist today. Many of these are oakbrush stands that have grown beyond the reach of elk or have become so dense that they physically exclude elk, but provide excellent habitat for deer. Another significant problem identified at the time of the survey,12/ but as yet unresolved, is the fact that much of the critical winter range is on private land and therefore beyond the control of Federal or state agencies. Elk habitat management objectives are as follows:

E 1 - Improve browse production and accessability on 1,500 acres of elk winter range through mechanical means. (Map 8)

E 2 - Improve administrative management of 10,240 acres of elk winter range in Game Management Units 23 and 24. (Map 11)

E 3 - Maintain 20,720 acres of aspen and Douglas fir types as suitable escape cover for elk in Game Management Units 22 and 32. (Map 1) Maintain openings in aspen and spruce-fir types in Game Management Units 23 and 24.

E 4 - Reduce detrimental elk - livestock interaction in known elk calving areas (Map 3).

E 5 - Determine browse form and age class, density, and composition on 21,400 acres of elk winter range in Unit 22. (Map 9, Table 14, Appendix 4)

E 6 - Allow elk populations in Units 22 and 32 to increase from their present level of 500 to a level where any further increase would result in competition with cattle or with deer for forage on critical winter range.

E 7 - Maintain wintering elk populations in Units 23 and 24 at the present level of 5,500 - 6,000 head.

E 8 - Maintain wintering elk populations in Unit 21 at the present level of 100 head.

12/ Boyd, Raymond J., 1970 Elk of the White River Plateau, Colo. Game, Fish and Parks. 126 Pages.

E 9 - Maintain wintering elk populations in Unit 33 at the present level of 900 - 1,100 head.

E 10- Reduce the resident deer population on Oak Ridge (See Map 1) from present level of 150 deer per square mile to 75 deer per square mile.

Table 7--Summary of ratings for browse and soil condition, 640 browse range condition transects GMU's 23 (Miller Creek) and 24 (White River) 1961 - 1963.

Item	Rating Low	Rating Med.	Rating High	Rating Total	Overall or Average Rating*
Browse Composition					1.74 (Medium-)
No of Transects	240	326	74	640	
% of Total	38%	51%	12%	100%	
Browse Density					2.24 (Medium+)
No. of Transects	98	290	252	640	
% of Total	15%	45%	39%	100%	
Browse Vigor					2.36 (Medium+)
No. of Transects	131	148	361	640	
% of Total	21%	23%	56%	100%	
Soil Condition					2.20 (Medium+)
No. of Transects	139	232	269	640	
% of Total	22%	36%	42%	100%	

* Computed on basis of Low = 1, Medium = 2, and High = 3

7. Waterfowl And Shore Birds

Waterfowl habitat in the Piceance Basin is somewhat limited (Map 4), however, opportunities do exist for some expansion, improvement, and maintenance of existing habitat. The creation of several reservoirs associated with the Bureau of Reclamation's Yellow Jacket Water Development Project will undoubtedly increase the available waterfowl and shorebird habitat in the area, but the uncertain status of the project precludes specific proposals at this time. If the development does indeed occur, the Division of Wildlife and BLM will work closely with the Bureau of Reclamation to maximize the benefits of the project to waterfowl. A few of the possibilities include small island creation, land and cover plantings, nest box

installation, and marsh development along with many other techniques.

For the present, habitat improvement will of necessity be kept at a small scale since very little waterfowl habitat in the Piceance Basin is under the control of the BLM or Division of Wildlife. Resulting waterfowl and shorebirds objectives are:

WS 1 - Expand nesting habitat with 29 new water bodies. (Map 8)

WS 2 - Improve nesting and brood cover on 6 stock reservoirs. (Map 8)

WS 3 - Improve nesting habitat of Canada geese on 80 miles of the White Rive. (Map 8)

WS 4 - Maintain riparian habitat along 53 miles of national resource land on NOSR streams and Black Sulphur, Fawn, Hunter, Willow, W. Stewart, Cow, Lake, Soldier, E. Douglas and Cathedral Creeks through livestock management (Map 6a).

WS 5 - Maintain islands, backwater areas and riparian vegetation on 3 miles of national resource land along the Colorado River as suitable waterfowl and shorebird nesting and cover habitat. (See Map 1)

WS 6 - Improve nesting habitat of Canada geese along 41 miles of the Colorado River. (Map 8)

8. Greater Sandhill Crane

In late April 1975 a number of Greater Sandhill Cranes, a Colorado State endangered species, were sighted by C-a Tract biologists on 84 Mesa.13/ The birds were engaged in foraging and dancing activities, but it is not known whether they nested in the area or moved northward to nest. Cranes have been known to nest in Rio Blanco County;14/ however, in recent years there have been no reports of nesting Cranes in northwestern Colorado other than those that traditionally nest in northern Routt County.

13/ RBOSP Progress Report 3 - Summary 1975. Denver, Colo.

14/ Jelger, A.H., 1910 Notes on birds and mammals of northwestern Colorado, University of Colorado Stnd. 7:132-146

The sightings on 84 Mesa and an isolated sighting in the fall of 1975 south of Rangely by Bureau of Land Management technicians, suggest that the Piceance Basin may provide, at the very least, resting areas for the Cranes and possibly unknown dancing or nesting grounds.

A Bureau of Land Mangement wildlife technician has been hired and is currently working exclusively on the following objective:

SC 1 - Inventory Sandhill Crane use areas and determine migration routes, dancing grounds, nesting areas and seasonal use dates throughout the HMP area. (Map 9, Table 14)

9. Turkey

The Division of Wildlife has introduced turkey into the HMP area in previous years and residual populations remain in the Middle Rifle Creek and the Dry Fork regions. The overall objective of the HMP will be to increase these relict populations through releases and protect the habitat deemed critical to their survival. More specific objectives are:

T 1 - Expand occupied turkey habitat from 4,120 to 42,600 acres of national resource land (Map 12) in the HMP area.

T 2 - Protect one-fourth mile of riparian habitat critical to winter turkey survival along Middle Rifle Creek. (Map 8).

T 3 - Establish feeding plots in the Dry Fork Area.

10. Sharp Tailed Grouse

It is believed by the Division of Wildlife that sharp tailed grouse can be successfully introduced into the high elevation browse-aspen ranges of the Roan Plateau and Calamity Ridge. The introductions will be experimental in nature to determine the combination of habitat components that will lead to the successful introduction of this species. The one objective will be:

STG 1 - Establish sharp tailed grouse on 8,680 acres of the Roan Plateau and Calamity Ridge. (Map 12).

11. Blue Grouse

This game bird was formerly more numerous throughout the Piceance Basin Wildlife Habitat Area and several explanations have been advanced to account for the recent decline in population. Although the rough winters of 1972-1973 and 1973-1974 are often suggested as causes, it is more likely that unfavorable spring weather for the last several years has contributed more to the decline. In any case, it is believed that suitable habitat still exists for blue grouse in the planning area and that little difficulty will be encountered in meeting the following objectives:

BG 1 - Increase fall blue grouse density from 1 - 5 birds per square mile to 5 - 10 per square mile on suitable blue grouse range throughout HMP area.

BG 2 - Increase recreational hunter days provided by blue grouse from 200 days to 400 days.

BG 3 - Maintain stands of Douglas fir at the head of draws and ridgetops within blue grouse range as preferred winter roosts.

12. General Non-Game

To effectively manage non-game bird and mammal populations, as well as non-game fish and reptitles, it is essential that the BLM add to its knowledge of the occurrence, distribution, abundance and habitat requirements of all species that occur in the Piceance Basin. The Bureau must also obtain information on what effect their management practices directed at other species will have on non-game wildlife. The baseline data collection required of oil shale Tracts C-a and C-b has done much to increase general knowledge of this subject, but these studies cover a limited area within the HMP area. To expand the area of coverage, it will not be necessary to design and undertake a large number of new studies. Most of the information that is required can be obtained through three new studies and one ongoing study conducted by the USFWS.

Supplemental information can be obtained incidental to other inventory work by providing technicians involved in the other studies with training and field forms to record non-game information. Non-game wildlife objectives are as follows:

NG 1 - Assess the effects of mule deer habitat improvement projects on non-game birds and mammals. (Map 9, Table 14)

NG 2 - Determine population density and trend for resident non-game birds. (Map 5, Table 14)

NG 3 - Protect 2,342 acres of national resource land cliff habitat for raptors on the Roan Cliffs and 2,745 acres on the Cathedral Bluffs. (Map 5)

NG 4 - Reduce losses of non-game birds and mammals in stock tanks. (Table 10)

NG 5 - Maintain suitable nesting and feeding trees for cavity nesters throughout the HMP area.

NG 6 - Protect suitable snags as raptor nesting or perching sites throughout the HMP area.

NG 7 - Protect all identified raptor nests. (Map 5)

NG 8 - Determine the quantity and quality of 125 miles of riparian habitat associated with small streams throughout the HMP area. (Map 9, Table 14, Appendix 4)

NG 9 - Identify all reptile and amphibian species present in the HMP area. (Table 14)

NG 10 -*Identify critical habitat components necessary for continued survival of all reptile and amphibian species present in the HMP area. (Table 14)

* Following identification of species present and critical habitat components it will be necessary to formulate additional objectives to locate and protect specific areas vital to these species. These future objectives will be met by such practices as protection of snake denning areas, protection of ponds and streams necessary for amphibian reproduction, and preservation of vegetative types necessary for survival of a particular species.

13. Fisheries

The most important fishery resource on national resource land that lies within the HMP boundary is located on the Naval Oil Shale Reserve on the Roan Plateau. Inventory work (See Table 8 for a summary of the study) conducted in late summer of 1975 on Trappers Creek, North Water Creek, and East Fork Parachute Creek revealed the need for a significant number of projects to be undertaken on these streams to protect the habitat of the Colorado State listed threatened Colorado River cutthroat trout (Salmo clarkii pleuriticus). These projects have been identified and scheduled for implementation in section "D" of the Wildlife Plan but funding needs will be separated from the total funding package and submitted to the Navy for their consideration, as they support any project work undertaken on the Naval Oil Shale Reserve.

Other fisheries habitat in the HMP area is in need of further inventory work before management recommendations can be formulated. The emphasis of the Wildlife Plan will be to schedule the inventory work and update the fisheries portion of the Plan when the information becomes available.

C-a and C-b shale tract biologists have obtained considerable information on the creeks near their projects, but little national resource land is involved along the streams that have good potential for development (Willow, Stewart, and Piceance Creeks) and the uncertain status of the tracts themselves make formulation of management recommendations difficult, if not impossible. Fisheries associated with the tract will be discussed further in the energy (Section 2-E, 2-F) portion of the HMP.

The endangered fish species endemic to the Colorado River drainage, the hump-back sucker, and hump-back chub deserve special emphasis, but not enough is known about their population status and distribution within the HMP area to do more than protect their potential habitat until the various interagency recovery teams concerned with the survival of these species can develop their plans for this specific area.

Action plans for the endangered fish species of the Colorado and White Rivers will be developed when the current studies being conducted by the NUS Corporation for C-a, Burkhard for Yellow Jacket Project, Woodward-Clyde for C-b, and Prewett for the BLM, are completed and analyzed to see if they will

TABLE 8: Summary of Stream Profile of NOSR Streams Inventoried September 1975
(See Appendix 4 for rating criteria and Definitions)

	Ave. Width	Ave. Depth	Pool/Riffle Ratio	Pool Quality	Riffle Quality	Bank Stability	Bank Cover Rating	Bottom Composition
Trappers Creek	4.6 Ft.	.24 Ft.	39.4/60.6	Class 1. 0 2. 0 3. 0 4. 47% 5. 53%	Class 1. 0 2. 0 3. 9.5% 4. 90.5%	Stable 35.7% Unstable 64.3%	Poor 90.5% Fair 9.5% Good	Boulder 5.4% Rubble 9.9% Coarse Gravel 10.9% Fine Gravel 7.3% Sand 1.4% Silt 36.4% Shale 26.6% Bedrock
Northwater Crk.	4.9 Ft.	.35 Ft.	40/60	1. 10% 2. 10% 3. 19% 4. 43% 5. 19%	1. 0% 2. 10% 3. 71% 4. 19%	Stable 65% Unstable 35%	Poor 54% Fair 40% Good 6%	Boulder 6.4% Rubble 34.5% Coarse Gravel 17.0% Fine Gravel 11.6% Sand 5.8% Silt 21.0% Shale Bedrock
E. Parachute Crk. (Lower Half)	7.5 Ft.	.4 Ft.	55/45	1. 33% 2. 42% 3. 25% 4. 0 5. 0	1. 17% 2. 58% 3. 17% 4. 8%	Stable 87.5% Unstable 12.5%	Poor 25% Fair 20.8% Good 54.2%	Boulder 18.7% Rubble 14.1% Coarse Gravel 18.3% Fine Gravel 7.4% Sand 6.2% Silt 27.0% Shale 7.9% Bedrock 0
E. Parachute Crk. (Upper Half)	3.2 Ft.	.28 Ft.	31/69	1. 0% 2. 8% 3. 0% 4. 33% 5. 58%	1. 0% 2. 0% 3. 42% 4. 58%	Stable 8.3% Unstable 91.7%	Poor 66.7% Fair 33.3% Good 0	Boulder 0 Rubble 0 Coarse Gravel 0 Fine Gravel 0 Sand 0 Silt 20.8% Shale 76.6% Bedrock 2.5%

provide the needed information.

The following objectives are considered to be starting points for the fisheries portion of this plan and more will be added as inventory work proceeds.

F 1 - Determine in-stream and riparian habitat values and potentials for improvement of 125 miles of streams throughout the HMP areas (Map 9; Table 14).

F 2 - Determine the suitability of Lake, Soldier, East Douglas, and Bear Park Creeks for introduction of Colorado River cutthroat trout (Map 9; Table 14).

F 3 - Raise bank cover ratings on 13 miles of NOSR streams to at least 50 percent Good, 40 percent Fair, and 10 percent Poor (present condition available from Table 8, criteria for ratings available in Appendix 4) (Map 8).

F 4 - Increase pool quality ratings on 13 miles of NOSR streams from Classes 4 and 5 to Classes 1 and 2. (Appendix 4; Map 8).

F 5 - Improve riffle quality on 13 miles of NOSR streams from 3 and 4 ratings to at least a 2 rating. (Appendix 4; Map 8).

F 6 - Reduce silt composition on NOSR streams to a maximum of 10 percent. (Table 8; Appendix 4; Map 8)

F 7 - Increase bank class on NOSR streams to a minimum of 60 percent shrub cover with grass understory. (Table 8; Appendix 4; Map 8)

F 8 - Increase canopy cover from 5 percent to 40 percent on NOSR streams (Table 8; Appendix 4; Map 8).

F 9 - Protect threatened Colorado River cutthroat trout population in NOSR streams.

F 10 - Establish minimum stream flow requirements needed to maintain aquatic and riparian habitats on 125 miles of streams throughout the HMP area (Map 9; Table 14).

F 11 - Improve stream cover on one-half mile of national resource land on Piceance Creek (Map 9).

F 12 - Protect backwater areas and sloughs along the Colorado River as critical habitat for the humpback sucker.

TABLE 9: Summary of Objectives, Methods and Evaluations For Piceance Basin HMP

	OBJECTIVE	METHODS	EVALUATION
	MULE DEER		
Md 1	(Improve browse vigor in Piceance Triangle).	AMP's (Little Hills, North Dry Fork, Main Dry Fork, Hatch Gulch, Segar Gulch, Thirteen Mile), Projects (#'s 3, 4, 16, 17, 19, 19a, 50, 51)	Range condition transects on each allotment every 2 years. Browse condition every 3 years. Survey entire GMU22 winter range in 1989-1991.
Md 2	(Improve browse vigor and density in Hammond-Barcus key area).	AMP's (Hammond Draw, Boise Draw, Little Spring Creek, Greasewood, Barcus-Pinto Gulch), Projects (#'s 1, 6, 18, 33, 49), Wildhorse Plan	" " " "
Md 3	(Improve browse vigor and density in Barcus-Ryan key area).	AMP's (Rocky Ridge, Barcus-Pinto Gulch, Boxelder, Square S, Reagles), Projects (#'s 5, 6, 33, 20, 21) Wildhorse Plan	" " " "
Md 4	(Maintain browse vigor, increase density in Ryan-Story key area).	AMP's (Square S, Black Sulphur, Fawn Creek, Piceance Mountain) Projects (#'s 39, 45).	" " " "
Md 5	(Determin browse condition on 210,000 acres of deer winter range).	16 man-months scheduled for browse condition transecting	Analysis of transects.
Md 6	(Assess affects of mule deer forage consumption on deer winter range at various population levels)	2 man-months each DOW-BLM to read 60 utilization transects each spring.	" " " "
Md 7	(Increase GMU 22 winter deer population to 40,000).	All AMP's in GMU 22, Projects (#'s 1, 3, 4, 5, 6, 16, 17, 18, 19, 19a, 20, 21, 24, 26, 33, 39, 41, 44, 45, 49, 50, 51) Harvest, season length and date recommendations.	DOW aerial population census.
Md 8	(Maintain GMU 32 & 33 winter deer population 8,000-12,000)	All AMP's in GMU 32 and 33, Projects (#'s 25, 28, 34, 35, 47, 48) Harvest, season length and date recommendations.	" " " "
Md 9	(Maintain GMU 23 winter deer population at 5,000-6,000).	Increase harvest through better access (DOW will pursue). Block up BLM and DOW land (Oak Ridge exchange, LO 7 area acquisition).	" " " "
Md 10	(Increase GMU 21 winter mule deer population to 10,000 - 12,000).	Restrictive seasons, Rangely AMP's, Wildhorse Plan, Natural reproductive potential.	" " " "

OBJECTIVE	METHODS	EVALUATION
Md 11 (Determine deer-livestock winter diet overlap on specific allotments).	Colorado State University contracted study.	Receipt of final report.
Md 12 (Determine topographical and vegetative characteristics of preferred mule deer winter habitat).	DOW contracted study.	" " " "
Md 13 (Complete browse condition inventory of GMU 21 winter range).	24 man-months acheduled for browse condition transecting.	Analysis of transects.
Md 14 (Maintain hunter density at 5.0/sq. mile, or less)	Acquire needed access.	DOW harvest record analysis.
Md 15 (Improve browse production on 4,595 acres of critical winter range).	Project #'s 1, 3, 16, 17, 18, 19, 19a, 20, 21, 25, 28, 33, 34, 35, 39, 44, 45, 47, 48, 49, 50, 51.	Browse condition and pellet group transects prior to treatment and 5 years after treatment for browse condition and annually for 10 years for pellet groups.
PEREGRINE FALCON		
P-1 (Assess current and potential Peregrine Falcon habitat)	DOW contracted study	Receipt of final report.
P-2 (Preserve one mile radius surrounding falcon eyrie).	BLM land exchange, or recommend U.S. Fish and Wildlife Service acquire.	Success or failure of acquisition attempt.
P-3 (Protect 570 acres of riparian habitat on NRL in Parachute Crk. drainage).	Naval Oil Shale Reserve AMP, Clough Albef AMP, East Fork AMP, JQS AMP, Projects (#'s 7, 8, 10d, 10e, 12, 38).	Range condition transects on AMP's.
BLACK FOOTED FERRET		
BFF-1 (Inventory 17,700 acres of potential black footed ferret habitat).	6 man-months allotted for research project.	Receipt of Final Report.

OBJECTIVE	METHOD	EVALUATION
BALD EAGLE		
BE-1 (Protect 2170 acres of bald eagle winter habitat).	Opposition to rights-of-way that would interfere with habitat. Special atipulations on R/W's, leasea and permits.	Yearly eagle population counts.
BE-2 (Identify specific roosting and perching sites on White River).	5 man-months acheduled for study.	Receipt of final report.
SAGE GROUSE		
SG-1 (Identify wintering, brood rearing and strutting grounds on 211,000 acres of sage grouse habitat).	DOW contracted study.	Receipt of final report.
SG-2 (Create 180 acres of wet meadow habitat).	Project #'s 4, 4abc, 24, 24a, 26, 26ab	Vegetation meaaurements before and three years after treatments. Annual brood counts.
SG-3 (Improve wet meadows on Roan Plateau)	AMP's (Piceance Mountain, Fawn Creek, Black Sulphur, McCarthy Gulch, Cow Creek).	Range condition transects on allotments every 2 years. Annual brood counts.
SG-4 (Increase fall density of aage grouae in Magnolia Peak area, 1-5 birds per sq mile to 5 to 10 birds/sq mile.)	AMP'a (Little Hilla, Main Dry Fork), Project #'s 4, 4abc, 14, 24, 24a	Annual brood counts.
SG-5 (Increase fall density from 1 to 5 to 5 to 10 birds/sq mile in Stake Springs, Ryan Gulch area)	AMP's (Square S, Black Sulphur, Fawn Creek), Project #'s 26, 26ab, 40	" " "

OBJECTIVE	METHOD	EVALUATION
ELK		
E-1 (Improved forage production on 1,500 acres of critical elk range).	Project #'s 13, 27, 42, 43, 46	Browse condition and pellet group transects prior to and 5 years after treatment.
E-2 (Improve administrative management of 10,240 acres of elk winter range in GMU's 23 and 24).	Oak Ridge exchange, Oak Ridge access (DOW), LO7 area land acquisition or exchange.	Success or failure of exchange and acquisition efforts.
E-3 (Maintain 20,720 acres of aspen and Douglas fir types).	Stipulations on timber cutting, rights-of-way and mining activities.	Review of EAR's for adequacy of stipulations. Compliance checks.
E-4 (Reduce elk-livestock interaction on elk calving areas).	Forest Service AMP's, Clough-Alber, JQS AMP's, access restrictions, road closures.	Evaluation of grazing systems in AMP's.
E-5 (Determine browse condition on 21,400 acres of elk winter range in GMU 22).	8 man-months scheduled for transecting.	Analysis of transects.
E-6 (Increase GMU 22 wintering elk population).	Natural reproductive increment, Piceance Mtn AMP, Projects 42 and 43.	DOW aerial population census.
E-7 (Maintain GMU 23 & 24 wintering elk population at 5500 - 6000).	Harvest and season length and date restrictions, Forest Service AMP's, Project #'s 13, 27, 46	" " " "
E-8 (Maintain GMU 21 wintering elk population at 100).	Harvest manipulation.	" " " "
E-9 (Maintain GMU 33 wintering elk population at 900 to 1100).	Glenwood AMP's, Project #'s 25, 28, 34, 35, 47, 48.	" " " "
E-10 (Reduce resident deer population on Oak Ridge to 75/sq. mile).	Oak Ridge exchange, Oak Ridge access (DOW will pursue), possible special hunt, Project #13	DOW aerial population census and pellet group transects.

OBJECTIVE	METHOD	EVALUATION
WATERFOWL & SHOREBIRDS		
WS-1 (Expand nesting habitat w/29 new water bodies).	Project #'s 46, 5, 6, 10, 10a, 26a, 31	Annual field observations on all new reservoirs.
WS-2 (Improve brood cover on 6 existing reservoirs)	Project #30.	Ocular estimation of percent vegetative cover before and 5 years after treatment.
WS-3 (Improve nesting habitat of Canada Geese on 80 mi. of White River).	Project #'a 15, 23.	Canada goose brood counts (float White River every three years).
WS-4 (Maintain 53 miles of riparian habitat on NRL).	AMP's (Naval Oil Shale, JQS, Clough-Alber, East Fork, Cow Creek, Piceance Mountain, Fawn Creek, Black Sulphur, Lake Creek), Projects (#'a 10, 10abcde, 11, 37, 38, 8, 12, others to be identified through scheduled research).	Range condition tranacets conducted every 3 years on all AMP'a.
WS-5 (Maintain islands, backwater areas, and riparian vegetation on 3 miles of NRL on Colorado River).	Stipulations on gravel sales, R/W's, oil and gas leases.	Review of EAR's for adequacy of stipulations. Ocular assessment every 3 years. Compliance checks.
WS-6 (Improve nesting habitat of Canada Geese on 41 mi. of Colo. River).	Project #36.	Canada goose brood counts (float White River every three years).
GREATER SANDHILL CRANE		
SC-1 (Inventory HMP area to determine migration routes, dancing and nesting areas).	6 man-months acheduled for research study.	Receipt of final report.

OBJECTIVE	METHOD	EVALUATION
TURKEY		
T-1 (Expand occupied habitat to 42,600 acres).	Annual releases for 3 years (FY-77, 78, 79).	Annual brood counts.
T-2 (Protect 1/4 mile of riparian habitat critical to turkey survival).	Project 22, Brush Creek Common AMP.	Vegetative condition transect prior to and 5 years after fence installation.
T-3 (Establish food plots in Dry Fork Area).	DOW project.	Annual track and scat counts.
SHARPTAILED GROUSE		
STG-1 (Establish sharptailed grouse on Roan Plateau and Cathedral Bluffs).	Annual releases for 2 years after source of supply is located.	Annual brood counts.
BLUE GROUSE		
BG-1 (Increase fall density from 1-5 to 5-10/sq mile on suitable range).	Project #'s 24, 4, 10, 10ab, 30, others to be developed after inventory work.	Annual brood counts.
BG-2 (Increase hunter days from 200 to 400).	" " " " " " " " "	Hunter check stations.
BG-3 (Maintain Douglas fir stands).	Forestry restrictions, stipulations on mining, mineral exploration and R/W's.	Review of stipulation on EAR's. Compliance checks.

OBJECTIVE	METHOD	EVALUATION
GENERAL-NON-GAME		
NG-1 (Assess effects of deer habitat improvement projects on non-game birds and mammals).	DOW contracted study on Lee Gulch P-J chaining and E. Greasewood sage beating.	Receipt of final report.
NG-2 (Determine population density and trend for non-game birds).	Cooperative effort with US Fish and Wildlife Service. Two tracts of NRL identified as study area. Other to be established. Two BLM man-months /year scheduled for transecting.	Analysis of transects.
NG-3 (Protect 5087 acres of cliff habitat for raptor nesting).	Stipulations on R/W's, mining and exploration permits.	Review of stipulations on EAR's. Compliance checks.
NG-4 (Reduce non-game wildlife losses in stocktanks).	Project 6b.	None needed.
NG-5 (Maintain suitable nesting and feeding trees for cavity nesters).	Stipulations on wood cutters, range and wildlife projects, mining and exploration activities and R/W's.	Review of stipulations on EAR's. Compliance checks.
NG-6 (Protect suitable snags as raptor nesting or perching sites).	" " " " " "	" " " "
NG-7 (Protect all identified raptor nests).	Stipulations on woodcutters, range and wildlife projects, mining and exploration activities and R/W's.	Review of stipulations on EAR's. Compliance checks.
NG-8 (Determine quantity and quality of 125 miles of riparian habitat associated with small streams throughout the HMP area).	DOW contracted study.	Receipt of final report.
NG-9 (Identify reptile and amphibian species in HMP area) NG-10 (Identify critical habitat components of reptile and amphibian species in HMP area).	Literature review of herpetological data. Analysis of C-a and C-h herpetological studies. Personal contacts with C.O. Counts of Colo. Herp. Soc., Bruce Bauerle of Mesa College, and herpetologists Hobart Smith, Paul Maslin and Charles Badcliff. Scheduling of contracted studies after analysis of existing data.	Analysis of information collected.

OBJECTIVE	METHOD	EVALUATION
FISHERIES		
F-1 (Determine in-stream and riparian habitat values of 125 miles of streams)	DOW contracted study.	Receipt of final report.
F-2 (Inventory Lake and Soldier Creeks to determine potential for Colorado Cutthroat trout introduction).	2 man-months scheduled for study.	" " " "
F-3 (Raise bank cover ratings on NOSR streams).	Projects #'s 7, 8, 10, 10abcde, 11, 12, 37, 38, Naval Oil Shale AMP, Clough Alber, JQS, and E. Fork AMP's.	Survey NOSR streams 5 years after completion of projects.
F-4 (Improve pool quality on NOSR streams)	" " " " "	" " "
F-5 (Improve riffle quality on NOSR streams).	" " " " "	" " "
F-6 (Reduce silt composition on NOSR streams).	" " " " "	" " "
F-7 (Increase bank class on NOSR streams)	" " " " "	" " "
F-8 (Increase canopy cover on NOSR streams).	" " " " "	" " "
F-9 (Protect threatened Colorado cut-throat trout population in NOSR streams).	Projects #'s 7, 8, 10, 10abcde, 11, 12, 37, 38, Naval Oil Shale AMP, Clough Alber, JQS, and E. Fork AMP's. Possible fishing restrictions by DOW. CSU Hybridization Study.	" " "
F-10 (Establish minimum flows needed to maintain aquatic and riparian habitat on 125 miles of streams)	DOW contracted study.	Receipt of final report.

OBJECTIVE	METHOD	EVALUATION
F-11 (Improve stream cover on one-half mile of Piceance Creek).	Project #29	Ocular estimation of percent canopy cover 5 years after willow planting.
F-12 (Protect backwater areas on Colo. River for humpback sucker.	Stipulations on gravel sales, mining and exploration, recreation activities and R/W's.	Review of stipulations on EAR's. Compliance checks.

CONSTRAINTS

C. Constraints

Recommendations contained in this plan are consistent with the management decisions reached through the Bureau of Land Management planning process, which produced the Garfield and White River Management Framework Plans (MFP). These multiple use planning documents establish coordinated land-use allocations for all resources and determine objectives and constraints for consideration in preparing detailed program activity plans (Habitat Management Plans for wildlife, Allotment Management Plans for range, etc.). The Management Framework Plan (MFP) considers input from all resources, resolves conflicts between resources and arrives at decisions only after a complete analysis of information obtained through public participation meetings has been made.

The Garfield Management Framework Plan was completed in 1975 and is on file at the Bureau of Land Management Office in Glenwood Springs. The White River Management Framework Plan, covering the majority of the HMP area, was also completed in 1975 and is on file in the Meeker Bureau of Land Management Office. The following is a brief summation of the Management Framework Plans major management decisions, which serve to guide and constrain the Piceance Basin Wildlife Habitat Management Plan:

White River MFP:

1. Livestock numbers will not be adjusted in the deer winter range until wildlife habitat and livestock forage inventories have been completed.

2. Initiate studies to determine relocation of fences, removal of some and changes in design of others.

3. Allow oil and gas exploration and development, oil shale development, saline minerals development, and coal develoment with sufficient stipulations to protect wildlife habitat.

4. Vegetative manipulation and other land treatment practices will be allowed on areas not within the intensive mineral activity areas.

5. Do not mechanically or chemically manipulate vegetation in Skull Creek Basin, Philadelphia Creek, Buckwater Draw,

Crooked Wash and Black Mountain areas.

6. Identify endangered species habitat areas.

7. Allow no surface disturbance of endangered species habitat areas as identified.

8. Use livestock as a tool to manipulate vegetation.

9. Priority for habitat management plans subsequent to inventories will be the wild horse range, areas of critical erosion, and concentrated wildlife use areas and Skull Creek Basin.

10. Do not remove wild horses from deer winter range, except those west of Douglas Creek. (This decision has subsequently been modified by the Wild Horse Management Plan. See Section F-2 for details).

11. Allow fisheries development in occupied beaver ponds and streams.

12. Herbicides will not be used as a method of vegetative manipulation unless recommended in an environmental analysis report and approved by the proper authorizing committee.

13. Allow water storage in stock tanks during times of livestock absence.

14. Restrict surface disturbance activities in wildlife fawning and calving areas during calving or fawning times.

15. Control noxious weed infestations.

16. Future development of water sources are to be designed to include fenced areas. Size of the area is to be determined on an individual basis.

17. No land treatment practice will be initiated until the completion of an Environmental Analysis Record (EAR) by an interdisciplinary team.

18. Accept the recommendation to fertilize deer and elk concentration areas.

19. Do not fence existing water sources and developments unless

the need is identified by field review.

20. Restrict phreatophyte control within 150 feet of all live or intermittent streams.

Garfield MFP:

1. Improve mule deer and elk habitat and populations.

2. Improve blue grouse habitat on the Naval Oil Shale Reserve.

3. Increase and expand the population of chukar partridge and turkey in this planning unit.

4. Expand habitat for raptors and cavity nesting birds.

5. Expand habitat for riparian inhabiting species and protect riparian habitat types.

6. Inventory, recommend management direction, and provide base line data pertaining to the fisheries resource in this planing unit.

7. Consolidate land pattern within this planning unit.

8. Obtain needed access within this planning unit for hunting, recreation, and proper resource management.

9. Establish habitat management plan priorities.

10. Improve big game winter range by thinning and seeding areas, particularly Pinyon-juniper stands with browse, perennial grass, and desired species of trees if natural seed sources are inadequate.

11. Maintain existing habitat for deer and elk in its present condition.

12. Prohibit camping, winter sports, and off-road vehicle traffic in critical wildlife areas.

13. Provide input into fire suppression activities within this planning unit.

PLANNED ACTIONS

D. Planned Actions

1. Species Management

The Division of Wildlife has proposed a number of Wildlife introductions throughout the HMP area and it is the Bureau's intention to cooperate fully with the Division in their efforts. This cooperation will take the form of Bureau of Land Management personnel assisting the Division of Wildlife in evaluating habitat to determine specific release sites and to provide logistical and technical support during the actual release program, if such programs are feasible.

The Division of Wildlife released 14 turkeys in the Dry Fork area in March 1975, near the Little Hills Experimental Station, and sightings this year indicate that most of the birds survived the winter and have successfully reproduced. The Division plans to release 12 - 15 birds in each of the next three years in the same general area (Map 12) and probably establish feeding stations (5 acre food plots) to increase the chances of the birds survival through the winter. Control of predators, particularly near the feeding stations, will be undertaken as deemed necessary by the Division of Wildlife. The installation of gallinaceous guzzlers by the Bureau in the Magnolia Peak area, though targeted for sage grouse (Map 8, Table 10), will also be of benefit to turkeys during the drier months. (objectives served: T 1, T 3).

The Division of Wildlife is also contemplating the establishment of sharptailed grouse in two areas of the Piceance Basin. The exact areas selected will be of differing vegetative types to gain information on the habitat type in the Piceance Basin most amenable to sharptailed grouse establishment. The types presently being considered are an aspen-grass association near upper Fawn and Dry Creeks and a grass-service-berry association near upper Duck or Corral Creek (Map 12). The areas will be evaluated in 1977 and the introduction of approximately 75 birds into each area will be accomplished in 1978. This project is dependent upon the availability of a suitable source of grouse for the introduction. (Objective served: STG 1).

The Bureau will cooperate with the Division of Wildlife in a supplemental release of wild turkey in the Middle Rifle Creek (Map 12) area to increase the base population of turkeys already occupying the suitable habitat. The Bureau of Land Management will fence one-fourth mile on each side of Middle

Rifle Creek to protect the stream influence zone from degradation by livestock (Map 8). The present lack of cover on the creek is thought to play a major role in increasing winter stress on the existing turkey population. The fence will provide livestock pass-throughs to the stream to negate any conflict with livestock. (Objectives served: T 1, T 2)

To increase the wintering deer population in Game Management Units 21, 22, 32, and 33, it may be necessary to continue restrictive and specified seasons or to manipulate season lengths, dates and harvests in other ways, as deemed necessary by the Division of Wildlife. The Bureau of Land Management will provide the Division with habitat condition information on which to base their decisions and will submit recommendations to local Wildlife Conservation Officers (WCO's) prior to the Division's annual season and harvest meetings. (objectives served: Md 7, Md 8, Md 9, Md 100.

Biologically sound buck-doe ratios (as determined by the Division of Wildlife) should be achieved and maintained throughout the HMP area.

The Bureau of Land Management may eventually request that certain creeks be stocked by the DOW after scheduled inventories have been accomplished. Species, dates, and areas to be stocked will be determined after analysis of the inventory work has been completed.

2. Habitat Management

The following habitat development and improvement projects are scheduled for implementation as shown in Table 10, which also sets forth cost estimates and manpower requirements for their accomplishment. Detailed costs and benefits expected can be obtained from the job documentation reports (JDRs) contained in Appendix 5. Map 8 gives the approximate location of each project.

Projects targeted for mule deer are designed to disperse deer from traditional concentration areas, allowing these areas to improve so that they may be used heavily during severe winters when they are critically needed. The projects are also designed to draw deer off of the winter range at the earliest possible date and to improve browse vigor throughout the winter range.

Elk habitat improvement efforts will be kept above mule deer winter range in order to lessen completion between the two species.

Projects for all other species are largely designed to improve reproduction success.

A separate Environmental Analysis Record (EAR) will be completed for each project prior to its implementation. At that time, stipulations designed to protect other resource values peculiar to that area will be placed on the project. All of the projects, however, will be required to meet the following general standards. Vegetative Manipulation:

1. Treated areas will be irregular in nature, consisting of patches, strips, and fingers that seek to maximize edge effect.

2. As an optimum guideline, no point on the treated area should be more than 100 yards from suitable cover. Exceptions to this guideline can be made if a need is revealed through an analysis by an interdisciplinary team.

3. Visual management techniques will be incorporated into all treatments, particularly those near major travel routes.

4. Existing roads will be used whenever possible to deliver men and equipment to the treatment sites. Any new roads constructed will be physically closed and seeded after

treatment, unless needed for maintenance or other management purposes.

5. Roads will not be cleared through sagebrush except in extraordinary cases. Equipment will be walked over the sagebrush.

6. No dead standing tree will be cut.

7. Sagebrush treatment will be evaluated on an individual basis providing for habitat requirements of sage grouse and other species dependent on sagebrush.

8. In general, an average of ten live trees per acre will be left on pinyon-juniper cutting areas (this may vary on a very few areas).

9. An archaeological clearance will be required on all project work.

Fences:

1. Fences will meet the criteria specified in Bureau Manual 1737 for big game ranges.

Water Developments:

1. Reservoirs will be fenced and livestock water will be piped to a stock tank,

2. Stock tanks will have bird and small mammal escape ramps installed.

3. Aquatic and riparian vegetation will be planted around all reservoirs to provide waterfowl cover.

4. Guzzlers will be situated on north facing slopes, if possible.

5. Guzzlers will be periodically checked to evaluate hunter and predator exploitation and need for maintenance.

Soils:

1. All projects will be checked against the 1975 - 1976 soil survey conducted by the Soil Conservation Service for the

Bureau of Land Management to insure that soil types are suitable for the purpose of the project.

The narrative that follows summarizes the rationale behind the major projects and lists management objectives served by each. Transects referred to are from 1973 Wild Horse Range Survey, 1965 - 1967 Deer Winter Range Survey, 1974 C-a Survey, 1975 Rangely Winter Range Survey or 1973 Rifle Winter Range Survey. (See Map 13 for areas covered by each survey).

Priority (from Table 10):

1. Greasewood Gulch sage beating - This bottomland sagebrush-greasewood type has reached an advanced state of decadence as have many of the drainage bottoms in the Piceance Basin. The overgrown sagebrush provides little forage for deer or sage grouse, however, it does afford excellent cover. Since adequate cover will still be available within 100 yards of any point on the beaten area, it is felt that the increase in forage production will more than compensate for the slight loss in overall cover. (Objectives directly served are MD 2, Md 7, Md 15).

1a. Greasewood Gulch seeding - This project is designed to test the results of different seeding mixtures and/or rates on a chained bottomland sagebrush-greasewood type. The abundance of decadent sagebrush types in drainage bottoms in the Piceance Basin make it mandatory that we acquire more knowledge concerning methods for revitalizing these areas. Seed mixtures to be tested will be selected after consultation with revegetation experts from the Soil Conservation Service, Colorado State University and various ecological consulting firms in addition to Bureau of Land Management specialists.

2. Greasewood Gulch exclosures - To be used in conjunction with the above project to determine the effects of livestock and mule deer on the experimental seeding.

3. Lee Gulch Chaining - Dense pinyon-juniper overstory (55 percent) inhibits browse production on this site which is adjacent to a mule deer winter concentration area (Map 2). Browse composition is rated as medium (See Appendix 4), however, density and vigor are extremely low. A properly laid out wildlife chaining will maximize edge effect and

stimulate browse production. Baseline data concerning non-game wildlife populations are presently being gathered on this site to compare with after treatment studies to assess the effects of the treatment. (Objectives directly served are Md 1, Md 7, Md 15).

4a. Timber Gulch sage beating, seeding, reservoir construction
4b. and fencing - The ultimate goal of this project to create
4c. a wet meadow environment with an abundance of water for use as a brood rearing area by gallinacious birds. The site is currently occupied by extremely decadent sagebrush, six to eight feet tall. The perennial stream in the bottom is fed by a number of nearby springs. The area is within blue grouse range and in recent years sage grouse have been noted in increasing numbers a slight distance to the north. The site is also in the vicinity of the DOW's proposed turkey introduction. (Objectives directly served are: SG 2, SG 4, WS 1, T 1, BG 1, BG 2).

5. Pinto Mesa Reservoirs - Development of seven reservoirs
5a. in this area of inadequate water will provide nesting habitat for waterfowl and shore birds and provide water sources for all species of wildlife. Increased water in this area will more evenly distribute livestock and mule deer on the Barcus-Pinto chaining. This chaining is a large range type chaining that receives little use by mule deer. Increasing utilization of grass by livestock on the chaining will tend to release browse from competition and the increased stature of individual browse plants will eventually provide badly needed cover for mule deer on the chaining. (WS 1, Md 2, Md 7).

6. Barcus Reservoirs - The rationale behind these five reser-
6a. voirs is the same as that given above. (WS 1, Md 2, Md 7).

7. Naval Oil Shale Reserve (NOSR) Stream Fencing, Reservoir
8. Construction, Willow Planting and Weir Placement - These
10. projects were developed as a result of the stream inven-
10a. tories conducted by Bureau of Land Management personnel
10b. in August 1975. The inventories revealed that the three
10c. streams surveyed (Trappers Creek, Northwater Creek, and
10d. East Fork Parachute Creek) were in a severely degraded
10e. condition due to improper livestock management. The pro-
11. jects are designed to restore the streams to their former
12. condition and maintain them through improved livestock
37. management systems. The projects consist of fence place-
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ments to control livestock, reservoir development to compensate for excluding livestock from the streams and in-stream improvements, such as weir logs to improve pool-riffle ratio and quality, and willow plantings to improve stream cover. The U.S. Navy will not allow Bureau of Land Management funds to be used on the Naval Oil Shale Reserve, but they have indicated that they may possibly use Navy funds to accomplish the restoration of the NOSR streams. Funding requests will be submitted to the Navy through the appropriate fiscal channels. (F 3 through F 9, WS 1, BG 1, BG 2).

9. Greasewood Gulch Plot fencing - This project involves the fencing of one-half of each of the experimental plots in the Greasewood Gulch. Lack of funds prevented the inclusion of this operation when the sagebrush beating and seeding study was first developed. By fencing one-half of each plot, the effects of unregulated livestock grazing on each of the 4 treatment areas can be measured.

13. Oak Ridge Oak Thinning - Same rationale as South Fork (Project #27). Approximately 400 acres should be treated. (E 1, E 7, E 10).

14. Magnolia Guzzlers - The Magnolia Peak region supports a large number of sage grouse and it will become increasingly important to wild turkeys as the DOW continues their efforts to establish this bird in the Piceance Triangle. The lack of dependable water sources and the low amount of summer precipitation in the area will tend to limit the desired increase in gallinaceous bird populations unless the situation is remedied by the development of artificial, but reliable sources of water. The installation of four properly spaced guzzlers will contribute to the solution of the problem. (T 1, SG 4).

15. White and Colorado Rivers Goose Nesting Platforms - Con-
23. struction of these devices will be funded by the Bureau of
36 Land Management and BLM personnel will assist the DOW in erecting the structures after locations have been mutually agreed upon. (WS 3, WS 6).

16. Howard Pinyon-juniper Thinning - Browse condition transects indicate that serviceberry is 50 - 80 percent heavily hedged, mountain mahogany 70 to 100 percent heavily hedged and bitterbrush is 90 percent heavily hedged in this area. Dead minus

young plants are equal to approximately 60 percent of the total. These figures indicate that browse vigor is extremely low as is browse density (5 - 13 percent). Pinyon-juniper overstory, judging from 1973 aerial photos, averages 30 - 40 percent making this area a suitable candidate for chaining. Chaining will be laid out on three north-south ridge tops and will be approximately 250 acres. (Md 1, Md 7, Md 15).

17. Greasewood Gulch Pinyon-juniper Thinning - The low browse density in this area (approximately 7 percent) coupled with low vigor ratings (mountain mahogany 76 percent hedged, dead minus young 82 percent, serviceberry 72 percent heavily hedged, dead - young 100 percent) and high pinyon-juniper overstory (35 - 45 percent) indicate that chaining rather than livestock management would be necessary in this area to improve browse condition. Chaining would cover approximately 200 acres on ridgetops and south facing slopes and would consist of patches, strips, and fingers in two separate areas. (Md 1, Md 7, Md 15).

18. Lower Barcus Pinyon-juniper Thinnings - The heavy pinyon-juniper overstory (50 percent +) in this area is probably the major causative factor leading to the low browse density (7 percent) that was observed here. Although vigor ratings of browse are fairly high, it is believed that a pinyon-juniper thinning operation would benefit mule deer by increasing browse density and encourage heavier utilization of the available browse. Project covers approximately 110 acres and lies on a relatively flat ridgetop with a slight northern exposure. (Md 2, Md 7, Md 15).

19. Dry Fork Sage Beating - Rank sagebrush in this valley bottom often reaches a height of 10 feet or more and the density of the sage (60 percent +) is such that little of the grass understory is available to mule deer. Mule deer make significant use of the meadow areas on private land in this area during the spring and creation of a grass meadow here will provide additional succulent forage at a time when it is critically needed by the species. (Md 1, Md 7, Md 15).

19a. East Greasewood sage Beating and Seeding - The sagebrush in this gulch is not particularly rank or decadent, but it is apparently of the subspecies, Artemisia tridentata tridentata which has very low palatability, and conse-

quently utilization is almost nil. Approximately 75 acres will be chopped and seeded with A. t. wyomingensis if a seed source can be located. This subspecies has moderate palatability and it will also grow in bottomland situations with A. t. tridentata. Baseline data concerning non-game wildlife populations are presently being gathered on this site to compare with after treatment studies to assess the effects of the treatment. (Md 1, Md 7, Md 15).

20. 20a. Wolf Ridge Pinyon-juniper Thinning - Extremely dense pinyon-juniper canopy cover (50 - 60 percent +) has resulted in a very sparse (less than 10 percent) browse and herb understory in this area. Thinning will cover about 260 acres on a relatively flat ridgetop. Seeding will include early season grasses and forbs to be used by mule deer as they leave the winter range. (Md 3, Md 7, Md 15).

21. 21a. Stake Springs Pinyon-juniper Thinning - This area is very similar to Wolf Ridge (transect figures will be inserted at a later date.) Thinned area will cover 320 acres and occupy a relative flat ridge top. Seed mixture will be much the same as that described for Wolf Ridge. (Md 3, Md 7, Md 15).

24. 24a. Dark Canyon Well - The water obtained from this well will be used to increase grass and forb density in a meadow area below the site. The increased water and forage available will hopefully lead to utilization of the area by brooding sage grouse. Livestock water will be piped to a tank and the meadow area will be fenced if subsequent observations reveal the need for livestock exclusion. (SG 2, SG 4, BG 1, BG 2).

25. West Elk Pinyon-juniper Thinning - Low browse density (7 percent), high pinyon-juniper canopy cover (45 - 50 percent) and 44 percent decadent browse suggest that this site would benefit from a firewood and fence post sale. The approximately 600 acres of pinyon-juniper available could stand at least 250 acres of treatment. (Md 8, Md 15).

26. 26a. 26b. Galloway Gulch Sagebrush Beating and Reservoir Construction - Removing approximately 50 percent of the sagebrush cover in this portion of Galloway Gulch and constructing 3

reservoirs to pond water and raise the surrounding water table will create a wet meadow environment suitable for sage grouse brood rearing. A seed mixture containing sufficient forbs to satisfy the requirements of a young sage grouse will be used to revegetate the draw. Fencing will prevent livestock from overgrazing the succulent vegetation. (SG 2, SG 5).

27. South Fork Oak Brush Thinning - Review of the transect data gathered during the 1961 - 1963 elk winter range survey indicates that many oak brush stands were over mature at that time and were in need of thinning. Conversations with the WCO in charge of this area substantiates the fact that several areas on BLM administered land are still in this condition. By hand thinning the dense overmature oak brush stands vigor will be materially increased by the encouragement of new root sprouts, and density will be decreased to levels that are considered more favorable to elk. Costs of a hand thinning operation can be radically reduced by use of Youth Conservation Corps (YCC) personnel under the supervision of DOW or BLM biologists. Approximately 380 acres should be treated in this area. (E 1, E 7).

28. Ward Gulch Pinyon-juniper Thinning - Browse vigor is fair in this area but density is rated at only 8 percent. Thinning the dense overstory (50 percent) through firewood sales and seeding browse species after tree removal would most likely result in a significant improvement. Up to 200 acres of pinyon-juniper could probably be removed without interfering with cover requirements of wildlife presently using the area. (Md 8, Md 15).

30. Reservoir Fencing - The 1975 range improvement inventory identified the need for protective fencing on these 6 reservoirs to protect waterfowl and shorebirds feeding and nesting habitat. (WS 2).

31. Hunter Creek Reservoir Fencing and Stock Tank - Damming
32. the flow of Hunter Creek at this point would create a reservoir approximately 150 yards wide and 200 to 350 yards in length. The cost would be substantial, but if an aquatic environment can be created of a size and quality equal to that formed in nearby Stewart Gulch by private landowners, the expenditure would be justified by the increase in waterfowl production alone. In

addition an excellent trout pond could be created by stocking the reservoir. Water right conflicts would have to be fully investigated before this project could be undertaken. (WS 1).

33. Barcus Sagebrush Beating - This bottomland sagebrush area is almost identical to the area occupied by the Greasewood experimental plots with tall decadent sagebrush forming a dense overstory (+ 60 percent). By the time this project and other similar bottomland treatment areas are scheduled for manipulation, enough information should have been obtained from the Greasewood plots to enable us to successfully revegetate this beaten area with desireable species. (Md 3, Md 7, Md 15).

34. East Ward Pinyon-juniper Thinning - This site has an extremely poor browse density rating (less than 1 percent) and what little browse is present is all in unsatisfactory condition with 100 percent of it being heavily hedged and 92 percent of it dead or decadent. A firewood sale here would have to be followed up with a seeding operation as there is not a sufficient natural seed source available. Approximately 200 acres of pinyon-juniper should be removed from the 700 acre site. (Md 8, Md 15).

35. East Rifle Pinyon-juniper Thinning - Few decadent browse plants are in evidence at this location but many are approaching that stage with 72 percent of the plants checked showing heavy hedging. The low density (3 percent) of browse also contributes to the poor condition of the range. A firewood and post sale taking 300 acres of the 800 available would eventually improve the situation. (Md 8, Md 15).

39. Dry Gulch Sagebrush Beating - The complete absence of seedling or young sagebrush in this area and the large number of decadent plants (57 percent) encountered on the transect account for the low vigor rating given this sagebrush type. It is believed that by beating strips in this area and seeding to grasses, forbs, and sagebrush, vigor can be restored to the type and ground cover can be increased to retard the erosion that is currently a significant problem on this ridge. No more that 100 acres of the approximately 600 acres of sagebrush available for treatment will be modified. (Md 4, Md 7, Md 15).

40. C-a Guzzlers - A great deal of suitable sage grouse habitat exists near Tract C-a, but the chronic lack of water limits the exploitation of the area by sage grouse to its fullest extent. The placement of 4 guzzlers to the west of Tract C-a should do much to increase sage grouse use of this area. (SG 5).

41. Spring Creek Pinyon-juniper Thinning - This area has excellent browse composition in that mountain mahogany, serviceberry, and sagebrush are all present and in good proportion, but density is only 10 percent and vigor is low with 85 percent of the serviceberry and 65 percent of the mountain mahogany heavily hedged. The 60 percent pinyon-juniper canopy cover is probably inhibiting browse production, and it is likely that a significant response will occur if the canopy coverage is reduced. Approximately 110 acres will be thinned on a southwest facing ridgetop. (Md 2, Md 7, Md 15).

42. Stewart Brush Beating - No transect data are available for this area, however, ocular estimates lead one to believe that grass and forb production could be increased tremendously by beating strips through the relatively dense browse cover. This treatment would benefit elk and deer by increasing forage production in an elk wintering area thereby lessening the tendency for elk to drift down into mule deer winter range. The increase in succulent forage would also benefit mule deer as they pass through the area on their way to summer range. The increase in grass and forbs would also benefit brooding sage and blue grouse. Beating will cover approximately 125 acres on a ridgetop with a slight northwestern exposure. Transects will be run before the operation is undertaken. (E 1, E 6, BG 1, BG 2).

43. East Stewart Brush Beating - Same rationale as Stewart brush beating. Project will be smaller - approximately 75 acres. (E 1, E 6, BG 1, BG 2).

44. Dead Horse Ridge Brush Beating - Excessive shrub composition (+ 65 percent) on this ridge inhibits grass and forb production in an area where it is needed to provide succulent spring forage for mule deer and sage grouse broods. Beating in strips will maximize ecotonal area and benefit most wildlife species present. A seed mixture containing early season grasses will be applied

after treatment. Treated area will involve approximately 150 acres. (Md 3, Md 7, Md 15, SG 5).

45. Yankee Gulch Pinyon-juniper Thinning - Pinyon-juniper canopy cover in excess of 50 percent and a browse density of only 6 percent with a medium vigor rating suggest that this relatively flat ridgetop would benefit from a thinning operation. Approximately 200 acres of pinyon-juniper would be removed. (Md 2, Md 3, Md 6, Md 7).

46. Sawmill Oak Brush Thinning - Same rationale as South Fork operation - 520 acres. (See project #27) (E 1, E 7).

47. Harris Pinyon-juniper Thinning - Decadent big sagebrush in pure stands and mixed browse under pinyon-juniper overstory characterizes this area. The degree of decadence (48 percent) and severity of hedging (96 percent) had drastically reduced the value of this area to mule deer, but it can be improved by chaining the pinyon-juniper and decadent sagebrush stands to revitalize browse production. Approximately 110 acres should be treated. (Md 8, Md 15).

48. West Rifle Pinyon-juniper Thinning - This ridge, located northwest of Rifle Gap Reservoir has low browse density (6 percent) and the browse that is available is predominantly in the severly hedged category (92 percent). Approximately 38 percent of the big sage, the most abundant browse species, is classed as dead or decadent. The moderately steep terrain does not lend itself to chaining, but a firewood sale in this area or a meandering caterpillar tractor equipped with a trickle seeder could remove much of the pinyon-juniper and crush the decadent browse which would stimulate production. Approximately 100 acres should be treated. (Md 8, Md 15).

49. Little Spring Creek Pinyon-juniper Thinning - This area has a moderately dense pinyon-juniper overstory (30 - 40 percent) and browse vigor is good but the density is very low. Approximately 300 acres should be treated. (Md 2, Md 7, Md 15).

50. Thirteen Mile Ridge Brush Thinning - Throughout this area much of the browse has become decadent and the taller growing species such as serviceberry has grown beyond the reach of deer. A hand thinning operation, much like that described for the South Fork Oak Brush thinning, would

greatly benefit this winter-transitional range. Individual plants could be selected by the Bureau of Land Management or DOW biologists and the cutting could be undertaken by Youth Conservation Corps crews. The area to be treated would cover over nine sections (5,760 acres) but actual brush removal would occur on only 500 acres. Treatment will be allowed only on south facing slopes. (Md 1, Md 7, Md 15).

51. Wagon Wheel Ridge Pinyon-juniper Thinning - Moderate overstory density (30 - 40 percent), fair browse density (15 percent), but vigor is low (bitterbrush 100 percent heavily hedged). Selectively thin by cutting or dozing individual trees on approximately 150 acres. (Md 1, Md 7, Md 15).

The projects summarized above and in Table 10 are by no means the extent of project work that needs to be undertaken in the HMP area. It is anticipated that the research and inventory work discussed in Section H will eventually reveal the need for additional physical projects. This is particulary true of the sage grouse, fisheries, and mule deer studies that were initiated in 1976. In addition, a number of possible projects have been identified in the Rangely area through the BLM's inventory work this past summer. Priority has been given to the Game Management Unit 22 (Piceance) portion of the area, but Unit 21 (Douglas) which encompasses the land south of Rangely has great potential for improvement. If the Rangely deer herd responds to the DOW's efforts to build up the population through restrictions on hunting, project work will be expanded in the HMP as deemed necessary by the BLM and DOW.

TABLE 10 HABITAT IMPROVEMENT PROJECTS

Priority	Job Name	Man Months Purpose	Man Months Need	Cost 1/	Units	Target Species	Objective Served	Out Year
1	Greasewood Sage Ch.	Project layout EAR Contract Supervision	1 MM	1,500	100 ac.	Mule Deer	Md 2,7,15	1
1a	Greasewood Seeding	Contract Supervision	.5 MM	4,000	100 ac.	Mule Deer	Md 2,7,15	1
2	Greasewood Exclosures	Project layout EAR	.5 MM	4,000	2 Exclos.	Research Data		1
3	Lee Gulch P-J Thin.	Project layout EAR Contract Supervision	1 MM	6,000	400 ac.	Mule Deer	Md 1,7,15	1
4	Timber Gulch Sage Ch.	Project layout EAR Contract Supervision	1 MM	1,000	80 ac.	Gallinaceous Birds	SG 2,4,WS 1, T 1, BG 1,2	1
4a	Timber Gulch Seeding	Contract Supervision	.25 MM	2,500	80 ac.	Gallinaceous Birds	T 1, BG 1,2 SG 2,4,WS 1,	1
4b	Timber Gulch Res's.	Project layout EAR Contract Supervision	1.5 MM	11,000	9 waters	Gallinaceous Birds	SG 2,4,WS 1, T 1, BG 1,2	1
4c	Timber Gulch Protective Fencing	Project layout EAR Contract Supervision	.5 MM	15,000	6 mi fence	Gallinaceous Birds	SG 2,4,WS 1, T 1, BG 1,2,	1
5	Pinto Mesa Res's.	Project layout EAR Contract Supervision	1.5 MM	17,500	7 waters	Waterfowl Mule Deer	WS 1, Md 2, Md 7	1
5a	Pinto Mesa Protective Fencing, pipeline & stock tank inst.	Project layout EAR Contract Supervision	.5 MM	7,000	2.0 mi. fence	Mule Deer Waterfowl	WS 1, Md 2, Md 7	1
6	Barcus Res's.	Project layout EAR Contract Supervision	1.0 MM	13,000	5 waters	Mule Deer Waterfowl	WS 1, Md 2, Md 7	1

1/ Cost does not include Man Months

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82.5

TABLE 10 HABITAT IMPROVEMENT PROJECTS

Priority	Job Name	Man Months Purpose	Man Months Need	Cost 1/	Units	Target Species	Objective Served	Out Year
6a	Barcus Protective Fencing pipeline & stocktank inst.	Project layout EAR Contract Supervision	.5 MM	5,000	1.5 mi fence	Waterfowl Mule Deer	WS 1, Md 2, Md 7	1
6b	Stock tank wildlife escape ramps (throughout HMP area	Installation	2 MM	2,000	100 ramps	Non-Game	NG 4	1
*7	Northwater Crk. Protective Fencing	Project layout EAR Contract Supervision	1.5 MM	7,500	2.5 Mi fence	Colo. Cutthroat trout	F 3 thru 9	2
*8	East Fork Parachute Cr. Protective Fencing (North)	Project layout EAR Contract Supervision	1.5 MM	10,500	3.5 mi fence	Colo. Cutthroat trout	F 3 thru 9	2
9	Greasewood Plot fencing	Project layout EAR Contract Supervision	.5 MM	7,500	3 mi fence	Mule Deer	Md 2, 7	2
*10	North Trapper Res.	Project layout EAR Contract Supervision	.25 MM	10,500	3 waters	Non-Game	WS 1, F 3 thru 9, BG 1, BG 2	2
*10a	South Trapper Res.	Project layout EAR Contract Supervision	.25 MM	3,500	1 water	Non-Game	WS 1, F 3 thru 9, BG 1,2	2
*10b	S. Trapper Spring Devel.	Spring Development	.5 MM	500	1 water	Non-Game	F 3 thru 9	2
*10c	E. Fork Parachute Spring Development	Spring Development	.5 MM	500	1 water	Non-Game	F 3 thru 9	2
*10d	N. side Trapper Cr. Fence	Project layout EAR Contract Supervision	.25 MM	9,000	3 mi fence	Trout	F 3 thru 9	2

* Funds to be requested from U. S. Navy for NOSR projects.

56.5

TABLE 10 HABITAT IMPROVEMENT PROJECTS

Priority	Job Name	Man Months Purpose	Man Months Need	Cost 1/	Units	Target Species	Objective Served	Out Year
*10e	S. side Trapper Cr. Fence	Project layout EAR Contract Supervision	.25 MM	9,000	3 mi fence	Trout	F 3 thru 9	2
*11	Trapper fence removal	Contract Supervision	.25 MM	3,000	3 mi fence removal	Mule Deer	Md 8	2
*12	E. Fork Parachute fence (south)	Project layout EAR Contract Supervision	.5 MM	9,000	3 mi fence	Trout	F 3 thru 9	2
13	Oak Ridge oak thinning	Project layout EAR Prep. Crew Supervision	1.5 MM	10,000	400 ac.	Elk	E 1, E 7, E10	2
14	Magnolia Guzzlers	Project layout EAR Prep. Crew Supervision	.5 MM	2,800	4 waters	Turkey Sage Grouse	T 1, SG 4	2
15	White River Goose Nesting Platforms	Installation Assistance	.5 MM		7 platforms	Canada Geese	WS 3	2
16	Howard P-J Thinning & Seeding	Project layout EAR Contract Supervision	1 MM	5,500 3,375	250 ac.	Mule Deer	Md 1, Md 7, Md 15	2
17	Greasewood P-J Thinning & Seeding	Project layout EAR Contract Supervision	.75 MM	4,400 2,700	200 ac.	Mule Deer	Md 1, Md 7, Md 15	2
18	Lower Barcus P-J Thinning & Seeding	Project layout EAR Contract Supervision	.5 MM	2,420 1,485	110 ac.	Mule Deer	Md 2, Md 7, Md 15	2
19	Dry Fork Sage Beating and Seeding	Project layout EAR Contract Supervision	.5 MM	1,800 1,620	120 ac.	Mule Deer	Md 1, Md 7, Md 15	2
19a	E. Greasewood Sage Beating & Seeding	Project layout EAR Contract Supervision	.5 MM	1,125 1,012	75 ac.	Mule Deer	Md 1, Md 7, Md 15	3

* Funds to be requested from U. S. Navy for NOSR projects.

59.3

TABLE 10 HABITAT IMPROVEMENT PROJECTS

Priority	Job Name	Man Months Purpose	Man Months Need	Cost 1/	Units	Target Species	Objective Served	Out Year
20	Wolf Ridge P-J Thinning	Project layout EAR Contract Supervision	1 MM	5,720	260 ac.	Mule Deer	Md 3, Md 7, Md 15	3
20a	Wolf Ridge Seeding	Project layout EAR Contract Supervision	.5 MM	3,510	260 ac.	Mule Deer	Md 3, Md 7, Md 15	3
21	Stake Springs P-J Thinning	Project layout EAR Contract Supervision	1 MM	7,040	320 ac.	Mule Deer	Md 3, Md 7, Md 15	3
21a	Stake Springs Seeding	Project layout EAR Contract Supervision	.5 MM	4,320	320 ac.	Mule Deer	Md 3, Md 7, Md 15	3
22	Middle Rifle Crk. fencing	Project layout EAR Contract Supervision	.5 MM	2,000	.5 mi.	Turkey	T 2	3
23	Rangely Geese Platforms	Project layout EAR Platform Installation	.25 MM	280	4 Platforms	Canada Geese	WS 3	3
24	Dark Canyon Well	Project layout EAR Contract Supervision	.5 MM	5,000	1 well	Sage Grouse	SG 2, SG 4, BG 1, BG 2	3
24a	Dark Canyon pipeline, meadow flooding, tanks	Project layout EAR Contract Supervision	.5 MM	2,000	3 waters 75 ac.	Sage Grouse	SG 2, SG 4	3
25	West Elk P-J Thinning & Seeding	Project layout EAR Contract Supervision	1.0 MM	5,500 3,375	250 ac.	Mule Deer	Md 8, Md 15	3
26	Galloway Sage Beating & Seeding	Project layout EAR Contract Supervision	.5 MM	1,750	25 ac.	Sage Grouse	SG 2, SG 5	3
26a	Galloway Reservoirs	Project layout EAR Contract Supervision	.5 MM	9,000	3 waters	Sage Grouse	SG 2, SG 5	3

49.5

TABLE 10 HABITAT IMPROVEMENT PROJECTS

Priority	Job Name	Man Months Purpose	Man Months Need	Cost 1/	Units	Target Species	Objective Served	Out Year
26b	Galloway Protective fencing	Project layout EAR Contract Supervision	.5 MM	5,000	2 mi fence	Sage Grouse	SG 2, SG 5	3
27	S. Fork oak thinning	Project layout EAR Contract Supervision	1.5 MM	9,500	380 ac.	Elk	E 1, E 7	3
28	Ward Gulch P-J Thinning & Seeding	Project layout EAR Contract Supervision	1.0 MM	4,400 2,700	200 ac.	Mule Deer	Md 8, Md 15	3
29	Piceance Crk. Willow Planting	Project layout EAR Crew Supervision (YCC)	.25 MM	100	½ mi stream	Trout	F 11	3
30	Existing Reservoir fencing	Project layout EAR Contract Supervision	1.0 MM	9,000	6 res. fenced	Waterfowl	WS 2	3
31	Hunter Crk. Res.	Project layout EAR Contract Supervision	1.5 MM	15,000	1 water	Waterfowl	WS 1	4
32	Hunter Crk. Protective Fencing & Stock tank	Project layout EAR Contract Supervision	.5 MM	3,500	1 mi fence	Waterfowl	WS 1	4
33	Barcus Sage Chaining & Seeding	Project layout EAR Contract Supervision	1.0 MM	2,200 1,350	100 ac.	Mule Deer	Md 3, Md 7, Md 15	4
34	East Ward P-J Thinning & Seeding	Project layout EAR Contract Supervision	1.0 MM	4,400 1,350	200 ac.	Mule Deer	Md 8, Md 15	4
35	E. Rifle P-J Thinning & Seeding	Project layout EAR Contract Supervision	1.0 MM	6,600 4,050	300 ac.	Mule Deer	Md 8, Md 15	4
36	Colo. River Goose Nesting Platforms	Project layout EAR Contract Supervision	1 MM	540	8 Platforms	Canada Goose	WS 6	4

11 70.6

TABLE 10 HABITAT IMPROVEMENT PROJECTS

Priority	Job Name	Man Months Purpose	Man Months Need	Cost 1/	Units	Target Species	Objective Served	Out Year
*37	Weir logs on NOSR Streams	YCC Crew Supervision	.75 MM		13 mi of Stream	Trout	F 3 thru 9	4
*38	Willow Plantings NOSR Streams	YCC Crew Supervision	.25 MM	2,750	13 mi of Stream Improvement	Trout	F 3 thru 9	4
39	Dry Gulch Sage Beating & Seeding	Project layout EAR Contract Supervision	.5 MM	1,350 1,500	100 ac.	Mule Deer	Md 4, Md 7, Md 15	4
40	C-a Guzzlers	Project layout EAR Contract Supervision	.5 MM	2,800	4 waters	Sage Grouse	SG 5	4
41	Spring Creek P-J Thinning & Seeding	Project layout EAR Contract Supervision	.5 MM	2,200 1,350	100 ac.	Mule Deer	Md 2, Md 7, Md 15	4
42	Stewart Brush Beating and Seeding	Project layout EAR Contract Supervision	.5 MM	1,875 1,687	125 ac.	Elk	E 1, E 6, BG 1, BG 2	5
43	E. Stewart Brush Beating & Seeding	Project layout EAR Contract Supervision	.5 MM	1,125 1,012	75 ac.	Elk	E 1, E 6, BG 1, BG 2	5
44	Dead Horse Brush Beating & Seeding	Project layout EAR Contract Supervision	.75 MM	2,250 2,025	150 ac.	Mule Deer	Md 3, Md 7, Md 15, SG 5	5
45	Yankee P-J Thinning & Seeding	Project layout EAR Contract Supervision	1.0 MM	4,400 2,700	200 ac.	Mule Deer	Md 4, Md 7, Md 15	5
46	Sawmill Oak Thinning	Project layout EAR Crew Supervision	1.5 MM	13,000	520 ac.	Elk	E 1, E 7	5

* Funds to be requested from U. S. Navy for NOSR projects

42.04

TABLE 10 HABITAT IMPROVEMENT PROJECTS

Priority	Job Name	Man Months Purpose	Man Months Need	Cost 1/	Units	Target Species	Objective Served	Out Year
47	Harris Res. P-J Thinning & Seeding	Project layout EAR Contract Supervision	.5 MM	2,420 1,485	110 ac.	Mule Deer	Md 8, Md 15	5
48	W. Rifle P-J Thinning & Seeding	Project layout EAR Contract Supervision	.5 MM	2,200 1,350	100 ac.	Mule Deer	Md 8, Md 15	5
49	Little Spring Crk. P-J Thinning & Seeding	Project layout EAR Contract Supervision	1.0 MM	6,600 4,050	300 ac.	Mule Deer	Md 2, Md 7, Md 15	5
50	Thirteen Mile Brush Thinning	Project layout EAR Crew Supervision	2.0 MM	12,500	500 ac.	Mule Deer	Md 1, Md 7, Md 15	5
51	Wagon Wheel Ridge P-J Thinning & Seeding	Project layout EAR Crew Supervision	.5 MM	3,300 2,025	150 ac.	Mule Deer	Md 1, Md 7, Md 15	5
			5	35,93.				

COORDINATION WITH OTHER PROGRAMS/AGENCIES

E. Coordination With Other Activities

1. Forest Management

Pinyon-juniper woodlands constitute the most extensive and economically important forest type on national resource lands in the HMP area. Consequently, forest practices on these lands can enhance or adversely affect wildlife habitat to a significant degree.

During the period 1960 to 1975, virtually all of the public demand for juniper posts and pinyon firewood within the Resource Area has been met by the wood available from existing large scale range and watershed chainings on 18,020 acres of national resource land. By 1978, however, these chainings will be exhausted from a commercial standpoint, and new sale areas will be needed. Based on projected short-term estimates provided by the Area Forester, approximately 700 acres per year of pinyon-juniper will be needed to meet the demand in the White River Resource Area alone. This demand can probably be met through wildlife and range chainings, but this is a highly inefficient method of harvesting forest products which results in much lost wood through breakage, rot, and contamination by soil. Therefore, it is recommended that timber sales of green wood be held on all proposed chaining areas prior to chaining.

All firewood and post sales will be coordinated between the Forestry and Wildlife programs and the following stipulations will be incorporated:

a. Sale areas will be laid out to maximize edge effect and retain adequate cover within the sale area. The minimum distance to cover will vary on each timber sale, depending on vegetation, topographical, and wildlife features of the area.

b. Sale areas will be examined by a Wildlife Biologist or a qualified Wildlife Technician and all trees utilized by cavity nesters will be marked for protection. (Objective NG 5).

c. Priority will be given to sales on sites having adequate understory vegetation for response to removal of overstory or to sites suitable for seeding after cutting operations.

d. Trees supporting raptor nests will not be harvested. In general, no harvesting will be permitted within one-quarter mile of an active raptor nest during the nesting season. The one-quarter mile standard is flexible depending on the raptor species involved. In the case of a peregrine falcon nest, the limit would be greater, while the limit could be relaxed for a species that tolerates disturbances. (Objectives NG 6, NG 7).

Forest management of Douglas fir stands on national resource land in the Piceance Basin are restricted by provisions of the Mining Act of 1872, which requires that timber on lands underlain by oil shale claims be reserved for use by the claimant, or that alternate timber be supplied if management requires that the timber be harvested. The small acreage occupied by Douglas fir on which oil shale claims have not been filed, occurs primarily in the southwestern portion of the HMP in the Rangely Planning Unit. Sales of this and other saw timber on national resource land should incorporate the following provisions:

a. Existing roads will be used whenever feasible.

b. New road construction will be kept to aminimum and roads not needed after completion of the sale shall be physically closed and seeded.

c. Where clear cutting is determined to be the best silvicultural practice, cutting blocks will be of irregular shape and not exceed 40 acres in size. (Objectives E 3, BG 3).

d. Buffer areas of no cutting will be left around raptor nest sites. A portion of the large snags surrounding raptor nesting sites will be preserved as hunting perches. The number to be left and the distance from the nest will be determined on an individual basis. (Objectives NG 6, 7).

e. On selectively marked sales, a portion of the snags will be left as raptor perches and sites for cavity nesters. The number to be left will be determined separately for each timber sale. (Objectives NG 5, 6, 7).

f. In fir stands, an undisturbed strip will be retained on the perimeter as preferred winter feeding and roosting sites for blue grouse and to retain the edge effect

between forest and shrub types. (BG 3).

g. Maintain a buffer strip along all perennial streams. Exact dimensions of strip will be determined on an individual basis.

h. Operation of logging equipment will not be permitted in stream channels or wet meadows unless an exception is made by an interdisciplinary team.

Timber harvesting operations on the 520,980 acres of Forest Service land within the HMP area are expected to be extremely limited. The Forest Service classifies its harvestable land on the basis of the silvicultural treatments necessary to harvest the timber without damage to other resource values. Of the 520,980 acres mentioned above, only 27,700 acres are placed in the Standard Component, where timber can be harvested with adequate protection of other resources under the usual provision of the timber sale contract.15/

An additional 42,000 acres are in the Special Component, which requires that special silvicultural techniques be used to protect other resources. The remaining acreage is either unsuitable for timber harvest; part of the wilderness system, or placed in the Marginal Component which requires substantial investment to become available for harvest. The above figures were computed from maps supplied with the draft EIS and are only approximations.

The latest revision of the Timber Management Plan for the White River National Forest covers the period 1977-1986 and under it, silvicultural treatment of from 4,470 to 22,470 acres annually would be possible. Due to current funding limitations and other constraints, however, only 2,900 acres annually are expected to be actually treated. Only a small portion of this will take place on the Forest Service land within the HMP area.

The overall effect of the treatments on wildlife is addressed in the draft EIS and the general conclusion is that wildlife species that prefer habitat diversity or intermediate seral stages would be benefited, while those species depending on climax communities would be adversely affected. The adverse

15/ 1976 Draft EIS for Timber Management Plan for the White River National Forest.

effects, however, would not be overly significant since an abundance of climax habitat types will continue to exist in the Flattops Wilderness Area.

Any future planning undertaken by the Forest Service should address the potential significance of the expansion of the White River elk herd. It is believed by the Bureau of Land Management that the expansion of this herd could lead to competition with mule deer on deer winter range unless elk winter range on Forest Service land is made more productive. The basis of the problem lies in the fact that most of the elk winter range in the HMP area is on private land that cannot be managed for the benefit of elk, and this puts the burden on the BLM and Forest Service to make their land as productive as possible. The 1961-1963 elk winter range survey conducted jointly by the Division of Wildlife and Forest Service identified a number of areas where elk forage production could be significantly increased but these potential improvement projects have not yet been scheduled for implementation. It is suggested that the possibility of elk habitat improvement be investigated by the Forest Service and that their efforts be coordinated with the Piceance Basin HMP as soon as possible.

2. Livestock Management

The court-ordered range Environmental Impact Statement (EIS) resulting from a lawsuit brought against BLM by the National Resources Defense Council in 1973 provides the Wildlife Activity with an excellent opportunity to submit to the Range Activity a set of wildlife objectives for each individual allotment before the Allotment Management Plans (AMP's) are written and initiated. Unfortunately, the first 29 AMP's in the Piceance Basin Planning Unit (Map 6) must be completed prior to July 1, 1976. Consequently, there will not be time to undertake any inventory work to supplement our present knowledge of the range situation other than to make superficial occular assessments of problem areas. Since AMP's cannot be implemented until the EIS is completed in fiscal year 1979, there will be ample time to change the AMP or HMP if future inventory work reveals a specific need for this.

The preliminary wildlife objectives submitted to the Range Activity for the Piceance Planning Unit are based on admittedly dated inventory work (specifically the 1965-1967 winter range survey, the 1973 range survey, and the 1975 C-a survey), but the

data are generally considered to be of good quality and it is unlikely that changes in browse composition, density, and to a lesser degree, vigor, could have reached such a magnitude in a few years as to completely invalidate the survey results.

Prior to the implementation of AMP's, the following studies will be completed in the Piceance Planning Unit (boundaries roughly correspond to Game Management Unt 22):

1. The system of production-utilization transects mentioned in objective Md-6 will be developed and read for two years. It is envisioned that approximately 60 permanent transects will be established. Considerably more are necessary to adequately sample the area but time and manpower constraints prevent this. Locations will be jointly agreed upon by the BLM and the DOW Wildlife Conservation Officers for GMU-21 and 22. (Objective 6).

2. Browse condition and pellet group transects will be run on 210,000 acres of mule deer winter and transitional range to update the 1965 to 1967 winter range survey. (Objective 5).

3. Sage grouse brood rearing grounds, strutting grounds, and wintering areas will be studied for three years to assess the habitat components of successful special use areas and to discover new areas that could be impacted by livestock management practices. (Objective SG-1).

The portion of the HMP area that lies within the Rangely Planning Unit (Map 6) will have AMP's completed on it by the end of fiscal year 1977, which should allow sufficient time to complete the winter range survey that was begun in the summer of 1975. Approximately 70 browse condition and pellet group transects have been run over the Rangely deer winter range and it is believed that another 200 will be needed to characterize the area and to arrive at sound wildlife objectives. (Objective Md 13).

The allotment Management Plan program for the area of the HMP that is under the administration of the Grand Junction District (Map 6) will begin in the summer of 1976 with field examinations of the allotments by BLM Glenwood Springs Office Range and Wildlife personnel. The 1973 Rifle deer winter range survey gathered wildlife habitat information on this area and supplemental information will be obtained on an as-needed basis. Rough drafts of the AMP's will be written during the winter of 1976-77 and completion of the EIS is anticipated in 1981.

Conversations with Forest Service personnel indicate that livestock-wildlife conflicts and problems on Forest Service allotments are minimal and localized and do not require significant adjustment at this time. It is anticipated that the Forest Service assessment plan mentioned in Section E-1 will address specific problems and point out inventory and management needs. One possible study that the Forest Service may want to consider is an assessment of the effects of increased canopy cover on forage production in areas that formerly maintained an open canopy through the action of spruce beetles.

On all Bureau of Land Management Allotments, the following standards related to wildlife will be observed when range projects are undertaken:

a. All new water developments will be fenced and water will be provided for livestock by tanks or water gaps.

b. Stock tanks will have wildlife escape ramps installed. (Objective NG-4).

c. Fences will be as low as possible, but in no case will they exceed the height and spacing standards set forth in Bureau Manual 1737. Exceptions may be made around water developments.

d. Plans for vegetative manipulation projects will be examined by an interdisciplinary team which may recommend stipulations and constraints on the project to insure protection or enhancement of wildlife values.

Specific wildlife objectives for a particular Allotment may be found in the plan for that Allotment. These plans are on record in the Range files of the Bureau of Land Management, Meeker Office. What follows is a summary, by Allotment, of the preliminary wildlife recommendations related to livestock management based on our current knowledge of the Piceance Basin Planning Unit. The HMP objectives served by each AMP are listed at the end of each summary.

Square S, Reagles, and Segar Gulch allotments - These three allotments are the only ones in the Piceance Basin Planning Unit which currently have AMP's in effect. The Square S utilizes a three-year deferred rotation system with six pastures; the Reagles allotment makes use of a three-pasture continuous seasonal system; and Segar Gulch is on a four-

pasture rest rotation system. The wildlife objectives contained in each plan are adequate, though occasionally vague, and the systems seem to be meeting the objectives. The Range section does not anticipate any major modification of these AMP's, as range studies indicate that the range is improving under all three systems. It may be necessary to formulate more specific wildlife goals, particularly with respect to vigor, after field work ahs been accomplished this summer. (Md 1, 3, 7, SG 5, WS 4).

Greasewood Allotment - Browse vigor and density are generally rated low throughout the Allotment, but composition ratings are consistently high with a diverse assortment of desirable species. The importance of the area to deer as winter range requires that the Allotment plan be based on an intensive management system. The use of the Allotment from mid-summer through late fall (December 7) implies that there is a certain amount of forage competition between cattle and deer. Stocking rate appears to be low enough to be acceptable from a wildlife standpoint, but a deferred rotation system utilizing at least three pastures should be developed to eliminate the possibility of repeated late fall use of any single area. Browse cover should be maintained at the present 40% in the central portion of the allotment, but an increase from 20% to 25% would be desirable in the northern portion. Serviceberry should be maintained at 28% ground cover on the southwestern part of the allotment. (These and all following cover figures are from 1976 range condition transects). (Md 2, 7).

Upper Fletcher Draw Allotment - Browse vigor is generally rated low throughout this Allotment but compositon and density appear to be adequate. Browse vigor will improve naturally if deer numbers continue to remain low or increase gradually, but if the population begins to increase too rapidly, it may be necessary to shorten season of use by cattle in the fall to restore vigor or request that DOW control deer numbers until vigor is restored. Creation of a pasture system allowing fall rest every two or three years would be beneficial to browse species. Sagebrush type conversion to grass would be in oppositon to Wildlife objectives since sagebrush stands are relatively vigorous. Browse cover should be maintained at the present 50% level in the central portion of the Allotment. (Md 10).

Lower Fletcher Draw Allotment - This Allotment has remained in the non-use category in recent years, but since it is li-

censed for winter use, the potential for livestock - wildlife forage competition is great. If the Allotment is activated, it should be placed under intensive management to minimize deterioration. A three pasture system that allows periodic winter rest for one pasture each year would be of considerable benefit to browse species. Stocking rate may have to be reduced to allow for a significant amount of unsuitable range which may not have been considered in the original range survey. Sagebrush ground cover in sagebrush types should be increased from the current 24% to 30%. (Md 10).

Main Dry Fork Allotment - This area seems to be in fair shape considering the heavy deer use. The primary objective would be to increase browse vigor, but it is unlikely that livestock management could do much more to accomplish this since stocking rate is not excessive and season of use (7/1 to 10/31) is relatively short. Better livestock distribution through water and salt placement will help to improve the range. Browse cover should be maintained at the current 50% level in the northern portion of the allotment with serviceberry and big sage making up 20% and 15% respectively of the composition. (Md 1, 7, SG 4).

Thirteen Mile Allotment - Stocking rate may have to be reduced since a fair amount of the Allotment is unsuitable for livestock due to topographical features, and it is unlikely that this was considered in the 1942 range survey which determined the stocking rate.

Season of use should not be extended into the fall, but a slightly earlier livestock turn-on date might be desirable from a wildlife standpoint assuming that there is still an abundance of grass and forbs as was the case in 1965 when the wildlife transects were run. This will be checked in the summer of 1976.

A change in class of livestock from cattle to sheep would be extremely detrimental to the condition of the browse which is already in poor shape. (Md 1, 7, BG 1, 2).

Hatch Gulch Allotment - Prolonged adherence to a system of continuous grazing throughout the late fall - early winter grazing period, combined with large numbers of wintering Mule deer, has left the browse condition on this Allotment in a state of extremely low vigor. Density and composition ratings are also very low throughout the Allotment, indicating the

need for an intensive management system to aid in restoration of browse conditions. Browse vigor in the eastern third of the Allotment could be increased from a low to medium rating by development of a pasture system that would divide the winter use equally between two or three pastures. The western portion of the allotment will probably require mechanical vegetative manipulation to improve vigor. Browse cover should be increased from an average 22% to 30% throughout the allotment. (Md 1, 7).

East Fork Spring Creek Allotment - Wildlife habitat condition information is lacking for this allotment. The needed information will be obtained in the summer of 1976.

Boise Creek Allotment - Although this Allotment is within deer winter range, pellet group counts indicate that it is not presently used intensively by wintering mule deer. The very poor condition of the browse and soil is probably due to dual spring-fall sheep use and past heavy winter deer use. It is recommended that this Allotment be placed under a two pasture rest rotation system and consideration be given to a change in class from sheep to cattle. The improvement in both browse and grass vigor would benefit livestock and enable the area to support increased deer numbers. (Md 2, 7).

Fawn Creek Allotment - The importance of this Allotment to wintering mule deer and sage grouse warrants the development of an intensive management plan that would eliminate dual spring-fall use in any one pasture. The winter use of the area by sage grouse precludes any large scale sagebrush chaining, but some small block or strip chaining would probably benefit both livestock and wildlife. Significant riparian habitat surrounding springs and Fawn Creek itself should be protected through proper grazing management and water placement, but private ownership of this habitat prevents direct Bureau of Land Management involvement. A well designed grazing system could raise browse vigor ratings from low to moderate throughout the northern part of the allotment. (Md 4, 7, SG 3, 5).

Cow Creek - McCarthy Gulch Allotments - These two Allotments will be combined into one management unit having a single AMP covering it, Trappers Creek, which supports a population of the State listed threatened Colorado River Cutthroat Trout, will be fenced and livestock entry will be strictly controlled to prevent further degradation of the aquatic and riparian habitat. The development of an AMP will have to consider these two facts.

The remaining riparian and aquatic habitat on Cow Creek should be protected in an AMP system since fishery development will probably be attempted on this creek after it has been surveyed. (Md 4, 7, E 6, WS 4, SG 3).

Spring Creek Allotment - Browse condition appears to have improved significantly in the last three years on this Allotment under decreased deer pressure. Watershed ratings, however, could benefit from a later livestock turn-on date (currently April 19). Dual spring-fall use should be eliminated through the AMP. Overall browse vigor ratings should be increased from low to moderate. Browse cover in pinyon-juniper types should be increased from 30% to 40%. Browse cover in mountain shrub types should be maintained at 54%. (Md 10).

Black Sulphur Allotment - Although spring grazing by livesstock is generally considered to be beneficial to deer winter range in that grass is removed and competion with browse is lessened, this practice can lead to considerable erosion problems. This seems to be the case here and it is recommended that spring cattle grazing be deferred through the Allotment Management Plan to allow for an improvement in watershed conditions. This Allotment should be intensively managed and dual spring-fall use should not be allowed in any single pasture.

Sagebrush manipulation on a large scale will not be permitted since this area receives considerable use by wintering sage grouse. Stocking rate may have to be reduced due to large amounts of unsuitable range that was probably not considered in the 1942 Range Survey. (Md 3, 7, SG 5, WS 4).

Little Spring Creek Allotment - The heavy winter deer use in this area combined with the pattern of winter-spring livestock use has resulted in a situation where both browse and watershed are in a deteriorating condition. Intensive management and an elimination of spring cattle use would contribute to an improvement of the range, but the real problem lies in the fact that there are too many deer in too small an area. DOW considers most of this Allotment a concentration area with winter densities ranging from 50 to 70 deer per square mile.16/ Wildlife habitat improvement projects will attempt to achieve a more equitable distribution of deer. (Md 2, 7).

North Dry Fork Allotment - Continuous dual season (spring-fall) use of this Allotment by livestock and high concentrations of wintering mule deer has led to a situation where browse vigor

16/ House Bill 1041 data supplied by local WCO, Ron Krager.

and density ratings are extremely low. Much of the watershed is in a high moderate erosion condition class, which may be attributable to early spring cattle use and excessive winter deer concentrations.

The competion for forage between deer and cattle, and the poor state of the watershed, can be remedied by discontinuing dual season use in any single area and by deferring the spring turn-on date until the range has reached the proper state of range readiness. A three pasture deferred rotation grazing system should be used to aid in increasing browse vigor ratings from low to moderate. (Md 1, 7).

Indian Springs - Dry Duck Creek Allotments - These two Allotments will be combined under one AMP. Wildlife habitat condition information is lacking for this area. The necessary information will be obtained this summer.

Piceance Mountain Allotment - This Allotment is the largest in the HMP area and it is extremely important to most of the wildlife species that occur in the Piceance Basin.

Allotment Management Plans for this area will not be prepared until early fall fo 1976. Prior to this, wildlife habitat data will be obtained on as much of the Allotment as possible to enable the Wildlife Section to develop objectives based on more timely information than what we now have. Preliminary data collection indicates that a rest rotation system will have to be developed for the area.

Barcus Pinto Allotment - This Allotment will be combined with the Boxelder and Rocky Ridge Allotments to permit the Range Section to develop an Allotment Management Plan that will eliminate dual season (spring-fall) use on any single pasture.

Boxelder Allotment - See Wild Horse Section E-5.

Hammond Draw Allotment - Wildlife habitat condition information is insufficient to develop recommendations. Required information will be obtained in 1976 and 1977.

Rocky Ridge Allotment - This Allotment has browse density and vigor ratings that are higher than what is normally expected in the Piceance Basin. This could be due, in part, to the low cattle stocking rate that is employed on this Allotment. Another factor could be the large amount of range that is topo-

graphically unsuitable for livestock use and on which little competition for forage occurs. In any case, it is doubtful that an AMP could be developed on this Allotment that would further benefit wildlife unless winter use was discontinued altogether. Increasing stocking rates or seasons of use would be detrimental to wildlife. (Md 2, 7)

Hyberger (6009 on Overlay 6), Little Rancho (6010), Davis Creek (6016), Davis Canyon (6022), Naval Oil Shale (6021) Allotments - These Allotments are all realtively small and are above the mule deer winter range. Habitat condition information is lacking on these Allotments, making it impossible to arrive at even preliminary wildlife objectives. It is believed that management practices directed at improving the range for livestock will also benefit the two major wildlife species in the area (elk and summering deer), as there is considerable diet overlap between elk and cattle, and mule deer will consume a large amount of grasses and forbs in the summer months. (E 6, SG 3, BG 1, BG 2).

Coyote Gulch (6017), Schutte Gulch (6018), Gordon Gulch (6015), Lower Fourteen Mile (6014) Allotments - These Allotments are within the deer winter range but more habitat condition information must be obtained before specific objectives can be developed. These Allotments will receive priority when field examinations are conducted in 1976. (Md 1, Md 7, BG 1 & 2).

Puckett Gulch (6001), Pine Knott Gulch (6002), Wood Road Gulch (6003), and Powerline (6001) Allotments - These four allotments contain very little Federal range and are scheduled to be classified as custodial. Any Allotment Management Plans developed for them will have the lowest priority for implementation. Consequently, no wildlife objectives are proposed at this time.

Little Hills Allotment - The importance of this allotment to wintering mule deer requires that any decision concerning livestock use be made only after up to date habitat information is collected. This allotment will be given the Number One priority when field studies begin in the spring of 1977.

Preliminary indications are that stocking rates will have to be lowered and/or season of use will have to be changed significantly. (Md 1, 7, SG 4).

3. Recreation Management

Traditionally, the principal recreation use made of the HMP area has been big game hunting. It is anticipated that hunting will remain the primary recreational activity in the region for the foreseeable future, but other uses such as sightseeing, rockhounding, floatboating, and off-road vehicle (ORV) use will undoubtedly become more important as the resident population increases in response to energy development. This increased year-round people pressure will have a significant, but largely immeasurable, impact on wildlife in the region unless steps are taken to control the activities that have the most severe adverse effects on wildlife.

To this end, a District Off-Road Vehicle (ORV) plan will be initiated on selected areas within the Craig District in the near future. The plan will be dependent upon future guidelines and policies set by the State and Washington Offices of the BLM, but it is expected to include the following provisions: (Wildlife plan objectives served are indicated by code numbers):

a. Areas used as calving or fawning rounds (Maps 2 and 3) will be closed to all recreational ORV entry, during calving or fawning season (specific dates will be in the District ORV Plan). (Md 7, 9, 10, E 6, 7, 8, 9).

b. Sage grouse strutting grounds, blue grouse booming grounds, and their associated nesting complexes will be closed to recreational ORV entry during the breeding season (Map 4). (SG 4, 5, BG 1, 2).

c. Recreational ORV use will be restricted in deer or elk concentration areas during the winter months (Maps 2 and 3). (Md 7, 9, 10, E 6, 7, 8, 9).

d. Motorcycles, trailbikes, and snowmobiles will be equipped with USDA approved spark arrestors and silencers.

Four locations within the White River Resource Area have been proposed for designation as intensive ORV use areas, but only one of these lies within the area encompassed by the HMP. This location is immediately south of the town of Rangely and will be used as a snowmobiling area. The site is singularly lacking in wildlife values and can probably be set aside for intensive ORV use without large scale damage to wildlife populations

or habitat. The boundaries of the area should be signed.

Wildlife and recreation BLM personnel will cooperate in designing interpretive signs to be placed at the major access points within the HMP area. One sign each will be placed at Rifle, Rio Blanco, White River City, Meeker, and Rangely. Selected habitat improvement projects that are visible to the general public may have to be signed to avoid misinterpretation since even chaining projects that incorporate visual management procedures are seldom aesthetically pleasing.

A public affairs program for the HMP has been prepared to enrich recreational enjoyment of the area. This program includes slide presentations, film clips, brochures, fact sheets, and environmental education workshops. (See Section I).

4. Watershed Management

It is believed that the habitat improvement projects undertaken through the Habitat Management Plan will have a beneficial effect on watershed conditons in the Piceance Basin. The increased vegetative cover that will result from vegetative manipulation projects will increase soil stability and this, in turn, will improve water quality by reducing sediment loads. Reservoir construction will also reduce the amount of sediment that is added to the major streams that drain the region.

The Livestock Grazing Program will have as one of its major goals, the improvement of watershed condition throughout the Resource Area. To accomplish this, early spring cattle grazing that was initiated in the past to improve wildlife habitat will have to be curtailed on a few allotments where soil conditions have regressed to an unsuitable level.

5. Wild Horse Management

Wild horses in the HMP are divided into two herd units. The Piceance Unit, occupying the northern third of the Piceance Basin Planning Unit west of Piceance Creek, contains approximately 240 horses. The Rangely herd unit occupies the eastern two-thirds of the southern half of the Rangely Planning Unit and consists of approximately 70 horses.

A draft Wild Horse Management Plan has been prepared by the Craig BLM District. This plan proposes that a 94,445 acre wild horse area be set up (Map 6) to accommodate 80 to 110 horses. The excess horses would be rounded up and given to individuals who can prove that they are able to properly care for the animals.

The proposed horse range will be made up of the following allotments: Pasture C of the Square S Allotment will contain 25-30 horses; Boxelder Allotment will run 25-30 head; Philadelphia, Hogan and Tommy's Draw Allotments will have 30-40 horses. Livestock use may have to be reduced on the Boxelder Allotment from the current 830 to 706 Animal Months (AM's) to meet wild horse forage requirements. Total horse and cow Animal Months (AM's) on the allotment would be 1231. Forage production on the other allotments is believed adequate to supply wildlife, horses, and livestock, but studies will be undertaken to assure this.

Thirty-four miles of the proposed wild horse range boundary are fenced. An additional 28 miles of fence would be required to complete the boundary fence, but natural barriers could reduce this amount. The fence would be constructed as a two-strand barbed wire fence with a wood pole across the top at a maximum height of 38 inches. A major portion of the fence would be built in deer winter range, but it is hoped that the above fence specifications would lessen the hazard to migrating deer.

The proposed construction of 12 new reservoirs and three spring developments will be beneficial to all species of wildlife in the area.

Proper management of wild horses will contribute to the accomplishment of wildlife objectives Md 2, 3, 4, 7, and 10.

6. Minerals Development

a. C-a Oil Shale Tract

See Map 7 for location of all developments. A complete description of all future activities on Tract C-a and an in-depth summary of all baseline data acquired through 1975 may be found in the Draft Detailed Development Plan (DDP) submitted by the Rio Blanco Oil Shale Project (RBOSP).

This plan was submitted to the Area Oil Shale Supervisor's Office (AOSSO) in Grand Junction in February 1976, and copies are on file there and in the Craig and Meeker Bureau of Land Management Offices for public review.

The plan has been reviewed by Bureau of Land Management personnel and numerous comments have been sent to the Area Oil Shale Supervisor's Office, U.S. Geological Survey for incorporation into the final draft. Those comments are on file at the Meeker Bureau of Land Management Office.

If the schedules presented in the draft DDP were adhered to, overburden stripping on the tract would begin on June 1, 1978, and actual retorting would start August 1, 1979. Construction of the Rangely C-a access road and the 230 KV transmission line would have to begin this year to meet the above start update. The problems and mitigative measures associated with these two support facilities have been addressed in an Environmental Analysis Record (EAR). This report is on file at BLM offices in Denver, Craig, and Meeker.

Table II presents a summary of the minimum acreage of terrestrial habitat that will be disturbed by activities on Tract C-a. The Table only presents the disturbance through Phase II (30 years) of the plant's operation. If the maximum development occurs (ultimate pit stage) approximately 10,000 acres will be disturbed. Reclamation will be proceeding concurrently with disturbance and at no time will the unreclaimed disturbed land approach this alarming figure.

Rio Blanco Oil Shale Project intends, through their Fish and Wildlife Management Plan, "to avoid or...minimize damage to wildlife habitat, increase production on adjacent habitats to compensate for habitat unavoidably destroyed or damaged; and control employee or contractor caused human disturbance". The plans to increase production on adjacent habitats fall within two categories - on-tract and off-tract. The on-site enhancement projects have been taken under consideration and will probably be adopted. The off-site projects present a problem in that the C-a lessees lack the authority to implement them. A decision by Management must be made as to how these projects will be effected if they cannot be undertaken by the lessees. The projects contained in the C-a tract development plan, with the ex-

TABLE 11: Area and Vegetative Types Disturbed by C-a During Phase I and Phase II

FACILITY	AREA DISTURBED (acres)									
	PHASE I (Years 1-6)			Transition			PHASE II (Years 6-30)			Cumulative Total
	Acres	Cumulative % Veg.	Type 1/	Acres	Cumulative % Veg.	Type	Acres	Cumulative % Veg.	Type	Acres
Open Pit Mine	100	75	Mixed Brush	140	70	Mixed Brush	770	65	Mixed Brush	
		20	Sagebrush		28	Sagebrush		25	Sagebrush	
		5	P-J		2	Sagebrush		7	P-J	
								3	Shadscale	1,010
Ore Conveyor	16	37	Sagebrush	0			0	37	Sagebrush	
		63	P-J					63	P-J	16
Plant Site Construction	115	41	Sagebrush	135	41	Sagebrush	0	41	Sagebrush	
		59	P-J		59	P-J		59	P-J	250
Processed shale, overburden and topsoil disposal areas. (Includes support roads).	298	4	Mixed Brush	175			3589			
		44	Sagebrush		48	Sagebrush		42	Sagebrush	
		52	P-J		52	P-J		58	P-J	4,062
Ancillary Facilities	347 2/	4	Mixed Brush	0			260	52	Sagebrush	
		31	Sagebrush					11	P-J	
		59	P-J					15	Bottomland Meadow	607
		6	Upland Meadow					14	Shadscale	
								6	Riparian	
								2	Rabbitbrush	
Totals	876			450			4619			5,945

1/ See following continuation sheet for partial list of wildlife species disturbed in each vegetative type.

2/ 140A vegetative composition unknown.

TABLE 11: Continuation Sheet

Partial List of Wildlife Species Disturbed in Each Vegetative Type

Mixed Brush:	bluebird, dark-eyed junco, blue-gray gnatcatcher, least chipmunk, deermouse, sagebrush vole, long and short-tailed weasel, coyote, mt. lion, mule deer.
Sagebrush:	mt. bluebird, vesper, chipping and sage sparrows, horned lark, sage grouse, least chipmunk, Apache pocket mouse, deer mouse, thirteen-lined ground squirrel, Nutall's cottontail, black-tailed jackrabbit, Merriam's shrew, coyote, mule deer.
P-J:	scrub jay, bushtit, mt. bluebird, dark-eyed junco, mt. chickadee, chipping sparrow, mourning dove, golden mantled ground squirrel, Colorado chipmunk, pinon mouse, bushy-tailed woodrat, porcupine, long and short-tailed weasel, coyote, mt. lion, mule deer.
Bottomland Meadow:	violet-green swallow, bushtit, house finch, horned lark, montane vole, long-tailed vole, deer mouse, striped skunk, coyote, mule deer.

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Partial List of Wildlife Species Disturbed in Each Vegetative Type

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P-J:	scrub jay, bushtit, mt. bluebird, dark-eyed junco, mt. chickadee, chipping sparrow, mourning dove, golden mantled ground squirrel, Colorado chipmunk, pinon mouse, bushy-tailed woodrat, porcupine, long and short-tailed weasel, coyote, mt. lion, mule deer.
Bottomland Meadow:	violet-green swallow, bushtit, house finch, horned lark, montane vole, long-tailed vole, deer mouse, striped skunk, coyote, mule deer.

ception of the guzzlers, were also arrived at in this HMP. These projects include the Wolf Ridge and Stake Springs pinyon-juniper thinnings and the Dead Horse Ridge brush beating. Others will no doubt be necessary to make up for the large acreage disturbed on tract C-a.

b. C-b Oil Shale Tract

Recent developments on tract C-b has resulted in a slow down of all phases of development activity on the tract. The C-b tract lessees have requested a moratorium on development until rock mechanics and mining methods are reassessed. This, and other developments - both economic and environmental, have placed the rate or extent of development of tract C-b in doubt and make it extremely difficult to evaluate the project with regard to wildlife habitat management in the HMP.

It is assumed that if the problems are solved without too much delay, the development of the tract will proceed according to the final DDP submitted to the Area Oil Shale Supervisor's Office in February 1976. This document presents plans for the development and rehabilitation of the 5,100 acre tract. The draft DDP was compared with HMP objectives in November 1975 and comments were forwarded to C-b officials at that time. The multitude of impacts to wildlife and wildlife habitat addressed in the DDP will not be recapitulated here.

The mitigative measures proposed in the DDP are much less specific than those developed by tract C-a and deserve some comment. The method chosen by C-b officials to mitigate the disturbance of approximately 2,000 acres of wildlife habitat over the life of the tract is to increase production on the remaining 3,100 acres of habitat within the tract boundaries. It is believed by the DOW and BLM that even if it were possible to increase production on this acreage, it would not be completely desirable to do so. Much of the remaining 3,100 acres have been chained in the past, and if removal of more pinyon-juniper cover is one of the methods contemplated for increasing production, this could reduce cover to a point where it becomes a limiting factor in itself. Increasing production in an area of high human activity is also undesirable from the standpoint of increasing adverse human-wildlife interactions.

A more logical approach to providing alternative habitat for wildlife displaced by the activities tract C-b would be to increase production on off-tract areas to the north of the tract across Piceance Creek. These south facing slopes are extremely important to wintering mule deer and they lie within a known deer concentration area.

The plan to increase fish and waterfowl habitat on the tract through construction of 6 ponds (3 in West Stewart and 3 in Scandard Gulch) is supported by the HMP, as the tract is one of the few areas in the Piceance Basin where this potential exists. Consideration should also be given to enhancement of aquatic and riparian habitat in Willow Creek and Middle and East Fork of Stewart Gulch where C-b's baseline studies have shown that such potential exists.

e. Colony Oil Shale Project

The development of oil shale reserves by the Colony Development Operation has been fully addressed in a Draft Environmental Impact Statement (EIS) prepared by the Bureau of Land Management. This draft EIS is on file at the Meeker and Grand Junction BLM Offices. The following summary of the proposed action and associated impacts is quoted from that document:

"Brief Description of Action:

The proposed Federal action is the consideration of a right-of-way permit for an oil shale products pipeline from a plant site in Colorado to Lisbon Valley, Utah. Directly related to this Federal action is the development of a 4,000 acre underground oil shale mine; mining of 61,000 tons per day of oil shale for 20 years; constuction and operation of a 47,000 barrel a day oil shale plant; construction of two dams - Davis Gulch processed oil shale disposal catchment and Middle Fork flood control; disposal of processed oil shale on 800 acres; construction of a 194-mile, 16 inch shale oil pipeline from the plant site on Roan Plateau to Lisbon Valley, Utah; development of a 15-mile long service corridor in the Parachute Creek Valley; construction of two 230 kv powerlines to the plant site; a 337 acre exchange of land between BLM and Colony Development Corporation; and diversion of 12.5 cubic feet per second of water from the Colorado River."

"Summary of Environmental Impacts and Adverse Environmental Effects:

Ambient air quality will be decreased.

Water quality will be decreased.

Annual consumption of 9,000 acre-feet of water.

Topographic alterations of 1,217 acres.

Disturbance of 2,196 acres of soil.

Disturbance of 2,196 acres of vegetation.

Removal of 1,889 acres of soil and vegetation from production.

Mining of 440 million tons of oil shale over a 20-year period.

Damage and destruction to wildlife habitat.

Reduction of aesthetic quality.

Increased population of 4,100 in Mesa and Garfield Counties.

Unknown archaeological and paleontological values may be disturbed and destroyed.

Employment levels will be changed.

Infrastructural facilities will be affected."

d. Superior Oil Shale Tract

Application has been made by the Superior Oil Company for consolidation of oil shale property by means of a land exchange with the BLM. Superior has offered 2,571.51 acres of their private land (See Map 7) in exchange for 1,769.78 acres of BLM administered land in an attempt to create a land configuration that will allow Superior to mine and process oil shale in the most economic manner. Nahcolite and Dawsonite would also be mined and processed at the site. The parcels of land involved are all located near the confluence of Piceance Creek and the White River.

Before the exchange can take place, an EIS may have to be written. It is anticipated that Wildlife impacts will be severe in that the mine is located within critical deer winter range and near the two most important water courses in the area. In addition, the proposed plant site is proximal to a preferred bald eagle roosting area.

e. In Situ Tract Nominations

These six tracts of land, ranging in size from tract number 3 (Map 7) with 1,159 acres, to tract 6 with 5,0222 acres have been nominated by various oil companies as potential sites for the development of the in situ or modified in situ method of oil shale extraction.

It is not known which of the six tracts, if any, will be selected but until the selection is made, 24,498 acres of wildlife habitat cannot be improved by vegetative manipulation projects or by any other physical development if BLM policy guidelines are adhered to. (It is BLM policy that habitat improvement projects not be undertaken on land that is likely to be disturbed in the immediate future.)

f. Oil and Gas

Oil and gas extraction has long been a part of the minerals activity in the HMP area. Stipulations and procedures developed over the years to protect wildlife habitat from the activities of oil and gas companies have generally been effective when coupled with timely and aggressive compliance work. The procedures and stipulations contained in the pamphlet, "Construction and Reclamation Procedures for Oil and Gas Activities", written by Craig District personnel, will continue to be used in mitigating adverse impacts.

New wildlife information obtained from the Division of Wildlife and other sources during the course of HMP preparation requires that the Oil and Gas Leasing Umbrella Environmental Analysis be reviewed and updated.

g. Coal

Moon Lake Electric Company has expressed an interest in developing coal reserves near the old Staley Mine, 10 miles east of Rangely on the White River. The coal development would supply a mine mouth power plant (1000 MW potential; first stage 150 - 300 MW) which would generate power for use by oil shale tracts in the vicinity. Exploration holes were drilled in 1974, but no further action has been taken.

Although the plant would be located slightly north of the HMP area, the coal reserves extend south into the Unit and would probably be mined.

Consolidation Coal Company controls large coal reserves in the Nine Mile Gap area (Map 7) but no announcement has been made concerning future operations at this location. Exploratory drilling was conducted in 1974.

Most of the current and proposed coal mining operations in northwestern Colorado are located well to the north of the HMP area, but two are near enough that impacts, primarily increased people pressure, will be felt in the Piceance Basin. These are the Colowyo Mine, operated by W. R. Grace Corporation, and the Utah International operated Wilson Creek Mine. These and other coal mining operations are treated in the Northwestern Colorado Regional Coal Environmental Inpact Statement prepared by BLM and USGS personnel this past year.

7. Fire Management

The Piceance Basin Wildlife Habitat area contains 589,160 acres of pinon-juniper woodland and 373,798 acres of brushland, portions of which are appropriate for prescribed burning to improve habitat. In addition, there are 581,775 acres of Douglas fir, spruce, and aspen forest in which wild fire must be carefully controlled to protect valuable timber values and habitat for big game, blue grouse, raptors, and numberous cavity-dwelling species of birds and mammals.

A specific fire management plan for the Piceance Basin wildlife area has not yet been developed but will be at the time when next updated. In the interim, the following sequence will be used to determine prescribed burning to improve habitat:

1. Proposed area defined on maps.

2. Fire control officer will then approve or develop a fire management plan as per fire weather conditions and MFP constraints, coordination with the U.S. Forest Service, and Colorado State Forest Services.

3. An Environmental Analysis record will be prepared.

4. A fire control plan will be designed and approved at least one year prior to the proposed prescribed burn.

5. Pre and past burn studies will be conducted to evaluate results and impacts on wildlife, human values, vegetation, soils, and cultural and historic values.

6. Each prescribed burn will be evaluated in terms of benefit and cost.

Wild fire control management objectives are:

1. Protect wildlife habitat in areas used for elk calving and winter cover, blue grouse feeding and wintering areas and snags/live trees used for raptor nesting and nesting/feeding by mammals and birds.

2. Maintain scenic quality adjacent to roads, trails, ridges, and panaramic vista points.

3. Protect valuable commercial forest timber stands.

4. Protect commercial forest, woodlands, and brush land sites where fire would destroy watershed values and and cause increased siltation.

5. Protect shrubland and grassland sites covered with forage valuable to livestock and wildlife.

Prescribed burning objectives are:

1. Release grass, forb, and shrubs undestory vegetation in dense stands of brushland and pinon-juniper woodland to increase forage for wildlife and livestock.

2. Reduce fire hazard situations along roadsides, buildings, or other locations where tinder dry vegetation could create a wildfire situation.

3. Improve wildlife habitat, livestock forage, and watershed quality conditions on dense averstory vegetation sites where topograph or cost/benefit relationships limit the use of fire over mechanical or chemical treatment methods.

Both wildfire control and prescribed burning practices will include detailed plans for presuppression, suppression, control,and protection. Fire, when used properly, is a very efficient, economic, and effective tool in fuel management and vegetative manipulation. Man month and dollar costs for wildfire control and prescribed burning will be defined during the next update and revision of the Piceance Basin wildlife habitat management plan.

8. Support Activities

a. Access Development, Improvement, and Management

Physical access is not a problem within the HMP unit, but several important areas are in need of legal access. The problem areas are generally in the southern portion of the unit where bottomlands bordering creeks and dry washes are controlled by private landowners. Access to large acreages of public land is either denied by the landowner or substantial fees are required of hunters to cross and/or hunt the private land. As a result of this situation, a significant amount of public land is under-hunted resulting in an excessive herd increment year after year until a point is reached where the habitat can no longer support the inflated population and large die-offs occur or the habitat is further degraded. By obtaining the access described below, these areas can be opened up to all segments of the public and animal populations can be more efficiently managed. (Objectives served are listed in parenthesis after each narrative).

Table 12 presents the needed access by priority and lists the estimated costs and man months needed for their acquisition. Map 11 illustrates the locations.

Roan Plateau - At the present time, access to the Roan Plateau and the Divide Road is restricted to Division of Wildlife hunting and fishing easements on Cow Creek and Black Sulphur Creek and a BLM public easement up Sprague Gulch. Movement along the Divide Road between these distant points of access, however, is blocked by private land at several locations. To facilitate travel for hunting and other wildlife recreation purposes, the following easements should be obtained along the Divide Road:

1. Acquisition of one-fourth mile of access across existing private road would allow travel on the Divide Road east of Cow Creek and make accessible from the north 6 miles of trout stream on Trappers Creek and 4,480 acres of mule deer, elk, and blue grouse habitat on the Naval Oil Shale Reserve. Closure of the road during the period November through March would be necessary to protect elk winter range. A second closure during May and June may be necessary if a suspected elk calving area does indeed exist on the Naval Oil Shale Reserve. (Md 8, Md 14, BG 2, E 6).

TABLE 12

Access Development, Improvement and Management

Priority	Project Name	Out Year	Units	MM[1]	Costs[2]	Action
1	JQS Trail	2	1.5 mi.	1.9	3,250	Acquire easement. Survey roa and property lines and sign.
2	Elk Park Creek	2		.1	750	Culvert placement.
3a	Roan Plateau a	3	.25 mi.	1.2	1,000	Acquire easement. Survey roa and property lines.
3b	Roan Plateau b	3	1.50 mi.	1.9	3,250	Acquire easement. Survey roa and property lines.
3c	Roan Plateau c	3	1.75 mi.	2.0	3,750	Acquire easement. Survey roa and property lines.
3d	Roan Plateau d	3	2.50 mi.	2.2	5,000	Acquire easement. Survey roa and property lines.
3e	Roan Plateau e	3	.75 mi.	1.4	1,750	Acquire easement. Survey roa and property lines.
4a	Willow Creek a	3	.25 mi.	1.2	1,000	Acquire easement. Survey roa and property lines.
4b	Willow Creek b	3	2.50 mi.	2.2	5,000	Acquire easement. Survey roa and property lines.
5	Burning Mountain	4	.9 mi.	1.4	2,000	Acquire easement. Survey roa and property lines.
6	Harvey Gap	4	.6 mi.	1.4	1,500	Acquire easement. Survey roa and property lines.
7	Lake Creek	4	1.50 mi.	1.9	3,250	Acquire easement. Survey roa and property lines.
8	Soldier Creek	4	3.00 mi.	2.4	6,000	Acquire easement. Survey roa and property lines.
9	Hunter Creek	5	1.75 mi.	2.0	3,750	Acquire easement. Survey roa and property lines.
10	County Line	5	.75 mi.	1.4	1,750	Acquire easement. Survey roa and property lines.
11	Stewart Gulch	5	8.75 mi.	6.4	17,500	Acquire easement. Survey roa and property lines.

Access for Roads

1/ The number of man-months estimeated allow for route analysis, Environmental Analysis, archaeological reporting, survey, drafting, appraising and general case processing. Cadastral survey may be needed in some cases but this was not incorporated in the estimates.

2/ The estimated costs include allowances for title searches and insurance plus consideration for easements.

2. If easements were obtained on 1½ miles of existing road near the head of Trappers Creek, an additional 14 miles of trout stream on NRL (North Water and East Fork Parachute Creeks) would be opened to access from the north, as would 21,680 acres of mule deer, elk, and blue grouse habitat. The same road closure restrictions mentioned in Roan Plateau ("a" above) would apply here also. (Md 8, Md 14, BG 2, E 6).

3. Travel to the west along the Divide Road is blocked at this point near the head of the west fork of East Stewart Gulch by private land holdings. An easement for public use is needed across 1 and three-fourths miles of existing road to allow use of 3,460 acres of mule deer, sage grouse, and blue grouse habitat by hunters and other recreationists. (Md 7, Md 8, Md 14, BG 2, E 6).

4. Legal road access over this 2 and one-half mile stretch of private land would extend the public's use of the Divide Road for another 9 miles and allow entry onto 9,200 acres of mule deer and blue grouse habitat on National Resource Lands. The need for access into Little Tom Creek was identified in the Roan Creek HMP and this need would be met by this easement. (Md 7, Md 8, Md 14, BG 2).

5. This final Roan Plateau easement of three-fourths mile would connect the Black Sulphur and Cow Creek access routes through the Divide Road and insure more equal hunter distribution throughout the southern Piceance and Roan Plateau areas. (Md 7, Md 8, Md 14, BG 2).

Willow Creek

1. An easement for public use of one-fourth mile of existing road across private land is needed to provide access through oil shale tract C-b to 8,750 acres of NRL south of the tract. This area has historically been underhunted, resulting in an overutilization of the habitat by mule deer. Acquiring access to this area would do much to further the even distribution of hunters throughout the Basin, which, in turn, would lower hunter den-

sities and ultimately result in a higher quality hunting experience for all hunters in the area. Grouse hunters and noncomsumptive users of the wildlife resource will also benefit from the access acquisition.

If access cannot be acquired there is a possibility that the Bureau can put in a road at the junction of two 40 acre tracts on National Resource land, one-fourth mile east of the present turn-off on Piceance Creek Road.

A closure of this road from mid-November through April 15 may be necessary to prevent harassment of wintering mule deer. (Md 7, Md 14, BG 2).

2. Easements for public use across 2 and one-half miles of existing road on private land along Willow Creek would open up an additional 4,800 acres of NRL south and west of tract C-b in an area of less than desirable deer havvest. Blue grouse and sage grouse hunting and viewing opportunities would also be enhanced by the additional acreage available for public use. Signing would be necessary to designate the beginning of National Resource Land. (Md 7, Md 14, BG 2).

Lake Creek - An easement for public use of 1 and one-half miles of existing road across private land is needed to provide access to 5 miles of trout streams on National Resource Land. In addition, the easement would open up approximately 5,100 acres of National Resource land to mule deer, elk, and blue grouse hunting and viewing. The road would probably have to be closed during May and June to protect an elk calving area located southwest of Lake Creek.

This stream and Soldier Creek below have potential for the introduction of the State listed threatened Colorado cuthroat trout. Since the headwaters and the middle reaches of both streams are controlled by the BLM or Division of Wildlife, it may be feasible to eliminate the present trout population and introduce native trout if a natural or artificial barrier can be found or constructed that would prevent the hybridization of the natives with the rainbows that would attempt to travel upstream from the private land. (Md 10, E 8, BG 2, F 2).

Soldier Creek - Three miles of public use easements are needed over private road to provide access to 3 miles of trout streams on National Resource Land. The easement would also provide access to 3,500 acres of National Resource Land that offer mule deer, elk, and blue grouse hunting. This Creek and Lake Creek, above, have excellent potential for trout habitat development and improvement, but the lack of access would prevent use even if development opportunities were exploited. It is anticipated that if the easements were to be obtained, this would be followed by development of the stream by such procedures as plantings of aspen and willows to increase stream cover, fencing to control livestock, and in stream improvements to obtain proper pool-riffle ratio. The creeks are scheduled to be inventoried during the summer of 1976 (Map 9, Table 5) to determine exact needs. (Md 10, E 8, BG 2, F 2).

Hunter Creek - Access to 11,880 acres of deer, sage grouse, and blue grouse range and a proposed waterfowl habitat development area would be facilitated by the acquisition of one and three-fourths miles of public use easements across existing private roadway. (Md 7, Md 14, BG 2).

Stewart Gulch - Easements across 8 and three-fourths miles of existing road are needed to provide public access to 16,260 acres of NRL that provide opportunities for deer, elk, sage grouse, and blue gourse hunting and viewing. This area is, as are most other tracts of National Resource Land south of oil shale tract C-b, presently underhunted by mule deer hunters. By acquiring access to the area and signing the NRL, an increased harvest could be realized, which would decrease the pressure on the overused habitat. A significant increase in hunter recreation days would also be obtained and distribution of hunters would be improved.

The road would probably need to be closed during the winter months. (November-March) to protect the elk winter concentration area on the ridge above Stewart Gulch. (Md 7, Md 14, E 6, BG 2).

JQS Trail - Approximately 3 miles of this main access road to the Naval Oil Shale Reserve is in private ownership. One and one-half miles of this road are currently maintained by

by Garfield County and have been incorporated into their road system; however, that portion of the road in sections 27 and 28 requires an easement for public use. This is needed to provide access to 35,200 acres of NRL that provides elk, deer, blue grouse, chukar, dove and rabbit hunting as well as 25 miles of trout stream. In addition to this, there is a developed BLM campground on the Naval Oil Shale Reserve and the entire area is quite scenic.

The JQS Trail is presently open to the public, but as there is no legal access this could change at any time. If the road were closed, the next nearest access would require an additional 40 miles of travel and one and one-half hours of travel time to arrive at the same point on the Naval Oil Shale Reserve. (Md 8, Md 14, BG 2).

Burning Mountain - Legal access across about .9 mile of private land would open up 4,040 acres of the Grand Hogback to mule deer and chukar hunting as well as other forms of public recreation. (Md 8, Md 14).

Harvey Gap - An easement for public access across .6 mile of private land located on the southwest side of Grass Valley Reservoir would open up 1,280 acres of National Resource Land on the Grand Hogback to deer hunters and other outdoor recreationists. (Md 8, Md 14).

County Line - This particular access would require building .75 mile of new road across NRL and private land and the acquisition of an easement on the .25 mile of private land. Mule deer and blue grouse hunting, as well as non-consumptive uses of wildlife, would be expanded on 7,100 acres of National Resource Land. (Md 8, Md 14, BG 2).

Elk Park Creek - Placement of a culvert across Elk Park Creek and some minor road maintenance would open up 4,640 acres of National Resource Land to mule deer and chukar hunting. (Md 8, Md 14).

b. Land Acquisition Classification and Withdrawal

Land acquisition through exchange will be pursued in areas where it is possible to block up NRL and where important wildlife habitat has been identified. Table 13 summarizes the acquisition program to be undertaken. The Table gives the priority of each acquisition, the acreage involved, benefits expected and an estimate of the man months required to consumate the exchange. Specific actions needed and scheduling will be incorporated into the Area Lands program activity plan. National Resource Land used for the exchanges will be those parcels identified in the Garfield and White River Management Framework Plans. Overlay 11 gives the location of the parcels to be acquired.

The only exchange that is currently being actively pursued is that involving the exchange of the BLM's Oak Ridge property for certain parcels (Map 11) owned by the Division of Wildlife in the Rangely area (Item 2 in Table 13).

Possible land acquisition through purchase methods may be pursued in the future, once appropriate regulations and procedures contained in the Federal Land Management and Policy Act of 1976 are developed.

TABLE 13

Land Acquisition

Priority	Name	MM Required	Acres	Benefits and Objectives
1.	Peregrine falcon nesting area (location presently unknown)	2 MM	500	Protect endangered species nesting habitat (DOW or USFWS will be requested to purchase tract if BLM cannot acquire through exchange. (P 2).
2.	Rangely DOW properties	3 MM	2,870	Maintain important deer winter range and place Oak Ridge property under DOW management. (Md 9, 14, E 2, E 7, E 10)
3.	Colorado River Islands and meander lands	3 MM	2,330	Protect critical riparian and aquatic habitat. (WS 5, F 13)
4.	Middle Rifle Creek	2 MM	620	Maintain critical deer winter range; provide hunting and fishing access. (Md 8, Md 14, T 1)
5.	LO 7 Hill	4 MM	7,200	Maintain important elk winter range. Provide hunter access to reduce deer population. (E 2, E 7, Md 9)
6.	West Rifle Creek	3 MM	2,800	Maintain important deer and elk winter range. Maintain riparian habitat. Provide access to NRL on Hogback. (Md 8, Md 14, E 9)
7.	West Elk Creek	2 MM	120	Provide access to NRL. Maintain riparian habitat.
8.	Main Elk Creek	2 MM	780	Maintain important deer winter range and riparian habitat. (Md 8, Md 14, E 7)
9.	Canal Creek	3 MM	2,200	Maintain important deer winter range and riparian habitat. (Md 8, Md 14)
10.	Ward Gulch	2 MM	600	Maintain important deer winter range. (Md 8, Md 14)

9. Other

Additional support required to implement the HMP is shown in Table 15.

Table 15 Support Activities

Support Activities	Man Months By Out Years 1	2	3	4	5	Costs
Plan Printing						$1,000
Public Affairs Program	2					$2,500
Property Line Survey & Easement Acquisition		2	12	7	10	
Operations	8	12	18	16	16	
Archaeological Clearance	1	2	2	2	2	
Wildlife Techs.	39	58	24	24	24	

ENVIRONMENTAL ANALYSIS
RECORD

F. Environmental Analysis Record (EAR)

The Environmental Analysis Record (EAR) for the Piceance Basin Wildlife Habitat Management Plan has been prepared following guidance and format contained in Bureau manual 1790 and Colorado State Office Manual Release, CSO 1-49. It is presented in the following 16 pages.

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

1790

TO : District Manager

DATE: Feb. 15, 1977

FROM : Area Manager, White River RA

SUBJECT: Environmental Assessment Record for Implementing the Piceance Basin HMP

A review of the Environmental Assessment Record to implement the Piceance Basin Habitat Management Plan shows that the environmental impacts caused by the proposed action can be adequately mitigated and will not significantly affect the quality of the human environment. Therefore, preparation of an impact statement pursuant to Section 102(2)(c) of PL 91-190 (83 Stat 852) is not recommended.

Stanley F. Talley

Attachment
EAR

OK
Thomas Hardin
3/1/77

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

EAR FACE SHEET

OFFICE: Craig District Office

FY & REPORT # CO-010-7-67

ACTION: Piceance Basin HMP
(Project Name, Case Type, etc.)

NO. OF PAGES 14

LOCATION: White River Resource Area
Piceance Basin

SERIAL NO. C.-

REQUIRED BY 43 CFR 23: YES [ ] NO [X]

TEAM SIGNATURES:	TITLE	RESOURCE VALUES ASSIGNED	HOURS
R.V. Ward	Wildlife Biologist		40
Tom Zimmerman	Forester		2
James M. Keuter	Outdoor Recreation Planner		4
Gerald L. Mertz	Surface Protection		2
Lloyd A. Fumefer	Ranger		6
Bill Lawton	Wildlife Spec.		1
C.E. Timmons	Geologist		1

ENVIRONMENTAL COORDINATOR: Terrence R. Foyer (Signature) February 23, 1977 (Date)

COMPLIANCE OFFICER: Mike Getman (Title or Name)

DISTRICT MANAGER: [illegible] (Signature)

2/25/77 (Date)

CSO 1790-1 (Aug. 1975)

F. Environmental Assessment Record

I. Description of the Proposed Action:

The proposed action is to implement the Piceance Basin Habitat Management Plan. This Habitat Management Plan is an outgrowth and continuation of the Bureau of Land Management's planning process. During this planning process, alternative actions were considered in developing the Unit Resource Analysis Step IV and the Management Framework Plan for both the Garfield and White River Planning Units.

II. Description of the Environment Affected:

A description of the existing environment of the Piceance Basin if found in Section A (Introduction) of this plan.

III. Analysis of the Proposed Action and Alternatives:

Various alternative management objectives were considered during the development of the White River and Garfield Management Framework Plan. Alternatives to the planned actions were accomplished through reviews of the earlier drafts of the HMP by the Interagency Coordination Committee (composed of representatives of the Bureau of Land Management, Colorado Division of Wildlife, U.S. Fish and Wildlife Service, U.S. Forest Service and the U.S. Geological Survey) and reviews by the BLM Area, District and State Office staffs. Numerous alternatives were discussed with the agencies and staffs involved and many were rejected or modified due to environmental concerns. Examples of alternatives eliminated or modified by the screening process follow:

Proposals concerning wildlife population levels received considerable analysis throughout all phases of plan preparation. Estimates of the optimum sustainable level of the Game Management Unit 22 (Piceance) deer herd alone varied from 20,000 to 65,000. The figure of 40,000 decided upon by the Colorado Division of Wildlife with the concurrence of the Bureau of Land Management should not result in any significant degradation of the habitat or in any undue impact on other resources, but close monitoring of habitat conditions will be necessary to insure that this is indeed the case.

The proposed levels of habitat condition improvement were arrived at only after thorough discussion of other alternatives that were deemed either too small to measure or too large to realistically achieve without severe impact to other resources.

Many of the stipulations placed on forestry management practices in earlier drafts of the plan were considered too restrictive and several changes were made.

1. The stipulation stating that no harvesting would be permitted within one-half mile of an active raptor nest was reduced to one-fourth mile with the provision that the limit be flexible depending on the raptor species. (See Section E-1 of final draft).
2. It was originally stipulated in the plan that clear cuts be restricted to five acre blocks, but this was relaxed to 40 acres to comply with Bureau of Land Management policy. (See Section E-1).

3. The stipulation that all large snags within one-fourth mile of a raptor nest would be left uncut was changed to read "a portion of all large snags ...". (Section E-1).
4. The stipulation that three snags per acre would be left was changed to "a portion of all snags will be left to serve as raptor perches and sites for cavity nesters". (Section E-1).
5. The stipulation to "maintain a buffer strip of at least 100 feet along perennial streams" was changed to "a buffer strip will be left along all permanent streams". (Section E-1).
6. The stipulation that "logging equipment will not be permitted in stream channels or wet meadows" was changed to "kept to a minimum".

Recommendations in earlier drafts concerning stocking reductions, changes in season of use and changes in class of livestock were considered by the Range section to be premature and based on inadequate data; Section E-2 of the Habitat Management Plan was changed accordingly. Examples of other changes made in the HMP at the request of the Range section are as follows:

1. Original recommendation concerning maximum fence height was actually lower than allowed in BLM Manual 1737. This was changed to comply with the manual.
2. The stipulation governing vegetative manipulation projects (Section D-2) for wildlife originally covered projects for Range, but this was changed to state that "Plans for vegetative manipulation projects will be examined by an interdisciplinary team which may recommend stipulations and constraints on the project to insure protection or enhancement of wildlife values".

3. Project plans for sagebrush chopping, reservoir construction, and fencing have been significantly modified to benefit livestock without lessening value to wildlife.

Following input from the Recreation section, project plans were modified to incorporate visual resource management techniques and provision was made to sign projects in high user concentration areas.

Several alternative project sites were eliminated when it became apparent that they would be located in proximity to intensive mineral activity areas. The value of the remaining projects will not be negated by future mineral developments.

Other alternatives were abandoned or modified due to watershed or soil concerns.

The remaining alternatives to the proposed action revolve around the level of implementation of the plan.

A. Environmental Impacts:

At this time the planned actions for habitat development and improvement projects are not specific enough to discuss in terms of exact impacts, as their effect will vary depending on the number, exact location, and size of projects undertaken. At the time the location, method, and size of each project is determined, a supplemental Environmental Assessment Record of the expected impacts and mitigating measures planned for each project can be prepared.

In general, certain impacts can be expected to occur with each type of project planned. The beneficial impacts are listed

as management objectives with the list of each planned action. In general, the following list of impacts can be expected to occur to some degree if the planned actions are implemented.

Impact:

a. Temporary loss of wildlife forage.

b. Potential destruction of wildlife special use areas.

c. Disturbance of wildlife species.

d. Destruction of habitat of non-target wildlife species.

e. Disruption of wildlife movement patterns.

f. Increased surface disturbance and soil erosion.

g. Increased sediment loads.

h. Reduced water quality in nearby streams.

i. Temporary increase in air and noise pollution.

j. Loss of harvestable timber.

k. Possible destruction of rare and endangered plant species.

l. Disruption of the visual resource.

m. Road construction to thinning areas could result in an increase in detrimental human-wildlife interactions.

n. Temporary loss of livestock and wild horse forage.

o. Disruption of livestock and wild horse movement patterns.

p. Possible concentration of livestock and wild horse in treatment areas.

q. Possible destruction or disruption of sage grouse breeding complexes and wintering areas.

r. If herbicidal sprays are used rather than mechanical treatments, an increase in chemical pollutants in watercourses could result.

s. Misapplication of sprays could result in removal of vegetation in non-target areas.

t. Possible increase in wildlife deaths due to fence entanglement.

u. Exclusion of livestock and wild horses from needed water sources.

v. Possible water right conflicts with other users.

w. Possible competition with existing wildlife species.

x. Increased forage competition between elk, deer, livestock, and wild horses.

y. Destruction of wildlife habitat by over-utilization.

z. Disturbance of wildlife species by researchers.

aa. Increased wildlife mortality due to destructive sampling techniques.

bb. Possible destruction of archaeological sites.

B. Possible Mitigating Measures

At the time the method of implementation, the exact location on the ground, and contract stipulations are to be drawn up for each planned action, the following possible mitigating measures should be applied, where possible.

Impact letter (from Section A)

a. Loss of wildlife forage on pinyon-juniper thinning areas where chaining is the selected thinning method can be reduced by chaining only one way to preserve existing browse plants. One-way chaining should be used only on sites where a proper seed bed can be prepared by a single chaining. Treatment areas should be seeded as soon as possible after treatment. Downed timber should be piled or sold to woodcutters immediately after treatment.

Sagebrush treatments should be designed for partial kill so that young, vigorous plants will remain to provide wildlife forage. All seed mixtures should be designed to meet the needs of known wildlife species in the area. Vegetation removed for reservoir construction should be compensated for by a proper seed mixture including emergent and submergent species.

b. Potential destruction of wildlife special use areas would include, but not be limited to, impacts on deer and elk winter concentration areas, calving and fawning grounds, blue grouse and sage grouse breeding complexes and wintering areas, and raptor nesting areas. These impacts would be mitigated by consulting all available inventory records and locating projects well away from these areas unless the project is specifically designed to improve the special use area in question.

c. Disturbance of wildlife species can be mitigated by the following measures: In the case of raptors, all applicable recommendations made in Section E-1 of the plan should be incorporated into project contracts. In critical deer and elk winter range, no project work should be undertaken during the period of November 1 through April 15. In elk calving areas, no project work should be undertaken during the period May 1 through June 30. No project work should be undertaken in deer fawning areas during the period May 15 through July 15. These dates may be expanded or contracted depending on the specific area in question. Projects near sage grouse strutting ground should not be undertaken during the period March 1

through April 30 (specific dates will vary depending on snow conditions on grounds). Projects near nesting and brooding grounds should have time constraints placed on them based upon the relationship between the observed strutting period for the particular year and the known nesting and brood rearing interval required by sage grouse.

d. Some habitat loss to non-target species, particularly lagomorphs, rodents, and small birds, is unavoidable in most projects but losses can be reduced by insuring that some brush and slash piles are left in the project area and by undertaking revegetation efforts as soon as possible. In no case will a project be undertaken in an area essential to the continued survival of non-target wildlife species.

e. Disruption of wildlife movement patterns can be minimized by limiting size of projects, adhering to fencing standards, providing cover corridors and by not undertaking projects during migration periods.

f. Increased surface disturbance and soil erosion can be lessened by selecting manipulation methods that minimize disturbance (i.e., hand thinning instead of chaining, etc.); constructing waterbars on access roads into project areas; providing gully plugs in project areas; proper timing of projects; implementing projects only on slopes and soil types suitable for the project and by revegetating areas as soon as possible.

g. The measures taken to mitigate f. above can also be used to
and
h. mitigate against increased sediment loads and decreased water quality.

i. Increased air and noise pollution can be lessened by insuring that equipment is properly muffled and in good running order.

j. Loss of harvestable timber can be avoided by holding timber sales prior to, instead of after, project work.

k. Loss of rare and endangered plant species can be elimianted by familiarizing technicians and professionals engaged in project work with the appearance of endangered species likely to be found in the area. A survey of the project area should then be undertaken to locate and protect these species.

l. Impacts on the visual resource can be lessened by incorporating applicable visual management techniques into the design of all projects. Where significant degradation of visual resource is unavoidable, signing should be used to inform the public that wildlife benefits expected from the project outweigh the temporary visual disruption.

m. To avoid adverse wildlife-human interactions resulting from new roads into project areas, all new roads should be physically closed after the project is completed, unless they are needed to maintain the project. If maintenance roads are needed, seasonal closures should be instituted to prevent disturbance to wildlife during critical periods.

n. Loss of livestock and wild horse forage due to wildlife project can be lessened by prompt revegetation efforts and inclusion of plant species beneficial to livestock into seeding mixtures.

o. Disruption of livestock and wild horse movement patterns can be avoided by the methods described in e. above and by close coordination in design, location and timing of projects between the Wildlife and Range sections.

p. Concentration of livestock and wild horses on wildlife project areas can be reduced by protective fencing measures and by timing project work to coincide with periods of rest called for in allotment management plans.

q. Destruction or disruption of sage grouse breeding complexes and wintering areas by sagebrush manipulation projects can be reduced or avoided entirely by adhering to guidelines laid down by the Western States Sage Grouse Workshop. Copies of the guidelines are on file at the Craig and Meeker offices of the Bureau of Land Management.

r. and s. Projects involving herbicidal sprays are required by law to have a separate Environmental Assessment Record (EAR) prepared for each case. Impacts and mitigating measures will be detailed fully in these future EAR's if any spray project work is undertaken in the Habitat Management Plan area.

t. Increased wildlife mortality due to fence construction can be lessened by adhering to fencing standards set forth in Bureau Manual 1737.

z. The possibility of increased disturbance to wildlife species

and by researchers engaged in inventory work called for in the

aa. HMP will be minimized by conducting studies during non-critical periods whenever possible and by using only thoroughly trained investigators. In the case of rare and endangered species, such as the peregrine falcon, only acknowledged experts will be hired to conduct studies.

bb. Archaeological surveys will be conducted before any ground disturbing activities take place.

C. Adverse Impacts That Cannot Be Avoided:

Impact letter (from Section A)

a. Some temporary loss of forage will result from many of the HMP projects but eventually forage production on these areas will be significantly increased.

d. Minor loss of habitat of non-target species will occur on most improvement project sites.

f. Surface disturbance and minor soil erosion will occur on most project sites but this should be of a temporary nature.

g. Increased sediment loads and decreased water quality will be

and

h. minor and temporary if the above mitigating measures are followed.

i. Temporary and localized increases in air and noise pollution are unavoidable.

l. Some alteration of the visual environment is unavoidable, but the small size of the projects will keep this to a minimum.

n. Some permanent loss of livestock forage will result from protective fencing measures but the increase in forage on unfenced pinyon-juniper thinning project areas will more than offset this minor loss.

u. Exclusion of livestock and wild horses from needed water sources caused by protective fencing can be eliminated by piping water to troughs, creating livestock pass-throughs, or by developing alternative water sources in the same area.

v. Water right conflicts resulting from reservoir construction and well and spring development can be resolved by limiting size of projects and by thoroughly investigating water right claims before implementing the project.

w. Competition between existing wildlife populations and introduced wildlife species will be avoided by careful analysis of all proposals and approval of introduction of only those species that have minimal habitat requirement overlap with existing species.

x. Increased competition for available forage between deer,
and
y. elk and livestock and possible over-utilization of forage due to the proposed increase in wildlife populations will be minimized by implementation of the wildlife project work scheduled in the HMP and by the improved management of livestock resulting from the Allotment Management Plan program being undertaken by the Range section. Careful monitoring of wildlife population levels and habitat conditions will be necessary to insure that population levels do not increase beyond the carrying capacity of the area.

t. Minor increase in wildlife mortality due to fence construction can be expected even if the standards contained in Bureau Manual 1737 are followed.

x. and y. The increased competition between livestock and wildlife for available forage brought about by allowing wildlife populations to increase could be significant unless project work and Allotment Management Plan implementation keep pace with expanding wildlife populations.

bb. It is possible that some archaeological sites may be missed by archaeological surveys and that such sites may be destroyed.

D. Relationship Between Short-Term Use and Long-Term Productivity:

Short-term loss will be restricted to the impacts of wildlife and other resources described in the preceding section. Following full implementation of the plan, the eventual long term gain will be the accomplishment of the objectives outlined in Section B (Management Objectives) of the plan. In addition, a significant increase in hunter and fisherman days and non-consumptive wildlife use will result from implementation of the plan. The Program Package Cover Schedule in Section G of the plan contains estimates of these recreation days added.

E. Irreversible and Irretrievable Commitment of Resources:

The expenditure of the funds required to initiate project work is the major commitment of resources that will result from implementation of the plan.

In some cases vegetative type conversions will result in a loss of the forestry resource, but this is not irreversible in the sense that eventually the original plant community could probably be restored by natural succession.

It is possible that some unknown historical or archaeological site will be inadvertently lost, but as it is standard Bureau policy to conduct archaeological surveys on all project areas, this should be kept to a minimum if not eliminated entirely.

IV. Public Interest and/or Controversy:

As mentioned previously, copies of all drafts of the Habitat Management Plan have been sent to the Colorado Division of Wildlife, U.S. Geological Survey, U.S. Fish and Wildlife Service, U.S. Forest Service, and Ca and Cb Oil Shale Tract officials. Comments from these agencies have been received and acted upon. In addition, copies of the Habitat Management Plan were sent to the Sierra Club, Audubon Society, The Wildlife Society, Colorado Wildlife Federation, Colorado State University and the Izaac Walton League. Comments were solicited from each of the groups. In addition, the development of the Management Framework Plans for Garfield and White River Planning Units involved public participation.

V. Recommendations:

At the time job documentation reports detailing methods of implementation, exact locations, contract stipulations, etc., are prepared, the possible mitigating measures listed under III A. of this environmental assessment record should be included. A supplemental environmental assessment record can then be prepared to determine if the measures included in the project plan could adequately mitigate expected environmental impacts of the individual project, or if other impacts could occur which may call for further mitigating measures.

IMPLEMENTATION SCHEDULE AND COST ESTIMATE

G. Implementation Schedule and Cost Estimate

Program Package forms1610-27 and 1610-28 have been completed for the HMP and are presented on the following pages. The entire HMP serves as the narrative required by Bureau Manual 1612.26A for the Program Package forms, but a few supplementary remarks are necessary for clarification.

1. Costs were computed on the basis of $2,300 per man month. (Base cost used in developing the fiscal year 1978 BLM budget.)

2. New positions by title and grade are as follows:

Position Title and Grade	Number Needed By Year 1	2	3	4	5
(T) Wildlife Tech. GS 5 (6 Month Appointment)	6	9	4	4	4
(T) Engineering Tech. GS 5 (6 Month Appointment)	1	2	3	2	2
(T) Range Tech. GS 5 (3 Month Appointment)	0	2	2	2	2

(T) = Temporary

3. With the completion of the various inventories identified in Section H of the HMP, a supplemental package will be submitted requesting funding for improvement projects and further research studies.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROGRAM PACKAGE COVER SCHEDULE

PACKAGE IDENTIFICATION	C 0 7 9 (STATE, PY)	Priority	Package Life
			Five Years

Package Name: Piceance Basin HMP

Package Purpose: Combined Species Wildlife Management

Program Area: White River Resource Area

(1)		CURRENT YEAR FY 19 (2)	BUDGET YEAR FY 19 (3)	PROGRAM YEAR FY 19 (4)	PROGRAM YEAR + 1 FY 19 (5)	PROGRAM YEAR + 2 FY 19 (6)	PROGRAM YEAR + 3 FY 19 (7)	PROGRAM YEAR + 4 FY 19 (8)	TOTAL (9)	AVG. ANNUAL PROGRAM OPERATIONS FY 19 (10)
A. COST DATA		$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S
Total Costs (Form 1610-28)		323	184	401	431	437	269	269	1,807	87
Construction (Form 1610-28)										
Construction Maintenance (Form 1610-28)										
Total Costs Less Construction and Maintenance		323	184	401	431	437	269	269	1,807	87
WASHINGTON OFFICE USE ONLY										
B. MANPOWER DATA		MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS
Permanent		34	25	48	47	38	26	26		
Temporary		39	19	48	67	34	34	36		
C. OUTPUT AND WORKLOAD MEASURE DATA		QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY
Habitat or Potential Habitat Of Rare Or Endan. Species Identified(number)	a	2			2				4	
	b	0			0				0	
	c	2			2				4	
Endangered Species Protected (number)	a		2			2			4	4
	b		0			0			0	0
	c		2			2			4	4
Aquatic Habitat Inventoried (Miles of stream)	a	300							300	
	b	0							0	
	c	300							300	
Riparian Habitat Inventoried (acres)	a	4,500							4,500	
	b	0							0	
	c	4,500							4,500	
Big Game Habitat Inventoried (Acres)	a	250,000	0	496,000	787,000				1,533,000	
	b	0	250,000	250,000	496,000				746,000	
	c	250,000	0	246,000	291,000				787,000	
Upland Game Habitat Inventoried(acres)	a	100,000	161,000	211,000					472,000	
	b	0	100,000	161,000					261,000	
	c	100,000	61,000	50,000					211,000	

(Instructions on reverse)

Form 1610-27 (October 1974)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROGRAM PACKAGE COVER SCHEDULE

PACKAGE IDENTIFICATION	C	0	7	9	Priority	Package Life
	STATE		FY			

Package Name

Package Purpose

Program Area

(1)		CURRENT YEAR FY 1976 (2)	BUDGET YEAR FY 1977 (3)	PROGRAM YEAR FY 1978 (4)	PROGRAM YEAR + 1 FY 1979 (5)	PROGRAM YEAR + 2 FY 1980 (6)	PROGRAM YEAR + 7 FY 1985 (7)	PROGRAM YEAR + 12 FY 1990 (8)	TOTAL (9)	AVG. ANNUAL PROGRAM OPERATIONS FY 19 (10)
A. COST DATA		$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S	$000'S
Total Costs (Form 1610-28)										
Construction (Form 1610-28)										
Construction Maintenance (Form 1610-28)										
Total Costs Less Construction and Maintenance										
WASHINGTON OFFICE USE ONLY										
B. MANPOWER DATA		MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS	MAN-MONTHS
Permanent										
Temporary										
C. OUTPUT AND WORKLOAD MEASURE DATA		QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY
Hunter Days Added 1/	a			92,000	100,000	107,700				
	b	89,900	89,900	89,900	89,900	89,900			30,000	30,000
	c			2,100	10,[illegible]00	17,800				
Fisherman Days Added	a				1,000	2,000	1,000			
	b	Unknown								
	c				1,000	2,000	1,000		4,000	4,000
Non-comsumptive Days Added	a				10,000	20,000			30,000	
	b	Unknown								
	c				10,000	20,000			30,000	30,000
Terrestrial Habitat Improved (acre)	a	3,600	1,480	2,010	1,600	12,230	45,300 2/	84,400 2/	150,620 3/	
	b									
	c	3,600	1,480	2,010	1,600	12,230	45,300	84,400	150,620 3/	
Terrestrial Habitat Maintained (acres)	a						44,400 2/		44,400 3/	195,020 3/
	b									
	c						44,400		44,400 3/	195,000 3/
Aquatic Habitat Improved (Miles)	a			25		100	100		225	
	b									
	c			25		100	100		225	

(Instructions on reverse) 1/ Base From 1975 DOW Harvest Statistics. 2/ Assuming Piceance Planning Unit AMP's Are Implemented. Form 1610-27 (October 1974)

3/ Habitat Improved Becomes Habitat Maintained In Final Column.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROGRAM PACKAGE INPUTS SCHEDULE

PACKAGE IDENTIFICATION			
C	O	7	9
STATE		FY	

Package Name
Piceance Basin HMP

SUBACTIVITY AND POSITION IDENTIFICATION (1)	CURRENT YEAR FY 1976 & TQ			BUDGET YEAR FY 1977			PROGRAM YEAR FY 1978			PROGRAM YEAR + 1 FY 1979			PROGRAM YEAR + 2 FY 1980			PROGRAM YEAR + 3 FY 1981			PROGRAM YEAR + 4 FY 1982		
	TOTAL COST (000's) (2)	POSITIONS (3)	M/M (4)	TOTAL COST (000's) (5)	POSITIONS (6)	M/M (7)	TOTAL COST (000's) (8)	POSITIONS (9)	M/M (10)	TOTAL COST (000's) (11)	POSITIONS (12)	M/M (13)	TOTAL COST (000's) (14)	POSITIONS (15)	M/M (16)	TOTAL COST (000's) (17)	POSITIONS (18)	M/M (19)	TOTAL COST (000's) (20)	POSITIONS (21)	M/M (22)
1220 - Range Management	2	--	1	2	--	1	30	3	13	41	3	18	14	2	6	14	2	6	14	2	6
Permanent Personnel		--	1		--	1		1	7		1	12		--	--		--	--		--	--
Temporary Personnel		--	--		--	--		2	6		2	6		2	6		2	6		2	6
1240 - Forest Management	5	--	2	5	--	2	5	--	2	5	--	2	5	--	2	5	--	2	5	--	2
Permanent Personnel		--	2		--	2		--	2		--	2		--	2		--	2		--	2
Temporary Personnel		--	--		--	--		--	--		--	--		--	--		--	--		--	--
1280 - Recreation Managemt.	5	--	2	5	--	2	5	--	2	5	--	2	5	--	2						
Permanent Personnel		--	2		--	2		--	2		--	2		--	2						
Temporary Personnel		--	--		--	--		--	--		--	--		--	--						
1285 - Wildlife Management	311	10	68	172	6	31	320	12	66	359		82	381	10	52	250	8	52	250	10	54
Permanent Personnel		2	29		2	20		2	24		2	24		2	24		2	24		2	24
Temporary Personnel		8	39		4	19		10	42		12	58		8	28		6	28		8	30
2230 - Road Maintenance							3	--	1												
Permanent Personnel								--	1												
3100 - PLDRT							38	1	12	21	1	7	32	1	10						
Permanent Personnel								1	12		1	7		1	10						
Temporary Personnel								--	--					--	--						
Package Total Funds	323			184			401			431			437			269			269		
Package Total M/M (P)			34			25			48			47			38			26			26
Package Total M/M (T)			39			19			48			64			34			34			36
Package Total Positions (P)		2			2			4			4			3			2			2	
(T)		8			4			12			14			10			8			10	

(Instructions on reverse)

Form 1610-28 (October 1974)

MANAGEMENT EVALUATIONS AND REVISION

H. Management Evaluation And Revision

Table 14 illustrates the fact that a significant portion of funds needed to fully implement the HMP will be used to fund original research or inventory critical wildlife habitat. The ultimate goal of the studies and inventories will be to provide land and wildlife management agencies in the Piceance Basin with the up-to-date information needed to effectively preserve and enhance the substantial wildlife values of the Basin.

Detailed research proposals and objectives for the Fiscal Year 1976 contracted research projects, funded by Sikes Act add-on funds, can be found in Appendix 6. What follows is a brief synopsis of these same contracted studies. Study areas may be found on Map 9.

1. Riparian and Aquatic Habitat Inventory - This study is supervised by Walt Burkhard, Division of Wildlife, and will be accomplished in conjunction with his work on the Yellow Jacket project. Mr. Burkhart's crews will inventory approximately 125 miles of stream and 16,000 acres of riparian habitat with emphasis on designating areas on national resource land that should be maintained or enhanced through management or developmental procedures. (Objectives directly served are NG 8, F 1).

2. Parachute Canyon Peregrine Falcon Survey - This study is directed by raptor specialists Jerry Craig, Division of Wildlife, and Dr. James Enderson, Colorado College, Greely. The entire Parachute Canyon complex will be surveyed by helicopter to locate the presence of a peregrine falcon eyrie. Production will be determined by distant observations. Critical habitat boundaries will be established and recommendations will be made for protection of the habitat. (Management objective directly served is P-1).

3. Non-game Wildlife Study and Survey - Dr. Walt Graul, Division of Wildlife is in charge of this study which seeks to determine the species and numbers of non-game birds and mammals present in the habitat manipulation areas scheduled for modification this summer.The effect of the habitat treatments will be assessed by comparing these baseline data to data obtained in subsequent breeding season and fall inventories of the treatment areas. A secondary objective of the study will be to determine significant biological activity areas for select non-game species. (NG 1).

4. Sage Grouse Special Use Area Study - This study contracted to the Division of Wildlife will have a three year duration and seek to locate sage grouse breeding, nesting, brooding, and wintering areas and determine specific actions needed for their protection or enhancement. (Objective directly served is SG 1).

5. Winter Forage Competition Between Mule Deer and Livestock - Dr. Richard Hansen of Colorado State University will use fecal analysis techniques to determine dietary overlap that exists during the winter months between mule deer and livestock on specific allotments in the HMP area. It is hoped that the results of this study will contribute to the development of allotment management plans that will reduce competition between herbivores in the Piceance Basin. (HMP management objective directly served is Md 11).

6. Topographical and Vegetative Characteristics of Preferred Mule Deer Winter Habitats in the Piceance Basin - This three year study will be under the supervision of Richard Bartmann, Division of Wildlife, Little Hills Research Station, and will have as its primary objective the identification of topographic and vegetational characteristics of mule deer winter habitats used under varying climatic conditions. This information is critically needed to enable management agencies in the Basin to make recommendations on specific habitat areas that should be protected, in view of forthcoming energy projects. This data would also be useful in determining which aspects of a disturbed habitat should be restored for the benefit of mule deer. Objective directly served is Md 12.

The remainder of the studies on Table 14 are either ongoing Division of Wildlife population or production inventories or Bureau of Land Management studies proposed to acquire needed habitat condition information or to evaluate the effects of habitat manipulation practices and to measure progress toward stated goals. All project work undertaken by the BLM will be monitored to determine the degree of success or failure of the project. The monitored systems will consist of both vegetative measurements (transects, exclosures, and photoplots) and animal use estimates (pellet counts and brood counts).

The system of browse utilization and pellet group transects will be developed in 1976-77 by the BLM biologist and the Wildlife Conservation Officer for Game Management Unit 22. The data obtained in future years from these transects will

be used to formulate hunting season and harvest recommendations.

The elk population trend counts will also be used to determine the degree of encroachment of elk on mule deer winter range. This will necessitate the expansion of the Division of Wildlife's present program of aerial census work.

The permanent intensive aquatic habitat inventory plots are dependent upon the implementation of the portion of the plan dealing with the streams on the Naval Oil Shale Reserve. As of this writing, it is unknown whether the Navy will fund the installation of the proposed projects (See Table 10) on the Naval Oil Shale Reserve.

The Piceance Basin Wildlife Habitat Management Plan will be reviewed and modified as needed upon receipt of a final report from any one of the above studies or inventories. Enough data will probably be acquired prior to the winter of 1977 to necessitate a substantial revision of the plan at that time.

TABLE 14 STUDY SCHEDULE

Type of Study	Objective Served or Evaluated	Method	Time Frame	Respon-sibility	MM	Cost	Results Expected
New Studies							
Nongame wildlife survey of vegetative treatments.	NG 1	Contract See Appendix 6	4/1 - 9/30/76 4/1 - 9/30/77 4/1 - 9/30/78 4/1 - 9/30/79	DOW	-	12,800 1st yr 15,000 2nd & 3rd yr & 4th yr	Assess effects of veg. manipulation projects on non-game wildlife.
Survey of sagegrouse special use areas	SG 1	Contract See Appendix 6	3/15 - 9/30/76 As needed 1977 and 1978	DOW	-	10,000/yr 28,000	Determine S.G. special use areas and identify potential improvement projects.
Riparian and aquatic habitat inventory	NG 8 F 1	Contract See Appendix 6	5/1 - 10/30/76	DOW	-	37,000	Inventory selected aquatic and riparian habitats.
Parachute Canyon Peregrine falcon survey	P-1	Contract See Appendix 6	5 days/April, 1976 5 days/June, 1976	DOW	-	2,000	Locate Peregrine falcon eyrie
Topo. and veg. characteristics of mule deer preferred winter range	Md 12	Contract See Appendix 6	6/77 - 6/80 3 winters	DOW	-	45.000 1st yr 30,000 2nd & 3rd yr.	Determine characteristics of preferred winter range under varying climatic conditions
Forage competition between mule deer & livestock on winter range	Md 11	Contract See Appendix 6	Winter 1976-1977	CSU	-	3,000	Determine degree of dietary overlap.
GMU 22 winter range inventory update	Md 5	Big Game Range Anal. Handbook 1970	July/Sept. 1976 June/Sept. 1977	BLM	6 12		Habitat condition

TABLE 14 STUDY SCHEDULE

Type of Study	Objective Served or Evaluated	Method	Time Frame	Respon-sibility	MM	Cost	Results Expected
GMU 21 winter range inventory completion	Md 13	Big Game Range Anal. Handbook 1970	July-Sept. 1976 May-Aug. 1977	BLM	6 12		Habitat condition
Browse age and form class transects on all deer and elk forage production projects.	Md 15 E 1	BLM Manual 6630	April - May prior to veg. treatments. 5 yrs after treatments on all projects.	BLM	2/yr		Vegetative Response to all treatments
Evaluation of vegetative response in Greasewood experimental plots		Integrated Range Water-shed Wildlife Inst. Memo CSO 75-210	June - July	BLM	.5/yr		Response to various treatments
Pellet Groups	Md 15 E 1	Pellet Group Counts	Annually on all veg. treatments	BLM	1/yr		Animal response to treatments.
Elk habitat inventory	E 5	Big Game Range Anal. Handbook 1970	June-Sept. 1979	BLM	8		Habitat Condition
Black Footed Ferret potential habitat inventory	BFF 1	Field observa-tions, soil & veg. typing.	Mar-Aug. 1976	BLM	6		Absence or presence of BFF
Sandhill crane use area and migration routes & dates.	SC-1	Field observa-tions & mailed question-naires.	Mar-Aug. 1976	BLM	6		Determination of Sandhill Crane use areas, migration routes & dates.
Bald eagle habitat inventory	BE 2	Field observa-tions.	Nov.1976-Apr. 1977	BLM	6		Special use areas of bald eagles on White River
Literature review and personal contacts with herpetological sources.	NG 9, 10	Computer searches Univ. Library work; interviews.	Feb. 1977	BLM	1		Reveal existing gaps in knowledge and deter mination of additional studies needed.

TABLE 14 STUDY SCHEDULE

Type of Study	Objective Served or Evaluated	Method	Time Frame	Respon-sibility	MM	Cost	Results Expected
Waterfowl use of reservoirs	WS-1	Field observations	April-May	BLM	.5		Waterfowl use of RMP reservoirs
Colorado Cutthroat hybridization	F- 9	Contracted	Spring - 1976	CSU		500	Determine degree of hybridization in NOSR Colo. Cutthroat
Lake and Soldier Creek Intensive Inventory	F-2	Standard Stream Survey See Appendix 4	Summer 1976	BLM	2		Determine condition of streams and develop recommendations
Census and Trend studies for non-game birds	NG-2	Spot mapping and strip census - 12 plots	Annual May & June	BLM DOW USFWS	3		Detection of species population changes over time.
Determination of specific elk use areas in GMU 22	E-5	Aerial survey	5 flights - Winter 1978	BLM DOW	1 1	1000	Determine specific elk use areas in GMU 22 prior to 1979 inventory.
ONGOING							
Winter Mule Deer Counts	Md 7, 8, 9, & 10	Helicopter or Fixed Wing	As deemed necessary by DOW	DOW			Population trend
Winter Elk Counts	E 6, 7, 8, 9, & 10.	Helicopter or Fixed Wing	3 counts/winter	DOW			Population trend mule deer winter range overlap.
60 utilization Transects	Md 6	USFS Form R2-2600-3 5/66	Spring-Fall Annually	DOW BLM	2 2		Level of browse utilization on mule deer winter range

TABLE 14. STUDY SCHEDULE

Type of Study	Objective Served or Evaluated	Method	Time Frame	Respon-sibility	MM	Cost	Results Expected
Sage grouse strutting ground counts	SG 4, 5	Fixed Wing & Vehicle Rts.	April - Annually	DOW BLM	1 .5		Population trend
Sage grouse brood counts	SG 4,5	Vehicle Route	July - August Annually	BLM DOW	1 1		Production estimates and response to mgmt. and treatment.
Blue grouse brood counts	BG 1	Vehicle Route	July - August Annually	DOW			Production estimates and response to mgmt. and treatment.
Canada Goose brood counts	WS 3, 6	Float White & Colo. Rivers	May - June Every 3 years	BLM DOW	.5 .5		Production estimates and response to mgmt. and treatment.
Browse & Range Condition transects for AMP's	Md 1, 2,3, & 4 P 3, SG 3	Integrated transects & Big Game Range Anal. Handbook 1970	See individual AMP's.	BLM	3/yr-(Wildlife) 3/yr-(Range)		Progress toward forage production goals.
Permanent Intensive Aquatic Habitat Inventory plots	F 3 thru 9	Standard Stream Survey See Appendix 4	July-August Annually	BLM	2/yr		Progress toward NOSR goals

PUBLIC AFFAIRS

I. Public Affairs

The following public affairs program has been formulated for the wildlife plan by Fil Jimenez, Environmental Education Coordinator of the BLM, Colorado State Office.

BACKGROUND

Piceance Basin in NW Colorado is a critical area for interagency wildlife planning and management. This importance is increased and hastened in time by energy and mineral development.

CONCEPT AND GOAL

To develop an education and public awareness program that reaches specific and general publics.

To make aware, inform, involved and motivate understanding, criticism, support and dialogue that contributes toward a forum for citizen expression and education.

TARGET GROUPS

Wildlife conservation: sportsman organizations, professional organizations, environmental groups.

Industry: coal, cattle, sheep, oil, guides, outfitters, tourists, other resource users.

School systems: elementary--universities.

Legislative: members of Congress, State Legislative and Civic leaders.

GENERAL OBJECTIVES

To create an awareness of the present situation in the Piceance Basin, i.e.: data, interrelationships. Inform the public that the area is a Sikes Act Planning Area and how the endangered

Species Act affects the area.

To create an awareness of the present and proposed energy development.

To gain an understanding of the impacts of resource development on wildlife and the goal of resource managers to mitigate the impacts with a resulting harmonious relationship between wildlife and resource development.

To enhance communication between BLM and different publics seeking their involvement in an on-going process of land management.

To allow publics to analyze, based on facts, costs (benefits to environment and society) to show that we are not always faced with dichotomies (either/or situations): that there are alternatives.

TECHNIQUES, METHODS, MATERIALS

Case studies, workshops, simulation exercises, filmstrip and slide-cassette programs, show-me trips, fact sheets, civic presentations, advisory board programs, radio-t.v. programs, research projects.

CONTENT

Baseline data - physical, socio-economic

Projected impacts

Projected management plans

SOURCES - RESOURCES

BLM Personnel (State, Washington, Service Center, District and Resource Area offices), Staley Studio, Colorado Division of Wildlife, U.S. Forest Service, U.S. Geological Survey, U.S. Fish and Wildlife Service, Soil Conservation Service, Colorado State University, and other schools and private organizations.

LOCATIONS

Piceance Basin communities, metro areas, clubs, chapters, schools, organizations, wherever interest is generated.

TIME FRAME

Pre-planning and material source compilation: Januray - October 1976.

Contracts for services, publications, visual-aids, development, program development and implementation: July 1976 - September 1977.

EVALUATION

By whom: Piceance Basin Wildlife Plan Interagency Coordinating Committee, District and State office personnel involved in project.

When: During planning (January-December 1976), prior to implementation, and during program.

Objectives: To examine accuracy and format.
To provide additional data.
To make program current.

COSTS - January 1, 1976 through September 30, 1977

Audio-Visual:

1 - 48 Frame Filmstrip (Original & 50 Copies)	$200	
1 - 15 to 20 minute Casettes (Original & 50 Copies)	75	
1 - 100 to 160 Slide Lap/Dissolve Program	50	
Reel/Reel and Cassette Recording	25	
		$ 350

Publications:

5 -	Separate Fact Sheets (2-4pages) Set up and duplicate copies 1,000 each	$300	
1 -	Case Study - Jr.-Sr. High School level Approximately 10 pages - 500 copies	100	
50 -	100 Publications of Entire Habitat Management Plan, loose leaf binder form, with photos, maps, etc.	500	
100 -	Abstract version publications of the Habitat Plan	200	
			$1,100

Services:

Professional voice recording for tapes Assistancein writing case study - other publications	200

Workshop:

1 - Mixed participant workshop Miscellaneous expenses	150
	$1,800

Man Months - S.O. Public Affairs = 1 M M

Travel - $ 200

RATIONALE FOR EDUCATION EFFORT

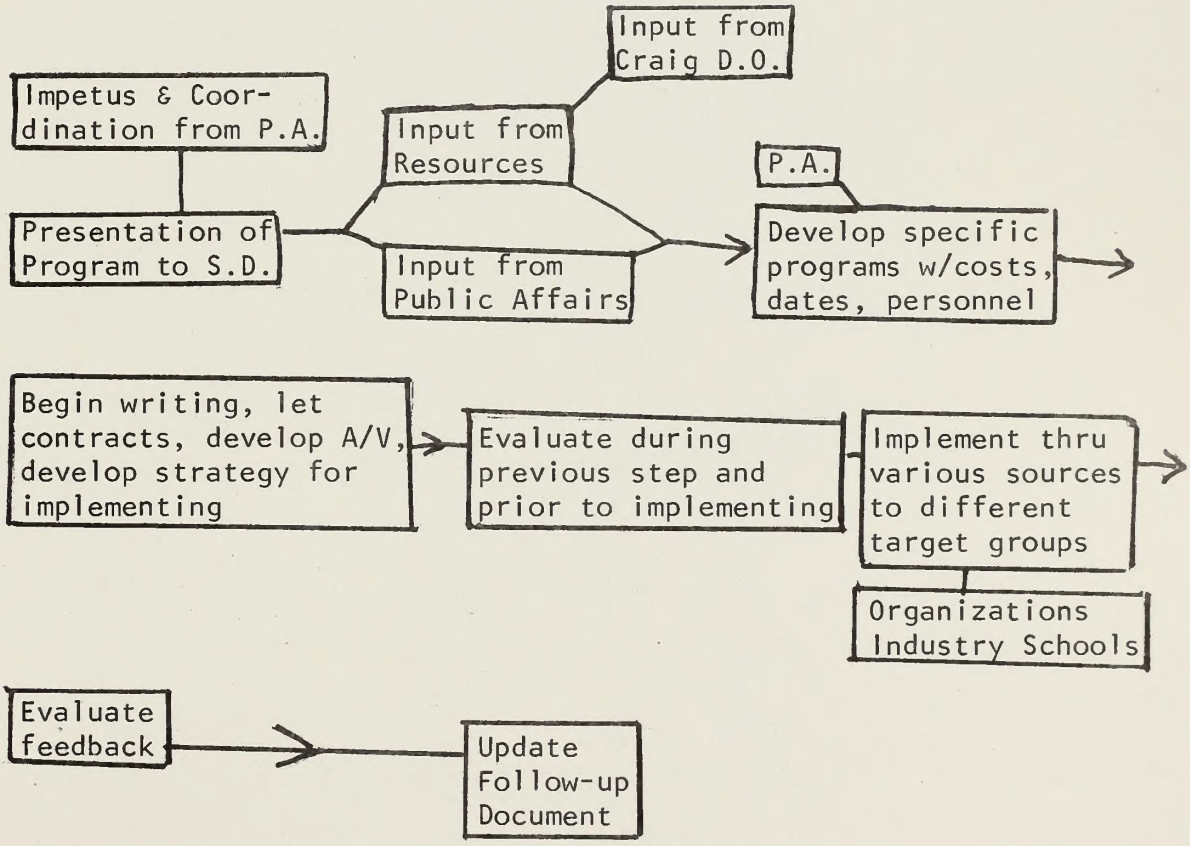
Aids in understanding of those affected by or concerned with wildlife/resource development.

Aids in decision-making by management by considering feedback received in operation of program.

Over all program is a series of short-term goals/objectives leading to a long-term objective: quality NRL Management.

Program doesn't cost - it pays.

HOW WILL IT BE HANDLED?



CLOSING

If this program were undertaken by BLM in Colorado it would be one of the first efforts in the Bureau to link a concentrated education program to a resource activity. If properly managed, it could serve as a pilot to the rest of the resource activities and other Bureau programs.

CONCURRENCE AND APPROVAL

J. Concurrence And Approval

This Habitat Management Plan has been prepared, reviewed, and approved for implementation by the undersigned parties. Final approval date shall be that given by the last signee:

Prepared By: R. V. Ward — Jan 14, 1977
R. V. Ward — Date
BLM Wildlife Biologist

Approved By: Marvin W. Pearson — Feb - 9 - 1977
Marvin W. Pearson — Date
District Manager

Richard Norman — Feb 9, 1977
Richard Norman — Date
Acting Regional Manager

Dale R. Andrus — 2/9/77
Dale R. Andrus — Date
State Director

Jack R. Grieb — 2-9-77
Jack R. Grieb — Date
Director

MAPS AND APPENDIX

APPENDIX I

MAPS OF PICEANCE BASIN WILDLIFE PLAN, BASED ON PLAN OVERLAYS AND BASE MAP

Map Content

#1	Habitat Types
#2	Big Game Range - Deer and Lion
#3	Big Game Range - Elk and Bear
#4	Upland Game and Waterfowl
#5	Raptor Habitat
#6	Livestock Management
#6a	Livestock Management Objectives
#7	Energy Developments
#8	Habitat Improvement Projects
#9	Studies
#10	Inventories
#11	Access and Land Acquisition
#12	Wildlife Introductions
#13	Existing Inventories

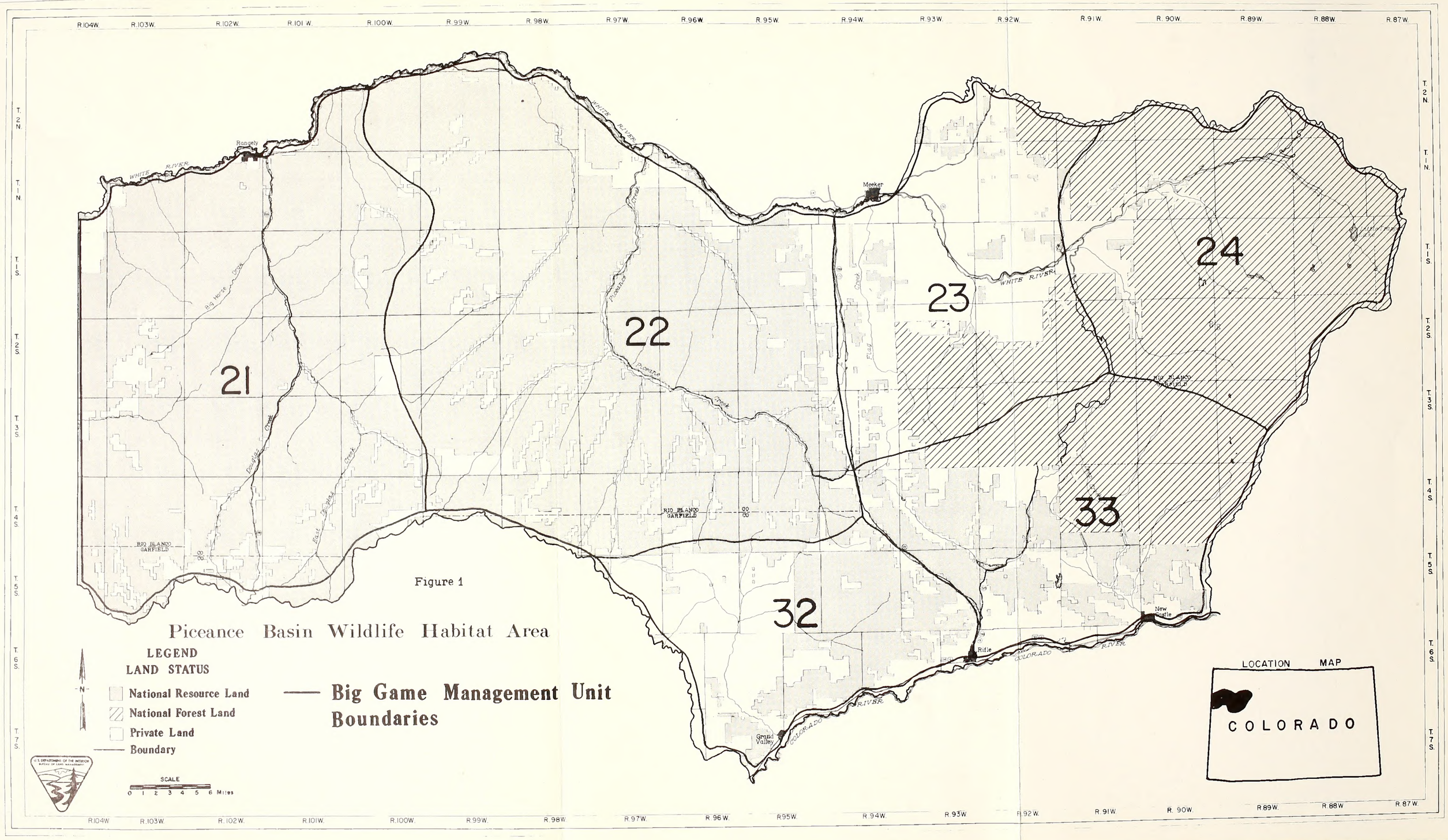
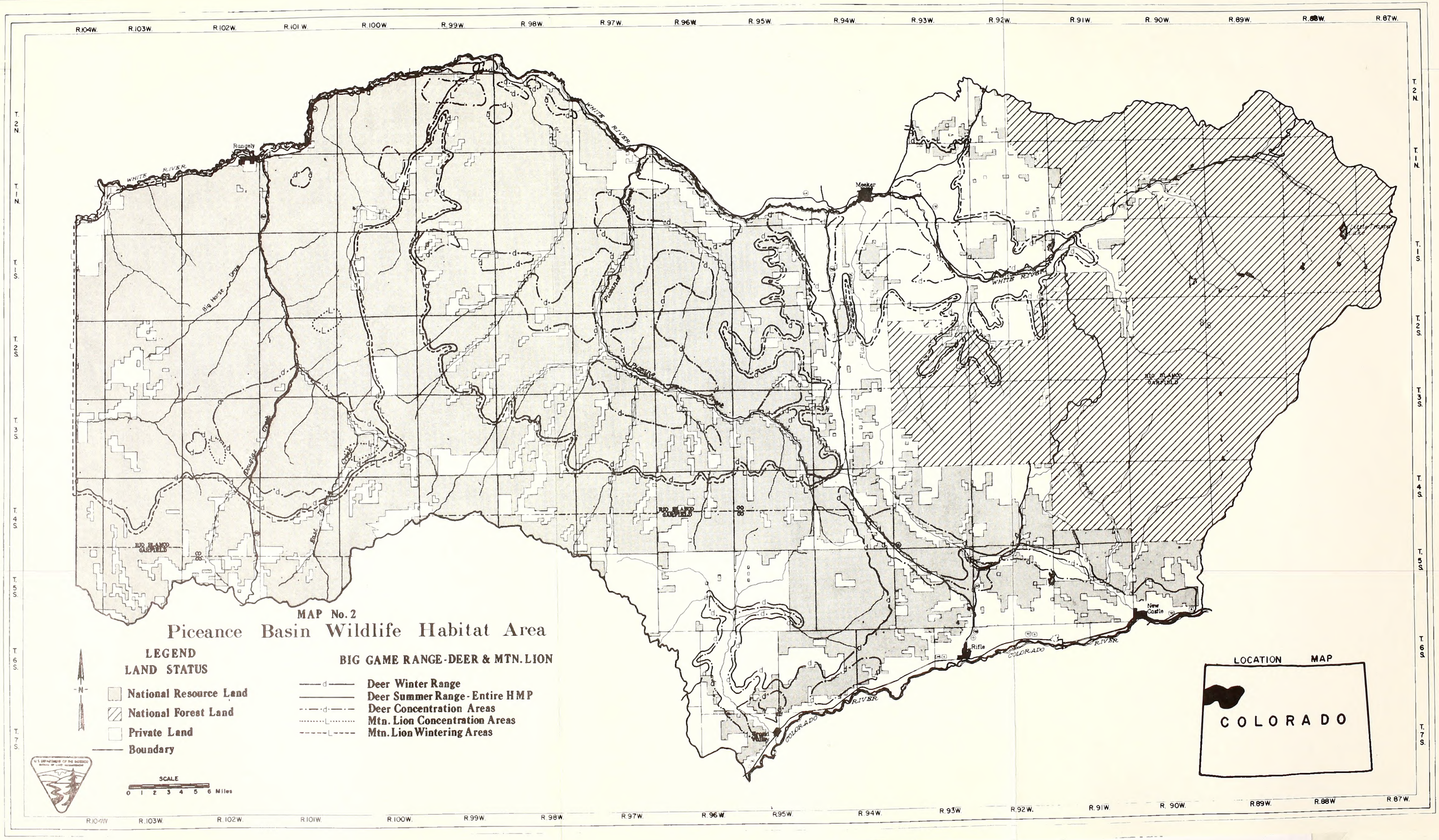


Figure 1

Piceance Basin Wildlife Habitat Area

MAP No. 1

Piceance Basin Wildlife Habitat Area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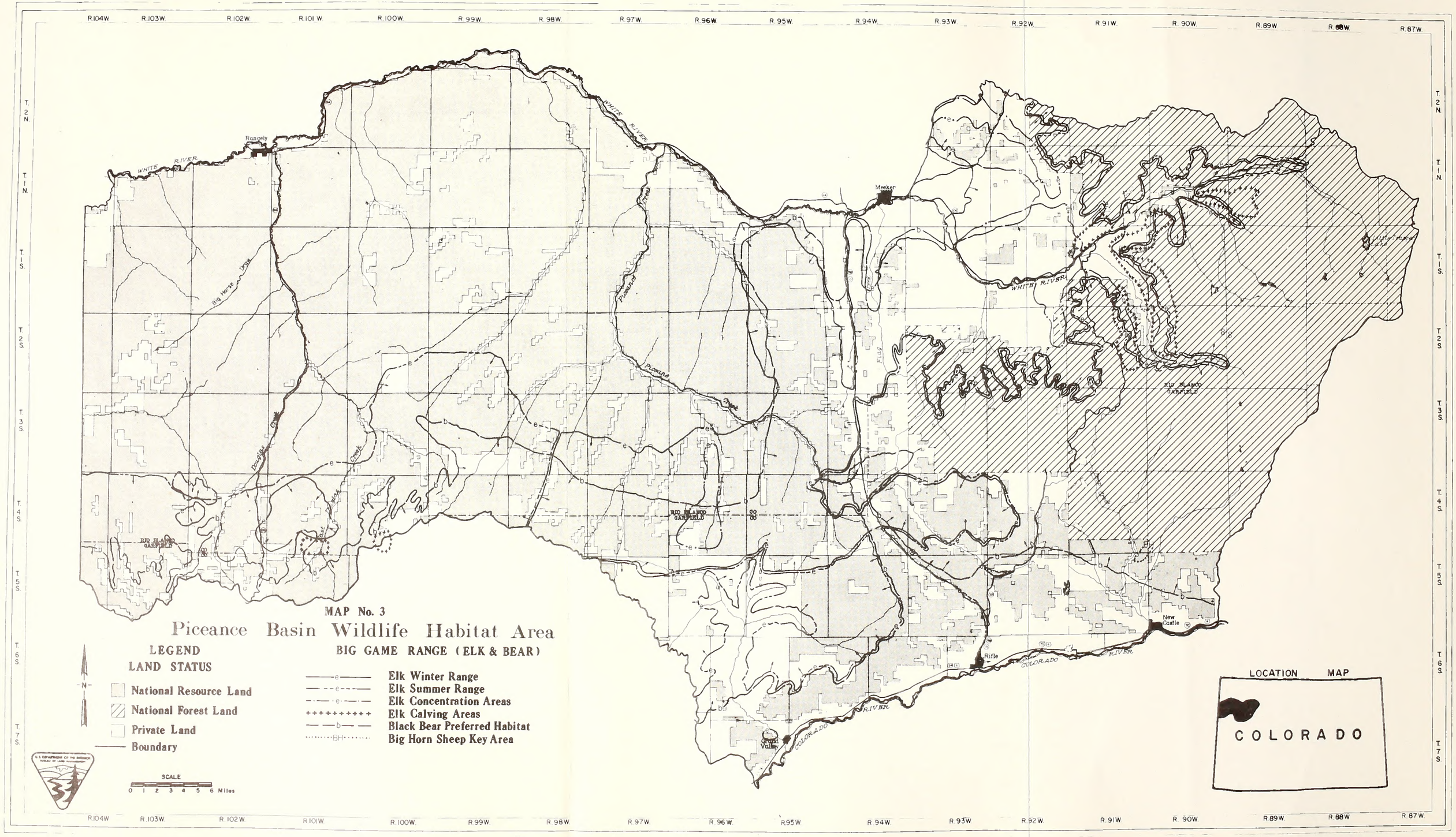
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T.2N.
T.1N.
T.1S.
T.2S.
T.3S.
T.4S.
T.5S.
T.6S.
T.7S.
Rangely
WHITE RIVER
Big Horse Draw
Douglas Creek
Piceance Creek
Meeker
Flag Creek
BIG BLANCO
GARFIELD
Rifle
New Castle
COLORADO RIVER
MAP No. 2
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
BIG GAME RANGE-DEER & MTN. LION
Deer Winter Range
Deer Summer Range - Entire HMP
Deer Concentration Areas
Mtn. Lion Concentration Areas
Mtn. Lion Wintering Areas
SCALE
0 1 2 3 4 5 6 Miles
LOCATION MAP
COLORADO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R.94W.
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T.2N.
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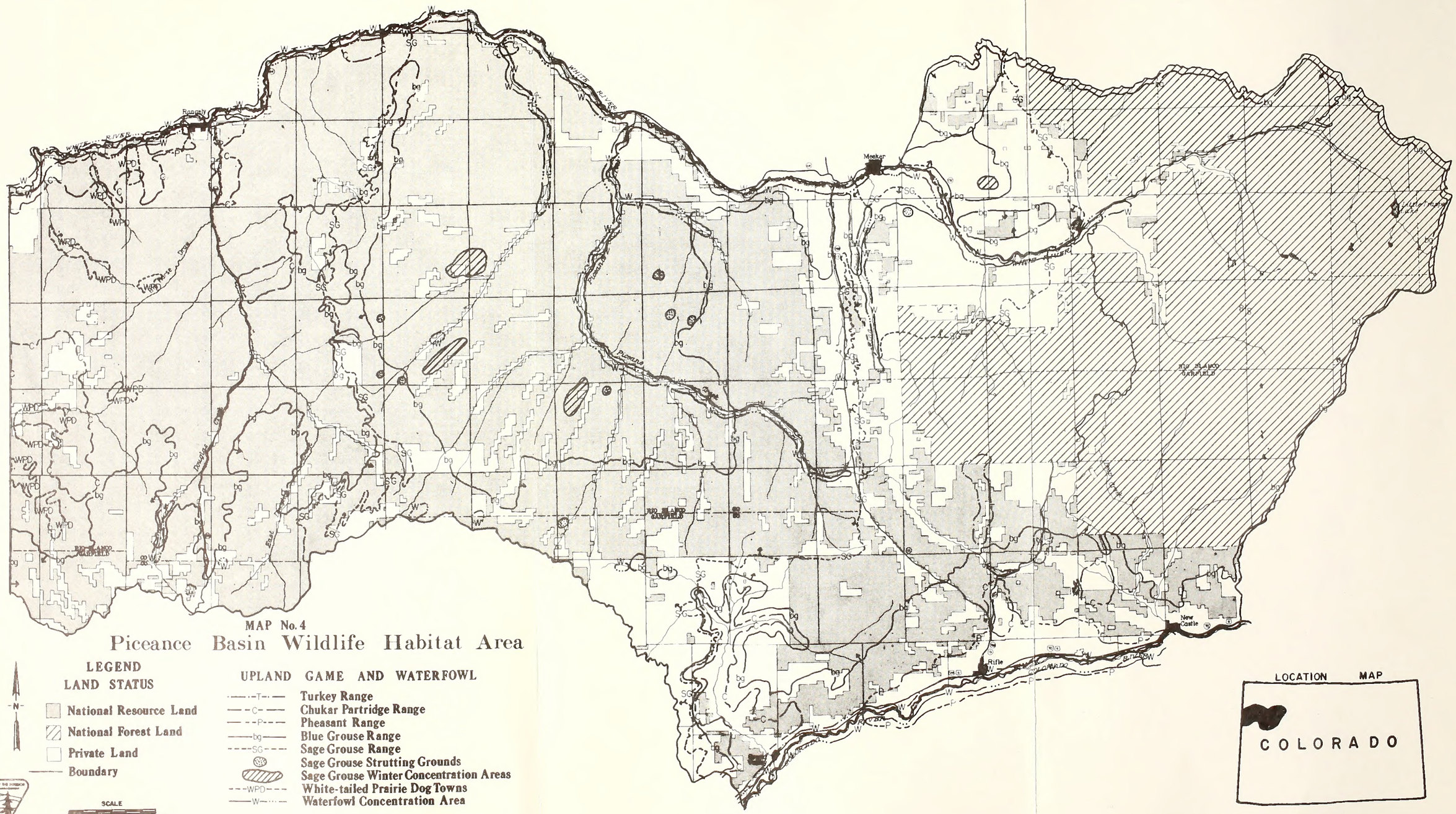
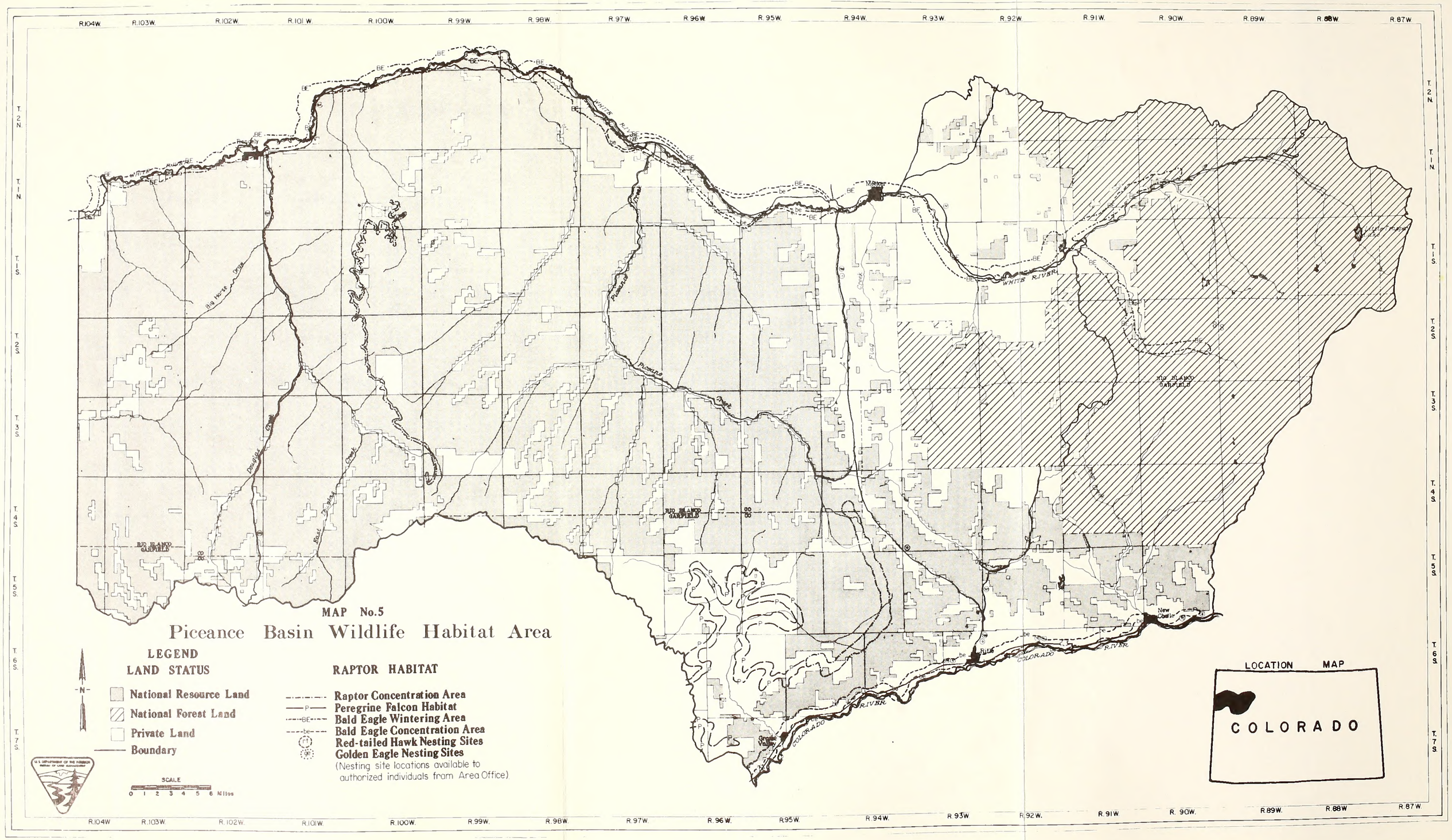
T.1S.
T.2S.
T.3S.
T.4S.
T.5S.
T.6S.
T.7S.
Rangely
WHITE RIVER
Big Horse Draw
Douglas Creek
Piceance Creek
Meeker
Flag
Plunkard Creek
RIO BLANCO
GARFIELD
Rifle
New Castle
Grand Valley
COLORADO RIVER
MAP No. 3
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
BIG GAME RANGE (ELK & BEAR)
Elk Winter Range
Elk Summer Range
Elk Concentration Areas
Elk Calving Areas
Black Bear Preferred Habitat
Big Horn Sheep Key Area
N
SCALE
0 1 2 3 4 5 6 Miles
LOCATION MAP
COLORADO



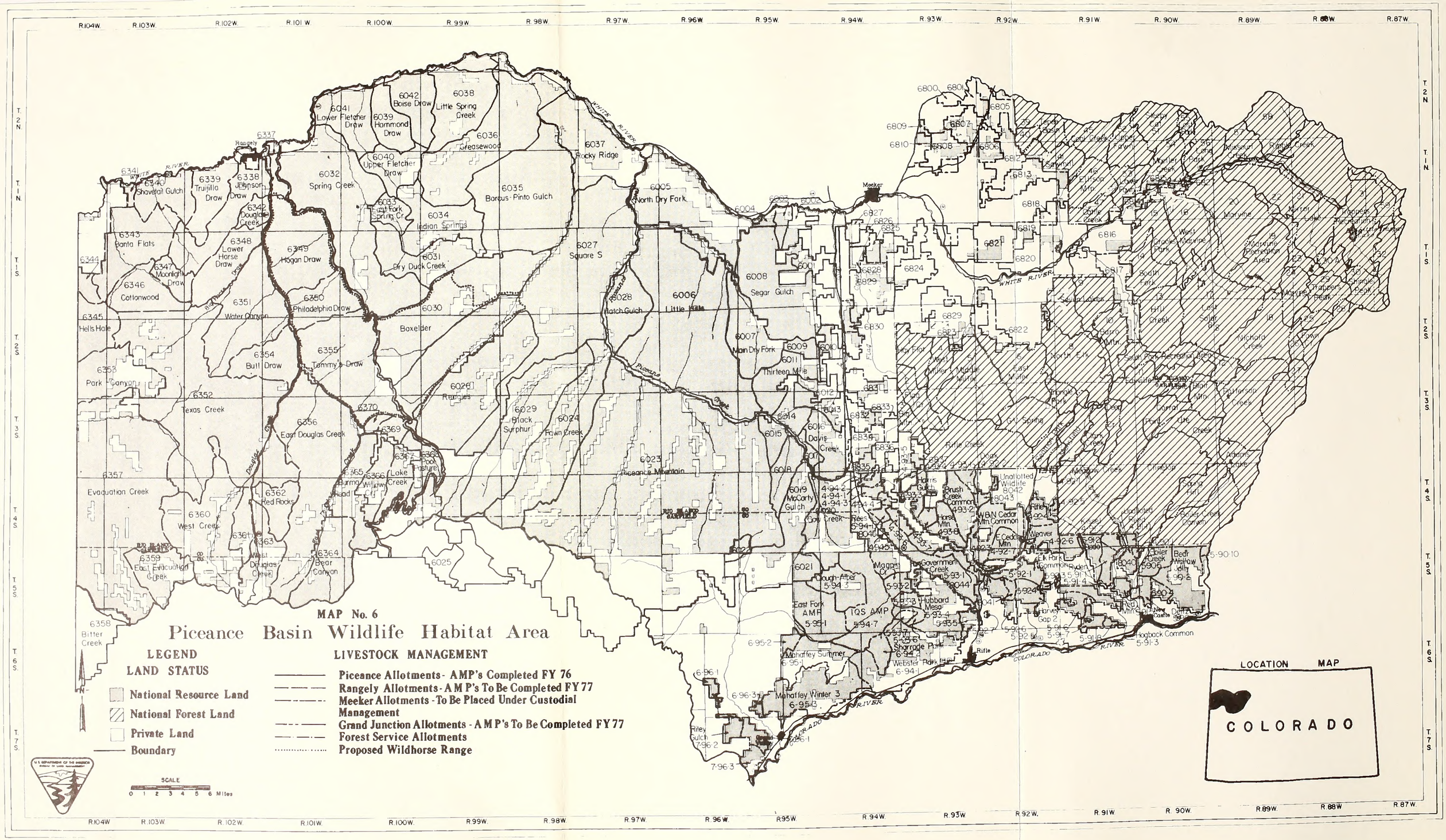
MAP No. 4

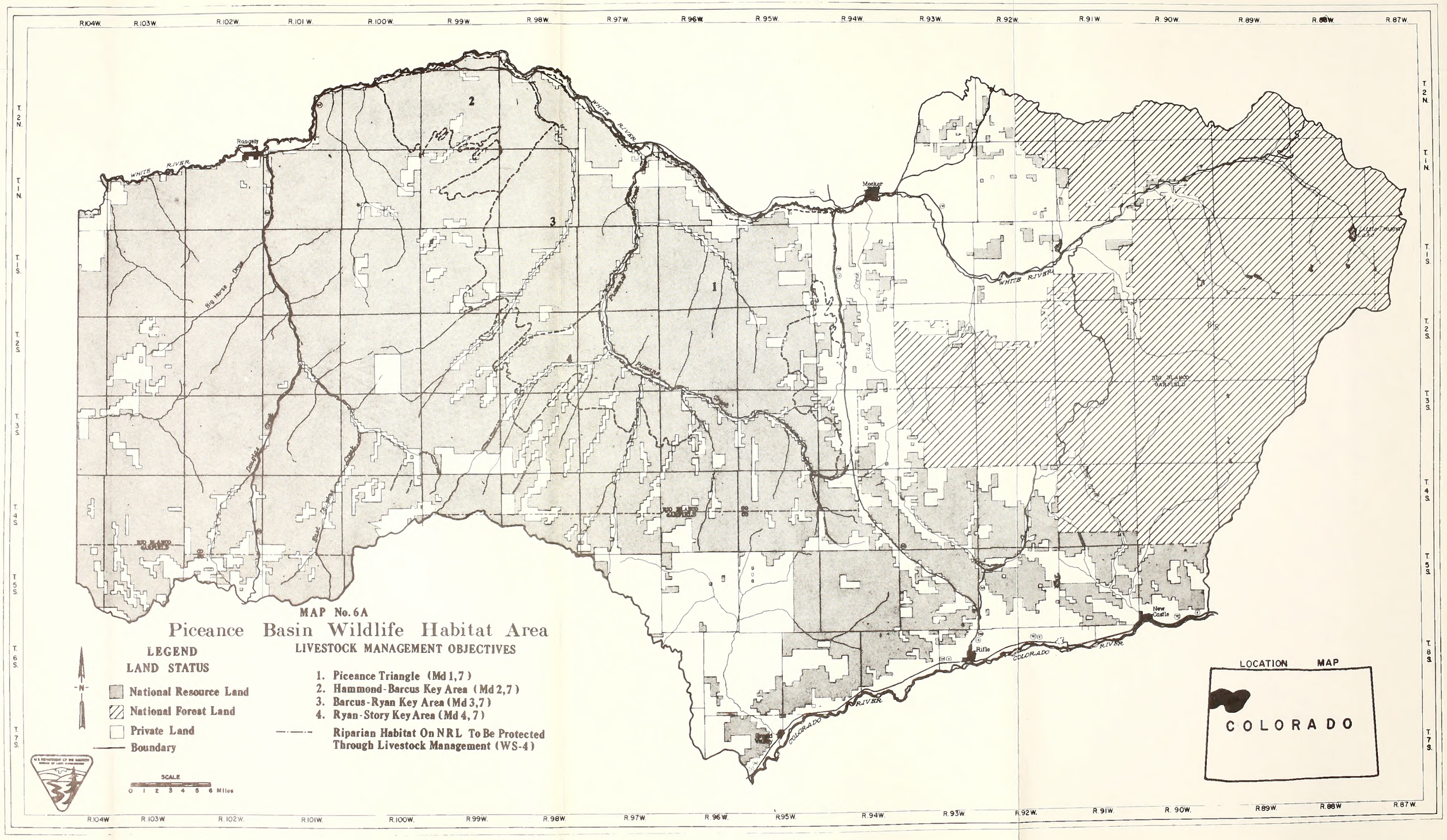
Piceance Basin Wildlife Habitat Area



MAP No.5

Piceance Basin Wildlife Habitat Area


MAP No. 6
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
LIVESTOCK MANAGEMENT
Piceance Allotments - AMP's Completed FY 76
Rangely Allotments - A M P's To Be Completed FY 77
Meeker Allotments - To Be Placed Under Custodial Management
Grand Junction Allotments - A M P's To Be Completed FY 77
Forest Service Allotments
Proposed Wildhorse Range
SCALE
0 1 2 3 4 5 6 Miles
LOCATION MAP
COLORADO
Rangely
Meeker
Rifle
WHITE RIVER
COLORADO RIVER
Piceance Mountain
R.104W.
R.103W.
R.102W.
R.101W.
R.100W.
R.99W.
R.98W.
R.97W.
R.96W.
R.95W.
R.94W.
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T.2N.
T.1N.
T.1S.
T.2S.
T.3S.
T.4S.
T.5S.
T.6S.
T.7S.



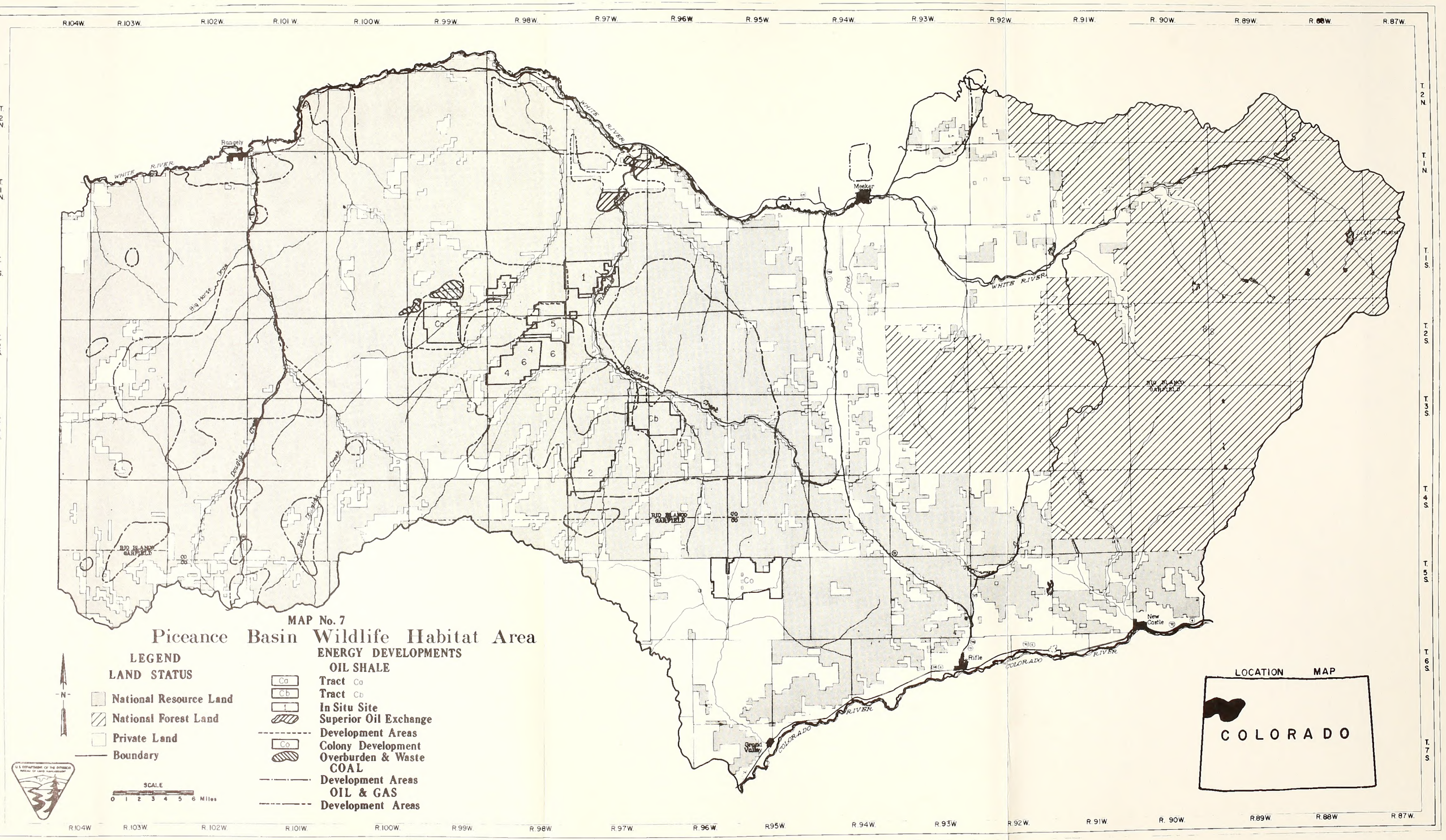
MAP No. 6A

Piceance Basin Wildlife Habitat Area

LIVESTOCK MANAGEMENT OBJECTIVES

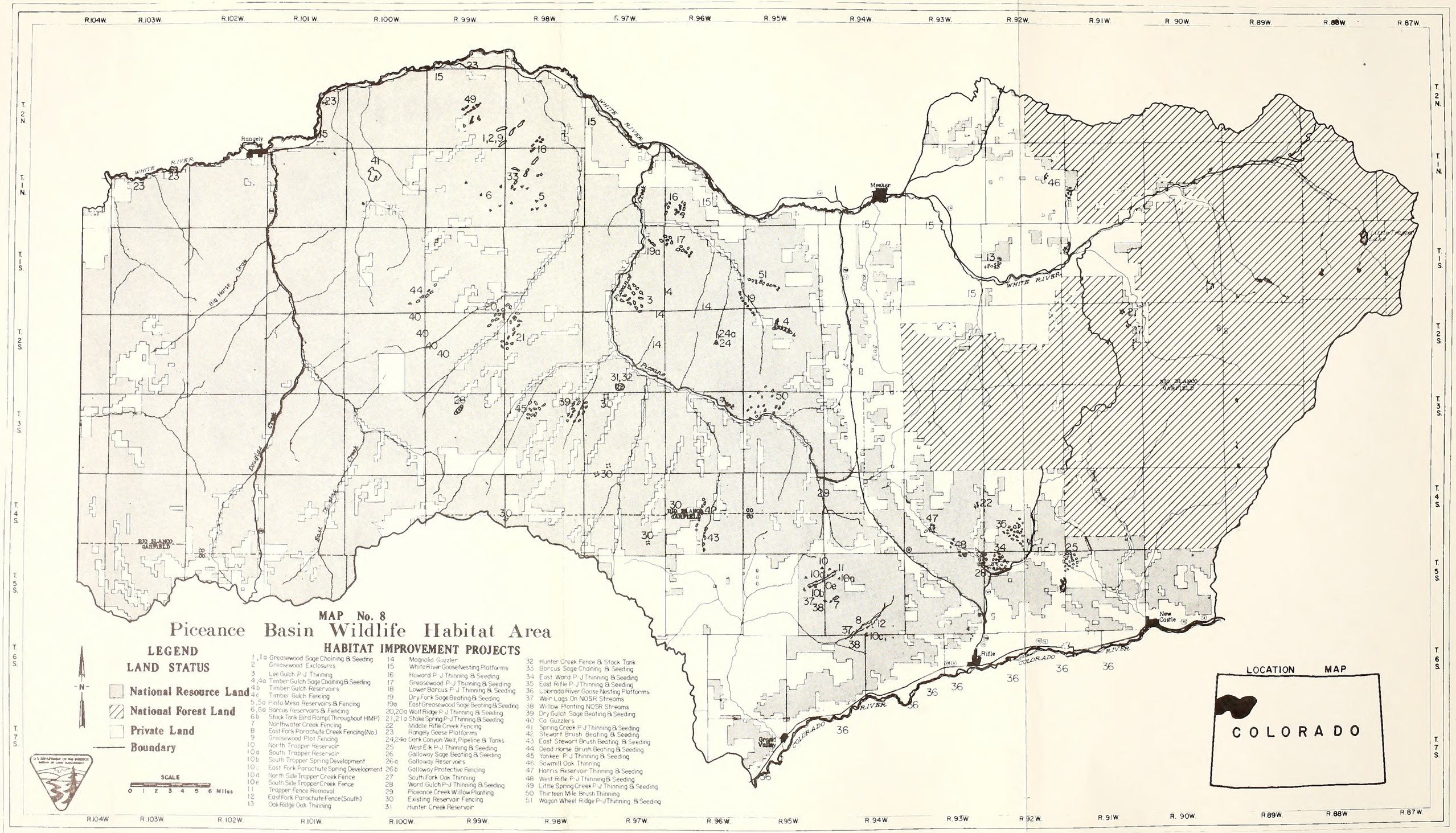
1. Piceance Triangle (Md 1,7)
2. Hammond-Barcus Key Area (Md 2,7)
3. Barcus-Ryan Key Area (Md 3,7)
4. Ryan-Story Key Area (Md 4,7)

Riparian Habitat On NRL To Be Protected Through Livestock Management (WS-4)



MAP No. 7

Piceance Basin Wildlife Habitat Area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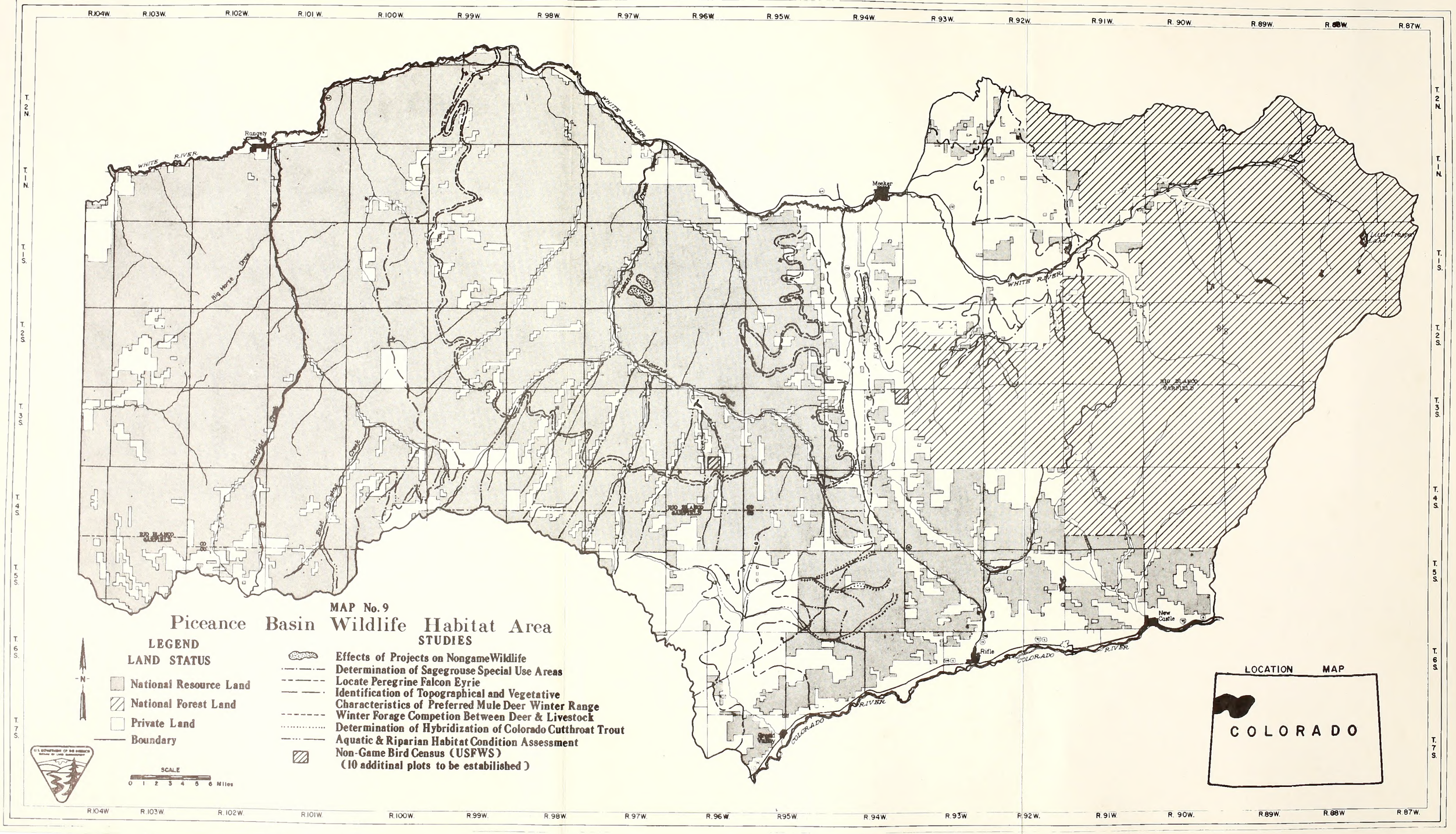
T.2N. T.1N. T.1S. T.2S. T.3S. T.4S. T.5S. T.6S. T.7S.
WHITE RIVER
Rangely
Meeker
Big Horse Creek
Douglas Creek
East Douglas Creek
Piceance Creek
Flag Creek
BLM NIO BLANCO GARFIELD
NIO BLANCO UNFIELD
Rifle
New Castle
Grand Valley
COLORADO RIVER
MAP No. 8
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
SCALE
0 1 2 3 4 5 6 Miles
HABITAT IMPROVEMENT PROJECTS
1, 1a Greasewood Sage Chaining & Seeding
2 Greasewood Exclosures
3 Lee Gulch P-J Thinning
4, 4a Timber Gulch Sage Chaining & Seeding
4b Timber Gulch Reservoirs
4c Timber Gulch Fencing
5, 5a Pinto Mesa Reservoirs & Fencing
6, 6a Barcus Reservoirs & Fencing
6b Stock Tank Bird Ramp (Throughout HMP)
7 Northwater Creek Fencing
8 East Fork Parachute Creek Fencing (No.)
9 Greasewood Plot Fencing
10 North Trapper Reservoir
10a South Trapper Reservoir
10b South Trapper Spring Development
10c East Fork Parachute Spring Development
10d North Side Trapper Creek Fence
10e South Side Trapper Creek Fence
11 Trapper Fence Removal
12 East Fork Parachute Fence (South)
13 Oak Ridge Oak Thinning
14 Magnolia Guzzler
15 White River Goose Nesting Platforms
16 Howard P-J Thinning & Seeding
17 Greasewood P-J Thinning & Seeding
18 Lower Barcus P-J Thinning & Seeding
19 Dry Fork Sage Beating & Seeding
19a East Greasewood Sage Beating & Seeding
20, 20a Wolf Ridge P-J Thinning & Seeding
21, 21a Stake Spring P-J Thinning & Seeding
22 Middle Rifle Creek Fencing
23 Rangely Geese Platforms
24, 24a Dark Canyon Well, Pipeline & Tanks
25 West Elk P-J Thinning & Seeding
26 Galloway Sage Beating & Seeding
26a Galloway Reservoirs
26b Galloway Protective Fencing
27 South Fork Oak Thinning
28 Ward Gulch P-J Thinning & Seeding
29 Piceance Creek Willow Planting
30 Existing Reservoir Fencing
31 Hunter Creek Reservoir
32 Hunter Creek Fence & Stock Tank
33 Barcus Sage Chaining & Seeding
34 East Ward P-J Thinning & Seeding
35 East Rifle P-J Thinning & Seeding
36 Colorado River Goose Nesting Platforms
37 Weir Logs On NOSR Streams
38 Willow Planting NOSR Streams
39 Dry Gulch Sage Beating & Seeding
40 Co. Guzzlers
41 Spring Creek P-J Thinning & Seeding
42 Stewart Brush Beating & Seeding
43 East Stewart Brush Beating & Seeding
44 Dead Horse Brush Beating & Seeding
45 Yankee P-J Thinning & Seeding
46 Sawmill Oak Thinning
47 Harris Reservoir Thinning & Seeding
48 West Rifle P-J Thinning & Seeding
49 Little Spring Creek P-J Thinning & Seeding
50 Thirteen Mile Brush Thinning
51 Wagon Wheel Ridge P-J Thinning & Seeding
LOCATION MAP
COLORADO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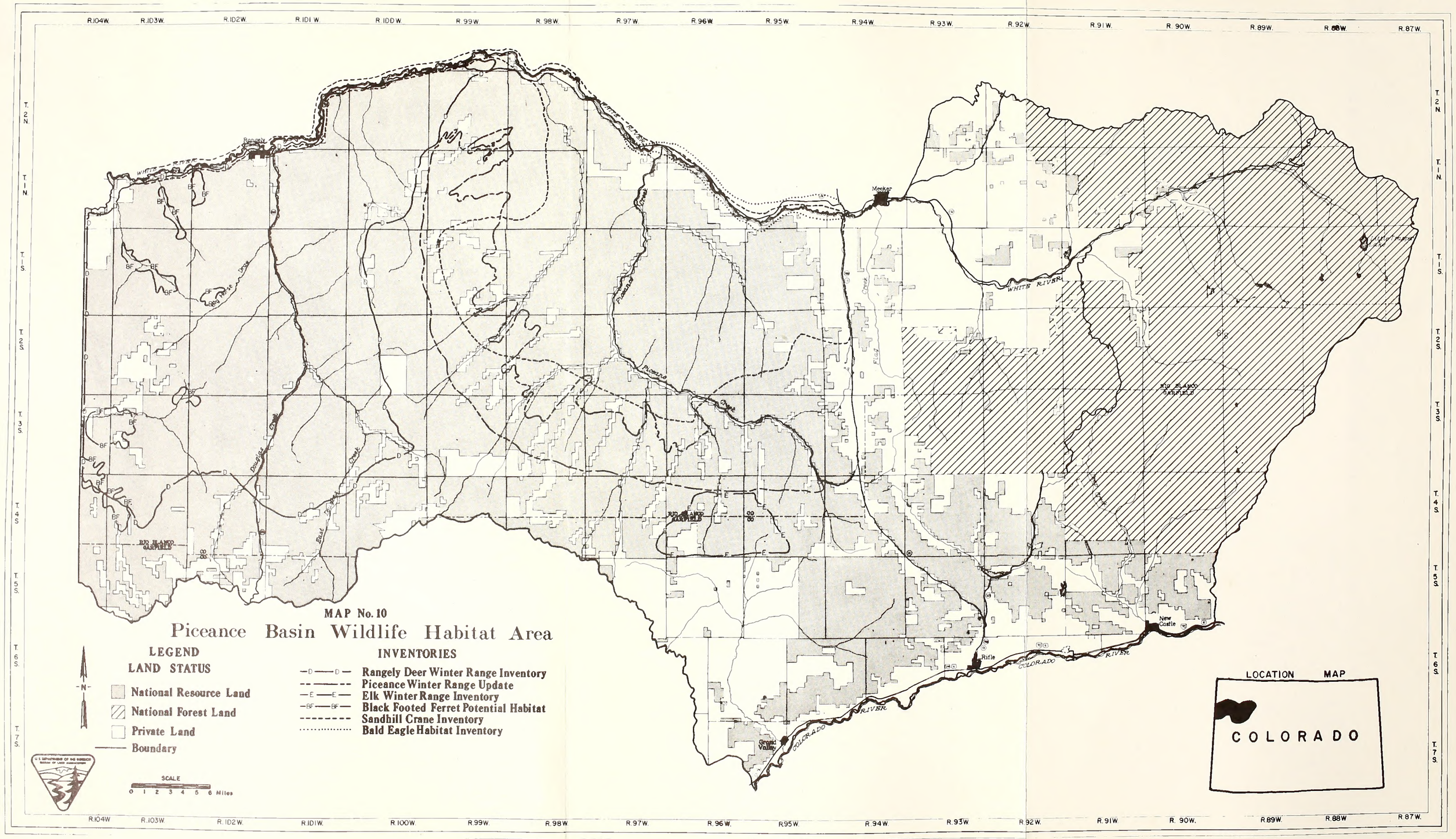
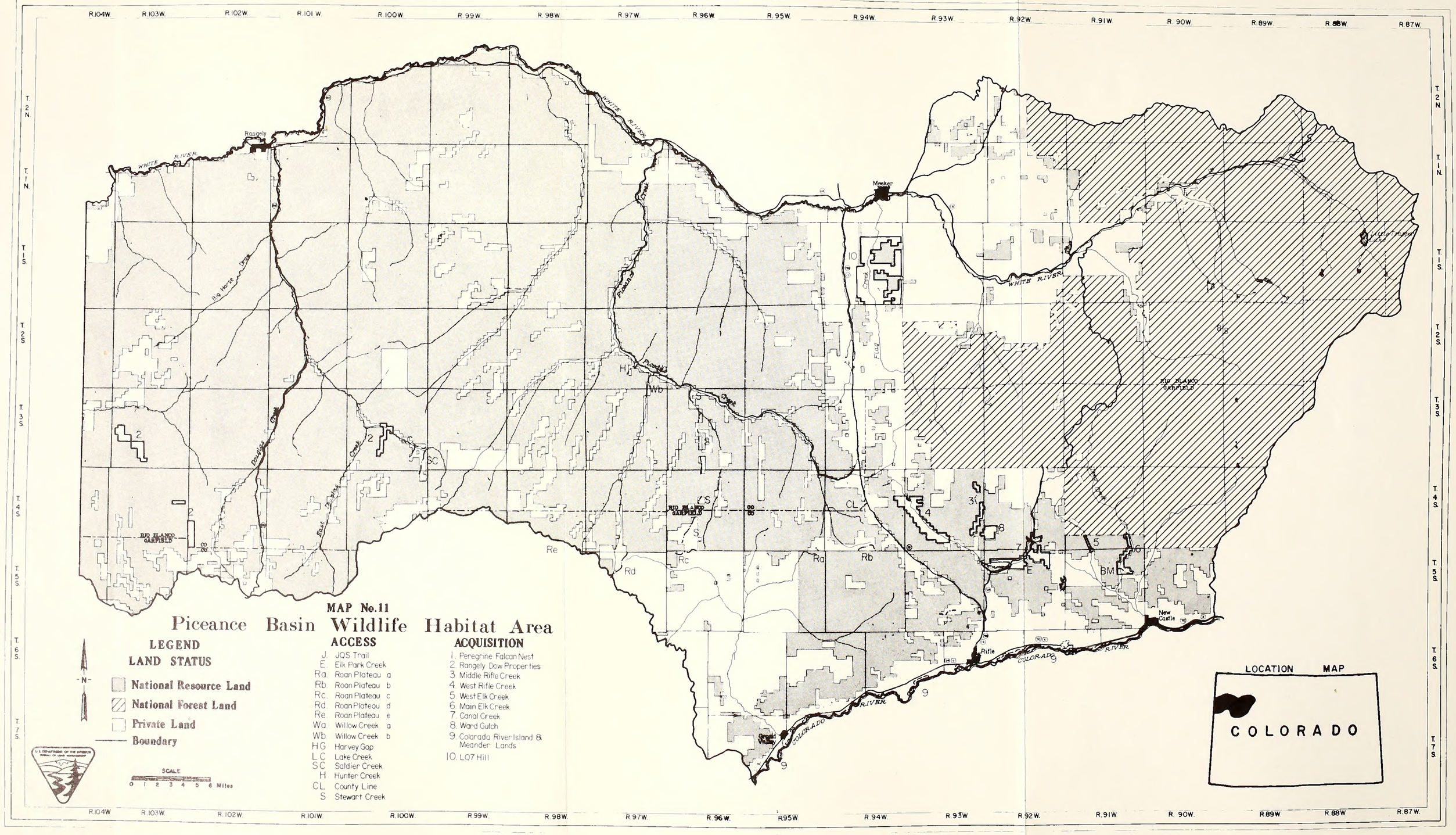
R.94W.
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T. 2 N.
T. 1 N.
T. 1 S.
T. 2 S.
T. 3 S.
T. 4 S.
T. 5 S.
T. 6 S.
T. 7 S.
Rangely
Meeker
New Castle
Rifle
WHITE RIVER
COLORADO RIVER
Big Horse Draw
Douglas Creek
Piceance Creek
BLM LAND
BLM LAND
BLM LAND
BLM LAND
BLM LAND
BLM LAND
MAP No. 9
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
N
SCALE
0 1 2 3 4 5 6 Miles
STUDIES
Effects of Projects on Nongame Wildlife
Determination of Sagegrouse Special Use Areas
Locate Peregrine Falcon Eyrie
Identification of Topographical and Vegetative Characteristics of Preferred Mule Deer Winter Range
Winter Forage Competion Between Deer & Livestock
Determination of Hybridization of Colorado Cutthroat Trout
Aquatic & Riparian Habitat Condition Assessment
Non-Game Bird Census (USFWS)
(10 additinal plots to be estabilished)
LOCATION MAP
COLORADO



MAP No. 10

Piceance Basin Wildlife Habitat Area


MAP No.11
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
SCALE
0 1 2 3 4 5 6 Miles
ACCESS
J. JQS Trail
E. Elk Park Creek
Ra. Roan Plateau a
Rb. Roan Plateau b
Rc. Roan Plateau c
Rd. Roan Plateau d
Re. Roan Plateau e
Wa. Willow Creek a
Wb. Willow Creek b
HG Harvey Gap
LC Lake Creek
SC Saddler Creek
H Hunter Creek
CL County Line
S Stewart Creek
ACQUISITION
1. Peregrine Falcon Nest
2. Rangely Dow Properties
3. Middle Rifle Creek
4. West Rifle Creek
5. West Elk Creek
6. Main Elk Creek
7. Canal Creek
8. Ward Gulch
9. Colorado River Island & Meander Lands
10. LQ7 Hill
LOCATION MAP
COLORADO
WHITE RIVER
COLORADO RIVER
Rangely
Meeker
Rifle
New Castle
BIG HORN DRAW
DOUGLAS CREEK
EAST DOUGLAS CREEK
PLEASANT CREEK
FLAG CREEK
BIG BLANCO GARFIELD
T. 2 N.
T. 1 N.
T. 1 S.
T. 2 S.
T. 3 S.
T. 4 S.
T. 5 S.
T. 6 S.
T. 7 S.
R.104W.
R.103W.
R.102W.
R.101W.
R.100W.
R.99W.
R.98W.
R.97W.
R.96W.
R.95W.
R.94W.
R.93W.
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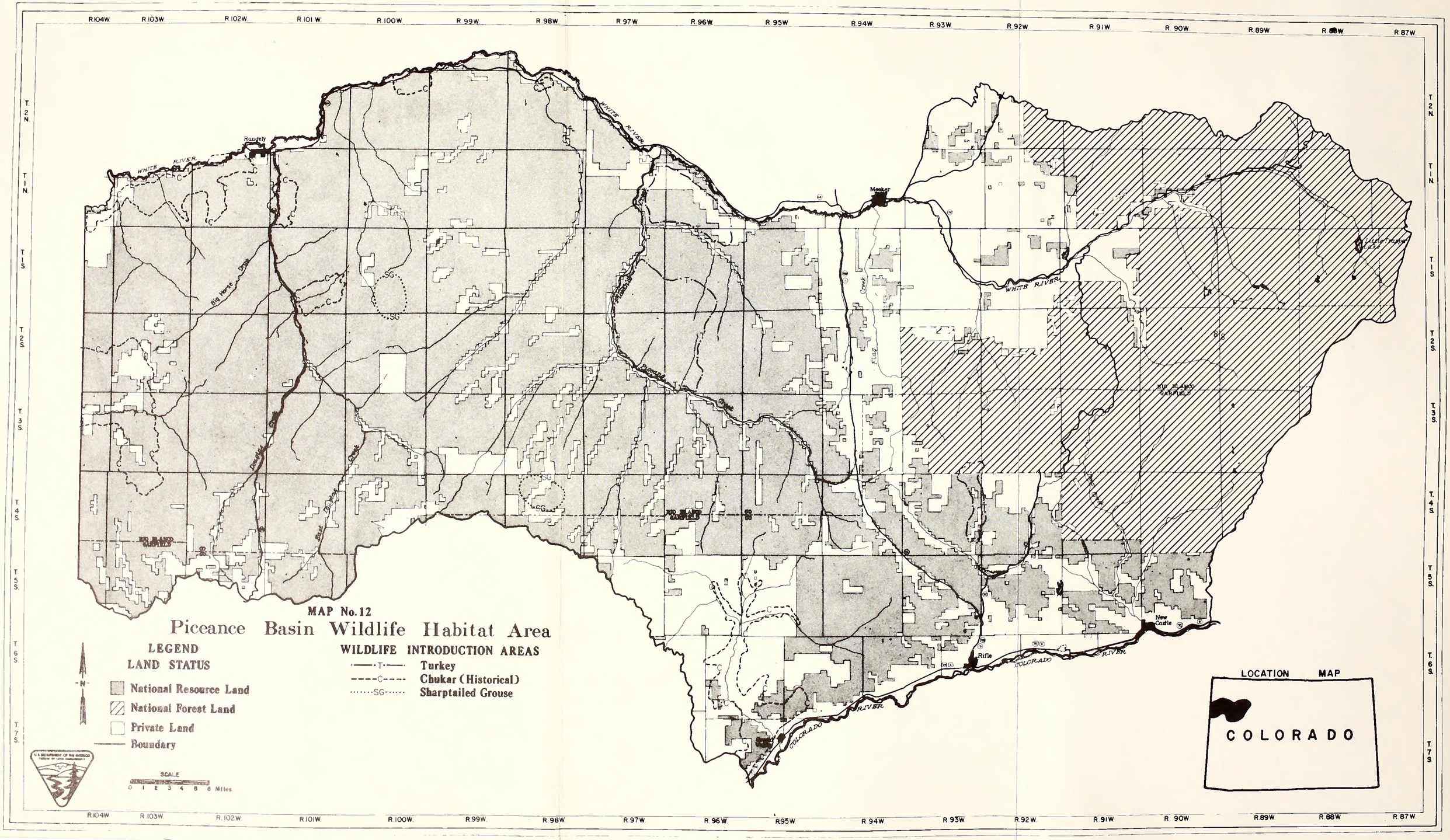
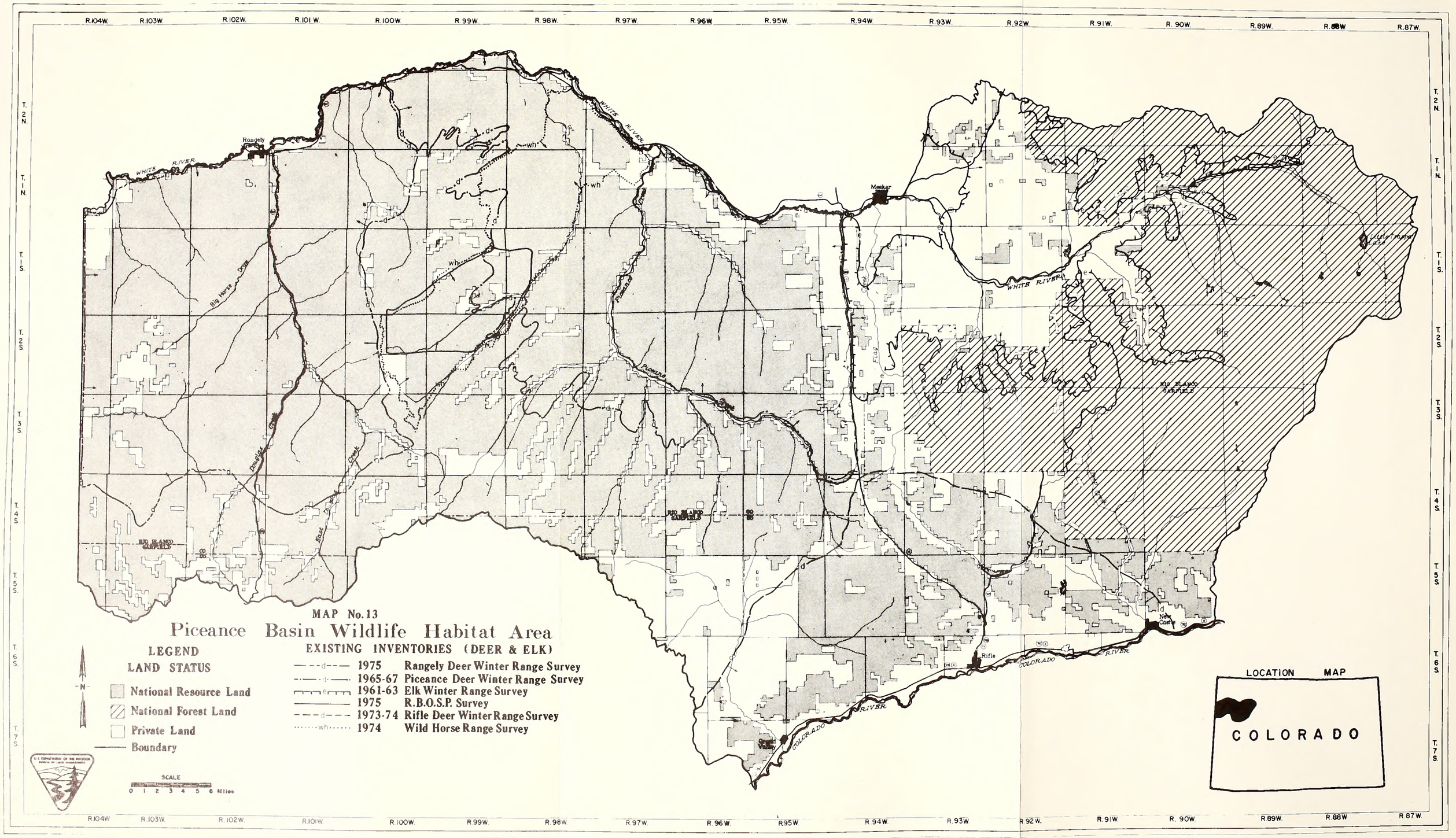
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.



MAP No. 12

Piceance Basin Wildlife Habitat Area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R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T. 2 N.
T. 1 N.
T. 1 S.
T. 2 S.
T. 3 S.
T. 4 S.
T. 5 S.
T. 6 S.
T. 7 S.
Rangely
Meeker
Rifle
New Castle
WHITE RIVER
COLORADO RIVER
Big Horse Draw
Douglas Creek
Black Diamond Creek
Piceance Creek
Yellow Creek
Flag
Little Thompson Creek
RIO BLANCO
GARFIELD
MAP No. 13
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
N
EXISTING INVENTORIES (DEER & ELK)
1975 Rangely Deer Winter Range Survey
1965-67 Piceance Deer Winter Range Survey
1961-63 Elk Winter Range Survey
1975 R.B.O.S.P. Survey
1973-74 Rifle Deer Winter Range Survey
1974 Wild Horse Range Survey
SCALE
0 1 2 3 4 5 6 Miles
LOCATION MAP
COLORADO

APPENDIX 2

Species List

(Reproduced from McKean W. T., 1974, Description of GMU 22. Reptiles and Amphibians compiled by R. E. Pillmore of the USFWS. List will be expanded to include other GMU's as time permits).

GAME SPECIES - WILDLIFE MANAGEMENT UNIT 22

Big game mammals 1/

Black bear (Ursus americanus) Uncommon.
Elk (Cervus canadensis) Uncommon.
Mountain lion (Felis concolor) Uncommon.
Mule deer (Odocoileus hemionus) Common.

Small game mammals 1/

Cottontail rabbit (Sylvilagus audubonii; S. nuttallii) Common.
Pine (red) squirrel (Tamiasciurus hudsonicus) Common.
Snowshoe hare (Lepus americanus) Common.

Small game birds 2/

Migratory waterfowl and shorebirds

Great Basin Canada goose (Branta canadensis) Uncommon.
Black brant (Branta nigricans) 3/ Possible rare migrant.
White-fronted goose (Anser albifrons frontalis) 3/ Possible rare migrant.
Whistling swan (Olor columbianus) Possible rare migrant.
Snow goose (Chen caerulescens caerulescens) 3/, 4/ Possible rare migrant.
Mallard (Anas platyrhynchos platyrhynchos) Common resident.
Gadwall (Anas strepera) Common spring and fall migrant.

1/ Nomenclature according to Lechleitner, R. R. 1969. Wild mammals of Colorado. Pruett Publishing Co., Boulder. 254 pp.

2/ Nomenclature from Bailey, A. M., and R. J. Niedrach. 1967. Pictorial check-list of Colorado birds. Denver Mus. Nat. Hist. 168 pp. Information on occurrence and status adapted from the above reference and Cringan, A. T., and L. Carlson. 1973. Wildlife in the Piceance Creek Basin, In: An environmental reconnaissance of the Piceance Basin, Rio Blanco and Garfield counties, Colorado. A report on the completion of Part 1, Phase One of the environmental inventory, analysis and impact study portion of the Regional Oil Shale Study being done for the State of Colorado by the Thorne Ecological Institute, Boulder, Colorado, 144 pp. Additional information on occurrence, in employing the term "possible", is adapted from the foregoing references and Davis, W. A. 1969. Birds in western Colorado. Colo. Field Ornithologists. 61 pp. Where adjective "possible" is absent, actual sightings have been reported verbally by any one or more Division personnel W. McKean, C. Reichert, C. Gore, S. Steinert, and R. Bartmann; or qualified by additional footnotes that follow.

Migratory waterfowl and shorebirds (continued)

Pintail (Anas acuta) Common spring and fall migrant.
American green-winged teal (Anas crecca carolinensis) Common migrant and uncommon yearlong resident 4/.
Blue-winged teal (Anas discors discors) Common migrant.
Cinnamon teal (Anas cyanoptera septentrionalium) Common migrant.
American wigeon (Anas americana) 4/ Common migrant and rare winter resident.
Northern shoveler (Anas clypeata) 4/ Common migrant and uncommon summer resident
Wood duck (Aix sponsa) 3/ Possible rare migrant.
Redhead (Aythya americana) Uncommon migrant.
Ring-necked duck (Aythya collaris) Uncommon migrant.
Canvasback (Aythya valisineria) Uncommon to rare migrant.
Greater scaup (Aythya marila nearctica) 3/ Rare migrant.
Lesser scaup (Aythya affinis) Uncommon migrant.
Common golden-eye (Bucephala clangula americana) Common migrant and winter resident.
Barrow's golden-eye (Bucephala islandica) 3/ Rare winter visitor.
Bufflehead (Bucephala albeola) Uncommon spring and fall migrant and rare winter resident.
Ruddy duck (Oxyura jamaicensis rubida) Common migrant and occasional summer resident.
Hooded merganser (Lophodytes cucullatus) Rare winter visitor on river.
Common merganser (Mergus merganser americanus) Common winter resident, uncommon summer resident.
Red-breasted merganser (Mergus serrator serrator) 3/ Possible rare migrant.
American coot (Fulica americana americana) Common migrant and summer resident.
Common Wilson's snipe (Capella gallinago delicata) Common migrant and rare winter resident.
Sandhill crane (Grus canadensis canadensis) Regular migrant.
Virginia rail (Ralus limicola limicola) Possible uncommon summer resident.
Sora (Porzana carolina) Possible uncommon summer resident.

Upland game birds

Blue grouse (Dendragapus obscurus obscurus) Common.
Sage grouse (Centrocercus urophasianus urophasianus) Uncommon to common.
Ring-necked pheasant (Phasianus colchicus) Uncommon.
Chukar (Alectoris chukar) 4/ Uncommon.
Band-tailed pigeon (Columba fasciata fasciata) Possible uncommon summer migrant.
Mourning dove (Zenaida macroura marginella) 4/ Common summer resident.

3/ Unverified in hunters' bag checks but legal game 1972-73.

4/ Changes in nomenclature follow the thirty-second supplement to the American Ornithologists Union check-list of North American birds published in Auk 90: 411-419, April, 1973.

W. T. McKean
August 1974

OTHER MAMMALIAN SPECIES [1/] - WILDLIFE MANAGEMENT UNIT 22

Furbearers [2/]

Short-haired

Beaver (Castor canadensis) Common.
Mink (Mustela vison) Uncertain.
Muskrat (Ondatra zibethicus) Uncommon.
Ringtail (Bassariscus astutus) Rare.
Weasels (Mustela erminea; M. frenata) M. erminea Uncertain; M. frenata Uncommon.

Long-haired

Kit fox (Vulpes velox) Uncommon.
Gray fox (Urocyon cinereoargenteus) Uncommon.
American badger (Taxidea taxus) Common to uncommon.
Spotted skunk (Spilogale putorius) Uncommon.
Striped skunk (Mephitis mephitis) Common.

"Varmint" mammals

Coyote (Canis latrans) Common.
Red fox (Vulpes fulva) Uncommon.
Raccoon (Procyon lotor) Uncommon.
Porcupine (Erethizon dorsatum) Common.
Bobcat (wildcat) (Lynx rufus) Common.
White-tailed jack rabbit (Lepus townsendii) Common.
Yellow-bellied marmot (Marmota flaviventris) Common.
White-tailed prairie dog (Cynomys leucurus) Uncommon.
Richardson's ground squirrel (Spermophilus richardsonii) Common.
Thirteen-lined ground squirrel (Spermophilus tridecemlineatus) Common.
Rock squirrel (Spermophilus variegatus) Common to uncommon.
Northern pocket gopher (Thomomys talpoides) Common.

1/ These species, grouped separately as "Furbearers", "Varmints" and "Nongame mammals" and outside of "game" categories, follow Chapter 62, Colo. Rev. Statutes 1963 As Amended, in Colo. Game, Fish and Parks Div. Laws and Regulations Hdbk., 1973 (Art. 1, Items 13, 17 and 18, Definitions, p. 3).

2/ Nomenclature from Lechleitner, R. R. 1969. Wild mammals of Colorado. Pruett Publishing Co., Boulder. 254 pp. Information on occurrence and status from the above reference and: Cringan, A. T., and L. Carlson. 1973. Wildlife in the Piceance Creek Basin, In: An environmental reconnaissance of the Piceance Basin, Rio Blanco and Garfield counties, Colorado. A report on the completion of Part 1, Phase One of the environmental inventory, analysis and impact study portion of the Regional Oil Shale Study being done for the State of Colorado by the Thorne Ecological Institute, Boulder, Colorado, 144 pp. Also, Armstrong, D. M., 1972, Distribution of mammals in Colorado. Monograph of the Museum of Natural History, the Univ. of Kansas, Number 3, 1972. 415 pp.

Nongame mammals

Golden-mantled ground squirrel (Spermophilus lateralis) Common.
White-tailed antelope squirrel (Ammospermophilus leucurus) Uncommon.
Least chipmunk (Eutamias minimus) Common.
Colorado chipmunk (Eutamias quadrivittatus) Common.
Unita chipmunk (Eutamias umbrinus) Uncommon to uncertain.

Vagrant shrew (Sorex vagrans) Uncommon.
Merriams shrew (Sorex merriami) 3/ Uncertain.

Townsend's big-eared bat (Plecotus townsendii) Common.
Silver-haired bat (Lasionycteris noctivagans) Common - not abundant.
Hoary bat (Lasiurus cinereus) Uncommon - common.
Big brown bat (Eptesicus fuscus) Common.
Western pipistrelle (Pipistrellus hesperus) Common.
Long-legged myotis (Myotis volans) Uncommon.
California myotis (Myotis californicus) Common - not abundant.
Small-footed myotis (Myotis leibii) Common.
Long-eared myotis (Myotis evotis) Uncertain.
Little brown myotis (Myotis lucifugus) Uncertain.

Ord's kangaroo rat (Dipodomys ordii) Uncommon - uncertain.

Western harvest mouse (Reithrodontomys magalolis) Uncertain.
Canyon mouse (Peromyscus crinitus) Common - uncommon.
Deer mouse (Peromyscus maniculatus) Common.
Pinon mouse (Peromyscus truei) Common.
Bushy-tailed wood rat (Neotoma cinerea) Common.

Gapper's red-backed vole (Clethrionomys gapperi) Uncommon.
Meadow vole (Microtus pennsylvanicus) Uncertain.
Montane vole (Microtus montanus) Uncertain.
Long-tailed vole (Microtus longicaudus) Common.
Sagebrush vole (Lagurus curtatus) Uncertain.

House mouse (Mus musculus) Uncommon.
Western jumping mouse (Zapus princeps) Uncommon.

3/ Occurrence listed by the Colo. Div. of Wildlife as extremely unusual - very few documented records within the past decade. (1972 Status Evaluation for Selected Colorado Species) appended to: 1973 Wildlife Operations Work Plan, Field Order No. 4 - 1973).

W. T. McKean
August 1974

OTHER AVIAN SPECIES 1/ - WILDLIFE MANAGEMENT UNIT 22

"Varmint" birds

Black-billed magpie (Pica pica hudsonia) Common resident.
Starling (Sturnus vulgaris) Common resident.

Nongame birds 2/

Common loon (Gavia immer) Possible rare migrant.
Horned grebe (Podiceps auritus cornutus) Possible rare migrant.
Eared grebe (Podiceps nigricollis californicus)
Western grebe (Aechmophorus occidentalis) Possible rare migrant.
Pied-billed grebe (Podilymbus podiceps podiceps) Possible uncommon migrant and rare summer resident.
Double-crested cormorant (Phalacrocorax auritus auritus) Possible rare migrant.
Great blue heron (Ardea herodias treganzai) Common summer resident.
Snowy egret (Egretta thula brewsteri) Uncommon summer resident 3/.
Black-crowned night heron (Nycticorax nycticorax hoactli) Possible common summer resident.
Least bittern (Ixobrychus exilis exilis) Possible rare summer migrant.
American bittern (Botaurus lentiginosus) Possible rare summer migrant.
White-faced ibis (Plegadis chihi) Possible rare migrant.
Whistling swan (Olor columbianus) Uncommon migrant.
Semipalmated plover (Charadrius semipalmatus) Possible rare migrant.
Killdeer (Charadius vociferus vociferus) Common summer resident and rare winter resident.
Mountain plover (Charadrius montanus) Possible rare migrant 3/.
Black-bellied plover (Pluvialis squatarola) Possible uncommon migrant 3/.

1/ These species, grouped separately as "Varmint" birds, "Nongame birds" and "Raptores" and outside of "game" categories, follow Chapter 62, Colo. Rev. Statutes 1963 as Amended, in Colo. Game, Fish and Parks Div. Laws and Regulations Hdbk., 1973. (Art. 1, items 13, 18, and 15, Definitions, p. 327).

2/ Nomenclature from Bailey, A. M., and R. J. Niedrach. 1967. Pictorial checklist of Colorado birds. Denver Mus. Nat. Hist. 168 pp. Information on occurrence and status adapted from the above reference and Cringan, A. T., and L. Carlson. 1973. Wildlife in the Piceance Creek Basin, In: An environmental reconnaissance of the Piceance Basin, Rio Blanco and Garfield counties, Colorado. A report on the completion of Part 1, Phase One of the environmental inventory, analysis and impact study portion of the Regional Oil Shale Study being done for the State of Colorado by the Thorne Ecological Institute, Boulder, Colorado. 144 pp. Additional information on occurrence, in employing the term "possible", is adapted from the foregoing references and Davis, W. A. 1969. Birds in western Colorado. Colo. Field Ornithologists. 61 pp. Where adjective "possible" is absent, actual sightings have been reported verbally by any one or more Division personnel Glenn E. Rogers, Claude E. White, George E. Steele, Louis D. Vidakovich or qualified by additional footnotes that follow. Notations concerning seasonal abundance of raptores are by Gerald R. Craig, Wildlife Biologist.

Nongame birds (continued)

Long-billed curlew (Numenius americanus americanus) Rare migrant.
Spotted sandpiper (Actitis macularia) Common summer resident.
Solitary sandpiper (Tringa solitaria cinnamomea) Common migrant and occasional summer resident 3/.
Willet (Catoptrophorus semipalmatus inornatus) Possible rare migrant.
Greater yellowlegs (Totanus melanoleucus) Possible common migrant.
Lesser yellowlegs (Totanus flavipes) Possible uncommon migrant.
Knot (Calidris canutus rufa) Possible rare migrant.
Pectoral sandpiper (Erolia melanotos) Possible rare migrant.
Baird's sandpiper (Erolia bairdii) Possible common migrant.
Least sandpiper (Erolia minutilla) Possible common migrant.
Long-billed dowitcher (Limnodromus scolopaceus) Possible uncommon migrant.
Stilt sandpiper (Micropalama himantopus) Possible rare migrant.
Semipalmated sandpiper (Ereunetes pusillus) Possible rare migrant.
Western sandpiper (Ereunetes mauri) Possible uncommon migrant.
Marbled godwit (Limosa fedoa) Possible rare spring migrant.
Sanderling (Crocethia alba) Possible rare migrant.
American avocet (Recurvirostra americana) Possible rare migrant.
Black-necked stilt (Himantopus mexicanus) Possible rare migrant.
Wilson's phalarope (Steganopus tricolor) Common migrant and uncommon summer resident.
Northern phalarope (Lobipes lobatus) Possible uncommon migrant.
Pomarine jaeger (Stercorarius pomarinus) Possible rare migrant.
Herring gull (Larus argentatus smithsonianus) Possible uncommon migrant.
California gull (Larus californicus) Possible rare migrant.
Ring-billed gull (Larus delawarensis) Possible uncommon migrant.
Franklin's gull (Larus pipixcan) Possible uncommon migrant.
Bonaparte's gull (Larus philadelphia) Possible rare migrant.
Sabine's gull (Xema sabini sabini) Possible rare migrant.
Forster's tern (Sterna forsteri) Possible rare migrant.
Common tern (Sterna hirundo hirundo) Rare migrant.
Least tern (Sterna albifrons athalassos) Possible rare migrant.
Black tern (Chlidonias niger surinamensis) Possible rare migrant.
Rock dove (Columba livia) Possible common resident.
White-winged dove (Zenaida asiatica mearnsi) Possible rare migrant.
Yellow-billed cuckoo (Coccyzus americanus americanus) Possible uncommon summer resident.
Poor-will (Phalaenoptilus nuttallii nuttallii) Common summer resident 5/.
Common nighthawk (Chordeiles minor hesperis; C. m. howelli) Common summer resident 3/.
White-throated swift (Aeronautes saxatalis sclateri) Common summer resident
Black-chinned hummingbird (Archilochus alexandri) Common summer resident.
Broad-tailed hummingbird (Selasphorus platycercus platycercus) Common summer resident 3/, 5/.
Rufous hummingbird (Selasphorus rufus) Possible common late summer migrant.
Calliope hummingbird (Stellula calliope) Possible rare migrant and summer resident.
Rivoli's hummingbird (Eugenes fulgens aureoviridis) Possible rare summer migrant.
Belted kingfisher (Megaceryle alcyon alcyon) Common resident.
Yellow-shafted flicker (Colaptes auratus luteus) Possible rare migrant.
Red-shafted flicker (Colaptes cafer collaris) Common resident 3/, 5/.

5/ Sight record given in unpublished checklist of birds of Naval Oil Shale Reserve, 1969-70, by L. M. Stephens.

Nongame birds (continued)

Lewis' woodpecker (Asyndesmus lewis) Possible common summer resident.
Yellow-bellied sapsucker (Sphyrapicus varius nuchalis) Common summer 3/, 5/ and occasional winter resident.
Williamson's sapsucker (Sphyrapicus thyroideus nataliae) Possible common summer resident.
Hairy woodpecker (Dendrocopos villosus monticola) Possible uncommon resident.
Downy woodpecker (Dendrocopos pubescens leucurus) Uncommon resident 5/.
Northern three-toed woodpecker (Picoides tridactylus dorsalis) Possible rare resident.
Eastern kingbird (Tyrannus tyrannus) Possible uncommon summer resident.
Western kindbird (Tyrannus verticalis) Common summer resident 3/.
Cassin's kingbird (Tyrannus vociferans vociferans) Possible uncommon summer resident.
Ash-throated flycatcher (Myiarchus cinerascens cinerascens) Common summer resident 3/.
Say's phoebe (Sayornis saya saya) Common summer 3/ and occasional winter resident.
Traill's flycatcher (Empidonax traillii) Possible uncommon summer resident.
Hammond's flycatcher (Empidonax hammondii) Possible migrant.
Dusky flycatcher (Empidonax oberholseri) Possible summer resident.
Gray flycatcher (Empidonax wrightii) Possible summer resident.
Western flycatcher (Empidonax difficilis hellmayri) Common summer resident 3/.
Western wood peewee (Contopus sordidulus veliei) Common summer resident 5/.
Olive-sided flycatcher (Nuttallornis borealis) Possible uncommon summer resident.
Horned lark (Eremophila alpestris leucolaema) Common resident 5/.
Violet-green swallow (Tachycineta thalassina lepida) Common summer resident 3/, 5/.
Tree swallow (Iridoprocne bicolor) Possible common migrant and uncommon summer resident.
Bank swallow (Riparia riparia riparia) Possible uncommon migrant and uncommon summer resident.
Rough-winged swallow (Stelgidopteryx ruficollis serripennis) Uncommon migrant and summer resident 3/.
Barn swallow (Hirundo rustica erythrogaster) Common migrant and summer resident 3/.
Cliff swallow (Petrochelidon pyrrhonota pyrrhonota) Common summer resident 3/, 5/.
Purple martin (Progne subis subis) Possible rare summer migrant.
Gray jay (Perisoreus canadensis capitalis) Possible uncommon resident.
Steller's jay (Cyanocitta stelleri macrolopha) Common resident 3/, 5/.
Scrub jay (Aphelocoma coerulescens woodhouseii) Common resident 3/, 6/.
Common raven (Corvus corax sinuatus) Common resident 3/, 5/.
Pinyon jay (Gymnorhinus cyanocephalus) Common summer resident 3/and possible uncommon winter resident.
Clark's nutcracker (Nucifraga columbiana) Common resident 3/, 5/.
Black-capped chickadee (Parus atricapillus garrinus) Uncommon resident 5/.
Mountain chickadee (Parus gambeli gambeli) Common resident 3/, 5/.
Plain titmouse (Parus inornatus ridgwayi) Common resident 3/.
Common bushtit (Psaltriparus minimus plumbeus) Possible common resident.
White-brested nuthatch (Sitta carolinensis nelsoni) Uncommon resident 3/.

6/ Specimens collected and cited in checklists of the Little Hills Exp. Station.

Nongame birds (continued)

Red-breasted nuthatch (Sitta canadensis) Rare resident 3/, 5/, 6/.
Pygmy nuthatch (Sitta pygmaea melanotis) Possible uncommon resident.
Brown-creeper (Certhia familiaris montana) Possible uncommon resident and common migrant.
Dipper (Cinclus mexicanus unicolor) Common resident 5/.
House wren (Troglodytes aedon parkmanii) Common summer resident 3/, 5/.
Bewick's wren (Thryomanes bewickii eremophilus) Possible common summer resident and rare winter resident.
Long-billed marsh wren (Telmatodytes palustris plesius) Possible rare winter resident.
Canyon wren (Salpinctes mexicanus conspersus) Uncommon summer resident 3/.
Rock wren (Salpinctes obsoletus obsoletus) Common summer 3/ and possible rare winter resident.
Mockingbird (Mimus polyglottos leucopterus) Uncommon summer resident 3/.
Catbird (Dumetella carolinensis) Rare summer resident.
Sage thrasher (Oreoscoptes montanus) Common summer resident 3/, 6/.
Robin (Turdus migratorius propinquus) Common summer resident 3/, 5/.
Hermit thrush (Hylocichla guttata auduboni) Common summer resident 5/.
Swainson's thrush (Hylocichla ustulata almae) Possible common migrant.
Veery (Hylocichla fuscescens salicicola) Possible common migrant and uncommon summer resident.
Western bluebird (Sialia mexicana bairdi) Possible common migrant and uncommon summer resident 3/.
Mountain bluebird (Sialia currucoides) Common migrant and summer resident 3/, 5/ and occasional winter resident.
Townsend's solitaire (Myadestes townsendi townsendi) Uncommon resident 5/.
Blue-gray gnatcatcher (Polioptila caerulea amoenissima) Common summer resident 3/.
Golden-crowned kinglet (Regulus satrapa amoenus) Possible uncommon migrant and rare summer resident.
Ruby-crowned kinglet (Regulus calendula cineraceus) Possible common migrant.
Bohemian waxwing (Bombycilla garrulus pallidiceps) Possible irregular winter migrant.
Cedar waxwing (Bombycilla cedrorum) Possible uncommon and irregular resident.
Northern shrike (Lanius excubitor invictus) Possible common winter resident.
Loggerhead shrike (Lanius ludovicianus excubitorides) Uncommon summer 3/ and common winter resident.
Gray vireo (Vireo vicinior) Possible uncommon summer resident.
Solitary vireo (Vireo solitarius plumbeus) Possible common summer resident.
Red-eyed vireo (Vireo olivaceus) Rare summer resident 3/.
Warbling vireo (Vireo gilvus swainsonii) Possible common summer resident.
Tennessee warbler (Vermivora peregrina) Possible rare but regular migrant.
Orange-crowned warbler (Vermivora celata orestera) Possible uncommon migrant and summer resident.
Nashville warbler (Vermivora ruficapilla ridgwayi) Possible rare migrant.
Virginia's warbler (Vermivora virginiae) Possible common summer resident.
Yellow warbler (Dendroica petechia aestiva) Common summer resident 3/, 5/.
Myrtle warbler (Dendroica coronata coronata) Possible common migrant.

Nongame birds (continued)

Audubon's warbler (Dendroica auduboni memorabilis) Common summer resident 3/, 6/.
Black-throated gray warbler (Dendroica nigrescens) Common summer resident 3/.
Townsend's warbler (Dencroica townsendi) Possible uncommon fall migrant.
MacGillivray's warbler (Oporornis tolmiei monticola) Common migrant and uncommon summer resident 5/.
Yellowthroat (Geothlypis trichas occidentalis: G. t. campicola) Possible uncommon summer resident.
Yellow-breasted chat (Icteria virens auricollis) Possible common summer resident.
Wilson's warbler (Wilsonia pusilla pileolata) Possible common migrant.
American redstart (Setophaga ruticilla tricolora) Possible rare migrant.
House sparrow (Passer domesticus domesticus) Common resident 3/.
Bobolink (Dolichonyx oryzivorus) Possible rare summer migrant.
Western meadowlark (Sturnella neglecta neglecta) Common summer 3/ and uncommon winter resident.
Yellow-headed blackbird (Xanthocephalus xanthocephalus) Common summer resident
Red-winged blackbird (Agelaius phoeniceus fortis) Common resident 3/.
Bullock's oriole (Icterus bullockii bullockii) Common summer resident 3/.
Rusty blackbird (Euphagus carolinus carolinus) Possible rare winter migrant.
Brewer's blackbird (Euphagus cyanocephalus) Common resident 3/.
Brown-headed cowbird (Molothrus ater artemisiae) Common summer resident 3/.
Western tanager (Piranga ludoviciana) Possible common migrant and summer resident.
Scarlet tanager (Piranga olivacea) Possible rare summer migrant.
Black-headed grosbeak (Pheucticus melanocephalus melanocephalus) Common summer resident 5/.
Blue grosbeak (Guiraca caerulea interfusa) Possible uncommon summer resident.
Lazuli bunting (Passerina amoena) Uncommon summer resident 3/.
Evening grosbeak (Hesperiphona vespertina brooksi) Irregular resident.
Cassin's finch (Carpodacus cassinii) Possible common resident.
House finch (Carpodacus mexicanus frontalis) Common summer 3/, 5/ and possible uncommon winter resident.
Pine grosbeak (Pinicola enucleator montana) Possible uncommon resident.
Gray-crowned rosy finch (Leucosticte tephrocotis tephrocotis; L. t. littoralis) Possible common winter migrant.
Black rosy finch (Leucosticte atrata) Possible common winter migrant.
Brown-capped rosy finch (Leucosticte australis) Possible common winter migrant.
Common redpoll (Acanthis flammea flammea) Possible rare winter migrant.
Pine siskin (Spinus pinus pinus) Common resident 3/, 5/.
American goldfinch (Spinus tristis tristis; S. t. pallidus) Common summer 3/ and possible uncommon winter resident.
Lesser goldfinch (Spinus psaltria psaltria) Possible uncommon summer and rare winter resident.
Red crossbill (Loxia curvirostra) Possible rare resident.
White-winged crossbill (Loxia leucoptera leucoptera) Possible rare winter migrant.

Nongame birds (continued)

Green-tailed towhee (Chlorura chlorura) Common summer resident 3/, 5/, and possible rare winter resident.
Rufous-sided towhee (Pipilo erythrophthalmus montanus) Uncommon summer and rare winter resident.
Lark bunting (Calamospiza melanocorys) Uncommon summer resident.
Savannah sparrow (Passerculus sandwichensis nevadensis; P. s. anthinus) Possible uncommon migrant and summer resident.
Grasshopper sparrow (Ammodramus savannarum perpallidus) Uncommon summer resident 5/.
Vesper sparrow (Pooecetes gramineus confinis) Common migrant and summer resident 5/.
Lark sparrow (Chondestes grammacus strigatus) Possible common migrant and summer resident.
Black-throated sparrow (Amphispiza bilineata deserticola) Possible common summer resident.
Sage sparrow (Amphispiza belli nevadensis) Common summer resident 3/.
White-winged junco (Junco aikeni) Possible ra e winter migrant.
Slate-colored junco (Junco hyemalis hyemalis; J. h. cismontanus) Possible rare winter resident.
Oregon junco (Junco oreganus) Common winter resident.
Gray-headed junco (Junco caniceps caniceps) Common summer 5/ and winter resident.
Tree sparrow (Spizella arborea ochracea) Possible uncommon winter migrant.
Chipping sparrow (Spizella passerina borcophila) Common summer resident 3/.
Brewer's sparrow (Spizella breweri breweri) Common summer resident 3/, 6/.
Harris' sparrow (Zonotrichia querula) Possible rare winter resident.
White crowned sparrow (Zonotrichia leucophrys) Common resident 3/, 5/.
Fox sparrow (Passerella iliaca schistacea) Rare summer resident 5/.
Lincoln's sparrow (Melospiza lincolnii alticola) Common migrant and summer resident 3/.
Song sparrow (Melospiza melodia) Common summer 3/ and possible uncommon winter resident.
Lapland longspur (Calcarius lapponicus alascensis) Possible rare winter migrant.
White-throated sparrow (Zonotrichia albicollis) Possible rare migrant.

Raptores 2/

Turkey vulture (Cathartes aura meridionalis) Common summer 3/, 5/ and rare winter resident.
Goshawk (Accipiter gentilis atricapillus) Rare resident.
Sharp-shinned hawk (Accipiter striatus velox) Possible rare summer and common winter resident.
Cooper's hawk (Accipiter cooperii) Uncommon summer 3/, 5/ and common winter resident.

Raptores (continued)

Red-tailed hawk (Buteo jamaicensis calurus) Common resident 3/, 5/.
Swainson's hawk (Buteo swainsoni) Uncommon summer 5/ and rare winter resident.
Rough-legged hawk (Buteo lagopus s. johannis) Rare summer 3/ and uncommon winter resident or migrant.
Ferruginous hawk (Buteo regalis) Rare summer and common winter resident.
Golden eagle (Aquila chrysaetos canadensis) Common resident 3/, 7/.
Bald eagle (Haliaeetus leucocephalus alascanus) Common winter resident 7/.
Marsh hawk (Circus cyaneus hudsonius) Common summer 3/, 5/, and winter resident.
Osprey (Pandion haliaetus carolinensis) Possible rare migrant.
Prairie falcon (Falco mexicanus) Rare resident 3/.
Peregrine falcon (Falco peregrinus anatum) Possible rare migrant.
Pigeon hawk (Falco columbarius) Possible rare winter migrant.
Sparrow hawk (Falco sparverius sparverius) Common summer 3/, 5/ and uncommon winter resident.
Screech owl (Otus asio) Possible uncommon resident.
Flammulated owl (Otus flammeolus flammeolus) Possible rare summer resident.
Great horned owl (Bubo virginianus) Common resident 3/, 5/.
Pygmy owl (Glaucidium gnoma californicum) Possible rare resident.
Burrowing owl (Speotyto cunicularia hypugaea) Common summer 5/ and possible rare winter resident.
Long-eared owl (Asio otus wilsonianus) Uncommon resident 5/.
Short-eared owl (Asio flammeus flammeus) Possible uncommon winter migrant.
Saw-whet owl (Aegolius acadicus acadicus) Possible uncommon resident.

7/ Golden and bald eagle specifically excluded from statutes defining "Raptore" as cited in footnote 1/ but herein listed to avoid omission.

Species List for Piceance Basin Wildlife Habitat Management Plan
Amphibians and Reptiles 1/

FT. COLLINS

SPECIES Common Name Scientific Name	NFWL * Specimens	UCM Specimens	Cited - Univ. of Colo Studies 1/2/	C-a tract C-b tract	Parachute Cr Petus 3/	Ua - Ub Utah			REMARKS
AMPHIBIANS									
1. Arizona Tiger Salamander Ambystoma tigrinium nebulosum	X	X	X	X					Rio Blanco & Garfield Counties
2. Western Toad Bufo boreas	H	X							Generally found above 7,000 ft. elevation.
3. Woodhouse Toad, Rocky Mountain B. woodhousei woodhousei	H		X		X	X			Rio Blanco & Garfield Counties generally below 7,000 ft. elevation
4. Striped Chorus Frog Pseudacris triseriata maculata	X	X	X	X		X			Rio Blanco & Garfield Counties
5. Leopard Frog, Western Rana pipiens brachycephala	X	X	X		X	X			Rio Blanco & Garfield Counties
6. Great Basin Spadefoot Toad S. intermontana	X			X	X	X			Rio Blanco & Garfield Counties
LIZARDS									
1. Northern Whiptail Lizard Cnemidophorus tigris septentrionalis	X	X				X			Garfield & Moffat Counties--NFWL Badger Wash, Garfield County
2. Plateau Whiptail Lizard Cnemidophorus velox	X	X			X				Garfield County
3. Yellow Collared Lizard Crotaphytus collaris auriceps	H	X			X				Garfield County - Rifle Gap Parachute Creek
4. Long-nosed Leopard Lizard Crotaphytus wislizeni wislizeni	H	H							Garfield County outside HMP area listed as Hypothetical

1/ — [illegible]

Amphibians and Reptiles 1/

SPECIES Common Name Scientific Name	NFWL Specimens	UCM Specimens	Cited - Univ. of Colo Studies 1/2/	C-a tract C-b tract	Parachute Cr Pettus 3/	Ua - Ub Utah			REMARKS
AMPHIBIANS									
1. ~~Utah~~ Arizona Tiger Salamander, Gabelosum Ambystoma tigrinium ~~mavortium~~	X	X	X	X					Rio Blanco & Garfield Counties
2. Western Toad Bufo boreas	H	X							Generally found above 7,000 ft. elevation.
3. Woodhouse Toad, Rocky Mountain B. woodhousei woodhousei	H		X		X	X			Rio Blanco & Garfield Counties generally below 7,000 ft. elevation
4. Striped Chorus Frog Pseudacris triseriata maculata	X	X	X	X		X			Rio Blanco & Garfield Counties
5. Leopard Frog, Western Rana pipiens brachycephala	X	X	X		X	X			Rio Blanco & Garfield Counties
6. Great Basin Spadefoot Toad S. intermontana	X			X	X	X			Rio Blanco & Garfield Counties
LIZARDS									
1. Northern Whiptail Lizard Cnemidophorus tigris septentrionalis	X	X				X			Garfield & Moffat Counties--NFWL Badger Wash, Garfield County
2. Plateau Whiptail Lizard Cnemidophorus velox	X	X			X				Garfield County
3. Yellow Collared Lizard Crotaphytus collaris auricops	H	X			X				Garfield County - Rifle Gap Parachute Creek
4. Long-nosed Leopard Lizard Crotaphytus wislizeni wislizeni	H	H							Garfield County outside IMP area listed as Hypothetical

Species List for Piceance Basin Wildlife Habitat Management Plan
Amphibians and Reptiles 1/

SPECIES Common Name Scientific Name	NFWL Specimens	UCM Specimens	Cited - Univ. of Colo Studies 1/2/	C-a tract C-b tract	Parachute Cr. Pettus 3/	Ua - Ub Utah			REMARKS
5. Desert Short-horned Lizard Phyrynosoma douglassi ornatissimum	X	X	X		X	X			Rio Blanco and Garfield Counties
6. Great Basin Sagebrush Lizard Sceloporus graciosus graciosus	X	X	X	X	X	X			Listed as abundant species on C-a tract (Rio Blanco and Garfield Counties
7. Northern Plateau Lizard Sceloporus undulatus elongatus	X	X	X		X	X			Eastern Fence Lizard and common on oil shale lease tracts.
8. Northern Tree Lizard Urosaurus ornatus wrighti	X	X			X	X			Rio Blanco and Garfield Counties
9. Northern Side-blotched Lizard Uta stansburiana stansburiana	X	X			X	X			Rio Blanco and Garfield Counties
SNAKES									
1. Western Yellow-bellied Racer Coluber constrictor mormon	X	X							Rio Blanco County (USFWS) Garfield County (UCM)
2. Midget Faded Rattlesnake Crotalus viridis concolor	X	X				X			Rio Blanco County
3. Great Plains Rat Snake Elaphe guttata emoryi	H	X							Garfield County
4. Mesa Verde Night Snake Hypsiglena torquata loreala	H			X		H			Mesa County Hypothetical for HMP Area
5. Utah Milk Snake Lampropeltis triangulum taylori	H			X		X			Mesa County Hypothetical for HMP Area
6. Desert Striped Whipsnake Masticophis taeniatus taeniatus	X	X	X						Rio Blanco County (USFWS) Moffatt County(UCM) also reported in Garfield County

Species List for Piceance Basin Wildlife Habitat Management Plan
Amphibians and Reptiles 1/

SPECIES Common Name Scientific Name	NFWL Specimens	UCM Specimens	Cited - Univ. of Colo Studies 2/	C-a tract C-b tract	Parachute Cr. Pettus 3/	Ua - Ub Utah			REMARKS
7. Western Smooth Green Snake Opheodrys vernalis blanchardi	H								Routt County - USFWS Hypothetical for HMP Area
8. Great Basin Gopher Snake Pituophis catenifer deserticola	X	X			X				Rio Blanco and Garfield Counties

Species List for Piceance Basin Wildlife Habitat Management Plan
Amphibians and Reptiles

1/ Scientific names follow nomenclature used in Smith, H. M., T. P. Maslin, and R. L. Brown, 1965. Summary of distribution of the herpetofauna of Colorado, A supplement to an annotated check list of the amphibians and reptiles of Colorado. Univ. Colo. Mus. Ser. Biol. No. 15. 62p.

2/ Maslin, Paul T., 1959. An annotated check list of the amphibians and reptiles of Colorado. Univ. of Colo. Studies. Series in Biology No. 6. 98p.

3/ Pettus, David, 1973. Cold-blooded vertebrate inventory analysis and impact study of the Parachute Creek Area, Garfield County, Colorado. Colony Environmental Study Part II, Vol.2, Chapt. VIII: 7-9, 16; also Part III, Chapt. III: 1-12.

APPENDIX 3

Sikes Act Supplement to Master Memorandum of Understanding

And Fiscal year 1976/1977 Work Agreements

Supplement to the
MASTER MEMORANDUM OF UNDERSTANDING
between
THE COLORADO DIVISION OF WILDLIFE
AND
THE BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF THE INTERIOR, COLORADO

SIKES ACT IMPLEMENTATION

This supplemental memorandum of understanding is pursuant to the Memorandum of Understanding between the Colorado Division of Wildlife (DOW) and the Bureau of Land Management (BLM), Colorado, dated April 9 1975.

The Sikes Act of October 18, 1974, Public Law 93-452, provided broad authority to: 1) Plan and carry out wildlife conservation and habitat rehabilitation programs on National Resource Lands (NRL) consistent with overall land use plans; 2) Protect significant habitat for Threatened and Endangered Species; and 3) Enforce regulations to control Off Road Vehicle traffic (ORV) or other public use of lands subject to conservation and rehabilitation programs conducted under the Act.

The Act in no way diminishes the authority of the State of Colorado to manage wildlife.

It is the purpose and intent of this supplement to provide a working relationship and procedure for implementation of the Sikes Act on NRL in Colorado between the Colorado Division of Wildlife and the BLM, Colorado.

Supplement to the
MASTER MEMORANDUM OF UNDERSTANDING
between
THE COLORADO DIVISION OF WILDLIFE
AND
THE BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF THE INTERIOR, COLORADO

SIGNS FOR IMPLEMENTATION

This supplemental memorandum of understanding is pursuant to the Memorandum of Understanding between the Colorado Division of Wildlife (DOW) and the Bureau of Land Management (BLM), Colorado, dated _____ April 9, 19 75.

The Sikes Act of October 18, 1974, Public Law 93-452, provides broad authority to: 1) plan and carry out wildlife conservation and habitat rehabilitation projects on National Resource Lands (NRL) consistent with overall land use plans; 2) protect threatened and endangered species; 3) enforce regulations to control off-road vehicle traffic, heavy or other public use of lands subject to conservation and rehabilitation programs conducted under the Act.

The Act is to be implemented by the authority of the State of Colorado to manage wildlife.

It is the purpose and intent of this supplement to provide guidelines, responsibilities and procedures for implementation of the Sikes Act on BLM lands in Colorado between the Colorado Division of Wildlife and the BLM, Colorado.

Definitions used in this supplement are defined as follows:

1) Conservation and rehabilitation program - Includes programs necessary to protect, conserve, and enhance wildlife resources to the maximum extent practicable on NRL consistent with any overall land-use and management plans (Management Framework Plan, see below) for the lands involved.

2) Management Framework Plan (MFP) - BLM's approved, multiple-use management plan for NRL in a specific administrative area. The MFP is a dynamic plan for NRL action resource management and is based on public input.

3) Habitat Management Plan (HMP) - BLM's intensive, detailed action plan for wildlife management on a specific, geographic biological area of NRL. The HMP is a cooperative plan with the State Wildlife agency and is based on an approved MFP. The HMP shall be the implementing document for the Sikes Act.

THEREFORE, BE IT RESOLVED THAT FOR THE PURPOSE OF ENACTING P.L. 93-452, the DOW and the BLM, Colorado, mutually agree to the following:

1) HMPs will be implemented only on areas where MFPs have been prepared, unless otherwise authorized by the Director, BLM, Colorado..

2) HMPs will be based on priorities within Colorado, as mutually selected by the Director, DOW, and the Director, BLM, Colorado. Criteria for establishing HMP priorities shall be based on the following:

a) Resource values to be enhanced and benefits produced.

b) Areas where the need for intensive wildlife management has been identified, through the BLM or DOW planning systems.

c) On or near areas where wildlife habitat is subjected to significant land use changes, particularly energy development, industrial uses, urban expansion and ORV use.

d) The existence of significant wildlife habitat, such as a deer winter range, or habitats of Endangered or Threatened Species.

3) Protection will be afforded to those fish and wildlife species designated as Threatened or Endangered by the Colorado Wildlife Commission or by the Secretary of the Interior pursuant to Section 4 of the Endangered Species Act of 1973.

4) HMPs will specify fish and wildlife habitat improvements or modifications needed.

5) Rehabilitation of NRLs will be undertaken where necessary to support HMP recommendations.

6) Hunting, fishing and trapping on HMP areas will be in accordance with applicable laws and regulations of Colorado.

7) It is herein recognized that the Secretary of the Interior has the authority to promulgate regulations to control the public use of NRL consistent with the HMP, including, but not limited to ORV use.

a) Resources values to be enhanced and benefits produced.

b) Areas where the need for intensive wildlife management has been identified, through the SRA or GDM planning systems.

c) In or near areas where wildlife habitat is subjected to significant land use changes, particularly energy development, industrial uses, urban expansion and OHV use.

d) The existence of significant wildlife habitat, such as a deer winter range, or habitats of endangered or threatened species.

2) Protection will be afforded to those fish and wildlife species designated as threatened or endangered by the Colorado Wildlife Commission or by the Secretary of the Interior pursuant to Section 4 of the Endangered Species Act of 1973.

4) NRMs will provide fish and wildlife habitat improvements or modifications needed.

5) Rehabilitation of IGMs will be undertaken where necessary to support NRM recommendations.

6) Hunting, fishing and trapping on NRM areas will be in accordance with applicable laws and regulations of Colorado.

7) It is hereby recommended that the Secretary of the Interior has the authority to promulgate regulations to control the public use of NRM consistent with the NRM, including, but not limited to OHV use.

8) Funds authorized and appropriated for HMP implementation on NRL in Colorado shall include, but not be limited to all activities associated with scientific resource management, such as the following: protection, research, census, law enforcement, habitat management, propagation, live trapping, transplantation, and regulated taking. Funds may be allocated for hiring of personnel, grants to colleges, contractual services, and physical habitat improvement projects. It shall be the joint responsibility of the Director, DOW, and the Director, BLM, Colorado, to define areas and projects for priority Sikes Act funding. It shall be the responsibility of the Director, BLM, Colorado, to secure funding through the BLM's program funding procedures. Final disbursement of Sikes Act Funds shall be made through the Director, BLM, Colorado, after consultation with the Director, DOW.

9) Plans and programs initiated on NRL under the Sikes Act in Colorado shall not conflict with comprehensive plans required of the State under any Federal or State Acts.

10) The BLM and DOW will discuss the following Sikes Act items during the course of their coordination meeting:

    a) HMP priorities for implementation.

    b) Program and budget recommendations for the upcoming and succeeding fiscal years.

    c) A progress report on the current status of HMP implementation.

d) Review of wildlife values produced under existing conservation and rehabilitation programs.

This supplement shall become effective on the date when last signed and shall remain in force until terminated by mutual agreement, by Amendment or abolishment of the Act by Congress, or by either party upon thirty days notice in writing to the other party of its intention to terminate upon a date indicated.

DEPARTMENT OF NATURAL RESOURCES

BY: for Harris Sherman, Executive Director

DATE: April 15, 1975

COLORADO DIVISION OF WILDLIFE

BY: Jack R. Grieb, Director

DATE: APR 18 1975

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COLORADO STATE OFFICE

BY: Dale R. Andrus, Director

DATE: 5/6/75

d) Review of wildlife values produced under existing conservation and rehabilitation programs.

This supplement shall become effective on the date when last signed and shall remain in force until terminated by mutual agreement, by amendment or abrogation of the act by Congress, or by either party upon thirty days notice in writing to the other party of its intention to terminate upon a date indicated.

DEPARTMENT OF NATURAL RESOURCES

By: _____
Morris Anderson, Executive Director

DATE: _____

COLORADO DIVISION OF WILDLIFE

By: _____
Jack T. Grieb, Director

DATE: _____

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COLORADO STATE OFFICE

By: _____
Frank K. Andrus, Director

DATE: _____

SUPPLEMENT NO. 3
SIKES ACT ANNUAL WORK AGREEMENT
FOR FISCAL YEAR 1976
between the
UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
and the
COLORADO DEPARTMENT OF NATURAL RESOURCES
Division of Wildlife

Purpose

It is the purpose of this agreement to establish the work to be mutually undertaken in FY 1976 to implement the Sikes Act Supplement to the Master Memorandum of Understanding, dated May 6, 1975, between the Colorado Division of Wildlife (DOW) and the Bureau of Land Management (BLM), Colorado.

Funding of Work

The work herein described and shown on Schedule 1, attached, shall be accomplished through expenditure of funds appropriated to the Bureau of Land Management in Fiscal Year 1976 for Implementation of the Sikes Act (88 Stat. 1369), as amended. This document will not constitute a commitment or obligation of funds on the part of the BLM nor an obligation to perform work attributed to the DOW. These specific funding obligatory commitments will be addressed in contracts to be executed between the aforementioned parties at a future date.

Agreement

We, the undersigned parties, do hereby agree on the work to be undertaken in the Piceance Basin Wildlife Habitat Area during Fiscal Year 1976 as described in Schedule 1, attached. This agreement shall remain in effect until completion of the work described or until supplemented by execution of a subsequent annual work agreement.

DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Colorado State Office

By: Charles M. Fowler
For Dale R. Andrus, State Director

Date: 2/6/76

STATE OF COLORADO
for the use and benefit of the
Department of Natural Resources
DIVISION OF WILDLIFE

By: Jack R. Grieb
Jack R. Grieb, Director

Date: FEB 20 1976

Schedule 1

BLM - Colorado and Colorado Division of Wildlife
Proposed Sikes Act Work for the Piceance
Basin Wildlife Habitat Area, FY 1976

Work to be Completed

Proposal - Name, Location, Species, Description, Responsible Agency	Units - (mi., acres, no. of studies, equipment)
Personnel (BLM): Conduct pre and post habitat improvement studies, assist in contract supervision, develop BLM Manual 6610 Inventory and 6620 Big Game Studies for the HMP area. Installation of wildlife escape ramps.	Two wildlife technicians
Equipment (BLM): Needed to conduct inventories and studies and implement habitat improvement projects. Camera, binoculars, spotting scope and cassette recorder are an integral part of non-game studies, monitoring of habitat improvement work and HMP management.	1 Camera, 35 mm, w/50 mm lens and 400 mm lens and cases for camera and lens, tripod for telephoto lens. 1 Stereoscope 2 Pair binoculars, 8x40 1 Spotting scope, 20-60 power, variable 1 Portable cassette tape recorder 1 Portable calculator 1 Battery operated slide viewer
Wildlife Studies (DOW): Survey of riparian and aquatic communities, stream surveys, species identification, determination of flows for Colo. Senate Bill 97.	1 study (100 miles of stream, 16,000 acres of riparian habitat)
Parachute Canyon Peregrine Falcon study/survey.	1 study (5 sq. miles, 3200 acres)
Non-game bird & mammal study and survey: assess ecological requirements - pre and post evaluations of habitat improvement sites; identify habitat areas used by non-game birds on the critical status list.	1 study (HMP areawide and select sites)
Study of sagegrouse breeding complex areas, wintering areas and wet meadow concentration area.	1 study HMP areawide

	Units: (mi., acres, no. of studies, equipment)
	Two wildlife technicians
	1 Camera, 35 mm, w/20 mm lens and 600 mm lens and cases for camera and lens, tripod for telephoto lens. 1 Stereoscope 2 Pair binoculars, 8x40 1 Counting screw, 25-50 power, variable 1 Portable cassette tape recorder 1 Portable calculator 1 Battery operated slide viewer
	1 study (100 miles of stream, 16,000 acres of riparian habitat)
	1 study (5 sq. miles, 3200 acres)
	1 study (UMP areas/ide and select sites)
	1 study MUP areas/ide

Schedule 1

BLM - Colorado and Colorado Division of Wildlife
Proposed Sikes Act Work for the Piceance
Basin Wildlife Habitat Area, FY 1976

Work to be Completed

Proposal - Name, Location, Species, Description, Responsible Agency	Units - (mi., acres, no. of studies, equipment)
Study to determine winter forage competition between wildlife and livestock.	1 study (HMP area - selected sites)
Wildlife Habitat Improvement (BLM):	
Barcus Reservoirs - Construction of five reservoirs, 3,000 cu. yd. each plus protective fencing, seeding and planting and drinking tanks to provide crucial aquatic wildlife habitat and drinking water for waterfowl, shorebirds, amphibians and big game (1285-6241).	5 reservoirs, 15,000 cu. yd.
Timber Gulch Chaining of Decadent Sagebrush and Reseeding - Improvement of critical sagegrouse meadow habitat. Includes reseeding with grasses and forbs to enhance food and cover (1285-6002).	80 acres
Timber Gulch Reservoirs and Protective Fencing - Establishment of new wet meadow habitat for sagegrouse and nongame birds and mammals (1285-6241).	11 reservoirs, 6 miles of fence
Greasewood/Barcus Chaining of Decadent Sagebrush and Reseeding - Improvement of crucial mule deer winter range. Includes reseeding of assorted vegetative species in different combinations and rates over five, 20 acre plots (1285-6002).	100 acres

Schedule 1

BLM - Colorado and Colorado Division of Wildlife
Proposed Sikes Act Work for the Piceance
Basin Wildlife Habitat Area, FY 1976

Work to be Completed

Proposal - Name, Location, Species, Description, Responsible Agency	Units - (mi., acres, no. of studies, equipment)
Greasewood/Barcus Study Exclosure - Construction of two, two-acre exclosures to evaluate mule deer livestock use of the treated area (1285-6448).	2 exclosures, 0.6 miles of fence
Lee Gulch Pinon-Juniper Chaining - Improvement of forage and cover juxtaposition on critical mule deer winter range. Includes interspersion of browse, forb and grass among "fingers" of dense tree cover (1285-6002).	400 acres
Pinto Mesa - Reservoirs Construction of 7 reservoirs, 3,000 cu. yds. ea. plus protective fencing and drinking tanks to provide a crucial mule deer water source and food, cover, nesting and resting habitat for waterfowl and shorebirds. (1285-6241)	7 reservoirs, 21,000 cu. yd.
Maintenance (BLM):	
Installation of wildlife escape ramps in watering troughs to benefit small birds and mammals (1285-8078).	100 escape ramps in 100 troughs
Public Affairs (BLM):	
Publication of HMP slides, brochures, maps, other printing costs	

Schedule I

Wyo. - Colorado and Colorado Division of Wildlife
Proposed Plans and Costs for the Piceance
Basin Wildlife Mitigation Area, FY 1976

Work to be Completed

Measure - Action, Location, Description, Accomplishments - Activity	Units - Job, acres, no. of animals, equipment
Habitat Improvement Projects - Fencing and Grazing Management - Fencing and grazing management on the Piceance Basin Wildlife Mitigation Area (BLM).	7 exclosures, 9.6 miles of fence
Habitat Improvement Projects - Vegetation Manipulation - Vegetation manipulation on the Piceance Basin Wildlife Mitigation Area (BLM).	500 acres
Habitat Improvement Projects - Water Development - Water development on the Piceance Basin Wildlife Mitigation Area (BLM).	7 reservoirs, 21,000 cu. yd.
Habitat Improvement Projects - Other Measures - Other measures on the Piceance Basin Wildlife Mitigation Area (BLM).	100 escape ramps in 100 brushpile
Habitat Improvement Projects - Other Measures - Other measures on the Piceance Basin Wildlife Mitigation Area (BLM).	6
Habitat Improvement Projects - Other Activity (BLM) - Rehabilitation of mine sites, strongholes, honey, tumbleweed burning sites	

Supplement No. 4
SIKES ACT ANNUAL WORK AGREEMENT
FOR FISCAL YEAR 1977
between the
UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
and the
COLORADO DEPARTMENT OF NATURAL RESOURCES
Division of Wildlife

Purpose

It is the purpose of this agreement to establish the work to be mutually undertaken in FY 1977 to implement the Sikes Act Supplement to the Master Memorandum of Understanding, dated May 6, 1975, between the Colorado Division of Wildlife (DOW) and the Bureau of Land Management (BLM), Colorado.

Funding of Work

The work herein described and shown on Schedule 1, attached, shall be accomplished through expenditure of funds appropriated to the Bureau of Land Management in Fiscal Year 1977 for implementation of the Sikes Act (88 Stat. 1369), as amended. This document will not constitute a commitment or obligation of funds on the part of the BLM nor an obligation to perform work attributed to the DOW. These specific funding obligatory commitments will be addressed in contracts to be executed between the aforementioned parties at a future date.

Agreement

We, the undersigned parties, do hereby agree on the work to be undertaken in the Piceance Basin Wildlife Habitat Area during Fiscal Year 1977 as described in Schedule 1, attached. This agreement shall remain in effect until completion of the work described or until supplemented by execution of a subsequent annual work agreement.

DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Colorado State Office

By: Dale R. Andrus
Dale R. Andrus, State Director

Date: 1/11/77

STATE OF COLORADO
for the use and benefit of the
Department of Natural Resources
DIVISION OF WILDLIFE

By: Jack R. Grieb
Jack R. Grieb, Director

Date: 1-3-77

Schedule 1
BLM - Colorado and Colorado Division of Wildlife
Proposed Sikes Act Work for the
Piceance Basin Wildlife Habitat Area, FY 1977

WORK TO BE COMPLETED

Work Item - Name, Location, Species Description, Responsible Agency	Units (Miles, Acres, Number, etc.)	Estimated Cost
Personnel (BLM): Supervise implementation of HMP; conduct pre- and post-treatment habitat improvement studies; contract supervision; interagency coordination	19 Temporary M/M 20 Permanent M/M	$61,200
Public Affairs (BLM): Prepare and distribute HMP and abstract for public use; prepare slide series; conduct necessary public affairs workshops and field trips; construct and install informative signs.	50-100 copies of complete HMP 100 copies of HMP abstract 5 copies of HMP slide series	$ 1,500
Wildlife Habitat Improvement: Bureau of Land Management Lower Barcus, Greasewood, Wolf Ridge and Howard Pinon-Juniper Chainings: Control of dense pinon-juniper stands in small patches and strips to increase mule deer forage and improve interspersion of food and cover.	820 acres	$29,100
Division of Wildlife: 1. Oak Ridge Thinning: Opening dense oakbrush stands by dozing or handcutting strips to release new oakbrush resprouts and grass understory to benefit wintering elk.	400 acres	$12,000

Schedule 1
BLM - Colorado and Colorado Division of Wildlife
Projected items not work for the
Piceance Basin Wildlife Habitat Area, FY 1977

WORK TO BE COMPLETED		
Work Item - Name, Location, Specifications, Description, Necessarily Major	Units (Miles, Acres, Number, etc.)	Estimated Cost
Personnel (Grade) Coordination Specialist (GS-11) - Coordinate BLM, conduct pre- and post-treatment habitat inventory studies, conduct management studies, conduct monitoring, inventory coordination	10 Temporary M/M 20 Permanent M/M	$81,200
Habitat Criteria (BLM): Develop and distribute BLM and advisory for public use; prepare slide series; conduct necessary public affairs meetings; and field trips; conference and install informative signs.	50-100 copies of complete HMP 100 copies of HMP abstract 5 copies of HMP slide series	$ 1,500
Wildlife Habitat Improvement: Use of fire, prescribed burning, brushbeat, Wolf Creek and Tanner Hollow-Stanley Creek Control of noxious plants in the access in order to increase water yields and improve wildlife habitat and improve conditions for fish and wildlife.	820 acres	$20,100
Physical Improvements: Use of rainbow fencing around springs, check dams, building of meandering ditches to manage the natural vegetation, and water monitoring in conjunction with monitoring site.	300 acres	$12,000

Work Item - Name, Location, Species, Description, Responsible Agency	Units (Miles, Acres Number, etc.)	Estimated Cost
2. Wildlife spring; Development of a spring and adjacent wet area to establish new wet meadow habitat for deer, sagegrouse and other wildlife.	1 spring	$ 1,150
Roan Plateau Access (BLM): Improve public hunting and fishing access over existing roads to 38,820 acres of National Resource Lands on the Roan Plateau by acquiring necessary easements and effecting required seasonal road closures to protect critical wildlife habitat.	1. 1/4 mile easement on Divide Road east of Cow Creek; 2. 1 1/2 miles easement at the head of Trappers Creek; 3. 1 3/4 miles easement at the head of the west fork of East Stewart Gulch; 4. 2 1/2 miles easement on Divide Road above Little Tim Creek; 5. 3/4 mile easement to connect Black Sulphur and Cow Creek access roads.	Cost included in BLM personnel costs.
Wildlife Habitat Maintenance (BLM): Use of gabions or other control structures to control flow of water into Timber Gulch and Pinto Mesa Reservoirs, repair existing fences and maintain the Greasewood Sagebrush Control Project.	18 Reservoirs 6 miles of fence 100 acres of sagebrush control.	$29,400
Special Inventory (BLM): Aerial reconnaissance as needed to monitor habitat improvement work and inventory wildlife use of habitat.	Approximately 15 hours flight time.	$ 1,000

Work Item - Name, Location, Description, Purpose, Justification, Project Unit Dimensions	Units (Miles, Acres, Number, etc.)	Estimated Cost
4. Wildlife Habitat Improvement - Improvement of ponds and associated areas to accommodate year-round waterfowl habitat for ducks, shorebirds and water birds.	1 impoundment	$ 1,500
Bean Pitman Acres (BPA): Improve poorly functioning and marginal acres, including about 50,000 acres of natural wetlands (ponds) on the Bean Pitman Ranch by providing accessibility and controlling adjacent areas of cattle grazing to produce excellent wildlife habitat.	1. 1/4 mile assessment on Dirtbin Road near of Cow Creek; 2. 1 1/2 miles assessment at the head of Teapoors Creek; 3. 1 3/4 miles assessment at the head of the west fork of East Stewart Butte; 4. 2 1/2 miles assessment on Dirtbin Road above Circle Ill. Creek; 5. 3/4 mile assessment on Comfort Block Subpond and Cow Creek access roads.	Cost included in BLM personnel costs.
Wildlife Habitat Improvement (BPA): Use of bulldozer or other contract equipment as in current fiscal year to divert water into Tower Butte, Jackpot Butte Reservoir, Pondy and other reservoirs, including and restoring the original Subpondy Control Projects.	16 Reservoirs 3 miles of fence 100 acres of cheatgrass seeding	320,000
General Improvement (BLM): Serial reconnaissance as needed to monitor habitat improvement work and inventory wildlife use of habitat.	Approximately 15 hours flight time.	$ 1,000

Work Item - Name, Location, Species, Description, Responsible Agency	Units (Miles, Acres Number, etc.)	Estimated Cost
Wildlife Habitat Studies (BLM): Continuation of the following FY 1976 wildlife studies via contractual arrangement with the Colorado Division of Wildlife:		
1. Study of sagegrouse breeding complex areas, wintering areas and wet meadow concentration areas.	1 Study, 150 square miles	$ 8,000
2. Study to determine winter range forage competition between wildlife and livestock (in cooperation with Dr. Richard Hansen, Colo. St. University).	1 Study, HMP area-wide	$ 3,000
3. Non-game bird and mammal study and survey: assess ecological requirements, pre- and post-evaluations of habitat improvement project sites.	1 Study, HMP area-wide	$10,500
	Total Estimated BLM Costs =	$143,700
	Total Estimated DOW Costs =	$ 13,150

Work Item: Water, Recreation, Wildlife, Description, Responsible Agency	Units (Miles, Acres, Number, etc.)	Estimated Cost
Wild rice habitat, Sandhill Crane (SCNA): Continue/conclude the following: 1. WCA activity studies via contractual arrangements with the Colorado Division of Wildlife.		-
1. Study of seasonal movements of SCNA in Area, wintering areas and well defined concentration areas.	1 Study, 150 square miles	$ 8,000
2. Study to determine winter range carrying capacity, habitat and interaction with Ft. Morgan Dam, Jackson Lake, etc. (in cooperation with Dr. Richard Ellison, CSU, Ft. Collins).	1 Study, NMP area-wide	$ 3,000
3. Non-game bird and mammal study and survey: assess ecological requirements, and habitat evaluations of habitat improvement project areas.	1 Study, NMP area-wide	$10,500
Total Estimated SCP Costs	=	$21,500
Total Estimated DOW Costs	=	$ 12,150

APPENDIX 4

Transecting Methods and Forms

Major Drainage _____

RIPARIAN HABITAT INVENTORY

1. Stream-Res. _____ 2. Writeup No. _____ 3. USGS Quad _____
4. Examiner _____ 5. Date _____ 6. P.U. _____
7. Mean Width Riparian Community _____ Ave. Stream Width _____ Est. Stream Flow ____
8. Dominant Veg. Type _____
9. % Canopy Cover _____
10. Avg. Veg. Ht. 0-5' from water _____ 5-10' from water _____
    10-20' from water _____
11. Overstory Veg. _____
12. Overstory condition _____
13. Understory Veg. _____
14. Understory condition _____
15. % Bank Cover (veg.) _____ % bare ground _____ % rock _____
16. Adjacent Habitat: P-J ____ Spruce Fir ____ Sage ____ Serviceberry ____ Aspen _____
    Other _____
17. Habitat Disturbance _____

18. Wildlife Use:
    a) Cover available for large mammals good _____ fair _____ poor _____
    b) Cover available for small mammals good _____ fair _____ poor _____
    c) Cover for fish overhang _____ In stream _____
    d) Signs & abundance of terrestrial animals (droppings, nests, tracks, etc.) _____

    e) Signs & abundance of aquatic animals (dams, cuttings, slides, etc.) _____

19. Habitat Improvement Opportunity _____

20. Present condition of overall riparian community: excellent _____ good _____ fair ____
    poor _____ non-existent _____. (Explain basis for judgment, comment, man's impact, etc.

21. Trends: Improving _____, Declining _____, Stable _____.
    Reasons _____

22. Notes: _____

INSTRUCTIONS

RIPARIAN HABITAT INVENTORY

General Instructions:

On field maps, outline riparian types by the dominant vegetative species. Assign a write up number to each area mapped. (Areas should be at least 2 acres or 75 yards long). Identify, on maps, anything of significance (i.e., roads, springs, improvements, beaver dams, nests, elk wallows, etc.).

Specific Instructions:

1. Name of stream, reservoir, etc.
2. Write up number. Use first two letters of stream name and number from number 1 (e.g., WH-1, WH-2, etc. for White River).
3. U. S. Geological Survey topographic quad. name.
4. Examiner. Last name only.
5. Date.
6. Bureau of Land Management planning unit.
7. Average width of riparian zone.
8. Identify dominant vegetative species.
9. Percent canopy attributed to vegetation over 3 feet high.
10. Height of vegetation in riparian zones.
11. Identify main overstory species.
12. Overstory condition.
    Good
    Vigorous stand of mature or all age classes of trees or shrubs. Adequate reproduction to maintain stand.
    Fair
    Some signs of decadence or disturbance. Site not fully occupied.
    Poor
    Large amount of decadence or heavy disturbance. Site not fully occupied and little evidence of reproduction.
13. Identify main understory species.
14. Understory condition.
    Good
    Dense cover of grasses, forbs or shrubs. Few raw stream banks, little evidence of destructive disturbance. Species diversity high.
    Fair
    Mostly perennial vegetation with some annuals. Very little bare ground. Disturbance not destructive to vegetation. Moderate species diversity.
    Poor
    Evidence of severe disturbance. Few perennial species and considerable bare ground. Few species present (little diversity).
15. Percent of banks (under 3 feet in height) in vegetation, bare soil, and rock.
16. Check as necessary. (Can be more than one. If appropriate, put percentages).

17. Habitat disturbance: Identify natural or man-made activities detrimental to vegetation or stream channel (e.g., overgrazing, tree cutting, mining, flooding, beaver activity, roads, etc.).

18. Wildlife use: Rate cover for large mammals (deer, elk, etc.) and small mammals (rodents, etc.). Record any evidence of wildlife use.

19. Identify habitat improvement opportunities for livestock, fish and terrestrial wildlife: fencing, planting, seeding, reservoir construction, in stream improvements, etc.

20. Condition of community: Overall impression of write up area.

Excellent

Diversity and abundance of typical riparian plants (trees, shrubs, forbs, grasses, etc.) and animals (mammals, birds, amphibians, invertebrates, etc.) good. Good age distribution, reproduction evident. Soil mostly covered with vegetation, bank erosion generally lacking. Cover for animals abundant. Vegetation shades water most of the day.

Good

Most groups of typically riparian plants (trees, shrubs, forbs, grasses, etc.) and animals (mammals, birds, amphibians, invertebrates, etc.) present at or near stream border, but numbers may be reduced. Age diversity fair, reproduction evident. Some bare soil areas noticeable, but erosion at low levels. Riparian animals somewhat reduced or typical species missing, due to cover loss. Vegetation shades water at least part of the day.

Fair

Many of the typically riparian plants (trees, shrubs, forbs, grasses, etc.) and animals (mammals, birds, amphibians, invertebrates, etc.) rare or missing from stream border. Age diversity lacking, little sign of reproduction. Bare soil may be common. Animal populations greatly reduced from lack of cover, may only be transitory in the community. Vegetative shade on stream lacking or only during morning and evening hours.

Poor

Typically riparian plants and animals scanty or lacking in both numbers and diversity. Little age variation, no sign of reproduction. Range plants (i.e., rabbitbrush, sagebrush, etc.) abundant down to water edge. Erosion of bare soil normally high, but may be reduced in monotypic grass communities which provide good ground cover but little diversity or animal cover. No shade on water from vegetation.

Nonexistent - Self explanatory

21. Trend

Improving

Good reproduction; high ratio of young to old/mature plants. Possible expansion of riparian community.

Declining

Significant invasion of upland species or annual forbs and grasses. Many decadent shrubs. Reproduction poor; low ratio of young to old/mature plants.

Stable

No significant invasion of upland species or annual forbs and grasses. Adequate reproduction to sustain community.

22. Any other items to note or general impressions: presence of springs, roads, fences, pollution, etc.

AQUATIC HABITAT EXTENSIVE SURVEY

STREAM _____ LOCATION _____

DATE _____ TIME _____ PARTY _____

STATION _____ LOCATION _____

AIR TEMP _____ WATER TEMP _____ WEATHER _____

TURBIDITY: CLEAR ___ MILKY ___ MURKY ___ MUDDY ___

WIDTH _____ DEPTH: L ___ M ___ R ___ GRADIENT _____

DISCHARGE: _____ VELOCITY _____

		T_1	T_2	T_3		INVERTEBRATES
Pool Quality	1					SURBER:
	2					
	3					
	4					
	5					
BOTTOM COMP.	BOULD.					ESTIMATED:
	RUBBLE					
	C.GRA.					
	F.GRA.					
	SAND					
	SILT					PHYSICAL DAMAGE:
	SHALE					
	BRK.					
BANK CLASS	LT.					
	RT					
BANK COVER	LT.					BARRIERS
	RT.					
BANK STABILITY	LT.					DIVERSIONS:
	RT					
RIFFLE QUALITY	1					FISH:
	2					
	3					
	4					

COMMENTS:

① POOL/RIFFLE RATIO

② CANOPY COVER = %

③ % BANK DAMAGE FROM LIVESTOCK

INSTRUCTIONS FOR EXTENSIVE FIELD FORM

STREAM LOCATION: USE ¼ SECTIONS - SECTION - TOWN-RANGE
TEMPERATURES: TAKEN IN SHADE.
TURBIDITY:
CLEAR -
MILKY - NATURAL COLOR OR VERY LIGHT SILTATION
MURKY - USUALLY ATTRIBUTED TO SILTATION.
MUDDY - DEFINITE SILTATION.
WIDTH: MEASURED OR ESTIMATED. IF TRANSECT AREA HAS A LOT OF VARIATION ESTIMATE AVERAGE.
DEPTH: MEASURE AND ESITMATE FOR TRANSECT AREA.
DISCHARGE: ESTIMATE C.F.S. AND TYPE OF RUN-OFF. STABLE - SOME SCOURING - EXTREME VARIATION BETWEEN NORMAL FLOWS AND SPRING DISCHARGE, ETC.
VELOCITY: TIME FLOATING ITEM.

BOTTOM COMPOSITION
BOULDER - ROCKS OVER 12"
RUBBLE - ROCKS 3" - 11"
COARSE GRAVEL - 1" - 3"
FINE GRAVEL - .1" - 1"
SAND
SILT
SHALE - SMALL FLAT CHUNKS
BED ROCK - LARGE SLABS OF SHALE WOULD COME IN HERE ALSO.
(ESTIMATE % COMPOSITION)

COMMENTS.
SPRINGS: POLLUTION
SPAWNING: BEAVER
CAMERA POINTS
OPINION:

BANK CLASS
ROCK - GRAVEL - SAND - SOIL
GRASS - SHRUB - TREE
(ABOVE HIGH WATER LINE)

BANK COVER.
SUBJECTIVE RATING OF THE QUALITY OF BANK COVER IN RELATION TO TROUT HABITAT REQUIREMENT.
GOOD - FAIR - POOR

BANK STABILITY
STABLE - NO SOIL SLOUGHING
UNSTABLE - EVIDENCE OF SOIL SLOUGHING IN THE PAST YEAR.

Pool			
Quality class no.	Length or Width	Depth	Shelter[1]
1	Greater than a.c.w.[2]	2′ or deeper	Abundant[3]
	Greater than a.c.w.	3′ or deeper	Exposed[4]
2	Greater than a.c.w.	2′ or deeper	Exposed
	Greater than a.c.w.	<2′	Intermediate[5]
	Greater than a.c.w.	<2′	Abundant
3	Equal to a.c.w.	<2′	Intermediate
	Equal to a.c.w.	<2′	Abundant
4	Equal to a.c.w.	Shallow[6]	Exposed
	Less than a.c.w.	Shallow	Abundant
	Less than a.c.w.	Shallow	Intermediate
	Less than a.c.w.	<2′	Intermediate
	Less than a.c.w.	2′ or deeper	Abundant
5	Less than a.c.w.	Shallow	Exposed

[1] *Logs, stumps, boulders, and vegetation in or overhanging pool, or overhanging banks.*
[2] *Average channel width.*
[3] *More than ½ perimeter of pool has cover.*
[4] *Less than ¼ of pool perimeter has cover.*
[5] *¼ to ½ perimeter of pool has cover.*
[6] *Approximately equal to average stream depth.*

RIFFLES

1 - BOULDERS-RUBBLE-COARSE GRAVEL. INTERSPACES ARE WELL WASHED AND FREE OF SILT. GOOD WATER DEPTHS ALLOWING FREEDOM OF MOVEMENT IN RIFFLES AND BETWEEN POOLS.

2 - BOULDERS-RUBBLE-COARSE GRAVEL. INTERSPACES ARE CLEAN. WATER DEPTHS RESTRICTING USE OF RIFFLES, HOWEVER MOVEMENT BETWEEN POOLS IS POSSIBLE.

3 - COARSE GRAVELS - SAND. WELL WASHED WITH LITTLE OR NO SILTATION. WATER DEPTHS STILL ALLOW MOVEMENT BETWEEN POOLS.

4 - SAND - SILT - FINE GRAVEL. SHALLOW WATER DEPTHS INHIBITING FISH MOVEMENT.

U. S. DEPARTMENT OF AGRICULTURE - Forest Service

2600

PACED TRANSECT RECORD - BROWSE RANGE CONDITION

Management unit_____ Key area_____ Type designation_____

Forest, or BLM District_____ Aerial photo No._____ Date_____

Examiners_____

Type identification no. (from map)_____ Transect location and description_____

(Describe starting point, direction of travel, interval between samples.)

GROUND COVER DATA

Item	Dot tally transect hits	No. of hits	Times "area factor"	Ground cover %	Browse density estimates No.	Density
Bare ground and eros. pave.					1	
Rock					2	
Moss					3	
Litter					4	
Grasses					5	
Forbs					6	
Gr. & Fo. species					7	
tally					8	
					9	
					10	
					Tot.	
					Ave.	%
Totals						

100% - woody plant density (overstory plus adjusted browse density) = "other area factor" 100-___=____

Ground Cover

1. Bare ground and eros. pave._____
2. Rock _____
3. Litter _____
4. Moss _____
5. Grasses & forbs _____
6. Adj. browse density* _____
7. Overstory density_____

Ground cover index_____ (Items 2-7 incl.)

*100% minus overstory density, times browse density = adjusted browse density. If no overstory is present this step is skipped. Use adjusted browse density in ground cover rating only.

BROWSE CONDITION

Species	Age Class Y	M	D	Hedging Class 1	2	3	No. (% Comp.)
D's							
I's							
LD's							
Totals.							

CONDITION RATINGS FROM SCORECARDS

	Soil	Browse Composition	Browse Density	Browse Vigor
High				
Med.				
Low				

R2-2600-4
4/62

PELLET GROUP COUNTS*

(By Season of Use)

Plot	Slope, Aspect	Elk		Deer		Other (Specify)	
		Summer Spring	Winter Fall	Summer Spring	Winter Fall	Summer Spring	Winter Fall
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
Totals							

*Pellet group counts not compulsory. Make counts if desired to indicate relative use by season, by slope or aspect, to compare use by class or kind of animal.

REMARKS: (Enter here observations on current erosion, on sites where habitat improvement appears feasible, etc. If needed, describe transect location in detail.)

Condition & Trend Studies

The following method will be used on National Forest Lands:

CONDITION

Soil condition, on browse ranges, will be rated by the use of the scorecard included in these instructions. Data for application to scorecards will be obtained from paced condition transects as described below. The rating (High, Medium, Low) of soil condition will be entered on Form R2-2600-4.

For browse condition, the shrubs will be rated separately for composition, density and vigor using the following procedure:

1. Within the vegetative type to be studied, select a route of travel for a 100-point paced transect. The chosen route should provide the best possible cross-section of the type being sampled.
2. Select a sampling interval, such as each two, three or five paces.
3. Pace along the selected route, heading always toward some chosen landmark. Walk only in openings between shrubs and trees.
4. As each selected sample point is reached, dot tally in appropriate space on Form R2-2600-4 whatever ground cover is found within a 3/4-inch loop immediately in front of a notch or mark on the boot toe. Count as a "hit" on grasses or forbs only if all or part of the live root crown falls inside the loop. Record as litter only

if more than half of the area of the circle is covered by dead plant material older than that resulting from current growth. Record hits on "rock" only for rock in place and effectively protecting the surface. Loose or moving rock on the surface of the ground should be tallied as erosion pavement. If desired, grasses and forbs may be identified and tallied by species.

5. At each sample point, tally (by species) the age class and hedging class of the shrub whose outer perimeter is nearest the boot toe. The following descriptions will aid in classification.

a. Age Classes

Y -- Established seedlings and young plants. Elongate growth form, simple branching; usually less than six years old, and basal stem diameter not over ½".

M -- Mature plants. Distinguished by heavier, often gnarled stems, complex branching, rounded growth form. Crown made up of more than three-fourths living wood.

D -- Decadent plants. Crowns made up of more than one-fourth dead wood.

b. Degrees of Hedging

L (or 1) -- Little or no hedging, indicating light use in the past three or four years. Growth tends to be linear.

M (or 2) -- Moderately hedged. Use past three or four years causing much development of lateral branching and more complex growth form.

H (or 3) -- Heavily or closely hedged. Heavy use in past three or four years causing a very much "broomed" or "clubbed" appearance.

6. At each tenth sample point, make a shrub density estimate using the angle gauge. Count and record total density, including all shrub species.

   The use of the angle gauge may not be practical in some cases; such as very dense and "clumpy" stands of oakbrush, in extremely dense stands of other species (particularly if shrubs are tall), or in the case of such decumbent, patchy species as kinni-kinnick. When the use of the angle gauge is not practical, density may be estimated by step-point procedure, by the use of dot-grid, crown density guide (crown coverage scale) using aerial photos, or by ocular estimate.

7. When 100 ground cover and shrub condition samples (and 10 browse density estimates) have been taken and recorded, make computations as follow.

   a. Total and compute average of browse density estimates.

   b. Subtract the average shrub density percent, as determined in "1" above, from 100. The remainder, called the "other area factor," represents the percent of the total area not under shrub cover. When timber overstory (more particularly pinon-juniper or ponderosa pine) exists in a browse type, and in timber types with shrub understory, an extra step is required to determine total

ground cover for soil rating. To eliminate duplication in ground cover computations, proceed as follows:

(1) Avoid tree crowns, as well as shrubs, when pacing along extensive condition transect line.

(2) Estimate tree crown cover by using crown density guide and aerial photo. If crown density is not more than 10% or 15%, the angle gauge may be used.

(3) Obtain average browse density in accordance with current instructions. Do not include any tree species, as juniper, in browse density readings.

(4) Subtract tree crown cover percent from 100%; multiply remaining percent by average browse density to get adjusted browse density. Example:

Tree crown cover = 20%
Average browse
100% - 20% = 80%
80% x 30% = 24% (adjusted browse density)

(5) In computing total ground cover: Add tree crown density to adjusted browse density to get woody plant density; subtract total from 100 to get "other area factor."

(6) Compute ground cover from this point on as in old instructions.

(7) Use the "adjusted" browse density only in ground cover computations. Use averages as determined by angle gauge or other method in making browse condition rating.

c. Convert dot tally for each category of ground cover (as bare ground, rock, litter, etc.) to a number, then multiply each number by the "other area factor." The result represents the percent of the total ground area occupied by each class of cover. The sample Form R2-2600-4 Appendix 8-20 illustrates the procedure.

d. Enter, in space provided on the form, observations on current erosion, plant pedestaling, etc. for use in making soil condition classification.

e. After all computations are complete, apply resulting data to scorecard to rate the soil and browse composition, density, and vigor. After all condition ratings have been made, place check mark in applicable "rating" block for soil condition and shrub composition. In the density column, enter the average density percent in appropriate block.
(i.e.: Density figures from 1-15 would be placed in "Low" block, 16-35 in "Medium," etc.) In vigor column enter the plant symbol of the key species in the proper block. (i.e.: If bitter brush was present, and of "medium" vigor, enter "Putr" in that block. If serviceberry rated "High," enter "AMA" in "High" block.)

NOTE: Shrub density is one indicator of the amount of forage available to browsing animals. In some cases, however, density can be so great that animals can penetrate thickets and clumps only with great difficulty. As a result, only the perimeters of such thickets contribute available forage. As an example, densities well in excess of 90% may be found in some stands. In such cases the observer should decide whether or not the density is excessive. If, in the opinion of the observer, density is so great that the amount of forage available to animals is definitely limited, it may be advisable to classify density as "Medium" rather than "High." A contributing factor is that frequently these extremely dense stands are self-pruning, and produce little available forage.

Observers should consider the effects of excessive densities when density is greater than 65%, although down-grading may not be desirable unless densities considerably exceed that figure.

8. As a transect is installed and browse condition classified, the transect should be shown on the type map. The transect is represented by the symbol "X_____," the "X" being the starting point. Classification symbols (H, M, or L), of shrub composition, density, and vigor will be placed (in alphabetical order, <u>composition</u>, <u>density</u>, <u>vigor</u>) above the transect line. Symbol for soil rating should be placed below the line.

Example: $X \frac{HLM}{M}$ for a type rating high in composition, low in density, medium in vigor, and medium in soil stability.

9. As range analysis work is carried on, it is often possible and desirable to gather information not required by the instructions.

As browse condition transects are run, a good idea of relative intensity of use may be obtained by pellet group counts. All groups, regardless of age, are counted and recorded. No attempt is made to compute animal days use per acre. Rather, the total number of pellet groups or droppings per acre is computed for each animal species involved.

It is often possible to estimate with some accuracy the time of year when droppings were deposited. Stocking records and observation will provide information as to when domestic livestock use given ranges. Quite often the character of droppings, as affected by the type of forage being used, will indicate season of use by deer and elk.

Ten-plot pellet group counts may be run in connection with the standard 100-shrub condition transect. Either 100th-acre or 100-square foot plots may be used, and the size used should be noted in the space provided on the form. Subsequent readings in the same

area should use the same size plot. Pellet group counts can be made before condition transects are installed They will be of help in locating key areas and best places to put in condition transects.

The pellet group counts will not provide data on days use per acre. Rather, they will give ideas as to relative use of various parts of a given key area, relative use by season of year, relative use by class of animal, and relative use over different periods of years.

Sites where possibilities for habitat improvement exist may be observed as range analysis work is done. When such sites are seen, notes concerning their location, the type of improvement possible, and size of area should be entered as "Remarks" on the form R2-2600-4 for the type. Also the capital letter "I", in parentheses, should follow the type designated on the map. This does not assure either that the site is susceptible to improvement or that detailed plans will be made to do so. Rather, it will provide a tickler list of projects which may warrant more detailed investigation.

TREND

Trend in condition of big game ranges will be determined by comparing successive condition ratings of shrub composition, density, vigor and of soil as established by condition transect.

BROWSE CONDITION CLASS SCORECARD

To use scorecard: Apply basic data (on composition, density and vigor) from condition transect record to scorecard. Start at highest class in each category and work down until data fits a condition class description.

Example (for composition only): A shrub stand has 31% bitterbrush (D), 48% sage (I), 13% skunkbush (LD), 8% snowberry (LD). It fails to fit "High," (too few D's). It fits "Medium" (well over 50% D's and I's, well over 15% D's).

COMPOSITION

Desirable and intermediate species (must be two or more) making up 75% or more of the composition, with desirables at least 45% of the composition.	H (high)
Desirable and intermediate species making up 50% or more of the composition with desirables at least 15% of the composition.	M (medium)
Desirable and intermediate species making up less than 50% of the composition, or desirables less than 15%	L (low)

DENSITY

66% plus	V (very dense)
36% to 65%	H (high)
16% to 35%	M (medium)
15% minus	L (low)

VIGOR

Hedging on key species mostly light or moderate with less than 16% of plants heavily hedged, and decadent minus young *less than 16% of total number of plants.			H (high)
Hedging on key species mostly moderate, not more than 35% heavily hedged;	and	Decadent minus young not more than 35%	M (medium)
More than 35% of plants of key species heavily hedged,	or	Decadent minus young more than 35%	L (low)

*Subtract the number of "young" plants from the number of "decadents." The principle is that if young plants are replacing decadent plants, the condition is satisfactory. If there is an excess of decadents, condition is unsatisfactory. Compute and record separately for each key species. The key species having the lowest vigor rating will be used to indicate the vigor rating for the transect. Do not average vigor ratings for two or more key species. Each key species is to be considered on its own merits.

SOIL STABILITY CONDITION CLASS

	Rating
Soil movement slight or none. Soil movement may be difficult to recognize. There may be evidence of past accelerated erosion, but is now stabilized; plant and litter cover appear effective in protecting the soil; plant pedestals are few or sloping sided. Rills, alluvial deposits, and gullies are absent or completely healed. On sloping lands some litter may be dammed against vegetation, forming miniature alluvial fans; trampling displacement is slight; rodent activity is normal or below. Usually 65 or more hits on ground cover and rocks.....	H (high)
Soil movement moderate. Plant and litter cover only partially protecting the soil. Some bunchgrass in openings pedestaled; some pedestals have steep sides; erosion pavement is forming in openings. On sloping land, occasional rills and alluvial deposits are present. Gullies, if present, are not steep sided and raw; trampling displacement and compaction are noticeable, but not excessive; runoff is murky. Usually 35-65 hits on ground cover and rocks.....	M (medium)
Soil movement advanced. Herbaceous plant cover and litter are ineffective in preventing soil movement. Openings between plants are almost completely bare with well-formed erosion pavement; pedestals beneath sagebrush, and plant pedestals in openings are 4+ inches higher than the surrounding bare soil. Rills are common sloping land; gullies, if present, have steep, raw sides; trampling displacement and compaction are common; rodent activity may be excessive; runoff is muddy. Usually less than 35 hits on ground cover.....	L (low)

RECORDER: _____

BROWSE CONDITION TRANSECT

DATE: _____

(Used for Rifle Survey Only)

Transect #:

Form Class	Age Class					Total	
	Seedling	Young	Mature	Decadent	Resprout	Satis.	Unsatis.
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
Total							

Available	Form Classes Hedging		
	Little	Moderate	Severe
All	1	2	3
Part	4	5	6
None	7	7	7
Dead	8	8	8

BROWSE DENSITY: (Angle Gauge)

1. ____%
2. ____%
3. ____%
4. ____%
5. ____%

Ave. Density: ____%

PELLET-GROUP COUNTS

Plot # and Location of Center	Deer Spr.	Cattle Spr.
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
Total Groups		
Per Acre (X 10)		
Converting Factor	1/ 13	12
Days Use/Acre		

BROWSE COMPOSITION

(From browse condition transect above)

	(Specie)	(% Comp)
1.		
2.		
3.		
4.		
5.		
6.		
Other		
TOTAL:		100%

Remarks:

(1) 1/100 acre circular plot = 11'9" radius; 10 plots - 1/10 acre
(2) 1/100 acre strip transect = 6.6 feet (79.2 inches) x 66 feet
Total strip - 660 feet x 6.6 feet = 1/10 acre

WILDLIFE TRANSECTS

TRANSECT NO: _____ (Used for Rifle Survey Only)

1. HABITAT.

   a. Species - (Deer, elk)

   b. Season - (Fall, Winter, Spring, Summer)

2. HABITAT STATUS.

   a. Quality - (Poor, Fair, Good, Excellent)

   b. Quantity - (Increasing, Stable, Decreasing)

3. POPULATION STATUS.

   a. Trend - (Increasing, Stable, Decreasing)

   b. Reproduction - (Natural, Artificial stocking)

4. NON-CONSUMPTIVE USE.

   _____

   _____

   _____

5. ENDANGERED SPECIES HABITAT.

   _____

   _____

   _____

   _____

   _____

   _____

6. FOOD.

   a. Existing -

   b. Condition.

   _____

   _____

   _____

   _____

   _____

   _____

TRANSECT #:_____

7. Water.

   a. Quality - (poor, fair, good, excellent)

   b. Quantity - (increasing, stable, decreasing)

   c. Distribution -

   d. Effects.

   _____

   _____

   _____

8. Cover.

   a. Quality - (poor, fair, good, excellent)

   b. Quantity - (Increasing, stable, decreasing)

9. Living Space - (poor, fair, good, excellent)

10. Migration Routes.

   _____

   _____

   _____

11. Crucial Habitat.

   a. Ecologically unique areas.

   _____

   _____

   _____

   _____

   b. Key areas.

   _____

   _____

   _____

   _____

   _____

TRANSECT NO: _____

12. Special Wildlife Use.

_____

_____

_____

13. Introductions.

_____

_____

_____

14. Conflict Areas.

_____

_____

_____

_____

15. Important Use Areas.

_____

_____

_____

16. Limiting Factors.

_____

_____

_____

17. Management Recommendations for Improvement.

(Expansion, Improvement, Maintenance, Food, Cover, Water, and/or space; introductions, reductions, or elimination of conflicts; potential projects).

_____

_____

_____

_____

_____

_____

TRANSECT NO: _____

18. Big Game Browse Utilization Sheets.

a. Pellet Group Counts.

_____

_____

_____

b. Browse Condition Transect.

_____

_____

_____

C. Stand Composition and Cover Record.

_____

_____

_____

d. Browse Density.

_____

_____

_____

19. Wildlife Species Observed.

1._____	6._____	11._____	16._____
2._____	7._____	12._____	17._____
3._____	8._____	13._____	18._____
4._____	9._____	14._____	19._____
5._____	10._____	15._____	20._____

20. Public Access

_____

_____

_____

21. Remarks.

_____

_____

_____

_____

Training on: _____

10. Big game species utilized on Ranch.

a. Major game animals.

b. Secure game ranch program.

c. Plans & copyright and cover sources.

d. Ranch history.

11. Existing Special Concerns.

1.		6.		11.	
2.		7.		12.	
3.		8.		13.	
4.		9.		14.	
5.		10.		15.	

16. Fencing Issues.

17. Remarks.

Procedures for International Bird Plot Census

The International Method

The International Study Conference on Bird Census Methods and Results was held at Hillerod, Denmark in 1968. Following this conference a standardized plot census technique was developed to accomplish three aims: (1) establish annual indices of population levels (2) to estimate population densities and (3) determine species composition of a community.

Species applicability

The method is suitable for territorial and non-colonial passerines and other species that have similar dispersion patterns. It is designed for stationary populations, whether breeding or not.

Establishing Study Plots

Study plots should be as near as practicable to a square. In open habitats, plots should be 42 hectares and in closed habitats plots should be 12 hectares. A given plot should be placed in a general habitat type rather than trying to include several habitat types - this will minimize "the edge effect".

Each study plot should be divided into one hectare units (100M x 100M) and these should be numbered - see attached sheets. As shown on the attached sheets it is desirable to place numbered stakes at the corners of the one hectare plots so that when counts are made, the observer always knows his (her) exact location. By using aerial photographs, it is sometimes possible to omit the stakes.

A detailed description of the study plot should be made. This description

should include: (1) location of the plot - latitude and longitude; relationship to existing towns and roads; mapping on aerial photo or topographic map if possible (2) general characteristics of the general landscape (3) altitudes if known, and slope characteristics (4) general statement about soil type and (5) a large-scale map of the gridded plot showing dominant plants and other important species in each one hectare unit.

Conducting the Counts

Before any counts are made a few trial runs should be made through the plots to learn the species that can be expected in the given area.

In conducting the census enter the first one hectare unit and go through it as shown in Appendix IX. When finished, enter the next one hectare unit and repeat the technique. Do this for all one hectare units in order. All counts should be conducted between 0.5 hours and 3.5 hours after local sunrise and should not be conducted when the winds exceed 10 mph or the sky is more than 50% overcast or it is foggy or precipitation has been recorded within one hour of the beginning or the end of the census.

Because of the above time restrictions it will take two or more mornings to completely census all one hectare units for a given census run.

For a given plot 3-5 complete census runs are desirable. These should be timed around the peak of breeding in your area. If possible, two winter counts should be conducted in January with an interval of 2 weeks separating each complete census. Each separate census should start at a different unit and go in a different order. For instance, if you start at unit A1 (Appendix IX) and work east, then back west, etc. on the first census, you might start at A3 and work south on the second census.

should include: (1) location on the plot - latitude and longitude relation- ship on marking board and video adapting an aerial photo or topographic map (2 attribute (3) whether characteristics of the general landscape (4) structures (5 areas, and other characteristics (6) general weather about well type and (7) a brief write-up on the physical site showing drainage patterns and other important factors in such the accurate map.

Conversion of Photos

Before any photos are made a few trial runs should be made through the phase to insure the exposure that will be suitable in the given area.

In developing the photo check the first one negative well and go through it to see if it is suitable. When satisfied, proceed the next one negative with the exposure the conditions. In this for all one negatives units in order. All photos should be developed between 0.5 hours and 1.5 hours after local sunrise and should not be developed when the wind exceeds 10 mph or the sky is more than 50% overcast or if the fog or precipitation has been received within one hour of the beginning or the end of the camera.

Because of the above time restrictions it will take two or more sorties to completely photo all the photos units for a given camera set.

For a given site 3-5 duplicate photos from are desirable. These should be taken around the peak of breeding in good weather. If possible, the winter photos should be repeated in January with an interval of 2 weeks separating each duplicate photos. Each separate season should start at a different hour and on a different order. For instance, if you start at unit A1 (beginning 1st week after, then next week, etc. on the first season, you might start at A2 and work back to the second season.

Recording Data

Forms as shown in Appendix XI should be prepared and used for recording your observations. Label each of the six units on the form so as to correspond with your grid map (A1, A2, etc.) and to show the order in which you surveyed the units.

Use the notations shown on Appendix X to plot your observations on the above data forms. You may want to use the species common name rather than the abbreviation of the genus-species scientific name on your data form. You may also need to invent codes for other activities, especially if you are dealing with non-breeding birds.

Evaluating the Data

When you have repeated the counts 3-5 times, you will hopefully see some consistency in the plotted data. You should be able to calculate actual densities for each species for your overall plot. Common sense will go a long way here. For instance, a singing territorial male indicates two birds if the count is during the heart of the nesting season (assuming one female on a nest).

In your overall evaluation, you should express your densities for each species according to the abundance figures shown in Appendix XIV.

Data in Subsequent Years

A given plot should be surveyed at least for two consecutive years. Obviously, surveys in years following the initial census should be patterned on the details of the initial census. For instance, try to do the counts on approximately the same dates and follow the same routes through the plots.

Filing of Data

After each season, send your summary of the results for each plot surveyed to Walter Graul, Colorado Division of Wildlife, 6060 Broadway, Denver, CO 80216.

Acknowledgements

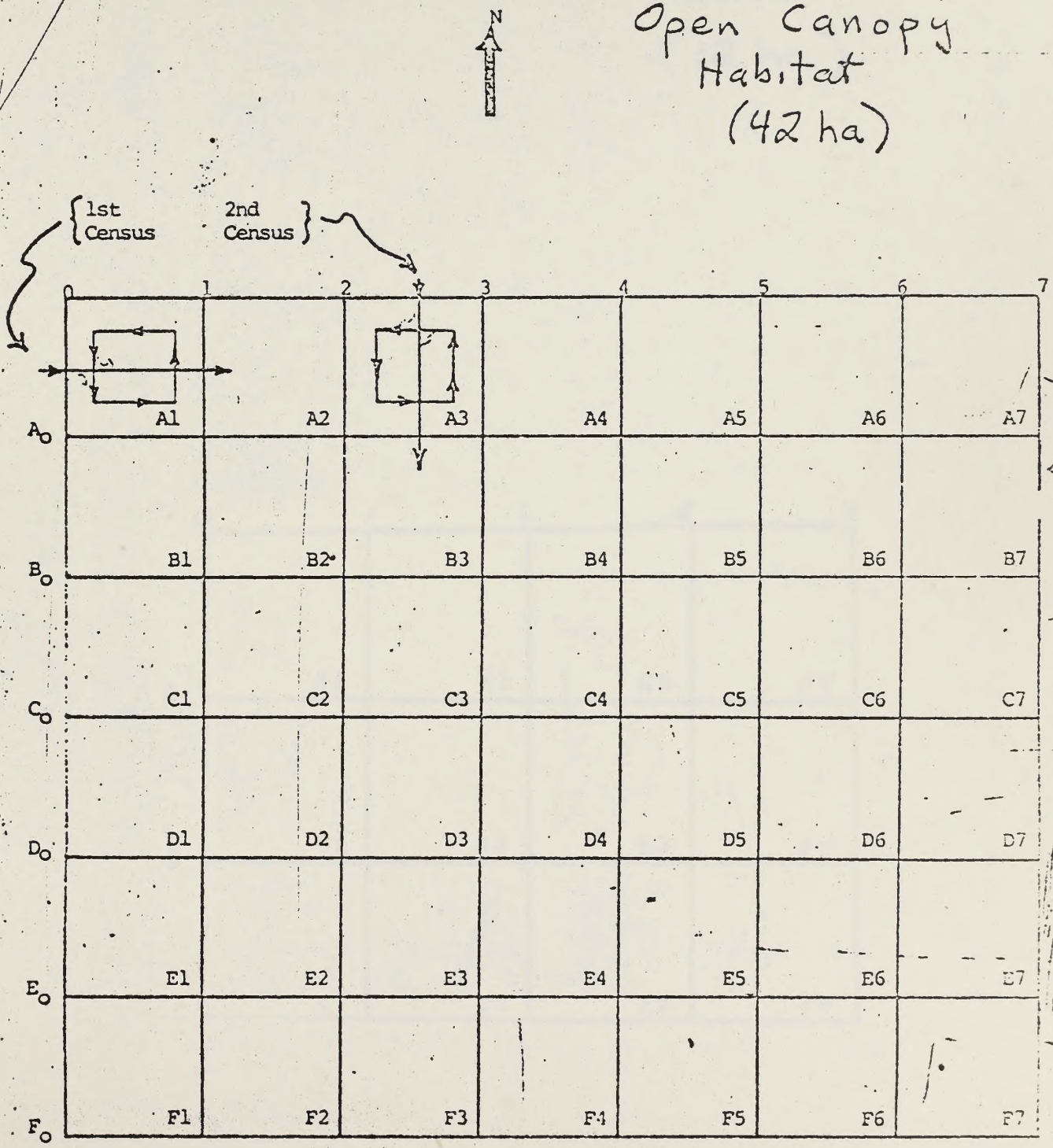
Many of the details presented here have been extracted from an article in Audubon Field Notes, Dec., 1970 and from a rough draft of a field manual being prepared in 1976 by the Wyoming Game and Fish Department.

Prepared By:

Walter D. Graul
Nongame Bird Specialist
Colorado Division of Wildlife
March 11, 1976

APPENDIX IX

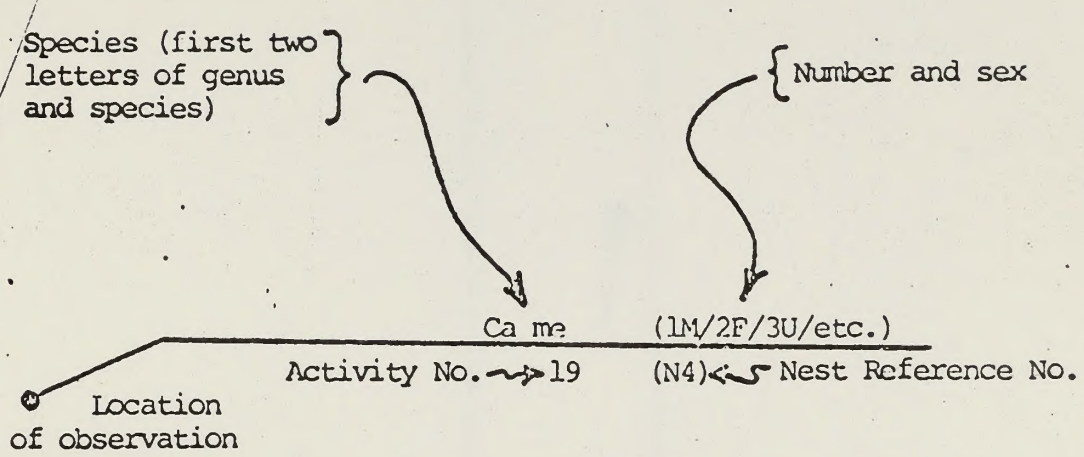
Census Travel Patterns Through Hectare Plots for 1st and 2nd Census



Closed Canopy
Habitat
(12 ha)

APPENDIX X

Format and Code Used in Recording Avian Census Data During Plot Mapping Censuses



No.	Activity
1	Species observed in breeding season
2	Species observed in possible nesting habitat (one or more individuals where pairing status is unknown or non-existant).
4	A pair observed in suitable nesting habitat.
6	Territorial behavior, display and courtship.
7	Visiting probable nest site. (Includes visitation for new nest site and departure from probable but unseen nest site).
10	Nest building.
11	Agitated behavior and distraction display by adults suggesting nest or young nearby.
13	Unfledged young independent of nest or recently fledged young.
19	Nest with adult seen incubating or nest with eggs or young seen or young heard.

APPENDIX XI

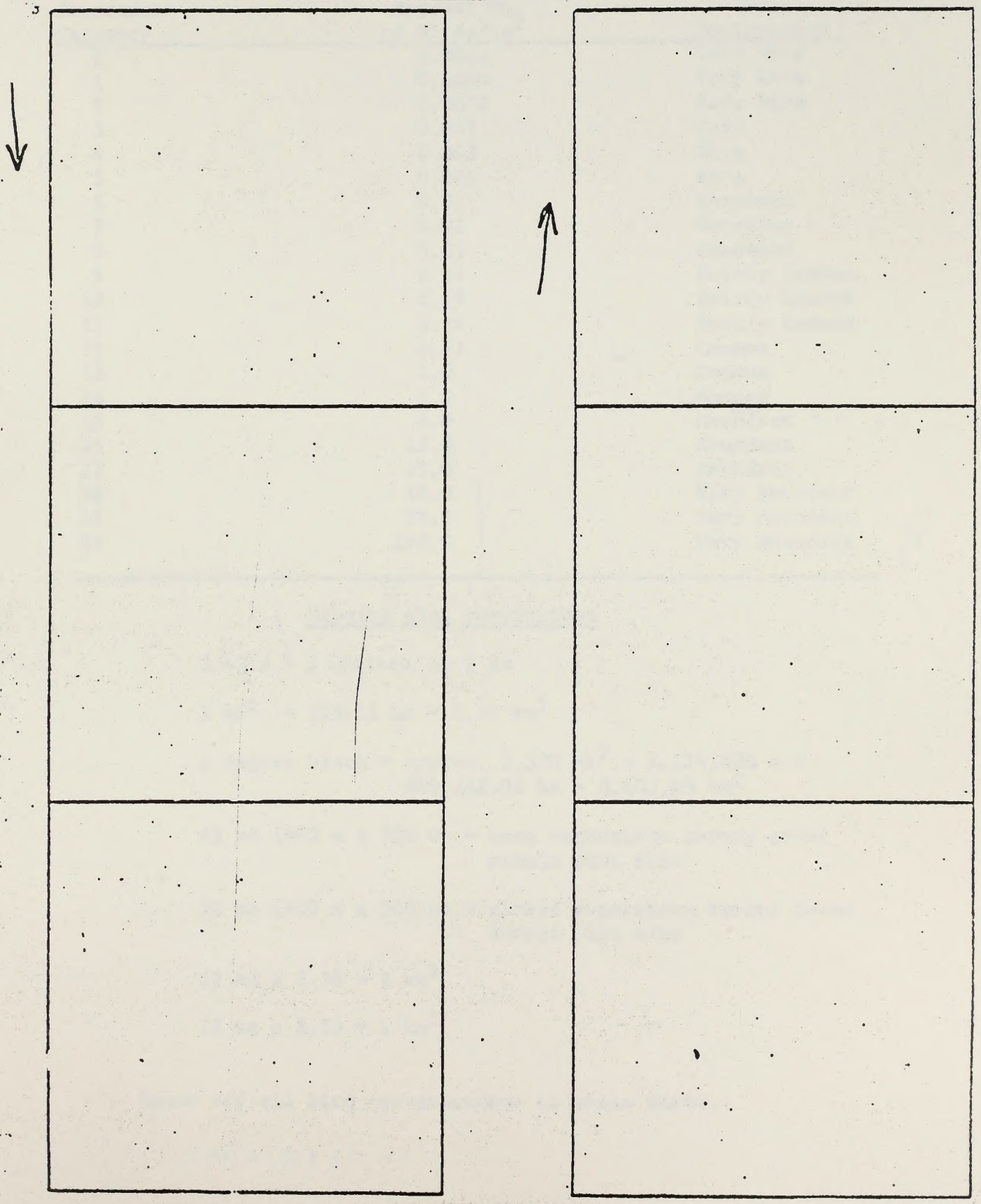
Mapping Plot Census Form with Sample Plot Data

Date_____ Habitat type_____

Time of initiation_____ Temp._____ Wind_____

Time of completion_____ % Cloud cover_____

Plot location_____ Census taker_____



APPENDIX XIV

MAPPING PLOT ABUNDANCE CATEGORIES MODIFIED FROM SKAAR (1969)

Abundance Category	Approx. No. of Birds/km^2	Verbal Designation
0	0.0002	Very Rare
1	0.0004	Very Rare
2	0.0008	Very Rare
3	0.002	Rare
4	0.003	Rare
5	0.006	Rare
6	0.01	Uncommon
7	0.02	Uncommon
8	0.05	Uncommon
9	0.10	Fairly Common
10	0.19	Fairly Common
11	0.39	Fairly Common
12	0.77	Common
13	2.0	Common
14	3.0	Common
15	6.0	Abundant
16	12.0	Abundant
17	25.0	Abundant
18	49.0	Very Abundant
19	99.0	Very Abundant
20	198.0	Very Abundant

Mapping plot conversions

2.47 a = 1 hectare or 1 ha

1 mi^2 = 259.11 ha = 2.59 km^2

1 degree block = approx. 3,320 mi^2 = 2,124,800 a = 860,242.92 ha = 8,602.43 km^2

42 ha (600 m x 700 m) = open vegetation canopy cover sample plot size

12 ha (400 m x 300 m) = closed vegetation canopy cover sample plot size

42 ha x 2.38 = 1 km^2

12 ha x 8.33 = 1 km^2

Round off all bird conversations to whole birds.

APPENDIX XIV

INDIANA PLOT ABUNDANCE CLASSIFICATIONS MODIFIED FROM BLAIR (1949)

Abundance Category	Average No. of Plots/Acre	Verbal Description
0	0.0000	Very Rare
1	0.0000	Very Rare
2	0.0002	Very Rare
3	0.0005	Rare
4	0.0013	Rare
5	0.004	Rare
6	0.01	Uncommon
7	0.02	Uncommon
8	0.04	Uncommon
9	0.07	Fairly Common
10	0.10	Fairly Common
11	0.15	Fairly Common
12	0.22	Common
13	0.0	Common
14	0.0	Common
15	0.0	Abundant
16	0.0	Abundant
17	0.0	Abundant
18	0.0	Very Abundant
19	0.0	Very Abundant
20	100.0	Very Abundant

UNITED SIGN CONVERSIONS

2.47 a = 1 hectare or 1 ha

1 mi^2 = 259.11 ha = 2.59 km^2

1 square block = approx. 3,200 mi^2 = 2,124,800 a = 859,242.91 ha = 8,002.43 km^2

42 ha (100 a x 200 m) = open vegetation canopy cover sample plot size

12 ha (100 a x 300 m) = closed vegetation canopy cover sample plot size

42 ha = 2.54 = 1 km^2

12 ha = 8.33 = 1 km^2

Read off all size conversions in whole units.

(Ac = 1/4 ha)

APPENDIX 5

Job Documentation Reports

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JOB DOCUMENTATION REPORT

JOB IDENTIFICATION

1. State (2–3) . . . C 0
2. District (4–5) . . . 0 1
3. Job No. (6–9) . . . 4 5 5 0
4. Transaction Code (10) . . .

I – GENERAL DESCRIPTION — Card 1

5. Job Name (11–30): LEE GULCH CHAINING

LOCATION CODES

6. Special Project Code (31–34) . . .
7. Planning Unit (35–36) . . . 0 8
8. Sub-Basin (37–38) 6 1 — 9. County (39–41) 1 0 3
10. Watershed No. (42–44) . . .
11. Allotment No. (45–47) . . .
12. Wildlife Habitat Area (48–50) . . .

SITE AND VEGETATIVE DESCRIPTION

13. Present SSF (51–52) 4 0 — 14. % Slope (53–54) 1 0
15. Exposure (55) 1 — 16. Soil Texture (56) . . . 2
17. Precipitation (inches) (57–58) . . . 1 3
18. Elevation (feet) (59–63) . . . 6 5 0 0
19. Vegetative Subtype (64–66) . . . 0 9 1

COMPOSITION *(Percent)*

20. Grasses (67–68) 1 5 — 21. Forbs (69–70) . . 1 5
22. Browse (71–72) . . . Overstory 50% . . . 2 0

COVER *(Percent)*

23. Vegetative (73–74) 5 0 — 24. Litter (75–76) . 2 1
25. Bare Ground (77–78) . . . 7 9

II – ANNUAL WORK PLAN INPUT DATA — Card 2

75. Subactivity (11–14) . . . 1 2 8 5
76. Work Job Code (15–18) . . . 6 0 0 2

UNITS PLANNED

77. Primary (19–24) . . . 4 0 0 0
78. Secondary (25–29) . . . J U O S

TIME OF AWARD

79. Fiscal Year (30–31) 7 6 — 80. Third (32) . . . 3

TIME OF COMPLETION

81. Fiscal Year (33–34) 7 7 — 82. Third (35) . . . 2

BLM COST — 83. Method (36) . . . 1

84. Material (37–41) . . .
85. Contract (42–47) . . . 6 0 0 0

CONTRIBUTED COST

86. Material (48–52) . . .
87. Labor/Equipment (53–57) . . .

MAINTENANCE

88. Responsibility (58) 1 — 89. Cycle (59–61) . 7 0 4

III – JOB DETAILS AND BENEFITS — Card 3

37. Primary Job Objective (11) . . . 7

PLANT AND PEST CONTROL

39. Chemical (12) — 42. Method (13) . . .
45. Mechanical – Method (14) . . . 2

ARTIFICIAL REVEGETATION

47. Pounds Seed/Acre (15–17) . . . .
48. Seedlings/Acre (18–21) — 49. Method (22)
51. AUM's Livestock Forage Added (23–26) . .
52. Future SSF (27–28) . . . 2 5

WATERSHED TILLAGE — 54. Method (29) . . .

FACILITIES 55. Type (30) — 56. Other Misc. (31)

WATER DEVELOPMENT/CONTROL

59. Structure Type (32) . . .

STORAGE (Ac. Ft.) 60. Flood (33–38)
61. Silt (39–44)

WILDLIFE HABITAT DEVELOPMENT/PROTECTION

62. Type (45–46) 2 1 — 63. Primary Species (47–49) 1 0 3
64. Animal Months (50–54) . . . 5 0 0
65. Number Increase (55–59) . . . 1 2 5
66. Pounds Fish Increase (60–64) . . .
67. Rare/Endangered (65) . . .

VISITOR DAYS ADDED — 68. Fisherman (66–69)

69. Hunter (70–73) 2 4 0 — 70. Other (74–77)

IV – PROGRESS REPORT — Card 4

COMPLETION DATA

UNITS 90. Primary (11–16) . . . .
91. Secondary (17–21) . . .

TIME 92. Fiscal Year (22–23) . . .
93. Third (24) . . .

94. Contract No. (25–29) . . . CT

CONTRIBUTION DETAIL

95. Agreement (30) — 96. Participant (31) . . .
97. Contributor's Name (32–51)

CONTRIBUTIONS

98. Deposited (52–56) . . .

Undeposited

99. Materials (57–61) . . .
100. Labor/Equipment (62–66) . . .

V – DETAIL ESTIMATE OF UNITS AND COSTS

WORK DESCRIPTION AND MATERIALS (a)	UNITS: EA. MILE, ETC. (b)	UNITS: COST (c)	BLM COSTS: MATERIALS (d)	BLM COSTS: CONTRACT (e)	COOPERATOR COSTS: MATERIALS (f)	COOPERATOR COSTS: LABOR (g)
Tree Chaining	ACRE	$15.00		$6,000.00		
TOTALS Materials						
Labor/Equipment						

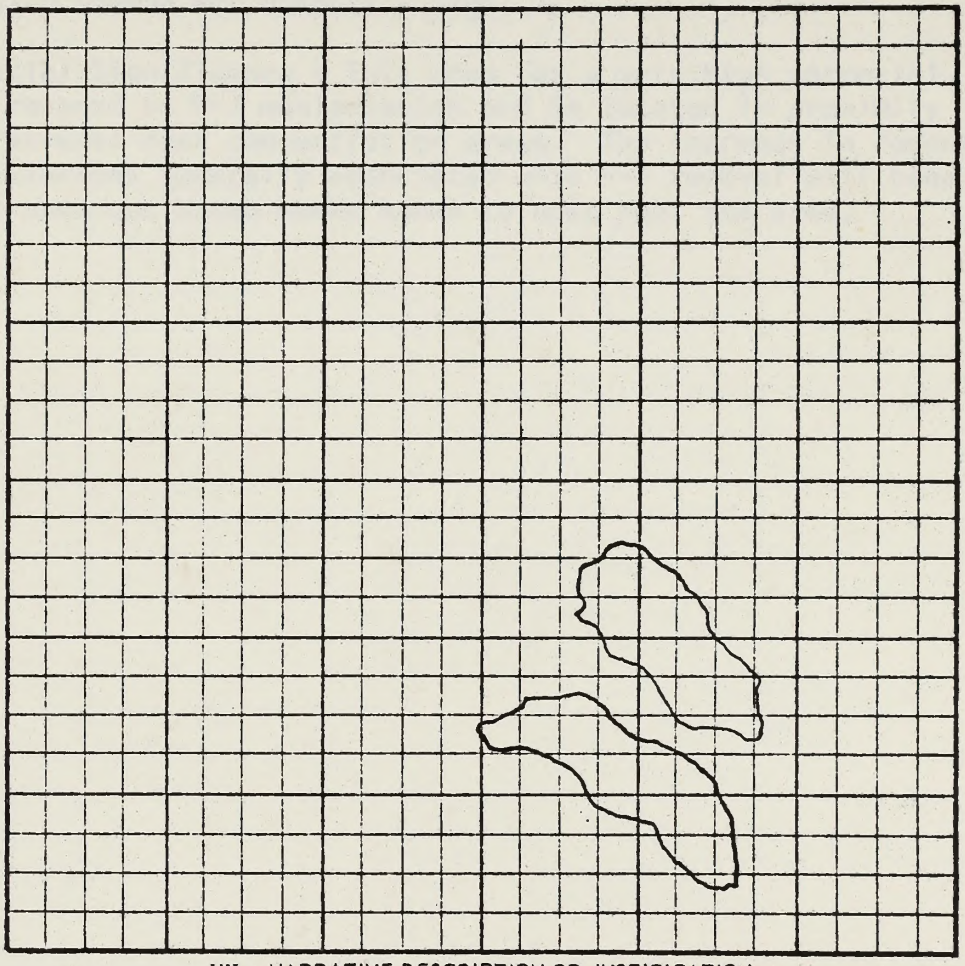
Form 1630-8 (November 1972)

JOB IDENTIFICATION STATE C O DISTRICT 0 1 JOB NUMBER 4 5 5 0

VI – LOCATION PLAT

Scale 1 inch = 1 Mile

T. 1 S R. 9 7 W Meridian



VII – NARRATIVE DESCRIPTION OR JUSTIFICATION

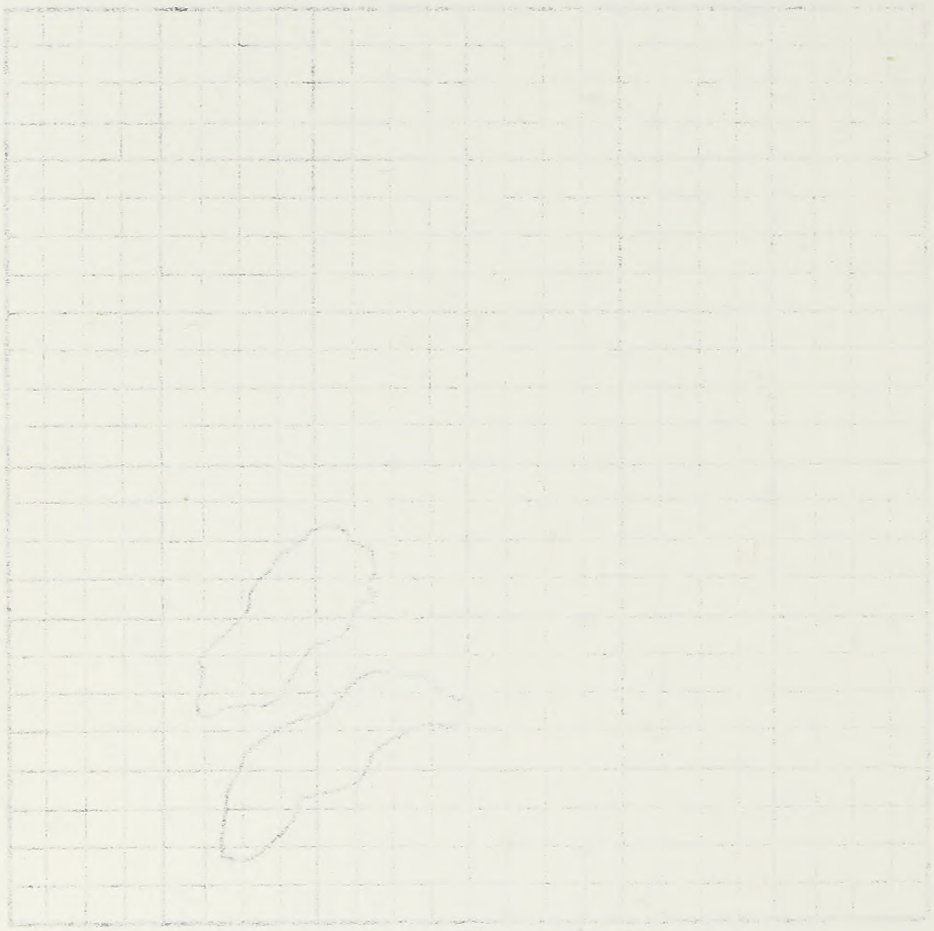
Project will consist of chaining 400 acres of Pinyon-Juniper within the area outlined above. Chaining will be designed to maximize edge affect, creating small openings and "fingers" in the dense tree cover. The area lies within critical mule deer winter range, but the dense overstory inhibits browse production.

1. Habitat Classification - Critical

2. Habitat Condition - Unsatisfactory
(Continued On Attached Sheet)

Prepared by	Title	Date
R. V. Ward	Wildlife Biologist	12/15/76
Approved by	Title	Date

GPO 853-196



LEE GULCH CHAINING

3. Bureau Planning Coverage - MFP 1976, HMP to be completed January 1, 1977.

4. Public Demand For Outputs - High.

5. Special Significance - This area has a very high potential to respond to P-J manipulation and is located in proximity to several deer concentration areas. The increase in rodent populations generally associated with P-J removal will benefit numerous buteo hawks known to nest near the area.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JOB DOCUMENTATION REPORT

JOB IDENTIFICATION

1. State (2–3) 0 0
2. District (4–5) 0 1
3. Job No. (6–9) 4 5 5 1
4. Transaction Code (10) 1

I – GENERAL DESCRIPTION — Card 1

5. Job Name (11–30): T I M B E R G U L C H C H A I N

LOCATION CODES

6. Special Project Code (31–34) . . . . .
7. Planning Unit (35–36) 0 8
8. Sub-Basin (37–38) 6 1 — 9. County (39–41) 1 0 3
10. Watershed No. (42–44) . . . . .
11. Allotment No. (45–47) . . . . .
12. Wildlife Habitat Area (48–50) . . . . .

SITE AND VEGETATIVE DESCRIPTION

13. Present SSF (51–52) 5 0 — 14. % Slope (53–54) 0 5
15. Exposure (55) 4 — 16. Soil Texture (56) 3
17. Precipitation (inches) (57–58) 1 4
18. Elevation (feet) (59–63) 7 0 0 0
19. Vegetative Subtype (64–66) 0 4 1

COMPOSITION *(Percent)*

20. Grasses (67–68) 1 5 — 21. Forbs (69–70) . . 1 0
22. Browse (71–72) 7 5

COVER *(Percent)*

23. Vegetative (73–74) 2 0 — 24. Litter (75–76) . 2 8
25. Bare Ground (77–78) 5 2

II – ANNUAL WORK PLAN INPUT DATA — Card 2

75. Subactivity (11–14) 1 2 8 5
76. Work Job Code (15–18) 6 0 0 2

UNITS PLANNED

77. Primary (19–24) 8 0.0
78. Secondary (25–29) . . . . . A R T R I

TIME OF AWARD

79. Fiscal Year (30–31) 7 6 — 80. Third (32) . . . 3

TIME OF COMPLETION

81. Fiscal Year (33–34) 7 7 — 82. Third (35) . . . 2

BLM COST 83. Method (36) 1

84. Material (37–41) 2 1 4 0
85. Contract (42–47) 1 3 6 0

CONTRIBUTED COST

86. Material (48–52) . . . . .
87. Labor/Equipment (53–57) . . . . .

MAINTENANCE

88. Responsibility (58) 1 — 89. Cycle (59–61) . 7 0 4

III – JOB DETAILS AND BENEFITS — Card 3

37. Primary Job Objective (11) 7

PLANT AND PEST CONTROL

39. Chemical (12) — 42. Method (13) . . . . .
45. Mechanical – Method (14) 2

ARTIFICIAL REVEGETATION

47. Pounds Seed/Acre (15–17) 1 0.0
48. Seedlings/Acre (18–21) — 49. Method (22) 1
51. AUM's Livestock Forage Added (23–26) . .
52. Future SSF (27–28) 3 5

WATERSHED TILLAGE 54. Method (29) . . . .

FACILITIES 55. Type (30) — 56. Other Misc. (31)

WATER DEVELOPMENT/CONTROL

59. Structure Type (32) . . . . .

STORAGE (Ac. Ft.) 60. Flood (33–38)
61. Silt (39–44)

WILDLIFE HABITAT DEVELOPMENT/PROTECTION

62. Type (45–46) 2 1 — 63. Primary Species (47–49) 6 0 5
64. Animal Months (50–54) 5 0 0
65. Number Increase (55–59) 1 0 0
66. Pounds Fish Increase (60–64) . . . .
67. Rare/Endangered (65) . . . . .

VISITOR DAYS ADDED 68. Fisherman (66–69)

69. Hunter (70–73) 1 0 0 — 70. Other (74–77)

IV – PROGRESS REPORT — Card 4

COMPLETION DATA

UNITS 90. Primary (11–16) . . . .
91. Secondary (17–21) . . . .
TIME 92. Fiscal Year (22–23) . . . . .
93. Third (24) . . . . .
94. Contract No. (25–29) . . . . . CT

CONTRIBUTION DETAIL

95. Agreement (30) — 96. Participant (31) . . .
97. Contributor's Name (32–51)

CONTRIBUTIONS

98. Deposited (52–56) . . . . .

Undeposited

99. Materials (57–61) . . . . .
100. Labor/Equipment (62–66) . . . . .

V – DETAIL ESTIMATE OF UNITS AND COSTS

WORK DESCRIPTION AND MATERIALS (a)	UNITS EA. MILE, ETC. (b)	UNITS COST (c)	BLM COSTS MATERIALS (d)	BLM COSTS CONTRACT (e)	COOPERATOR COSTS MATERIALS (f)	COOPERATOR COSTS LABOR (g)
Sagebrush Chaining	ACRE	$ 12.00		$960.00		
Drilling Seed	ACRE	$ 5.00		$400.00		
Furnish Seed Varieties	LB.	$ 2.67	$2,136.00			
TOTALS Materials			$2,136.00			
Labor/Equipment				$1,360.00		

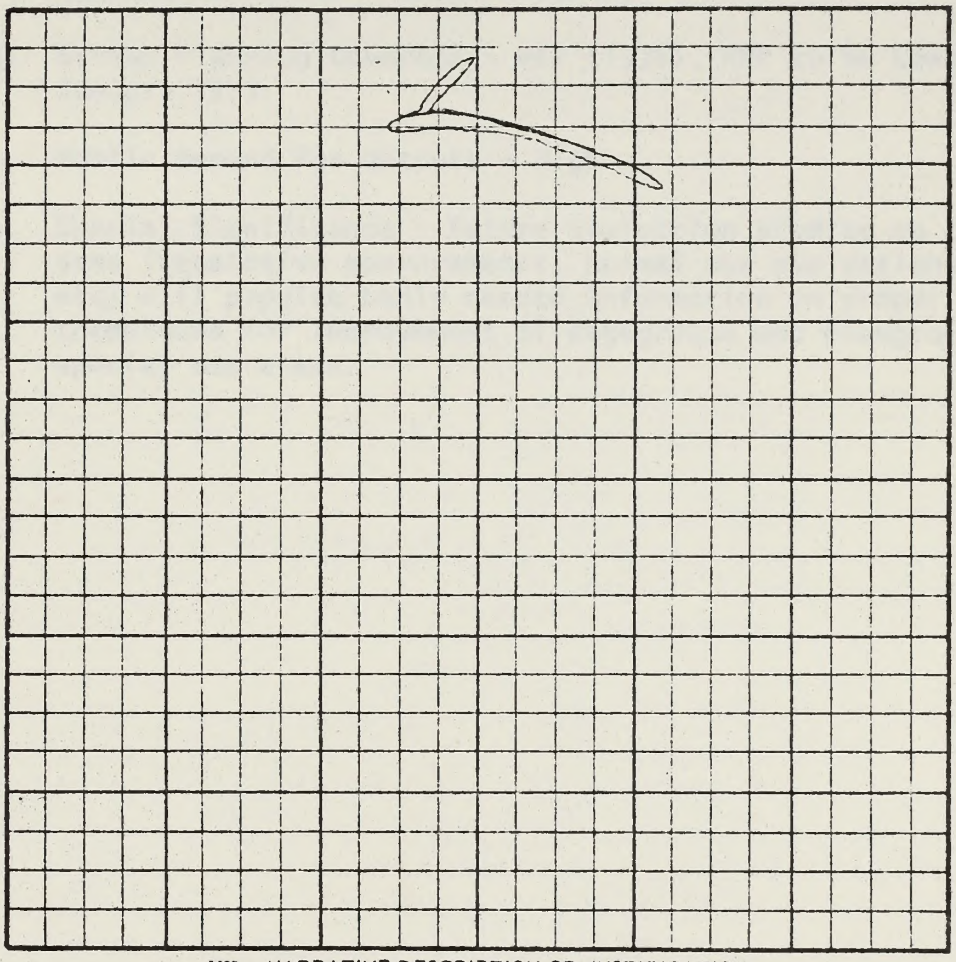
Form 1630–8 (November 1972)

JOB IDENTIFICATION STATE C 0 DISTRICT 0 1 JOB NUMBER 4 5 5 1

VI – LOCATION PLAT

Scale 1 inch = 1 Mile

T. 2 S R. 9 5 W Meridian



VII – NARRATIVE DESCRIPTION OR JUSTIFICATION

Project will consit of chaining 80 acres of dependent sagebrush and reseeding with forbs and grass to create a wet meadow environment for sagegrouse brood rearing. There are at least three sagegrouse strutting and nesting areas within four miles of the project area and it is felt that creation of this brood rearing area will result in increased survival of sagegrouse chicks. The area is also transitional deer range and increased production of succulent forage will be of direct benefit to mule deer.

(Continued On Attached Sheet)

Prepared by	Title	Date
R. V. Ward	Wildlife Biologist	12/15/75
Approved by	**Title**	**Date**

TIMBER GULCH CHAINING

1. Habitat Classification - Critical

2. Habitat Condition - Unsatisfactory

3. Bureau Planning Coverage - MFP (1976), HMP to be completed January 1977.

4. Public Demand For Outputs - High

5. Special Significance - Future evaluation studies on the area (vegetative measurements, animal use evaluations, etc) will provide badly needed information on proper techniques for improvement of sagegrouse and bluegrouse special use areas.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JOB DOCUMENTATION REPORT

JOB IDENTIFICATION
1. State (2–3) . . . C 0
2. District (4–5) . . . 0 1
3. Job No. (6–9) . . . 4 5 5 2
4. Transaction Code (10) . . . 1

I – GENERAL DESCRIPTION — Card 1

5. Job Name (11–30): T I M B E R G U L C H R E S

LOCATION CODES
6. Special Project Code (31–34) . . .
7. Planning Unit (35–36) . . . 0 8
8. Sub-Basin (37–38) 6 1 — 9. County (39–41) 1 0 3
10. Watershed No. (42–44) . . .
11. Allotment No. (45–47) . . .
12. Wildlife Habitat Area (48–50) . . .

SITE AND VEGETATIVE DESCRIPTION
13. Present SSF (51–52) 5 0 — 14. % Slope (53–54) 0 5
15. Exposure (55) 4 — 16. Soil Texture (56) . . . 3
17. Precipitation (inches) (57–58) . . . 1 4
18. Elevation (feet) (59–63) . . . 7 0 0 0
19. Vegetative Subtype (64–66) . . . 0 4 1

COMPOSITION (Percent)
20. Grasses (67–68) 1 5 — 21. Forbs (69–70) . . . 1 0
22. Browse (71–72) . . . 7 5

COVER (Percent)
23. Vegetative (73–74) 2 0 — 24. Litter (75–76) . . . 2 8
25. Bare Ground (77–78) . . . 5 2

II – ANNUAL WORK PLAN INPUT DATA — Card 2

75. Subactivity (11–14) . . . 1 2 8 5
76. Work Job Code (15–18) . . . 6 2 4 1

UNITS PLANNED
77. Primary (19–24) . . . 1 1 . 0
78. Secondary (25–29) . . . 2 2 0 0 0

TIME OF AWARD
79. Fiscal Year (30–31) 7 6 — 80. Third (32) . . . 3

TIME OF COMPLETION
81. Fiscal Year (33–34) 7 7 — 82. Third (35) . . . 2

BLM COST — 83. Method (36) . . . 1
84. Material (37–41) . . .
85. Contract (42–47) . . . 2 6 0 0 0

CONTRIBUTED COST
86. Material (48–52) . . .
87. Labor/Equipment (53–57) . . .

MAINTENANCE
88. Responsibility (58) 1 — 89. Cycle (59–61) . . . 7 0 2

III – JOB DETAILS AND BENEFITS — Card 3

37. Primary Job Objective (11) . . . 7

PLANT AND PEST CONTROL
39. Chemical (12) — 42. Method (13) . . .
45. Mechanical – Method (14) . . .

ARTIFICIAL REVEGETATION
47. Pounds Seed/Acre (15–17) . . . .
48. Seedlings/Acre (18–21) . . . — 49. Method (22)
51. AUM's Livestock Forage Added (23–26) . . .
52. Future SSF (27–28) . . .

WATERSHED TILLAGE — 54. Method (29) . . .

FACILITIES 55. Type (30) — 56. Other Misc. (31)

WATER DEVELOPMENT CONTROL
59. Structure Type (32) . . . 2
STORAGE (Ac. Ft.) 60. Flood (33–38) . . . 6
61. Silt (39–44) . . .

WILDLIFE HABITAT DEVELOPMENT PROTECTION
62. Type (45–46) 2 4 — 63. Primary Species (47–49) 6 0 5
64. Animal Months (50–54) . . . 5 0 0
65. Number Increase (55–59) . . . 1 0 0
66. Pounds Fish Increase (60–64) . . .
67. Rare/Endangered (65) . . .

VISITOR DAYS ADDED — 68. Fisherman (66–69) . . .
69. Hunter (70–73) . . . — 70. Other (74–77) . . .

IV – PROGRESS REPORT — Card 4

COMPLETION DATA
UNITS 90. Primary (11–16) . . . .
91. Secondary (17–21) . . .
TIME 92. Fiscal Year (22–23) . . .
93. Third (24) . . .
94. Contract No. (25–29) . . . CT

CONTRIBUTION DETAIL
95. Agreement (30) — 96. Participant (31) . . .
97. Contributor's Name (32–51)

CONTRIBUTIONS
98. Deposited (52–56) . . .
Undeposited
99. Materials (57–61) . . .
100. Labor/Equipment (62–66) . . .

V – DETAIL ESTIMATE OF UNITS AND COSTS

WORK DESCRIPTION AND MATERIALS (a)	UNITS: EA. MILE, ETC (b)	UNITS: COST (c)	BLM COSTS: MATERIALS (d)	BLM COSTS: CONTRACT (e)	COOPERATOR COSTS: MATERIALS (f)	COOPERATOR COSTS: LABOR (g)
9 RES. @ 2,000 cu. yds. ea. = 18,000 @ .50¢/yd.=$9,000.00	Cu. Yd.	$ .50¢		$9,000.00		
6 Miles Of Stock Fencing = $2,500.00/Mile Installed = $15,000.00	Mile	$2,500.00		$15,000.00		
TOTALS Materials						
Labor Equipment				$24,000.00		

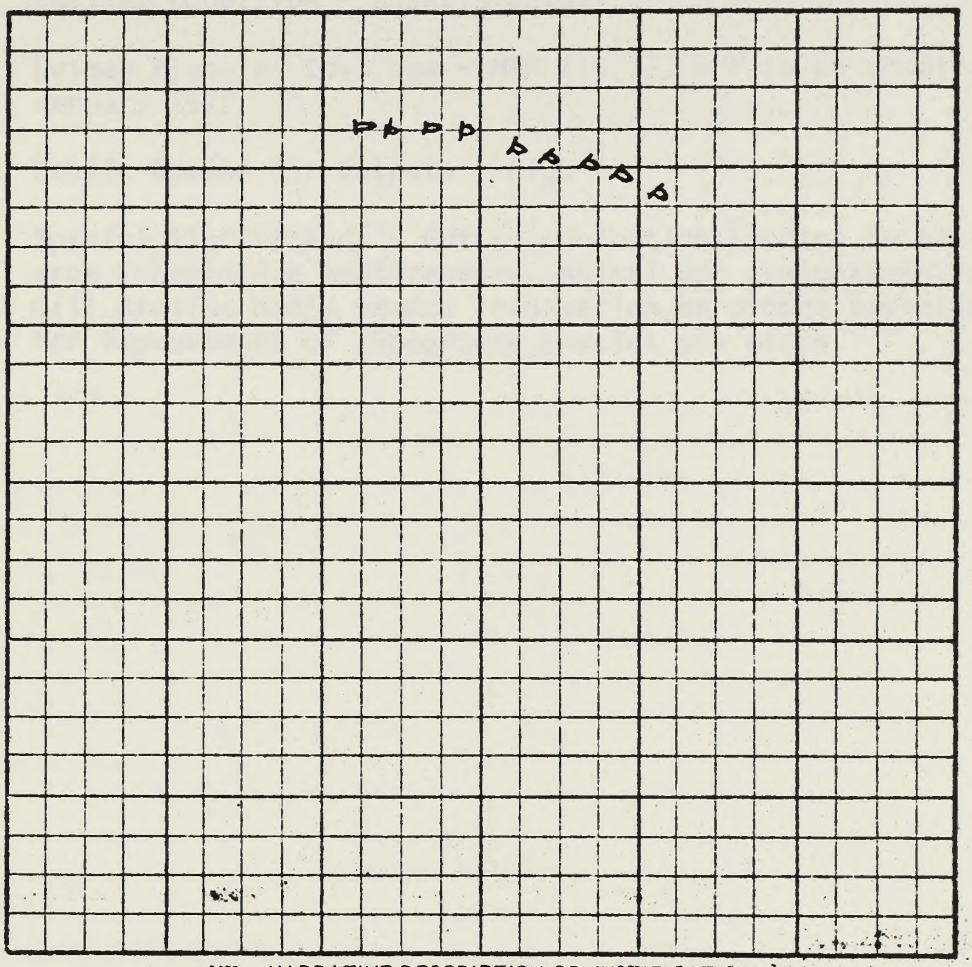
Form 1630–8 (November 1972)

JOB IDENTIFICATION STATE C 0 DISTRICT 0 1 JOB NUMBER 4 5 5 2

VI – LOCATION PLAT

Scale 1 inch = 1 Mile

T. 2 S. R. 95 W Meridian



VII – NARRATIVE DESCRIPTION OR JUSTIFICATION

Project will consist of construction of nine reservoirs, which, in conjunction with chaining and seeding covered in separate JDR, will create a wet meadow environment for sage grouse brood rearing. Creation of water sources will benefit all wildlife species in area and provide potential nesting areas for waterfowl and shorebirds.

(Continued On Attached Sheet)

Prepared by	Title	Date
R. V. Ward	Wildlife Biologist	12/15/75
Approved by	Title	Date

TIMBER GULCH RESERVOIRS

1. Habitat Classification - Critical

2. Habitat Condition - Unsatisfactory

3. Bureau Planning Coverage - MFP (1976), HMP to be completed January 1977.

4. Public Demand For Outputs - High

5. Special Significance - Future evaluation studies on the area (vegetative measurements, animal use evaluations, etc.) will provide badly needed information on proper techniques for improvement of sagegrouse special use areas.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JOB DOCUMENTATION REPORT

JOB IDENTIFICATION

1. State (2–3) . . . . . C 0
2. District (4–5) 0 1
3. Job No. (6–9) 4 5 4 8
4. Transaction Code (10) 1

I – GENERAL DESCRIPTION Card 1

5. Job Name (11–30)
G R E A S E W O O D - C H

LOCATION CODES

6. Special Project Code (31–34) . . . . .
7. Planning Unit (35–36) 0 8
8. Sub-Basin (37–38) 6 1 9. County (39–41) 1 0 3
10. Watershed No. (42–44) . . . . .
11. Allotment No. (45–47) . . . . .
12. Wildlife Habitat Area (48–50) . . . . .

SITE AND VEGETATIVE DESCRIPTION

13. Present SSF (51–52) 6 0 14. % Slope (53–54) 0 5
15. Exposure (55) 1 16. Soil Texture (56) 3
17. Precipitation (inches) (57–58) 1 2
18. Elevation (feet) (59–63) 6 1 0 0
19. Vegetative Subtype (64–66) 0 4 1

COMPOSITION (Percent)

20. Grasses (67–68) 1 4 21. Forbs (69–70) . . 1 4
22. Browse (71–72) 7 2

COVER (Percent)

23. Vegetative (73–74) 1 6 24 Litter (75–76) . 2 6
25. Bare Ground (77–78) 5 8

II – ANNUAL WORK PLAN INPUT DATA Card 2

75. Subactivity (11–14) 1 2 8 5
76. Work Job Code (15–18) 6 0 0 2

UNITS PLANNED

77. Primary (19–24) . . . . . 1 0 0 . 0
78. Secondary (25–29) . . . . . A R T I R 1

TIME OF AWARD

79. Fiscal Year (30–31) 7 6 80. Third (32) . . . 3

TIME OF COMPLETION

81. Fiscal Year (33–34) 7 7 82. Third (35) . . . 2

BLM COST 83. Method (36) 1

84. Material (37–41) 3 5 0 0
85. Contract (42–47) 2 0 0 0

CONTRIBUTED COST

86. Material (48–52) . . . . .
87. Labor/Equipment (53–57) . . . . .

MAINTENANCE

88 Responsibility (58) 1 89. Cycle (59–61) 7 0 4

III – JOB DETAILS AND BENEFITS Card 3

37. Primary Job Objective (11) 7

PLANT AND PEST CONTROL

39. Chemical (12) 42. Method (13) . . . . .
45. Mechanical – Method (14) 2

ARTIFICIAL REVEGETATION

47. Pounds Seed/Acre (15–17) . . . . . 1 0 . 0
48. Seedlings/Acre (18–21) 49. Method (22) 1
51. AUM's Livestock Forage Added (23–26) . .
52. Future SSF (27–28) 4 5

WATERSHED TILLAGE 54. Method (29) . . . .

FACILITIES 55. Type (30) 56. Other Misc. (31)

WATER DEVELOPMENT/CONTROL

59. Structure Type (32) . . . . .
STORAGE (Ac. Ft.) 60. Flood (33–38)
61. Silt (39–44)

WILDLIFE HABITAT DEVELOPMENT/PROTECTION

62. Type (45–46) 2 1 63. Primary Species (47–49) 1 0 3
64. Animal Months (50–54) 1 0 0
65. Number Increase (55–59) 2 5
66. Pounds Fish Increase (60–64) . . . .
67. Rare/Endangered (65) . . . . .

VISITOR DAYS ADDED 68. Fisherman (66–69)
69. Hunter (70–73) 6 0 70. Other (74–77)

IV – PROGRESS REPORT Card 4

COMPLETION DATA

UNITS 90. Primary (11–16) . . . . . .
91. Secondary (17–21) . . . .
TIME 92. Fiscal Year (22–23) . . . . .
93. Third (24) . . . . .
94. Contract No. (25–29) . . . . . CT

CONTRIBUTION DETAIL

95. Agreement (30) 96. Participant (31) . . .
97. Contributor's Name (32–51)

CONTRIBUTIONS

98. Deposited (52–56) . . . . .
Undeposited
99. Materials (57–61) . . . . .
100 Labor/Equipment (62–66) . . . .

V – DETAIL ESTIMATE OF UNITS AND COSTS

WORK DESCRIPTION AND MATERIALS (a)	UNITS EA MILE, ETC (b)	UNITS COST (c)	BLM COSTS MATERIALS (d)	BLM COSTS CONTRACT (e)	COOPERATOR COSTS MATERIALS (f)	COOPERATOR COSTS LABOR (g)
Sagebrush Chopping	ACRES	$15.00		$1,500.00		
Drilling Several Varieties Of Seed For Test Purposes	ACRES	$ 5.00		$ 500.00		
Seed Varieties	1,000 lbs.	3.50/lb	$3,500.00			
TOTALS Materials			$3,500.00			
Labor/Equipment				$2,000.00		

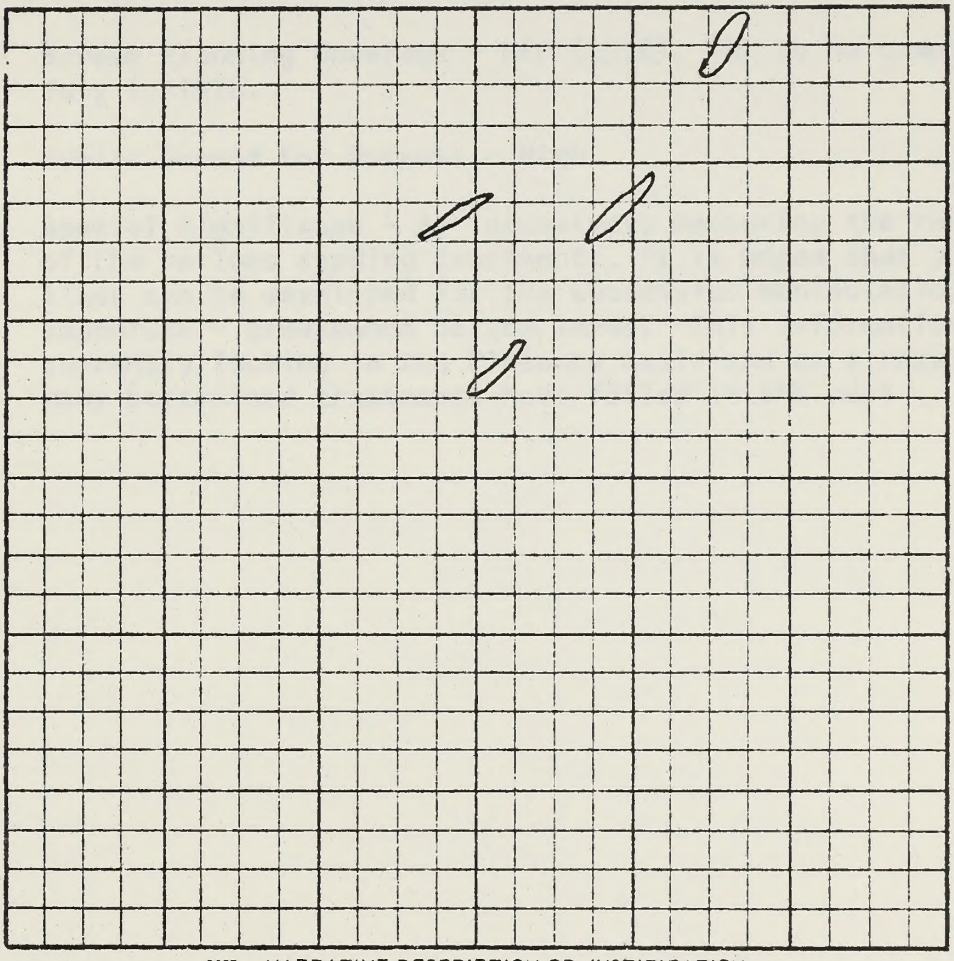
Form 1630–8 (November 1972)

JOB IDENTIFICATION STATE C 0 DISTRICT 0 1 JOB NUMBER 4 5 4 8

VI – LOCATION PLAT

Scale 1 inch = 1 Mile

T. 1 & 2 N R. 98 & 99 W R99/R98 Meridian



VII – NARRATIVE DESCRIPTION OR JUSTIFICATION

Project will consist of chopping and seeding (see mixture to be varied on each of the four plots) 100 acres of decadent sagebrush to provide food for mule deer on critical winter range. Area currently provides very little wildlife forage due to the rank growth of sagebrush, greasewood and rabbitbrush.

(Continued On Attached Sheet)

Prepared by	Title	Date
R. V. Ward	Wildlife Biologist	12/15/75
Approved by	Title	Date

GREASEWOOD - BARCUS CHAINING

1. Habitat Classification - Critical

2. Habitat Condition - Unsatisfactory

3. Bureau Planning Coverage - MFP (1976), HMP to be completed July 1, 1976.

4. Public Demand For Outputs - High

5. Special Significane - By intensively measuring the results of the various seeding treatments, it is hoped that guidelines can be developed for the successful manipulation of sagebrush - greasewood bottom lands. This information is currently lacking in the Piceance basin and as a result many bottomland treatments have failed in the past.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JOB DOCUMENTATION REPORT

JOB IDENTIFICATION
1. State (2–3) . . . . . C 0
2. District (4–5) 0 1
3. Job No. (6–9) 4 5 5 3
4. Transaction Code (10) 1

I – GENERAL DESCRIPTION — Card 1

5. Job Name (11–30): P I N T O R E S E V O I R S

LOCATION CODES
6. Special Project Code (31–34) . . . . . .
7. Planning Unit (35–36) 0 8
8. Sub-Basin (37–38) 6 1 9. County (39–41) 1 0 3
10. Watershed No. (42–44) . . . . . .
11. Allotment No. (45–47) . . . . . .
12. Wildlife Habitat Area (48–50) . . . . . .

SITE AND VEGETATIVE DESCRIPTION
13. Present SSF (51–52) 5 0 14. % Slope (53–54) 0 5
15. Exposure (55) 1 16. Soil Texture (56) 3
17. Precipitation (inches) (57–58) 1 2
18. Elevation (feet) (59–63) 6 5 0 0
19. Vegetative Subtype (64–66) 0 4 1

COMPOSITION (Percent)
20. Grasses (67–68) 1 5 21. Forbs (69–70) . . 1 0
22. Browse (71–72) 7 5

COVER (Percent)
23. Vegetative (73–74) 1 0 24. Litter (75–76) . 2 8
25. Bare Ground (77–78) 6 2

II – ANNUAL WORK PLAN INPUT DATA — Card 2

75. Subactivity (11–14) 1 2 8 5
76. Work Job Code (15–18) 6 2 4 1

UNITS PLANNED
77. Primary (19–24) 6 7 0
78. Secondary (25–29) 3 3 0 0 0

TIME OF AWARD
79. Fiscal Year (30–31) 7 6 80. Third (32) . . . 3

TIME OF COMPLETION
81. Fiscal Year (33–34) 7 7 82. Third (35) . . . 3

BLM COST 83. Method (36) 1
84. Material (37–41) . . . . . .
85. Contract (42–47) 3 8 5 0 0

CONTRIBUTED COST
86. Material (48–52) . . . . . .
87. Labor/Equipment (53–57) . . . . . .

MAINTENANCE
88. Responsibility (58) 1 89. Cycle (59–61) . 7 0 2

III – JOB DETAILS AND BENEFITS — Card 3

37. Primary Job Objective (11) 7

PLANT AND PEST CONTROL
39. Chemical (12) 42. Method (13) . . . . .
45 Mechanical – Method (14) . . . . . .

ARTIFICIAL REVEGETATION
47. Pounds Seed/Acre (15–17) . . . . . .
48. Seedlings/Acre (18–21) 49. Method (22)
51. AUM's Livestock Forage Added (23–26) . .
52. Future SSF (27–28) . . . . . .

WATERSHED TILLAGE 54. Method (29) . . . .
FACILITIES 55. Type (30) 56. Other Misc. (31)

WATER DEVELOPMENT/CONTROL
59. Structure Type (32) 2
STORAGE (Ac. Ft.) 60. Flood (33–38) 1 1
61. Silt (39–44)

WILDLIFE HABITAT DEVELOPMENT PROTECTION
62. Type (45–46) 4 5 63. Primary Species (47–49) 5 0 1
64. Animal Months (50–54) 6 0 8
65. Number Increase (55–59) 1 5 4
66 Pounds Fish Increase (60–64) . . . .
67. Rare/Endangered (65) . . . . . .

VISITOR DAYS ADDED 68. Fisherman (66–69)
69 Hunter (70–73) 1 0 0 70. Other (74–77)

IV – PROGRESS REPORT — Card 4

COMPLETION DATA
UNITS 90. Primary (11–16) . . . .
91. Secondary (17–21) . . . .
TIME 92. Fiscal Year (22–23) . . . . . .
93. Third (24) . . . . . .
94. Contract No. (25–29) . . . . . CT

CONTRIBUTION DETAIL
95 Agreement (30) 96. Participant (31) . . .
97. Contributor's Name (32–51)

CONTRIBUTIONS
98. Deposited (52–56) . . . . . .
Undeposited
99. Materials (57–61) . . . . . .
100 Labor/Equipment (62–66) . . . . .

V – DETAIL ESTIMATE OF UNITS AND COSTS

WORK DESCRIPTION AND MATERIALS (a)	UNITS EA. MILE, ETC (b)	UNITS COST (c)	BLM COSTS MATERIALS (d)	BLM COSTS CONTRACT (e)	COOPERATOR COSTS MATERIALS (f)	COOPERATOR COSTS LABOR (g)
7 RES, @ 3,000 Cu. Yd. Ea. @ .50¢/yd = $10,500.00	Cu.Yd.	$ .50		$16,500.00		
Bentonite Installed @ $1,000/RES = $7,000.00	Ea.	$1,000.00/RES.		$ 7,000.00		
Fence And Tank Installed $1,000/RES = $11,000	JOB	$1,000/RES		$11,000.00		
TOTALS Materials						
Labor/Equipment				$24,500.00		

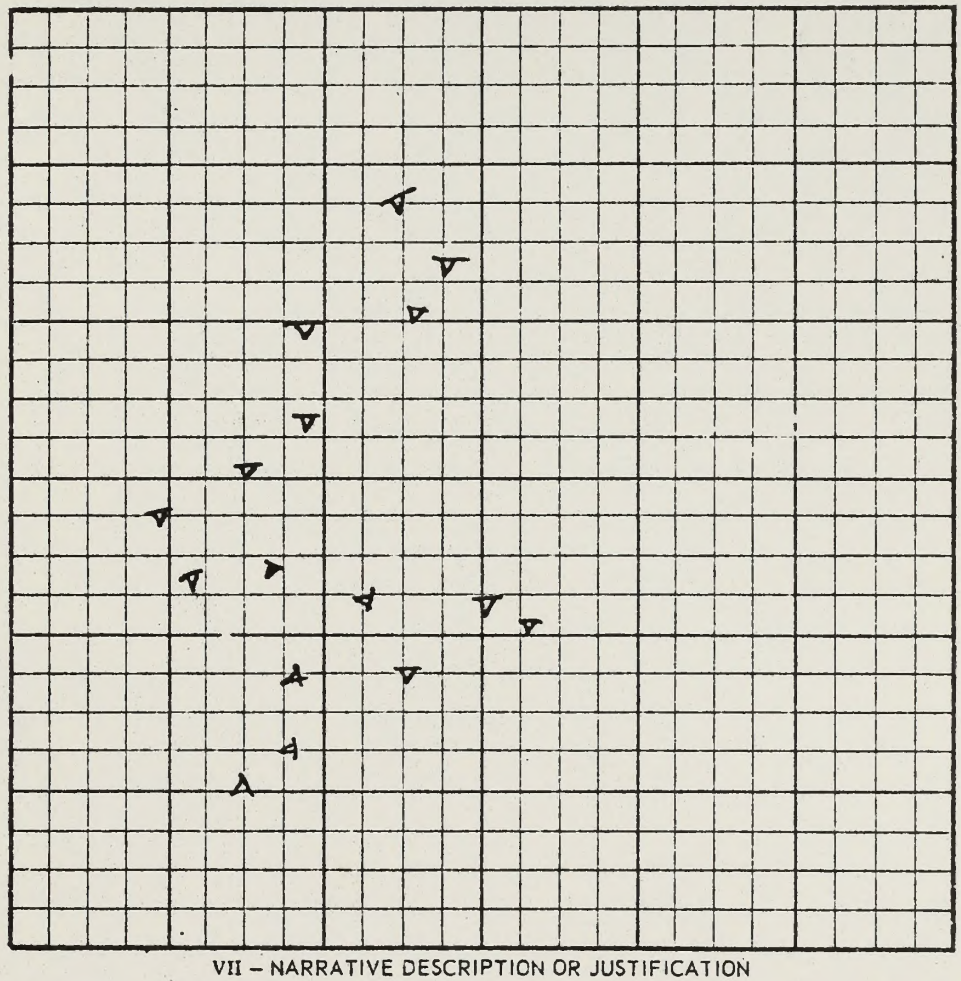
Form 1630–8 (November 1972)

JOB IDENTIFICATION STATE C 0 DISTRICT 0 1 JOB NUMBER 4 5 5 3

VI – LOCATION PLAT

Scale 1 inch = 1 Mile

T. 1 N R. 98 W Meridian



VII – NARRATIVE DESCRIPTION OR JUSTIFICATION

Project will consist of construction of 7 reservoirs chosen from the 16 shown above. Reservoirs will provide nesting habitat for waterfowl and shorebirds and provide water sources for all species of wildlife. Reservoirs will be completely fenced and water will be piped out to livestock troughs to prevent damage to the ponds by domestic livestock. Waterfowl nesting sites are in short supply in the Piceance basin and this particular area is currently without adequate water for most wildlife species.

(Continues On Attached Sheet)

Prepared by	Title	Date
R. V. Ward	Wildlife Biologist	12/15/75
Approved by	Title	Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JOB DOCUMENTATION REPORT

JOB IDENTIFICATION
1. State (2–3) . . . . . C O
2. District (4–5) 0 1
3. Job No. (6–9) . . . . .
4. Transaction Code (10) 1

I – GENERAL DESCRIPTION Card 1

5. Job Name (11–30)
B A R C U S R E S E R V O I R S

LOCATION CODES
6. Special Project Code (31–34) . . . . .
7. Planning Unit (35–36) 0 8
8. Sub-Basin (37–38) 6 1 9. County (39–41) 1 0 3
10. Watershed No. (42–44) . . . . .
11. Allotment No. (45–47) . . . . .
12. Wildlife Habitat Area (48–50) . . . . .

SITE AND VEGETATIVE DESCRIPTION
13. Present SSF (51–52) 5 0 14. % Slope (53–54) 0 5
15. Exposure (55) 1 16. Soil Texture (56) . . . 3
17. Precipitation (inches) (57–58) 1 2
18. Elevation (feet) (59–63) 6 5 0 0
19. Vegetative Subtype (64–66) 0 4 1

COMPOSITION (Percent)
20. Grasses (67–68) 1 5 21. Forbs (69–70) . . 1 0
22. Browse (71–72) 7 5

COVER (Percent)
23. Vegetative (73–74) 1 0 24. Litter (75–76) . 2 8
25. Bare Ground (77–78) 6 2

II – ANNUAL WORK PLAN INPUT DATA Card 2

75. Subactivity (11–14) 1 2 8 5
76. Work Job Code (15–18) 6 2 4 1

UNITS PLANNED
77. Primary (19–24) 5 0
78. Secondary (25–29) 1 5 0 0 0

TIME OF AWARD
79. Fiscal Year (30–31) 7 6 80. Third (32) . . . 3

TIME OF COMPLETION
81. Fiscal Year (33–34) 7 7 82. Third (35) . . . 3

BLM COST 83. Method (36) . . . . . .
84. Material (37–41) . . . . . .
85. Contract (42–47) 1 8 0 0 0

CONTRIBUTED COST
86. Material (48–52) . . . . . .
87. Labor/Equipment (53–57) . . . . . .

MAINTENANCE
88. Responsibility (58) 1 89. Cycle (59–61) . 7 0 2

III – JOB DETAILS AND BENEFITS Card 3

37. Primary Job Objective (11) 7

PLANT AND PEST CONTROL
39. Chemical (12) 42. Method (13) . . . . .
45. Mechanical – Method (14) . . . . . .

ARTIFICIAL REVEGETATION
47. Pounds Seed/Acre (15–17) . . . . . .
48. Seedlings/Acre (18–21) 49. Method (22)
51. AUM's Livestock Forage Added (23–26) . .
52. Future SSF (27–28) . . . . . .

WATERSHED TILLAGE 54. Method (29) . . . .
FACILITIES 55. Type (30) 1 56. Other Misc. (31)

WATER DEVELOPMENT/CONTROL
59. Structure Type (32) 2
STORAGE (Ac. Ft.) 60. Flood (33–38) 5
61. Silt (39–44)

WILDLIFE HABITAT DEVELOPMENT/PROTECTION
62. Type (45–46) 2 4 63. Primary Species (47–49) 1 0 3
64. Animal Months (50–54) 5 0 0
65. Number Increase (55–59) 1 0 0
66. Pounds Fish Increase (60–64) . . . .
67. Rare/Endangered (65) . . . . . .

VISITOR DAYS ADDED 68. Fisherman (66–69)
69. Hunter (70–73) 70. Other (74–77)

IV – PROGRESS REPORT Card 4

COMPLETION DATA
UNITS 90. Primary (11–16) . . . .
91. Secondary (17–21) . . . .
TIME 92. Fiscal Year (22–23) . . . . . .
93. Third (24) . . . . . .
94. Contract No. (25–29) . . . . . CT

CONTRIBUTION DETAIL
95. Agreement (30) 96. Participant (31) . . .
97. Contributor's Name (32–51)

CONTRIBUTIONS
98. Deposited (52–56) . . . . . .
Undeposited
99. Materials (57–61) . . . . . .
100. Labor/Equipment (62–66) . . . . .

V – DETAIL ESTIMATE OF UNITS AND COSTS

WORK DESCRIPTION AND MATERIALS (a)	UNITS EA. MILE, ETC (b)	UNITS COST (c)	BLM COSTS MATERIALS (d)	BLM COSTS CONTRACT (e)	COOPERATOR COSTS MATERIALS (f)	COOPERATOR COSTS LABOR (g)
5 Res. @ 3,000 cu.yd. Ea @ .50¢/yd. = $7,500.00	Cu. Yd	$ .50		$7,500.00		
Bentonite Installed @ 1,000/Res = $5,000.	EA.	$1,000/RES		$5,000.00		
Fence And Tank Installed @ $11,000/Res. = $5,500.00	Job	$1,000/RES		$5,500.00		
TOTALS Materials						
Labor/Equipment				$18,000.00		

Form 1630-8 (November 1972)

PINTO MESA RESERVOIRS

1. Habitat Classification - Important

2. Habitat Condition - Unsatisfactory

3. Bureau Planning Coverage - MFP (1976), HMP to be completed by January 1977.

4. Public Demand For Outputs - High

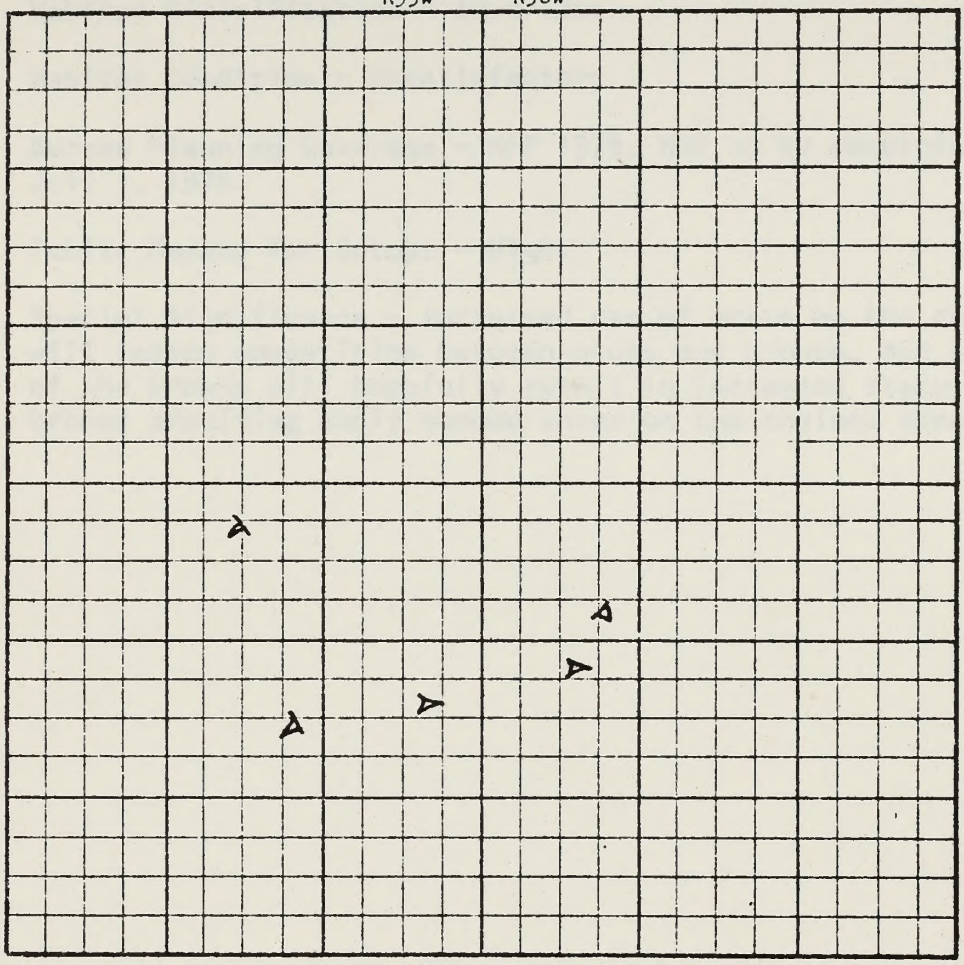
5. Special Significance - Reservoirs will have a secondary benefit to all species of wildlife in this high forage production area by increasing usage through better distribution of wildlife and livestock populations.

JOB IDENTIFICATION STATE C 0 DISTRICT 0 1 JOB NUMBER

VI – LOCATION PLAT

Scale 1 inch = 1 Mile

T. 1 N R. 98 & 99 W R99W R98W Meridian 6th Principle



VII – NARRATIVE DESCRIPTION OR JUSTIFICATION

Project will consist of five reservoirs which will be fenced with water piped out for livestock use. Increased water in this area will more evenly distribute livestock and mule deer; increase utilization of the ample forage production on the Pinto and Barcus chainings and provide nesting and feeding habitat for waterfowl and shorebirds.

(Continued On Attached Sheet)

Prepared by R. V. Ward	Title Wildlife Biologist	Date 03/11/76
Approved by	Title	Date

GPO 833-198

BARCUS RESERVOIRS

1. Habitat Classification - Important

2. Habitat Condition - Unsatisfactory

3. Bureau Planning Coverage - MFP 1976, HMP to be completed July 1, 1976.

4. Public Demand For Output - High.

5. Special Significance - Increased use of grass on the chainings will lessen competition between grass and browse, and release of the browse will hopefully result in increased stature of browse providing badly needed cover on the chained areas.

APPENDIX 6

Research Proposals

Project Title: Parachute Canyon Complex Survey for Peregrine Falcons: Piceance Basin Wildlife Habitat Area.

Duration of Study: 5 days in April, 5 days in June, 1976

Background and Need:

Several sightings of adult peregrine falcons have been made in Parachute Canyon over the past three years during the breeding season. On two occasions an adult peregrine falcon was observed hunting over the Colorado River near Grand Valley. It is evident that at least one pair of peregrine falcons may reside in the Canyon, but an intensive survey by specialists trained in locating breeding peregrines will have to be undertaken to locate the eyrie site. The survey is needed to offer greater protection to key habitats for this endangered falcon.

Objective:

1) Locate the presence of a peregrine falcon eyrie site in the Parachute Canyon region.

2) Establish breeding success of the pair of peregrines should their eyrie site be located.

3) Develop recommendations for protection and improvement of eyrie and associated hunting territory.

Procedures:

1) The entire canyon complex should be surveyed in mid-April in an attempt to locate the eyrie site. Due to the inaccessibility of many of the cliffs, it will be necessary to survey much of the region by helicopter. Once the site is located, peregrine biologists Craig and Enderson will proceed to the site on foot and observe actions and activities of the pair to ascertain breeding attempts.

2) After the site has been located, Craig and Enderson will return in mid-June to determine productivity.

3) Delineate critical habitat for protection of the eyrie site and associated hunting territory.

4) Prepare project report.

Estimated Expenditures:

Personal Services

Name	Title	Period	Rate	Total
Gerald R. Craig[1/]	Raptor Biologist	10 days	N/A	N/A
James H. Enderson[1/]	College Professor	10 days	N/A	N/A
Ron Krager	Project Coordinator	1 day	N/A	N/A
Tom Henry	Regional Biologist	1 day	N/A	N/A

Operating Supplies, Services and Equipment

Item	Unit	Unit Cost	Total
Helicopter	16 Hours	$120/hr.	$1,920
			$1,920

1/ Salaries, per diem and equipment will be provided in conjunction with ongoing statewide peregrine investigations.

Summary of Estimated Costs:

Personal Services	0
Operating Supplies, Services and Equipment	$1,920.00
Contingency	80.00
Total Cost of Project	$2,000.00

Responsibility: Colorado Department of Natural Resources, Division of Wildlife.

Project Title: Survey of Sage Grouse Strutting Ground Complexes, Production and Concentration Areas Within the Piceance Basin Wildlife Habitat Area

Duration of Study: March 15 through September 30, 1976

Background and Need:

Much of the land in the Piceance Basin is publicly owned and managed by the Bureau of Land Management. Public lands in the Northwest Region are rapidly being explored and developed for energy sources. This activity will reduce the carrying capacity of some lands which have supported good wildlife populations. There is an urgent need to develop available lands to increase their wildlife carrying capacity to offset losses. Benefits to habitat development are generally slow to materialize. Little data are available for this area regarding the sage grouse population and potential for habitat improvement. Base population indices are necessary to evaluate the effectiveness of development. This project will provide the necessary information preliminary to actual improvement. Future development is expected to follow the Western States Sage Grouse Committee's recommendations for improving sage grouse habitat.

Objectives:

1) Map current and potential sage grouse habitat.

2) Map occupied sage grouse population range, and determine locations of significant biologic activity areas.

3) Provide population indices for spring breeding and fall populations.

4) Identify potential locations for habitat improvement.

5) Determine current use of habitat improvement sites.

6) Determine relationships of sage grouse population, distribution and habitat conditions to livestock grazing systems and intensity.

Procedures:

1) Locate and map strutting grounds and conduct counts (April 1-May 15).

2) Map Habitat.

3) Map population range.

4) Locate and map production and brood rearing areas and count broods (July 15-September 15).

5) Locate springs, potential meadow sites and areas for habitat protection and enhancement (July 1-Sept. 30).

6) Recommend areas and treatments for habitat protection and enhancement.

7) Prepare project report.

Estimated Expenditures:

Personal Services

Name	Title	Period	Salary	Expense	Total
	Wildlife Tech. 1-A	6 mos. (3/15-9/15) at $727.	$4,362	$700.00	$5,062
Ron Krager	Project Coordinator	10 days	N/A	100.00	100
Harvey Donoho	Small Game Supervisor	5 days	N/A	0	0
Tom Henry	Regional Biologist	5 days	N/A	0	0
					$5,162

Operating Supplies, Services and Equipment

Item	Unit	Unit Cost	Total
Misc. Supplies, Maps, Photos			$ 100
Pickup (auction salvage of $691, B. Jones) Oper. & Maint.			238
Camper Trailer, Purchase and Operation			1,500
Horse Rental			100
Fixed-wing aircraft	20 hours	$45.00/hr.	900
			$2,838

Summary of Estimated Costs:

Personnel Services	$5,162.00
Operating Supplies, Services & Equipment	2,838.00
Total	$8,000.00

Responsibility: Colorado Department of Natural Resources, Division of Wildlife

Project Title: Nongame Wildlife Survey, Pre and Post Treatment Evaluations of Habitat Improvement Sites and Identification of Significant Habitat Areas for Selected Birds on the Critical Status List; Piceance Basin Wildlife Habitat Area.

Duration of Study:

Phase I: April 1 through September 30, 1976

Additional Phases in same period in subsequent year, or at intervals, as funds available.

Background and Need:

Under the Piceance Basin Habitat Management Plan, Job Documentation Reports and Research Proposals, the following habitat treatment projects are to be conducted the summer of 1976:

1) Greasewood -Gulche - Sagebrush chaining and reseeding, 100 acres.

2) Timber Gulch - Sagebrush chaining and reseeding, 80 acres.

3) Lee Gulch - Pinyon-Juniper chaining, 400 acres.

Habitat manipulation project studies have commonly monitored changes in biotic communities after habitat modification, but little, if any, baseline data prior to the manipulations have been obtained for nongame wildlife. It is imperative, therefore, that qualitative and quantitative data on nongame wildlife be obtained prior to habitat modification to be used as a baseline against which to assess the effect on these populations of such alterations.

Comprehensive and intensive inventories of nongame birds and mammals are needed in the habitat manipulation areas prior to and following treatment. There is also a considerable need to compile information available on nongame wildlife throughout the Piceance Basin and to identify the significant habitat areas used by selected species so that measures to protect various habitats can be included in habitat management plans.

Objectives:

1) Determine the species and numbers of nongame birds and mammals present in the habitat manipulation areas prior to initiation of the modifications in these three project areas.

2) Determine the immediate post-modification populations of nongame bird and mammals in the three treatment areas.

3) Assess the effect of three habitat treatments on nongame by comparing subsequent spring or breeding season inventories and fall inventories with the baseline data obtained in pre-treatment studies.

4) Gather and compile all population and distribution data available for the Piceance Basin Wildlife Habitat Area from other studies.

5) Determine significant biologic activity areas for select nongame species.

Procedures:

1) Select permanent study plots based on the standards established by the International Bird Census Committee (Audubon Field Notes, December, 1970, 24 (6): 723-726) in each of the three habitat treatment areas.

2) The bird study plots will be of 40 hectares in the center of each of the three treatment areas, and the mammal plots will be five-acre grids in the center of each 40-hectare plot.

3) For birds, begin censusing the plots daily to determine the status of spring migrants, and, once nesting begins, locate nests and follow nesting success. Following habitat treatments, continue bird census into fall migration period (September).

4) For mammals, set 99 live traps at the grid intersections and run for six consecutive days prior to habitat treatment, ear tag all live mammals and release at site. Post habitat treatment, repeat the prescribed live trapping, followed by three consecutive days of snap trapping in September, according to the North American method.

5) Compile and analyze pre and post treatment data by species.

6) Compile population and distribution data available from published literature, agency and organization files, unpublished project reports, personal contacts and other sources.

7) Map concentration areas and significant biologic activity areas (primarily nesting and young rearing habitats, migration routes and roost sites) for select species.

8) Prepare project report.

Estimated Expenditures:

Personal Services:

Name	Title	Period	Salary	Expense	Total
2 each	Wildlife Tech. 1-A	4/1-9/30/76 6 months	$727/mo.	$1,200	$9,924
Ron Krager	Project Coordinator	15 Days	N/C		0
Tom Henry	Regional Biologist	10 Days	N/C		0
Walt Graul	Nongame Bird and Nongame Mammal Specialist	20 Days	N/C		0
				Total	$9,924

Operating, Supplies, Services and Equipment

Item	Unit	Unit Cost	Total
Pickup Operation and Maintenance or Mileage Payment if Needed			$1,500
Misc. supplies (bait, tags, paint, maps, aerial photos)			150
Paper, forms, postage			50
Steel Fence Posts, 20 @ 2.00			40
1/2" Rebar, 350 - 4' lengths			31
Spencer live traps, 150 @ 4.80			720
Museum Specials, 200 @ .70			140
Four-wheel drive pickup (DOW turn-in)			N/C
Mist nets (2 - 25N, 4 - 24N)			32
			$2,663
Contingency			63

Summary of Estimated Costs:

Personal Services	$9,924.00
Operating Supplies, Services and Equipment	2,663.00
Contingency	63.00
Total	$12,800.00

Responsibility: Colorado Department of Natural Resources, Division of Wildlife

Project Title: Survey of Riparian and Aquatic Communities and Collection of Water Flow Data Within the Piceance Basin Wildlife Habitat Area and Portions of the White River Drainage.

Duration of Study: May 1 through October 30, 1976 and continuing.

Background and Need:

Demands for energy and development of water resources in portions of the White River Drainage and Piceance Basin, make it necessary to assure continued maintenance of streams and related aquatic and riparian habitats which are important to wildlife. A requirement in reaching this objective is analysis of accurate information on water flows and hydrologic data. Data on the majority of important areas are not available at this time. To collect it will require a significant effort in terms of cost and manpower.

Objectives:

1) Collect specific habitat data on selected streams and aquatic habitats with the study area. Once analysis of the data is completed specific recommendations for required stream flows will be made to the Colorado Water Conservation Board with the objective of obtaining decreed water rights. The authority to obtain such decrees being under 37-92-102, C.R.S., 1973. Study will allow the Colorado Water Conservation Board and the State of Colorado to obtain decreed water rights on selected streams. Such rights will allow future involvement by the State of Colorado and the Bureau of Land Management in maintaining important aquatic and ~~associated~~ Riparian habitats for wildlife.

2) Determine locations of significant ~~terrestrial~~ Riparian and aquatic wildlife habitats and important biologic activity areas to provide increased protection and benefits for the wildlife resources.

Procedures:

1) Equip two field crews for a four month period (July through October) to collect data as defined and in the manner described in attached "Stream Profile Instruction Manual." Each crew will consist of two qualified biologists capable of collecting accurate flow, animal population and environmental condition data. Once field data is collected it will be forwarded to the Environmental Resources Section at the Denver Headquarters of the Division of Wildlife. The data will then be processed through a computer program to obtain specific data for analysis. Completion of the analysis will result in flow recommendations being made.

2) Map locations of important biological activities and significant terrestrial and aquatic habitats.

3) Develop recommendations for habitat protection and improvement of significant habitats.

4) One full-time clerical position will be required to facilitate completion of the computer data. This position will be required for a 12 month period, which due to responsibilities, will exceed the field collection period.

Estimated Expenditures:

Personal Services:

Name	Title	Period	Salary	Exp.	Total
4 Each	Wildl. Tech. 1-A	July 1-Oct. 30	$11,632	$10,600	$22,232
1	Adm. Clerk A	12 mos.	7,740		7,740
Clee Sealing	Wildlife Biologist	20 days	N/A	200	200
Ron Krager	Project Coordinator	20 days	N/A	200	200
Walt Burkhard		30 days	N/A	300	300
					$30,672

Operating Supplies, Services and Equipment

Item	Unit	Unit Cost	Total
Vehicle Mileage (2 Pick-up Trucks)	10,000 miles	.12¢/mile	1,200
Equipment Maintenance & Replacement			2,500
Data Preparation and Copying			500
Film and Processing			80
Computer Time	150 inputs	$5.00 ea.	750
			$ 5,030

Summary of Estimated Costs:

Personal Services	$30,672
Operating Supplies, Services & Equipment	5,030
Contingency	1,298
Total Cost of Project	$37,000

Responsibility: Colorado Department of Natural Resources, Division of Wildlife.

COLORADO DIVISION OF WILDLIFE

STREAM PROFILE

INSTRUCTION MANUAL

Stream Profile Measurement Manual

A SAG-TAPE METHOD OF CROSS SECTION MEASUREMENT FOR USE WITH INSTREAM FLOW DETERMINATIONS

General Description

The Sag-Tape procedure is designed to utilize a computer program (R-2 "CROSS") designed by Region 2 of the U. S. Forest Service and adopted by the Colorado Division of Wildlife.

This program is designed to calculate a series of hydrologic parameters based on field data collected with the Sag-Tape technique, and Manning's formula for stream discharge.

Field Equipment Needed.

1. Steel tape or chain. A 100 foot reel tape is normally used. It is necessary to know or determine the weight in pounds for a 1 (one) foot section of the tape. This can probably be obtained from the manufacturer for most surveying tapes. This weight (lbs/ft) is required for the computer program.

2. Tension Scale. This is a small spring scale that is used to measure the tension applied when stretching the tape between the two stakes of the cross-section. A regular tape tension scale is available described as a "Tape Tension Handle," 30 pound capacity such as K&E Co., Cat. No. 89-1071 or Lufkin Cat. No. 586.

3. Tape Clamp Handle. This is to hold the tape in tension. It can be a modified "vice-grip" or for steel tapes a Lufkin Tape Clamp Handle Cat. No. 584.

4. Cross-Section Stakes. Two metal stakes 24 to 36 inches in length. These must be strong enough to permit driving into a rocky stream bed and have some means for attaching the tension handle and clamp.

5. Measuring Rod. Any device suitable for measuring the distance in feet and tenths of feet from the tape to the channel bottom. The bottom half (0 to 6' section) of a surveyors rod is well suited.

6. Abney Hand Level. This should be calibrated in percent slope. It is necessary for leveling the tape and for determining stream gradient.

7. Current Meter. Either a Pygmy or Price type meter. The Pygmy is for shallow water as it is two-fifths as large as the Price.

8. Chalk Line and Line Level. Thirty feet in length and marked off in feet. This is to be used on streams 20 feet or less in width on calm days.

9. Hand sledge Hammer.

10. Field Forms. R-2 Cross Forms and Stream Discharge Measurement Forms.

Field Measurement Procedure

1. Establishing Cross-Sections. Data collected may eventually be involved in some type of litigation. Accuracy and documantation become essential. Errors in the field data, no matter how small greatly affect the computer program.

   a. Select an area within the survey section that will undergo the greatest physical change with changes in flow, i.e. wide, shallow riffles or long slow stretches.

   b. The profile should be made at the lower reach of such an area. It should not be influenced by areas of turbulence such as rapids, waterfalls, etc.

   c. Drive the stakes above the grass line (normal high water line, not flood stage) at approximately the same elevation. They should be at right angles to the stream channel and the water flow.

2. Measurement. Once the cross section is established, the steel tape or chain is stretched from the top of one of the cross-section stakes to the tape clamp and spring scale, which is attached to the other stake. Tension is applied to the tape, as the tape is drawn up and clamped. The tension shown on the scale must be at least 5 pounds, plus one pound for each 10 feet of transect length; i.e. stake to stake distance. The computer will correct for depth errors due to tape sag if it is given the weight of the tape in lbs/ft.; the length of tape across the transect or cross-section, and the tension in lbs. on the spring

scale. Use the Abney level to make sure the ends of the tape are level.

Depth measurements are taken from the tape to the ground surface or channel bottom and recorded in feet and tenths. The first and last measurements are always taken at the cross-section stakes. Measurements may be taken along the tape at fixed intervals, or at any interval desired to show changes in the existing ground surface or channel bottom. It is important to remember the computer does not know the shape of the cross-section, but reconstructs it from measurement data as though it were a series of straight line segments between the cross-section stakes. Therefore, the surveyor should take care to perform sufficient depth measurements to adequately describe the cross-section profile.

Notes on Measurement Sources of Error

A. Tape Tension. Be sure to have at least 5 pounds plus 1 pound for each 10 feet of cross-section. Apply extra tension if in doubt.

B. Level cross-section stakes. This operation of leveling the tops of the two cross-section stakes or the tape ends is fairly important. The tops of the two stakes should be on the same level line, or nearly so to prevent an inadvertent skewing of the program output data.

C. Distance. Concerning the physical hookup of the sag-tape field equipment, be sure that the "0" distance mark on the tape is actually at or affixed to the "0"-point stake of the cross-section. This point is a key reference point in the program procedure.

D. Depth. When measuring along the tape or longer cross-sections, it is sometimes necessary to manipulate the tape by hand to read the distance. Avoid inadvertent lifting or depression of the tape which may disturb the natural "sag".

E. Streambank-Waterline Intersect Distance from "0"-Point. It is extremely important to accurately locate the distance from the "0"-point at which the first and furthest waterlines are encountered across the width of the channel. Do not take horizontal measurements at increments less than .5 foot foot. (Example: 0 - .5 - 1 - 1.5 - 2 - 2.5 - 3 - 3.5, etc.)

Note: On long cross-sections the depth from tape to bottom at the waterline points may not be the same on both sides of the channel due to tape "sag", and if the actual water channel is off-center of the total cross-section.

F. Entry of Data on Field Form. Double check the distance and depth measurement entries. Make sure what you measured is what you entered, and what you entered is in the required format. Key punching is done directly from the field form and most of the plot-abort-incidents to date have been due to erroneous field data entered on the form.

G. Discharge Measurement. Actual discharge measurement procedures should follow those of:

United States Geological Survey

Discharge Measurements of Gaging Stations

Book 3 Chapter A-8

If the water depth is under 2.5 feet use the .6 method if over 2.5 feet use the .2-.8 method. The number of measurements can be variable as long as no more than 10 percent of the total flow is between two measurements.

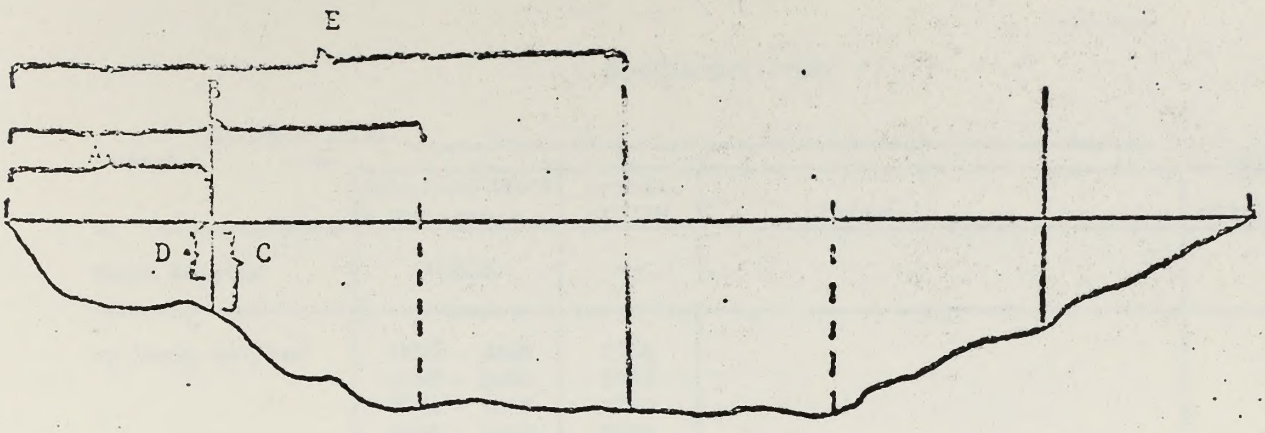
Divide the width of the stream by the number of observation sections. For simplicity it should be an even number. This distance is B. The first reading "A" will be at one-half that distance. Each succeeding reading will increase by the width of the observation section. This refers to the following figure. The letters refer to figure and to field form.

H. Number of Profiles Required per Stream Section.

At least two profiles will be taken along each section of typical stream reach. One profile at the lower terminus and one profile at the upper terminus. Judgement may dictate additional profiles if stream channel charactertics change or major tributaries enter the channel. Location of profiles must be selected to consistently represent the stream section being studied.

I. Photographs. At least one 35 mm color slide will be taken of each profile site and correctly identified once developed. The original slide or duplicate will be forwarded with the field data forms.

J. Average Rock Size. List on field form estimate of average rock size within the channel where profile is taken. Use attached breakdown on stream substrate for making estimate.



A = Distance from initial point on first reading--(A is always ½ B)

B = Width of measured section--each section should be equal

C = Depth of section

D = Meter depth (observation depth)

E = Distance from initial point of second reading

F = Revolutions = number of revolutions counted on meter

G = Time in seconds = length of reading

H = At point = velocity from meter rating table for each reading

I = Mean in vertical = if two readings are taken on each section (.2 and .8) average them in this column

J = Area = Width x depth or B x C

K = Discharge - mean velocity x area or I x J

Sum these to bottom of page to determine total discharge in cfs

Stream Substrate

OBSERVERS: _____

	measurements in mm-range	Approx. MEDIAN	TALLY	TOTAL
mooth Boulder	>4000	--		
ry Large Boulder	3500 - 4000 3000 - 3500 2500 - 3000 2000 - 2500	3750 3250 2750 2250		
rge Boulder	1650 - 2000 1330 - 1650 1000 - 1330	1825 1490 1165		
dium Boulder	830 - 1000 665 - 830 500 - 665	915 750 580		
all Boulder	415 - 500 335 - 415 250 - 335	450 375 290		
rge Cobble	190 - 250 130 - 190	220 160		
all Cobble	100 - 130 64 - 100	115 85		
ry Coarse Gravel	50 - 64 32 - 50	57 40		
arse Gravel	16 - 32	24		
dium Gravel	8 - 16	12		
ne Gravel	4 - 8	6		
avel	2 - 4	3		
y arse Sand	1 - 2	1.5		
k t/Clay	<1	--		

PROGRAM NARRATIVE OUTLINE

For Research and Survey
Part IV Program Narrative

State: Colorado Project Number: W-38-R

Project Title: Piceance Deer Study

I. Study Title: Topographic and Vegetative Characteristics of Preferred Mule Deer Winter Habitats in The Piceance Basin

A. Need -- Current and future oil shale related activities in the Piceance Basin require constant input by wildlife interests into decision making on facility placement, roads, etc. The wintering mule deer herd in the area is one of the largest and most important in Colorado and is a key consideration in such decisions. However, only recently has much factual information been collected on deer herd dynamics and habitat use. Unfortunately, much of this information has been on a broader scale than is required for many of the recommendations that are made.

One facet of critical importance is identification of specific characteristics of deer winter habitats condusive to winter survival. Previous work on winter deer distribution in the basin indicates changing winter climatic conditions, particularly snow, affects deer choice of habitats. Identification of key characteristics of those habitats used by deer under various climatic conditions should provide a better understanding of deer-habitat relations in the Piceance Basin.

PROGRESS REPORTING OUTLINE

For Research and Survey
Part IV Program Narrative

State: Colorado Project Number: W-98-R

Project Title: Cheyenne River Study

I. Study Title: Topography and Vegetative Characteristics of Preferred Mule Deer Winter Habitats in the Cheyenne Basin

A. Goal -- Current and future oil shale related activities in the Cheyenne Basin require consideration by wildlife interests into decision making on facility placement, roads, etc. The wintering mule deer herd in the area is one of the largest and most important in Colorado and is a key consideration in such decisions. However, only recently has some factual information been collected on deer herd movements and habitat use. Unfortunately, much of this information has been on a broader scale than is required for many of the recommendations that are made.

One facet of critical importance is identification of specific characteristics of deer winter habitat conducive to winter survival. Previous work on winter deer distribution in the basin indicates marginal winter climatic conditions, particularly snow, affects deer winter habitats. Identification of key characteristics of these habitats used by deer under various climatic conditions should provide a better understanding of interrelationships relating to the Cheyenne Basin.

B. Objective -- To identify topographic and vegetational characteristics of mule deer winter habitats used under varying climatic conditions.

C. Expected Results or Benefits -- Assessment of winter habitat characteristics important to mule deer survival has immediate and long-range application to the oil shale situation in the Piceance Basin. This knowledge will enable recommendations on specific habitat areas that should be protected and why. It is best to preserve such areas at the start rather than attempt restoration in the end. For areas that are disturbed, recommendations can be made concerning those aspects that should be restored for the benefit of mule deer.

D. Approach -- Several study areas will be selected within the Piceance deer winter range to represent the different habitat situations that exist. Deer presence and activity will be recorded on each area at intervals during the time most deer are on the winter range. The precise locations of animals observed from both ground and air reconnaisance will be plotted on maps so they can be related to selected topographic and vegetational features of the sites. Climatic measurements will be made on each area to aid in interpreting deer habitat use patterns. The necessary topographic and vegetation data will be obtained from maps, photos and field surveys during summers by appropriate analysis methods.

Implementation of the study is desired during June, 1976. Three winters of data gathering will be needed to accommodate variability between winters. Topographic and vegetation data will be gathered on each study area over a two-summer period. Final analysis and reporting of study results will be completed by late summer, following the final winter's work. (Time schedule and estimated personnel and budgetary needs will be inserted prior to final sign-off. This segment has been delayed due to a severe eye injury incurred by the project director, Richard Bartmann of the Division of Wildlife).

Attachment No. 1, 1977
BLM-DOW Sikes Act Contract;
Second Year

Project Title: Survey of Sage Grouse Strutting Ground Complexes, Production and Concentration Areas Within the Piceance Basin Wildlife Habitat Area

Duration of Study: Phase II, March 15 through September 30, 1977. Additional phases as funds become available.

Background and Need:

Much of the land in the Piceance Basin is publicly owned and managed by the Bureau of Land Management. Public lands in the Northwest Region are rapidly being explored and developed for energy sources. This activity will reduce the carrying capacity of some lands which have supported good wildlife populations. There is an urgent need to develop available lands to increase their wildlife carrying capacity to offset losses. Benefits to habitat development are generally slow to materialize. Little data are available for this area regarding the sage grouse population and potential for habitat improvement. Base population indices are necessary to evaluate the effectiveness of development. This project will provide the necessary information preliminary to actual improvement. Future development is expected to follow the Western States Sage Grouse Committee's recommendations for improving sage grouse habitat.

In Phase I, approximately 1/2 of the available sage grouse range in the Piceance Basin was inventoried.

Objectives:

1) Map current and potential sage grouse habitat.

2) Map occupied sage grouse population range, and determine locations of significant biologic activity areas.

3) Provide population indices for spring breeding and fall populations.

4) Identify potential locations for habitat improvement.

5) Determine current use of habitat improvement sites.

Procedures:

1) Locate and map strutting grounds and conduct counts (April 1-May 15).

2) Map Habitat.

3) Map population range.

4) Locate and map production and brood rearing areas and count broods (July 15-September 15).

5) Locate springs, potential meadow sites and areas for habitat protection and enhancement (July 1-Sept. 30).

6) Recommend areas and treatments for habitat protection and enhancement.

7) Prepare project report.

Estimated Expenditures:

Personal Services

Name	Title	Period	Salary	Expense	Total
	Wildlife Tech. 1-A	6 mos. (3/15-9/15) at $727.	$4,362	$700.00	$5,062
Ron Krager	Project Coordinator	10 days	N/A	100.00	100
Harvey Donoho	Small Game Supervisor	5 days	N/A	0	0
Tom Henry	Regional Biologist	5 days	N/A	0	0
					$5,162

. . . . . .

Operating Supplies, Services and Equipment

Item	Unit	Unit Cost	Total
Misc. Supplies, Maps, Photos			$ 238
Postage, Phone			100
Pickup		Oper. & Maint.	1,500
Fixed-wing aircraft	20 hours	$50/hr.	1,000
			$2,838

Summary of Estimated Costs:

Personal Services	$5,162.00
Operating Supplies, Services and Equipment	2,838.00
Total	$8,000.00

Responsibility: Colorado Department of Natural Resources, Division of Wildlife

Attachment No. 2, 1977
BLM-DOW Sikes Act Contract
Second Year

Project Title: Study to Determine Competition Between Wildlife and Livestock on Winter Range Within the Piceance Basin Wildlife Habitat Area

Duration of Study: April 1, 1977 through December, 1977; Field Collections May-June, 1977.

Background and Need:

During the past 15 years mule deer (*Odocoileus hemionus*) populations in Colorado and throughout the west have been declining as reflected in Colorado's record low deer harvest of 1975 (Riffel, 1975; Lashnits, 1975). This decline in all of the Western States happened even though well-trained wildlife biologists applied the best management techniques available to correct this situation (Smith, 1976).

The "wildlife attitude" of twenty years ago is reflected in Hay et al. (1961) and Hansson et al. (1962). They state that a reduction in numbers in the mule deer herds existing in the 1950's and early 1960's by either sex hunts is necessary in order to replenish the deteriorating habitat. They implied that high mule deer mortality which was being observed on winter ranges, apparently due to undernourishment, could be decreased if herd numbers were reduced by hunter harvests. There is current concern for mule deer populations which have continued to decline in areas where mortality from hunter harvests has been controlled and greatly restricted in recent years. Many of these same areas are not being influenced by urban sprawl, highway construction, surface mining disturbances, or by recent changes in livestock grazing.

The concern of deer populations presently at a low level in many western states (Wynkoop, 1974; Salwasser, 1975) coupled with winter mortality remaining as high as it was in the 1950's and early 1960's (Salwasser, 1975; Bartmann, 1974a, 1974b), clearly indicates that a more detailed investigation into the casual factors of deer winter mortality is warranted.

Although numerous studies have been undertaken to determine mule deer seasonal diets (Carhart and Coutts, 1941; Trout and Thiessen, 1968 Medin and Anderson, 1973; Kufeld et al. 1973; Hansen and Dearden, 1975) there are few recent studies in Colorado which link the diets of deer and livestock for the same winter range area (Hansen and Reid, 1975). Perusal of the literature Suggests that more is published about mule deer diets on winter ranges than is known about livestock diets on mule deer winter ranges. Although mule deer and livestock may not use mule deer winter range simultaneously, there is concern for the potential depletion of mule deer foods by livestock which graze during the fall and winter seasons. Some plants which could potentially support higher mule deer numbers on their winter ranges may be removed by livestock when the deer are on their summer range. This aspect of food competition has not been adequately documented but needs to be investigated. On winter ranges of mule deer, the effects of grazing by livestock in the fall or winter might limit the numbers of deer which can survive, if common foods are in short supply.

Objective:

1) To determine the proportions of the major foods of mule deer and livestock on selected winter ranges of mule deer.

Procedures:

1) Sampling areas will be selected by BLM and DOW personnel on the basis of suspected competition for forage.

2) The major foods eaten from each area will be quantified by a microhistological technique (Sparks and Malechek, 1968) from fecal samples of deer and livestock. The samples will be collected on a monthly basis. The areas within a drainage basin will be at least one half mile apart and the collections will be spread out to cover at least 0.25 mile square.

3) The Colorado Division of Wildlife, in consultation with the Bureau of Land Management, will obtain for each of the study areas records on the season and extent of use by month for deer and each livestock class.

4) At least 50 subsamples of fecal material for each herbivore will be collected from each area. One pellet (deer or sheep) from different pellet groups will be dropped into the appropriate labeled paper bag until 50 or more have been composited together to make up a sample from an area. A very small "pinch" of dung from cattle or horses from each of 50 (or more) different droppings will be composited to make a sample.

5) Microanalysis will be conducted by the CSU Composition Analysis Laboratory. Five microscope slides will be made from each sample. The percentages of forage classes in the "diets" will be determined from the examination of 20 microscope fields per microscope slide at 100X on slides made so about 3 identifiable fragments can be found in each microscope field.

   Similarity of foods consumed between herbivore species, between areas, will be determined by Kulcyznski's formula (Oosting, 1956) and by Spearman's rank-order correlation (Snedecor and Cochran, 1973). High similarity in diets, high positive rank-order correlations, and high use on the same plants may be used to suggest potential high "competition" between herbivores for plants growing on winter ranges.

Personnel:

The work at the Composition Analysis Laboratory and field collection of samples will be supervised by Dr. Richard M. Hansen. The microhistological preparations and analyses will be technically supervised by Ms Terry Foppe and

Ms Mary Gilbert who are full time staff members of the Composition Analysis Laboratory. In addition, the laboratory has five others who work part time in microhistological analyses. Mr. Gary Lucich, who is conducting a study on the foods eaten by does and fawns during the late pregnancy and lactation periods, may be the technician who does most of the microscopic analyses on these samples.

Selection of study areas and determination of seasonal use by deer and livestock will be accomplished by Division personnel. Ron Krager will coordinate Division activities and provide data to Dr. R. Hansen.

Estimated Expenditures:

Personnel Services	$ 650.00
Operating Supplies and Services	100.00
Laboratory Analysis 1/	2,250.00
Total Cost of Project	$3,000.00

1/ The Composition Analysis Laboratory has computer programs which will routinely obtain average plant compositions with standard errors or standard deviations; diversity in diets; diet overlaps; and Spearman's rank-order statistic.

Responsibility: Colorado Department of Natural Resources, Division of Wildlife and through agreement with Dr. Richard M. Hansen, Colorado State University.

Attachment No. 3, 1977
BLM-DOW Sikes Act Contract,
second year.

Project Title: Nongame Wildlife Survey, Pre and Post Treatment Evaluations of Habitat Improvement Sites and Identification of Significant Habitat Areas for Selected Birds and Mammals on the Critical Status List; Piceance Basin Wildlife Habitat Area.

Duration of Study:

Phase II: April 1 through September 30, 1977

Phase I has been completed; Additional Phases in same period in subsequent year, or at intervals, as funds available.

Background and Need:

Under the Piceance Basin Habitat Management Plan, Job Documentation Reports and Research Proposals, two habitat projects have been scheduled for treatment and study.

1) Greasewood - Sagebrush chaining and reseeding, 100 acres; scheduled for the summer of 1978.

2) Lee Gulch - Pinyon-Juniper chaining, 400 acres, completed Sept. 1976.

Habitat manipulation project studies have commonly monitored changes in biotic communities after habitat modification, but little, if any, baseline data prior to the manipulations have been obtained for nongame wildlife. It is imperative, therefore, that qualitative and quantitative data on nongame wildlife be obtained prior to habitat modification to be used as a baseline against which to assess the effect on these populations of such alterations.

Comprehensive and intensive inventories of nongame birds and mammals are needed in the habitat manipulation areas prior to and following treatment. There is also a considerable need to compile information available on nongame wildlife throughout the Piceance Basin and to identify the significant habitat areas used by selected species so that measures to protect various habitats can be included in habitat management plans.

Phase II Objectives:

1) Determine the species and numbers of nongame birds and mammals present on the Greasewood Gulch habitat manipulation area prior to initiation of the treatment.

2) Determine the post-modification populations of nongame bird and mammals on the Lee Gulch treatment area.

3) Assess the immediate effect of habitat treatment on nongame birds and mammals by comparing pre and post-treatment data from the Lee Gulch Site.

4) Gather and evaluate nongame bird and mammal data available for the Piceance Basin Wildlife Habitat Area from other studies and use these data to determine sensitive habitat areas for select nongame species.

Procedures: (In Sequence)

1) Review data from C-a and C-b tract studies, U.S. Fish and Wildlife Service studies, and Colorado Division of Wildlife studies to determine sensitive habitat areas for select nongame species in Piceance Basin.

2) For birds, conduct eight complete census surveys on both study areas between 20 May and June 30, 1977.

3) For mammals, data will be gathered by live-trapping and snap-traping according to the guidelines established on the two study areas in 1976. General guidelines are as follows:

Area	Sample Technique	Time
Lee Gulch	Snap-trap	5 May - 3 June
Lee Gulch	Live-trap	12 August - 21 August
Greasewood Gulch	Live-trap	14 July - 24 July
Greasewood Gulch	Snap-trap	15 August - 21 August

4) Compile and analyze pre and post-treatment data.

5) Prepare overall project report.

Estimated Expenditures:

Personal Services:

Name	Title	Period	Salary	Expense	Total
2 each	Wildlife Tech. 1-A	4/1-9/30/77 6 Mos.	$727/mo.	$8,724	$8,724
Ron Krager	Project Coordinator	15 Days	N/C		0
Tom Henry	Regional Biologist	10 Days	N/C		0
Walt Graul Steven Bissell	Nongame Bird and Nongame Mammal Specialist	20 Days	N/C		0
			Total		$8,724

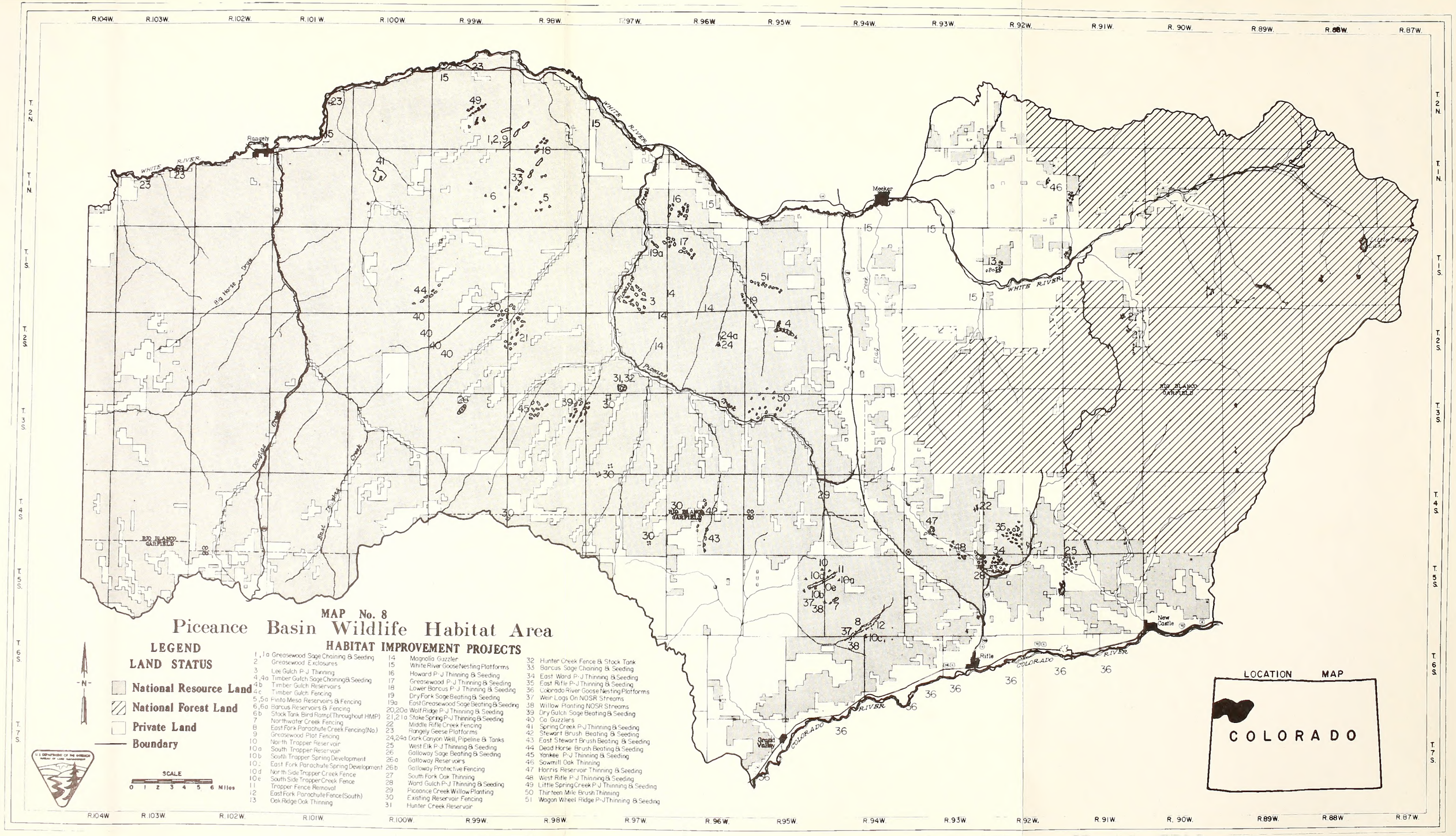
Operating, Supplies, Services and Equipment

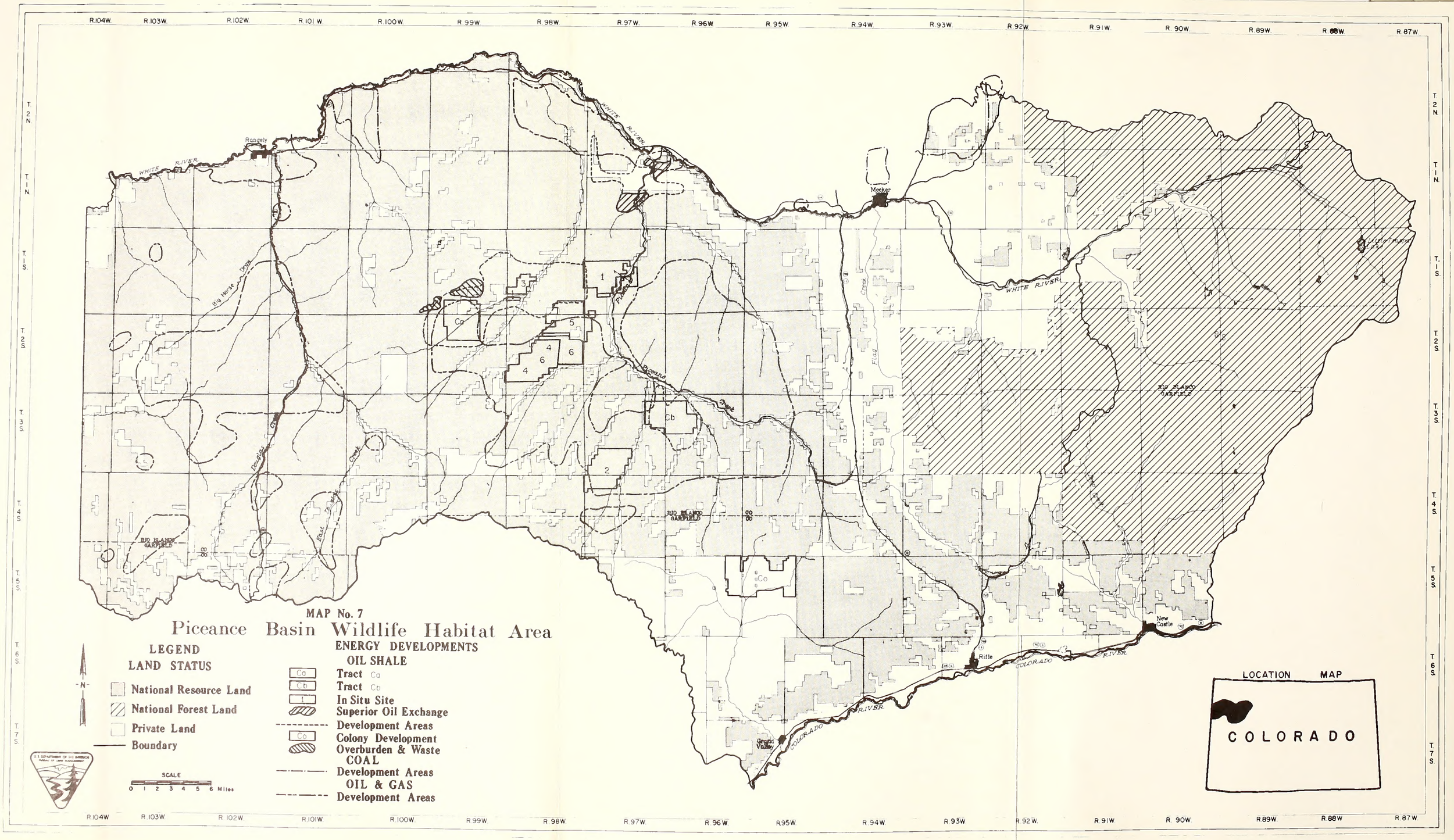
Item	Total
Pickup Operation and Maintenance or Mileage Payment if Needed	$1,500
Misc. supplies (bait, tags, paint, maps, aerial photos)	150
Paper, forms, postage, phone	126
Total	$1,776

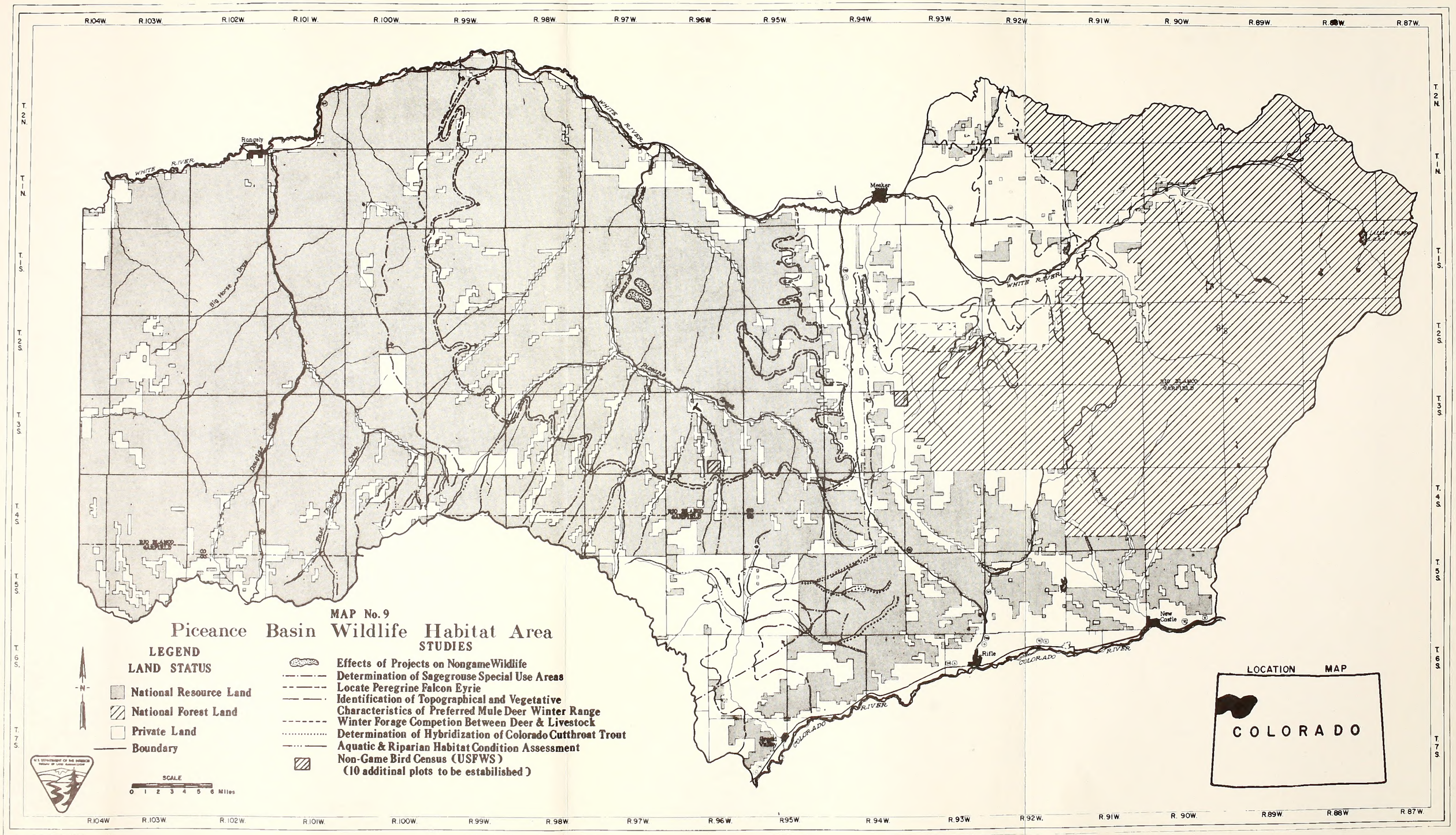
Summary of Estimated Costs:

Personal Services	$8,724
Operating Supplies, Services and Equipment	1,776
Total	$10,500

Responsibility: Colorado Department of Natural Resources, Division of Wildlife


MAP No. 8
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
SCALE
0 1 2 3 4 5 6 Miles
HABITAT IMPROVEMENT PROJECTS
1,1a Greasewood Sage Chaining & Seeding
2 Greasewood Exclosures
3 Lee Gulch P-J Thinning
4,4a Timber Gulch Sage Chaining & Seeding
4b Timber Gulch Reservoirs
4c Timber Gulch Fencing
5,5a Pinto Mesa Reservoirs & Fencing
6,6a Barcus Reservoirs & Fencing
6b Stock Tank Bird Ramp (Throughout HMP)
7 Northwater Creek Fencing
8 East Fork Parachute Creek Fencing (No.)
9 Greasewood Plot Fencing
10 North Trapper Reservoir
10a South Trapper Reservoir
10b South Trapper Spring Development
10c East Fork Parachute Spring Development
10d North Side Trapper Creek Fence
10e South Side Trapper Creek Fence
11 Trapper Fence Removal
12 East Fork Parachute Fence (South)
13 Oak Ridge Oak Thinning
14 Magnolia Guzzler
15 White River Goose Nesting Platforms
16 Howard P-J Thinning & Seeding
17 Greasewood P-J Thinning & Seeding
18 Lower Barcus P-J Thinning & Seeding
19 Dry Fork Sage Beating & Seeding
19a East Greasewood Sage Beating & Seeding
20,20a Wolf Ridge P-J Thinning & Seeding
21,21a Stake Spring P-J Thinning & Seeding
22 Middle Rifle Creek Fencing
23 Rangely Geese Platforms
24,24a Dark Canyon Well, Pipeline & Tanks
25 West Elk P-J Thinning & Seeding
26 Galloway Sage Beating & Seeding
26a Galloway Reservoirs
26b Galloway Protective Fencing
27 South Fork Oak Thinning
28 Ward Gulch P-J Thinning & Seeding
29 Piceance Creek Willow Planting
30 Existing Reservoir Fencing
31 Hunter Creek Reservoir
32 Hunter Creek Fence & Stock Tank
33 Barcus Sage Chaining & Seeding
34 East Ward P-J Thinning & Seeding
35 East Rifle P-J Thinning & Seeding
36 Colorado River Goose Nesting Platforms
37 Weir Logs On NOSR Streams
38 Willow Planting NOSR Streams
39 Dry Gulch Sage Beating & Seeding
40 Co. Guzzlers
41 Spring Creek P-J Thinning & Seeding
42 Stewart Brush Beating & Seeding
43 East Stewart Brush Beating & Seeding
44 Dead Horse Brush Beating & Seeding
45 Yankee P-J Thinning & Seeding
46 Sawmill Oak Thinning
47 Harris Reservoir Thinning & Seeding
48 West Rifle P-J Thinning & Seeding
49 Little Spring Creek P-J Thinning & Seeding
50 Thirteen Mile Brush Thinning
51 Wagon Wheel Ridge P-J Thinning & Seeding
LOCATION MAP
COLORADO
Rangely
Meeker
Rifle
New Castle
Grand Valley
WHITE RIVER
COLORADO RIVER
Big Horse Creek
Douglas Creek
Piceance Creek
Yellow Creek
Stake Springs Creek
Dry Fork
Hunter Creek
Wagon Wheel Ridge
Little Spring Creek
Dead Horse Creek
Sawmill Creek
Harris Creek
Ward Gulch
Stewart Gulch
Galloway Creek
Dry Gulch
Lee Gulch
Timber Gulch
Trapper Creek
Oak Ridge
Magnolia Guzzler
Big Blanco Garfield
Rio Blanco Garfield
Mesa Garfield
R.104W. R.103W. R.102W. R.101W. R.100W. R.99W. R.98W. R.97W. R.96W. R.95W. R.94W. R.93W. R.92W. R.91W. R.90W. R.89W. R.88W. R.87W.
T.2N. T.1N. T.1S. T.2S. T.3S. T.4S. T.5S. T.6S. T.7S.


R.104W.
R.103W.
R.102W.
R.101W.
R.100W.
R.99W.
R.98W.
R.97W.
R.96W.
R.95W.
R.94W.
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T.2N.
T.1N.
T.1S.
T.2S.
T.3S.
T.4S.
T.5S.
T.6S.
T.7S.
Rangely
WHITE RIVER
Big Horse Draw
Douglas Creek
Piceance Creek
Meeker
Flag Creek
Grand Valley
Rifle
New Castle
COLORADO RIVER
RIO BLANCO
GARFIELD
Co
Cb
1
2
4
5
6
MAP No. 7
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
ENERGY DEVELOPMENTS
OIL SHALE
Tract Co
Tract Cb
In Situ Site
Superior Oil Exchange
Development Areas
Colony Development
Overburden & Waste
COAL
Development Areas
OIL & GAS
Development Areas
N
SCALE
0 1 2 3 4 5 6 Miles
LOCATION MAP
COLORADO


R.104W.
R.103W.
R.102W.
R.101W.
R.100W.
R.99W.
R.98W.
R.97W.
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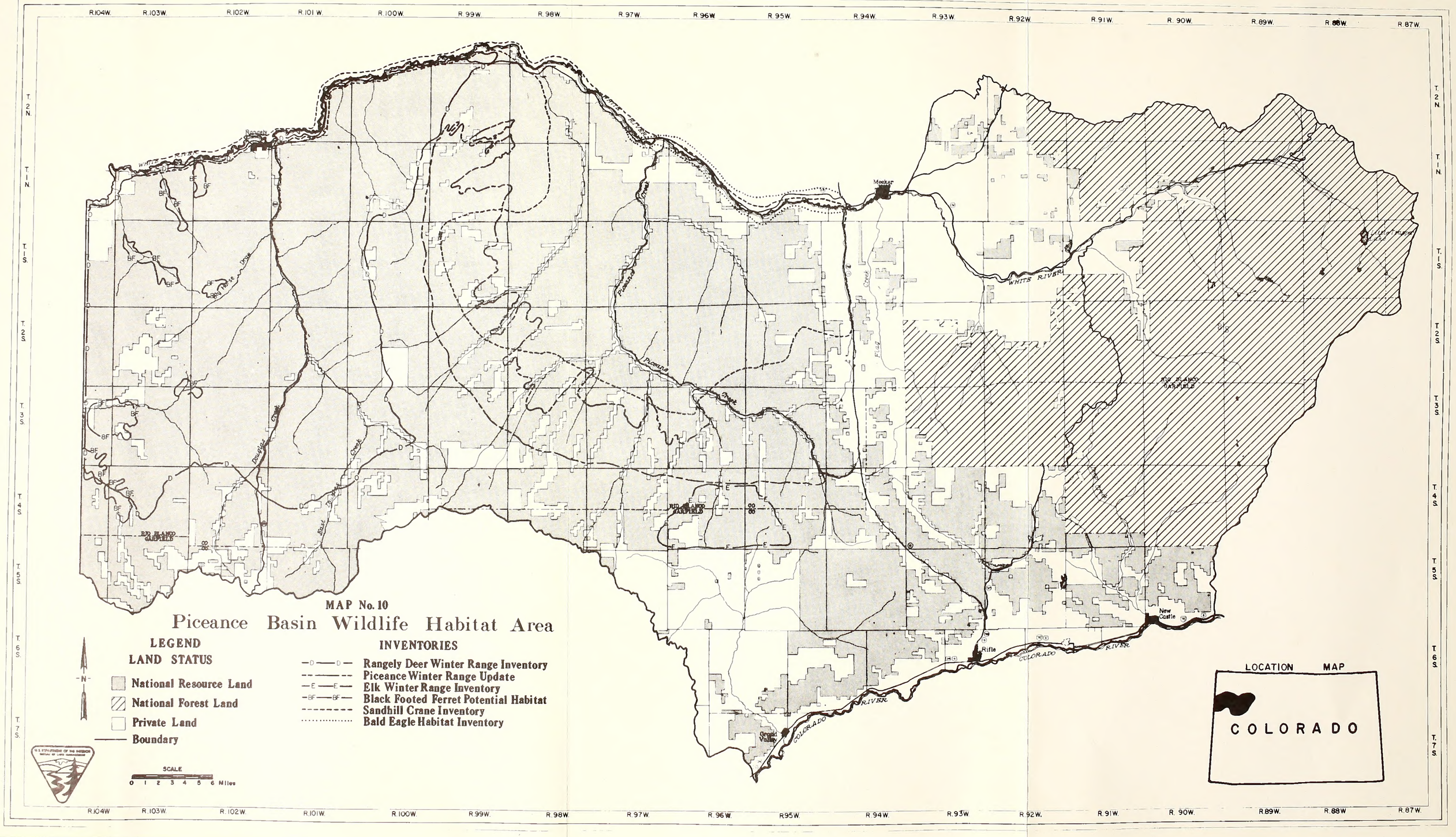
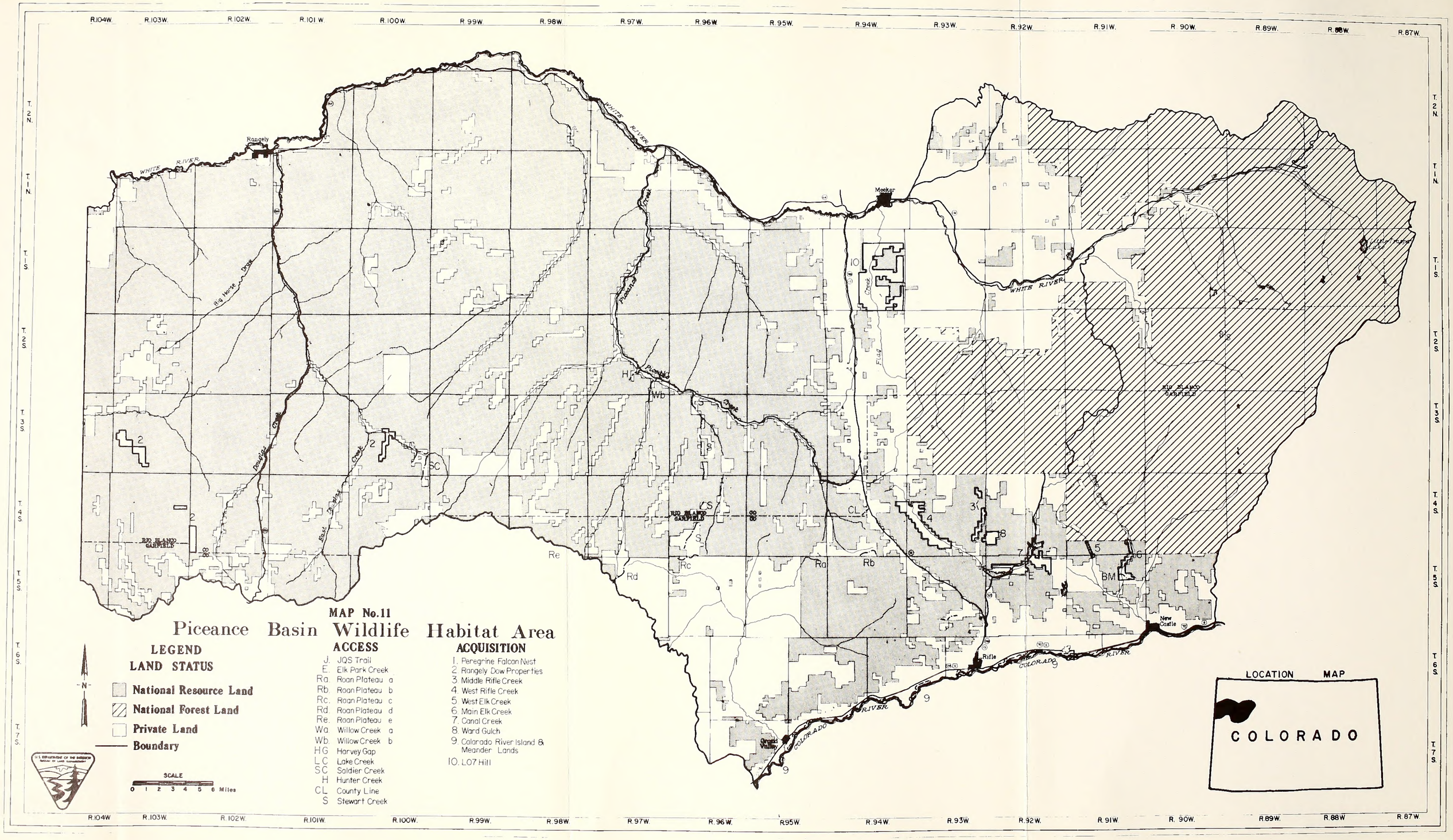
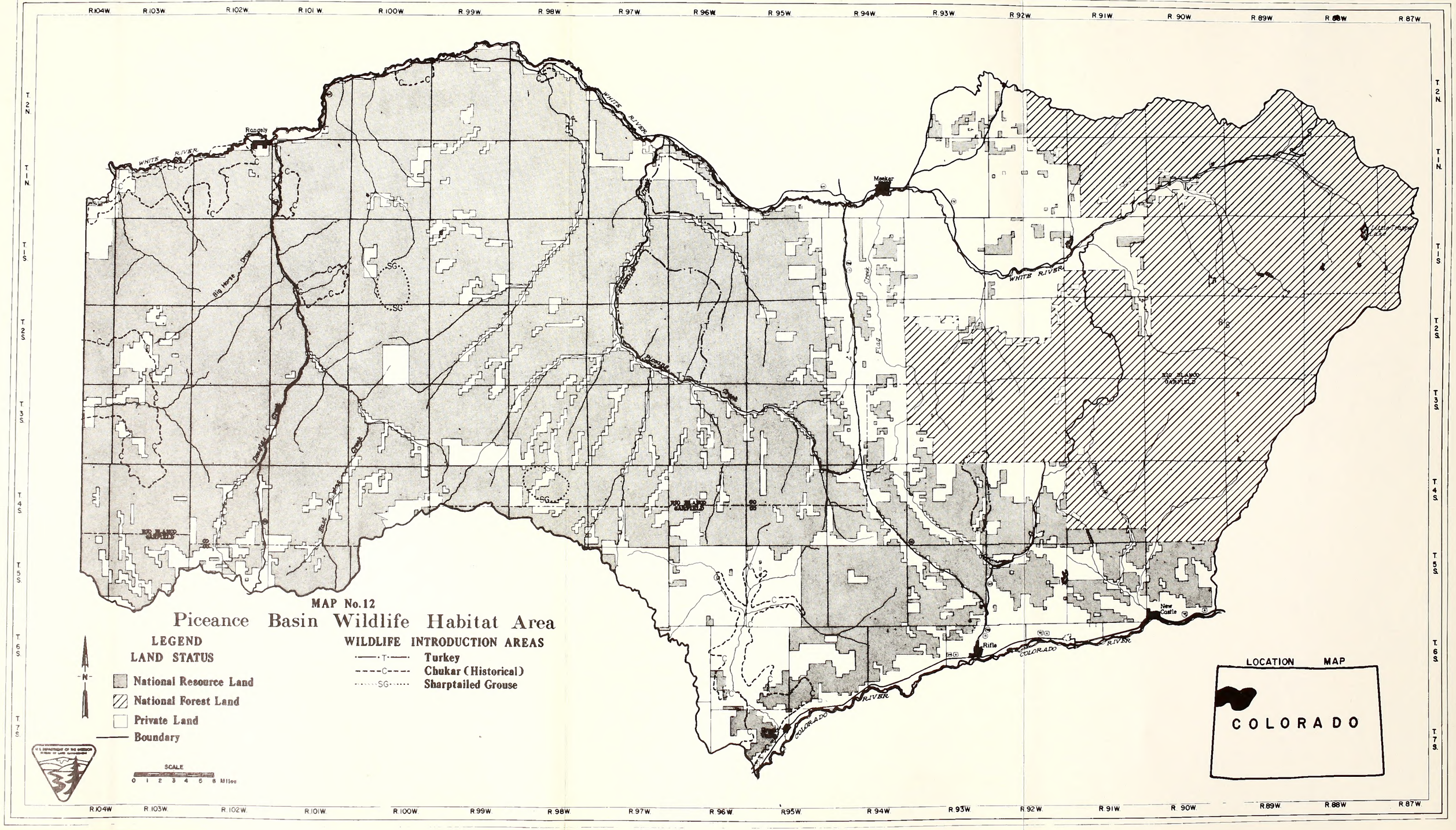
R.95W.
R.94W.
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T. 2 N.
T. 1 N.
T. 1 S.
T. 2 S.
T. 3 S.
T. 4 S.
T. 5 S.
T. 6 S.
T. 7 S.
Rangely
WHITE RIVER
Big Horse Draw
Douglas Creek
Dry Fork
Plunkett
Meeker
BLM LAND
GARFIELD
Rifle
New Castle
COLORADO RIVER
MAP No. 9
Piceance Basin Wildlife Habitat Area
STUDIES
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
Effects of Projects on Nongame Wildlife
Determination of Sagegrouse Special Use Areas
Locate Peregrine Falcon Eyrie
Identification of Topographical and Vegetative Characteristics of Preferred Mule Deer Winter Range
Winter Forage Competion Between Deer & Livestock
Determination of Hybridization of Colorado Cutthroat Trout
Aquatic & Riparian Habitat Condition Assessment
Non-Game Bird Census (USFWS)
(10 additinal plots to be estabilished)
N
SCALE
0 1 2 3 4 5 6 Miles
LOCATION MAP
COLORADO

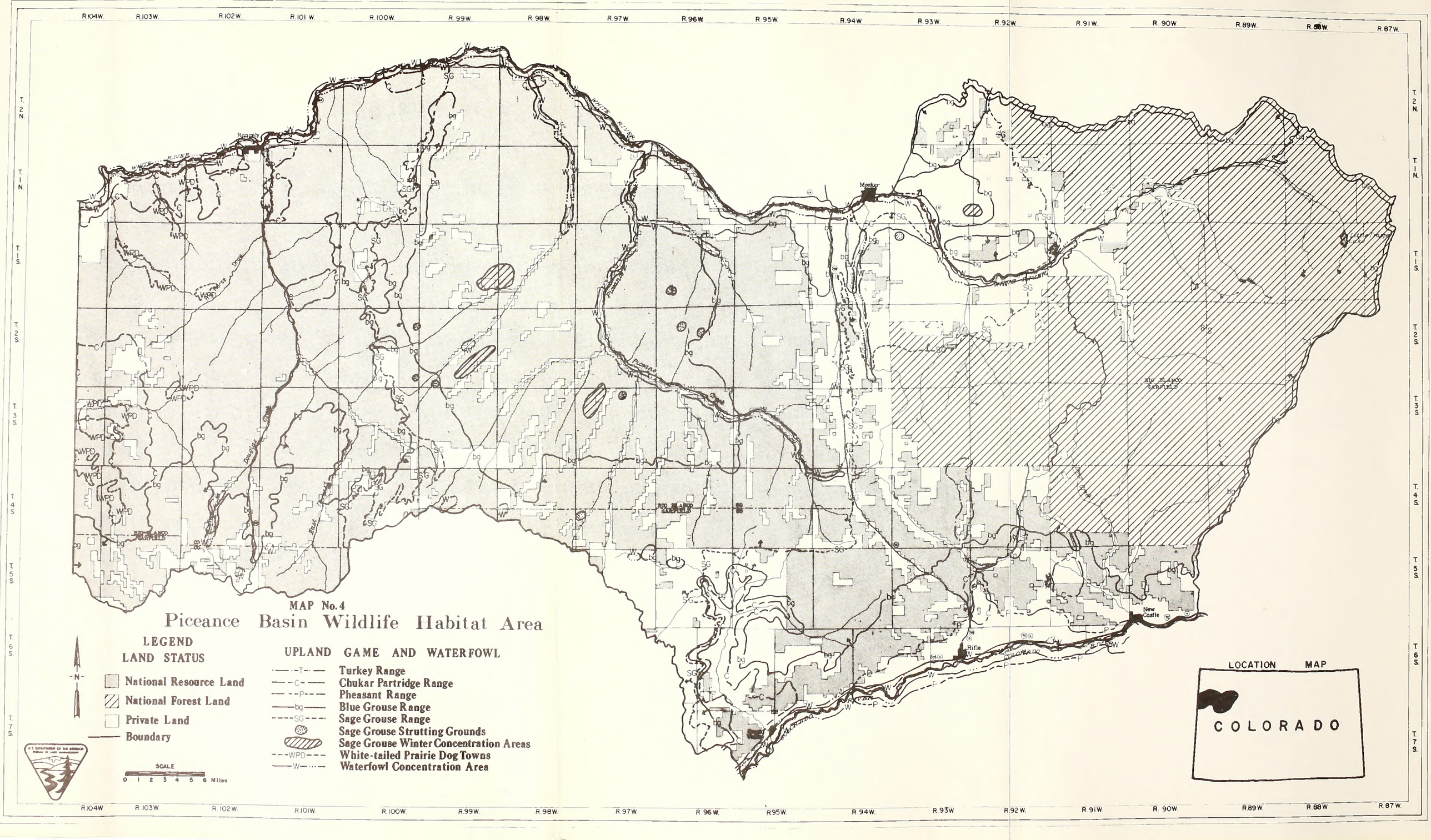

MAP No. 10
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
INVENTORIES
Rangely Deer Winter Range Inventory
Piceance Winter Range Update
Elk Winter Range Inventory
Black Footed Ferret Potential Habitat
Sandhill Crane Inventory
Bald Eagle Habitat Inventory
SCALE
0 1 2 3 4 5 6 Miles
N
LOCATION MAP
COLORADO
Rangely
Meeker
Rifle
New Castle
Grand Valley
WHITE RIVER
COLORADO RIVER
Piceance Creek
Douglas Creek
Big Horse Draw
Flag Creek
BLM LAND
BLM LAND
BLM LAND
R.104W.
R.103W.
R.102W.
R.101W.
R.100W.
R.99W.
R.98W.
R.97W.
R.96W.
R.95W.
R.94W.
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T.2N.
T.1N.
T.1S.
T.2S.
T.3S.
T.4S.
T.5S.
T.6S.
T.7S.

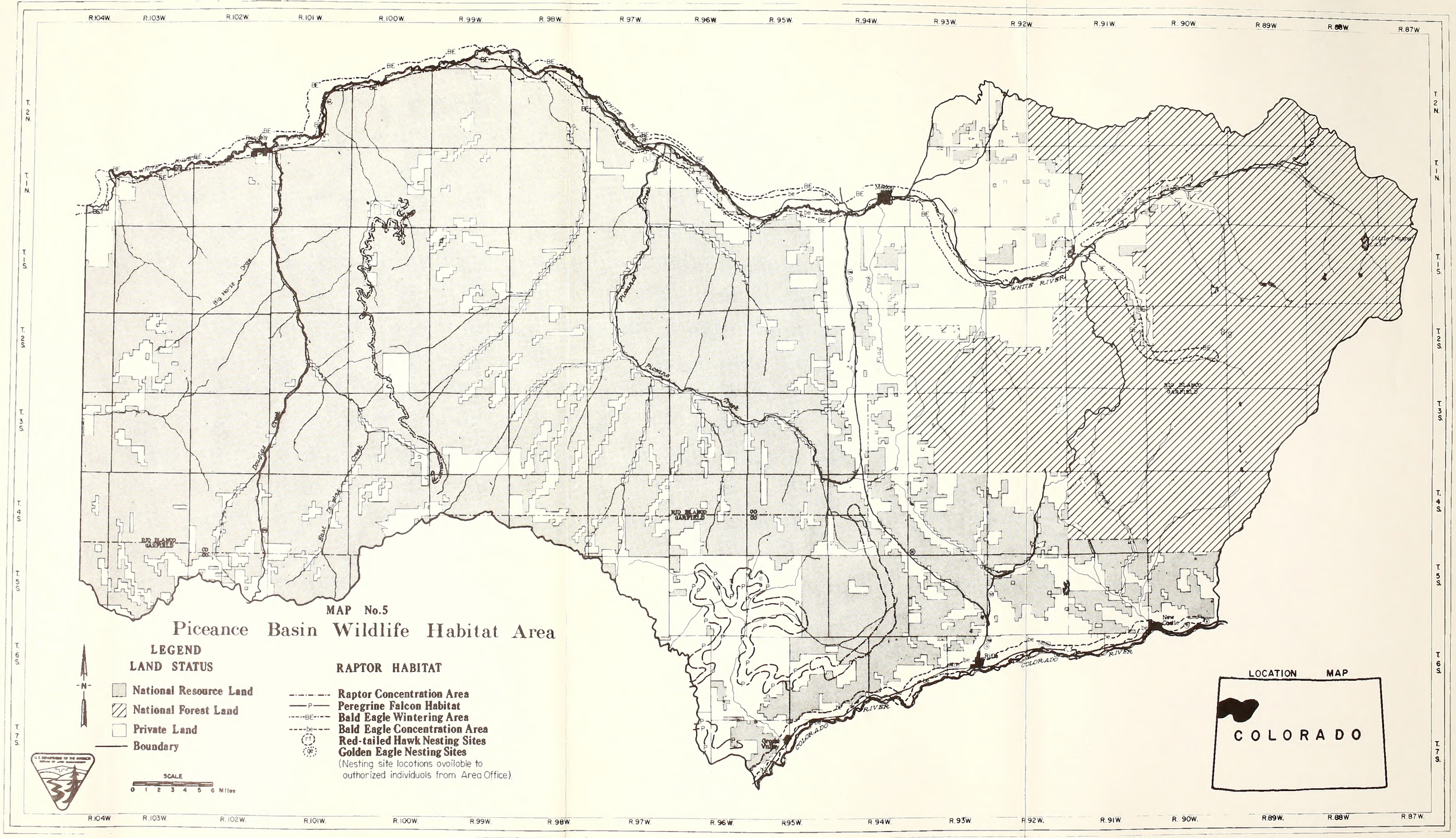

MAP No.11
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
N
SCALE
0 1 2 3 4 5 6 Miles
ACCESS
J. JQS Trail
E. Elk Park Creek
Ra. Roan Plateau a
Rb. Roan Plateau b
Rc. Roan Plateau c
Rd. Roan Plateau d
Re. Roan Plateau e
Wa. Willow Creek a
Wb. Willow Creek b
HG Harvey Gap
LC Lake Creek
SC Soldier Creek
H Hunter Creek
CL County Line
S Stewart Creek
ACQUISITION
1. Peregrine Falcon Nest
2. Rangely Dow Properties
3. Middle Rifle Creek
4. West Rifle Creek
5. West Elk Creek
6. Main Elk Creek
7. Canal Creek
8. Ward Gulch
9. Colorado River Island & Meander Lands
10. LO7 Hill
LOCATION MAP
COLORADO
Rangely
Meeker
Rifle
New Castle
Grand Valley
WHITE RIVER
COLORADO RIVER
Big Horse Draw
Douglas Creek
Piceance Creek
Yellow Creek
Flag Creek
RIO BLANCO
GARFIELD
R.104W. R.103W. R.102W. R.101W. R.100W. R.99W. R.98W. R.97W. R.96W. R.95W. R.94W. R.93W. R.92W. R.91W. R.90W. R.89W. R.88W. R.87W.
T.2N. T.1N. T.1S. T.2S. T.3S. T.4S. T.5S. T.6S. T.7S.



MAP No. 12

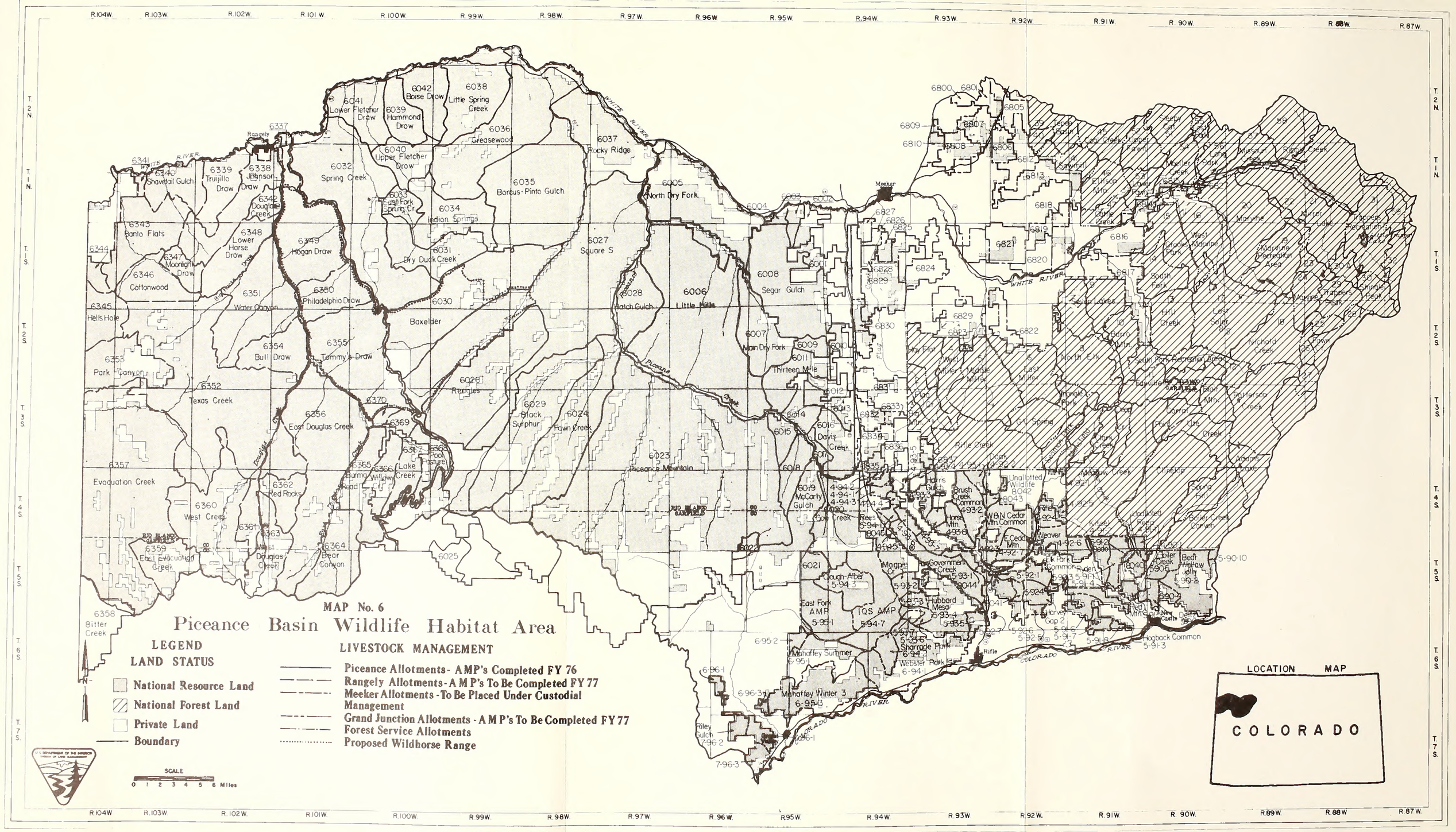
Piceance Basin Wildlife Habitat Area

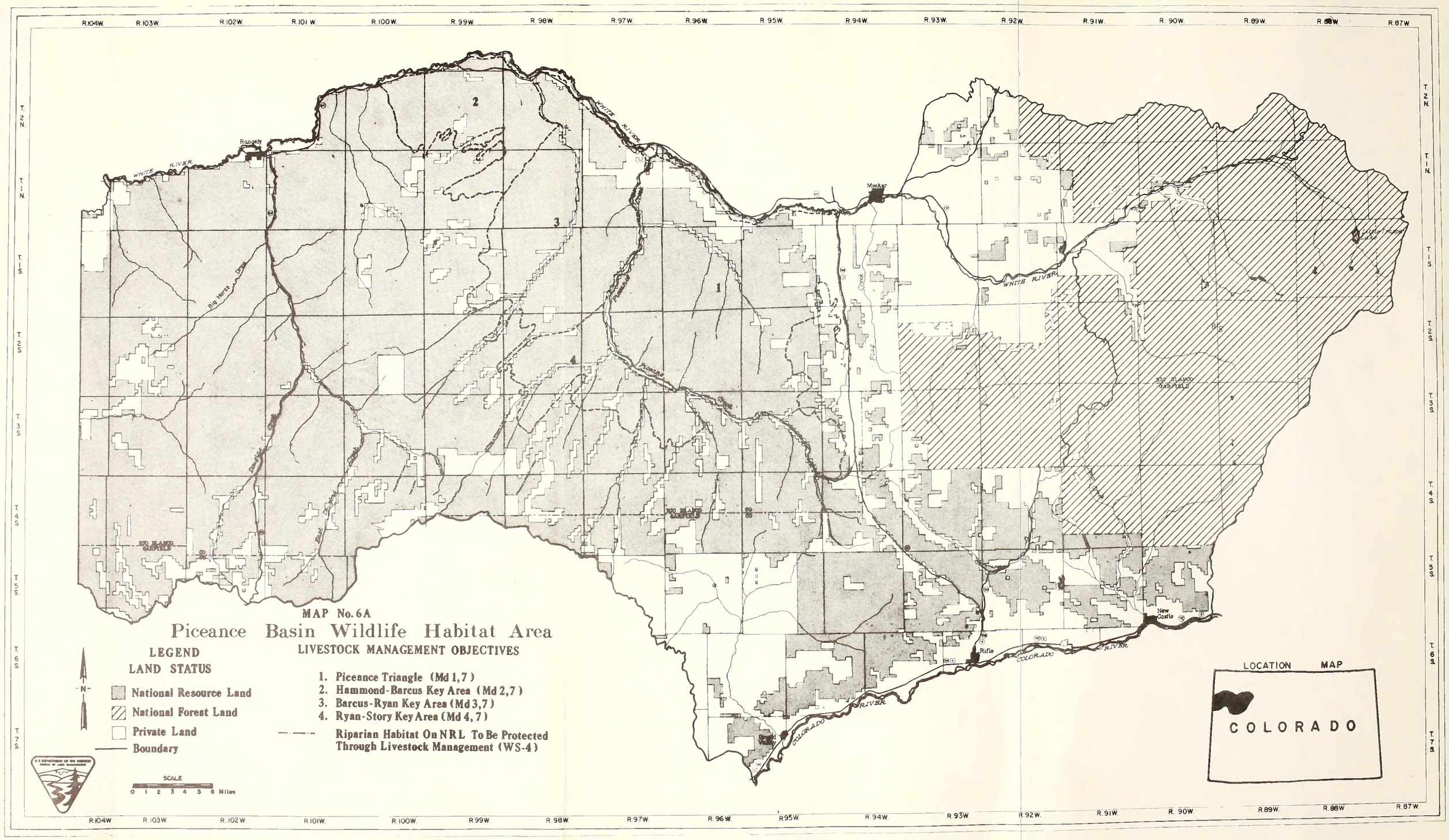

R.104W.
R.103W.
R.102W.
R.101W.
R.100W.
R.99W.
R.98W.
R.97W.
R.96W.
R.95W.
R.94W.
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T.2N.
T.1N.
T.1S.
T.2S.
T.3S.
T.4S.
T.5S.
T.6S.
T.7S.
Rangely
Meeker
Rifle
New Castle
WHITE RIVER
Piceance Creek
Douglas Creek
Black Sheep Creek
Yellow Creek
BLM LAND
OATFIELD
MAP No. 4
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
UPLAND GAME AND WATERFOWL
Turkey Range
Chukar Partridge Range
Pheasant Range
Blue Grouse Range
Sage Grouse Range
Sage Grouse Strutting Grounds
Sage Grouse Winter Concentration Areas
White-tailed Prairie Dog Towns
Waterfowl Concentration Area
N
SCALE
0 1 2 3 4 5 6 Miles
LOCATION MAP
COLORADO



MAP No.5

Piceance Basin Wildlife Habitat Area


MAP No. 6
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
LIVESTOCK MANAGEMENT
Piceance Allotments - AMP's Completed FY 76
Rangely Allotments - A M P's To Be Completed FY 77
Meeker Allotments - To Be Placed Under Custodial Management
Grand Junction Allotments - A M P's To Be Completed FY 77
Forest Service Allotments
Proposed Wildhorse Range
SCALE
0 1 2 3 4 5 6 Miles
LOCATION MAP
COLORADO
Rangely
Meeker
Rifle
WHITE RIVER
COLORADO RIVER
Piceance Mountain
Little Hills
Piceance Creek
R.104W.
R.103W.
R.102W.
R.101W.
R.100W.
R.99W.
R.98W.
R.97W.
R.96W.
R.95W.
R.94W.
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T.2N.
T.1N.
T.1S.
T.2S.
T.3S.
T.4S.
T.5S.
T.6S.
T.7S.



MAP No. 6A

Piceance Basin Wildlife Habitat Area

LEGEND

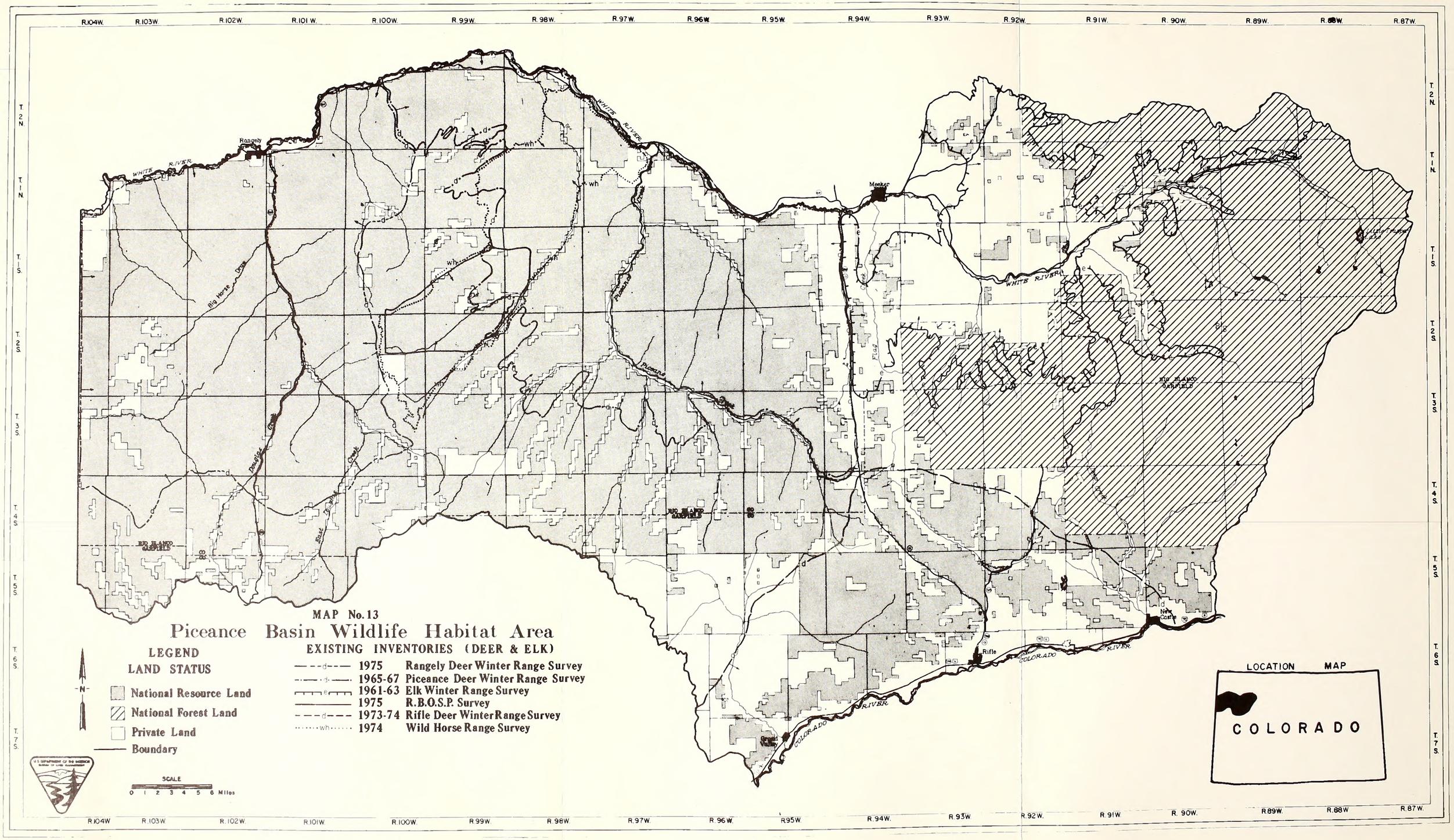
LAND STATUS

- National Resource Land
- National Forest Land
- Private Land
- Boundary

LIVESTOCK MANAGEMENT OBJECTIVES

1. Piceance Triangle (Md 1,7)
2. Hammond-Barcus Key Area (Md 2,7)
3. Barcus-Ryan Key Area (Md 3,7)
4. Ryan-Story Key Area (Md 4,7)

—·—·— Riparian Habitat On NRL To Be Protected Through Livestock Management (WS-4)


MAP No. 13
Piceance Basin Wildlife Habitat Area
LEGEND
LAND STATUS
National Resource Land
National Forest Land
Private Land
Boundary
EXISTING INVENTORIES (DEER & ELK)
1975 Rangely Deer Winter Range Survey
1965-67 Piceance Deer Winter Range Survey
1961-63 Elk Winter Range Survey
1975 R.B.O.S.P. Survey
1973-74 Rifle Deer Winter Range Survey
1974 Wild Horse Range Survey
SCALE
0 1 2 3 4 5 6 Miles
LOCATION MAP
COLORADO
Rangely
Meeker
Rifle
New Castle
WHITE RIVER
COLORADO RIVER
Big Horse Draw
Piceance Creek
Yellow Jacket Pass
BIG BLANCO WILDFIELD
R.104W.
R.103W.
R.102W.
R.101W.
R.100W.
R.99W.
R.98W.
R.97W.
R.96W.
R.95W.
R.94W.
R.93W.
R.92W.
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
T.2N.
T.1N.
T.1S.
T.2S.
T.3S.
T.4S.
T.5S.
T.6S.
T.7S.

referenced. These two documents are on file at the Bureau of Land Management area offices in Meeker and Glenwood Springs under file code 1605.

1. Wildlife Habitat

The most common habitat type [2/] occurring within the HMP area is the Pinyon-Juniper Woodland, which covers 589,160 acres or 29 percent of the total acreage of the unit. (See Table 1 for acreage breakdown of all habitat types). The Pinyon-juniper type exhibits considerable variability within itself, ranging from sites with little understory vegetation (Photo #1) to others that contain abundant and diverse understory species (Photo #2). Drainge bottoms within the Pinyon-juniper type are generally dominated by big sagebrush (Photo #3) but often greasewood occurs in quantity and frequently achieves dominance (Photo #4). Sagebrush also occupies extensive areas in the Rangely area and is commonly encountered as the dominant species on ridgetops and mesas within the Piceance Basin (Photo #5). On xeric, more alkaline sites in the vicinity of Rangely and Grand Valley, saltbush replaces the sagebrush as the principal plant species (Photo #6).

The high country of the Roan Plateau and Cathedral Bluffs also has extensive sagebrush tracts, but the mountain shrub types (serviceberry, snowberry, oakbrush (Photos #7 and #8) are more in evidence at these intermediate altitudes (6,500-8,000 feet). Northern exposures in this altitude range often result in the creation of small pockets of aspen and Douglas fur, or sub-alpine and white fir (Photo #9).

The most heavily forested areas, however, occur in the eastern portion of the habitat area. Here the gradual uplift of terrain that occurs eastward from the Utah border is greatly accelerated, resulting in sufficient elevation and precipitation to maintain a climax community of the spruce-fir type. Much of the spruce, however, has been beetle-killed and the subsequent reduction in canopy cover has facilitated establishment of an understory that is much more productive than is normally associated with the spruce-fir type (Photo #10). Interspersed throughout the forest are large park-like meadows and scattered to extensive stands of aspen. Lower elevations and southern exposures support an abundance of mountain shrub types.

2/ Habitat types are defined by the dominant vegetative species present.

TABLE 1

WILDLIFE HABITAT TYPES WITHIN HMP AREA

Habitat Type	Dominant Plant Species*	Acreage	Percent Total
Grassland	Brma Agtr-1 Feth	105,360	5.1
Sagebrush	Artr	463,483	22.6
Mountain Shrub	AME Cemo Quga	373,798	18.2
Pinyon-Juniper	Pied Juos	589,160	28.7
Conifer	Psme Pico Pipu	210,118	10.2
Waste		27,321	1.3
Broadleaf	Potr	165,760	8.1
Saltbush	Atco	22,080	1.1
Greasewood	Save-2	19,200	0.9
Halfshrub	Erla	1,638	0.1
Cropland		40,083	2.0
Riverbottom	Sali spp. POPU spp. POA spp.	32,480	1.6
	Total	2,050,481	99.9

* Explanation Of Plant Symbols On Following Page

APPENDIX I

MAPS OF PICEANCE BASIN WILDLIFE PLAN, BASED ON PLAN OVERLAYS AND BASE MAP

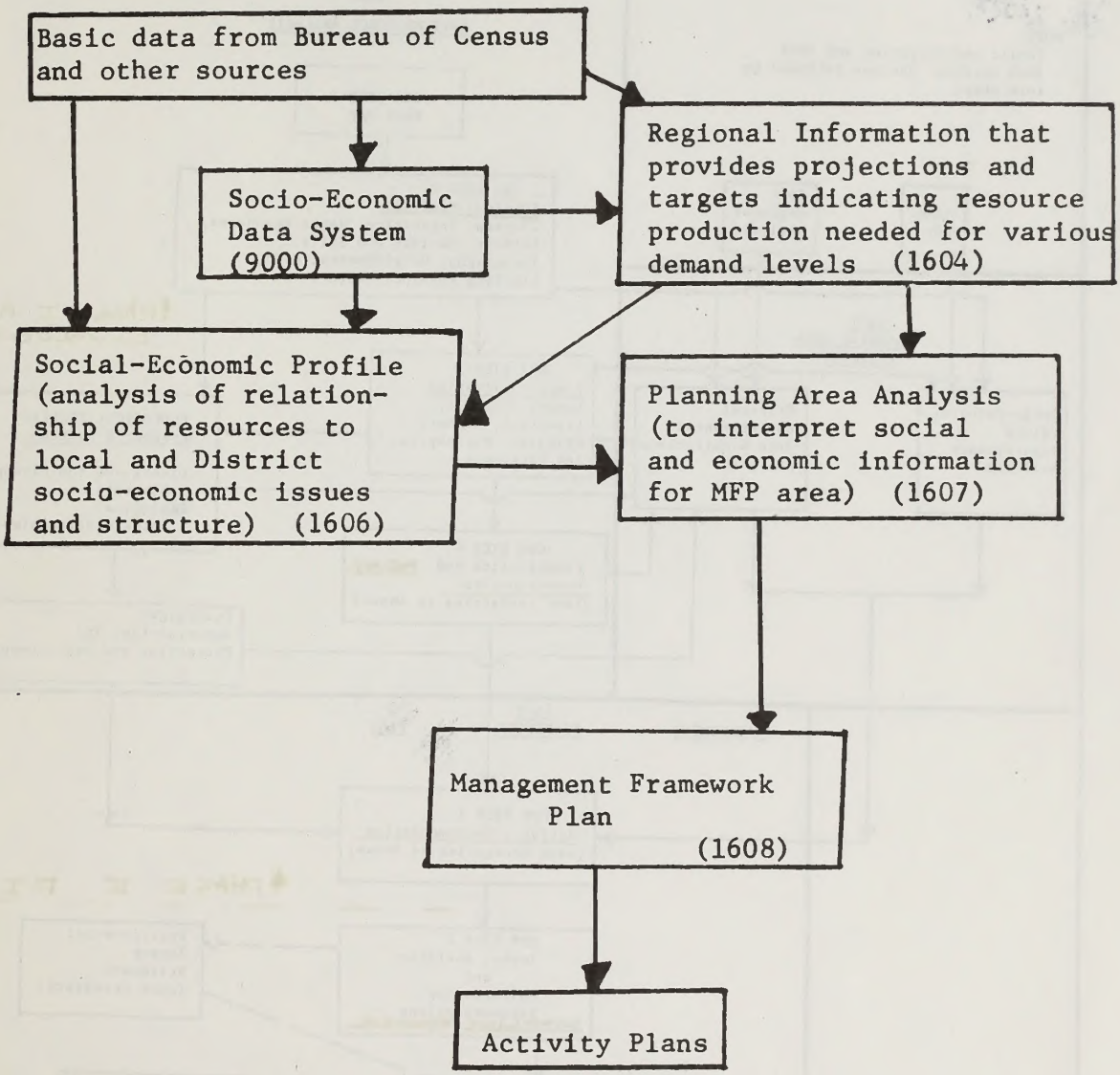
Map Content

#1	Habitat Types
#2	Big Game Range - Deer and Lion
#3	Big Game Range - Elk and Bear
#4	Upland Game and Waterfowl
#5	Raptor Habitat
#6	Livestock Management
#6a	Livestock Management Objectives
#7	Energy Developments
#8	Habitat Improvement Projects
#9	Studies
#10	Inventories
#11	Access and Land Acquisition
#12	Wildlife Introductions
#13	Existing Inventories

1601 - PLANNING SYSTEM

Planning System Operation

SOCIAL AND ECONOMIC DATA FLOW THROUGH SYSTEM



GUIDANCE - OBJECTIVES, GOALS, CRITERIA, STANDARDS
INFORMATION - INCLUDES INVENTORY, DISPLAY & ANALYSIS OF DATA
DECISION - AN APPROVED COURSE OF ACTION

1601 - PLANNING SYSTEM

Data Flow Through URA and MFP Including

Environmental Inputo Into MFP