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BEAR RIVER BASIN
ENVIRONMENTAL ASSESSMENT
BIOTIC RESOURCES
FLORA- FAUNA
APPENDIX III

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BEAR RIVER BASIN
ENVIRONMENTAL ASSESSMENT
BIOTIC RESOURCES
FLORA-- FAUNA
APPENDIX III

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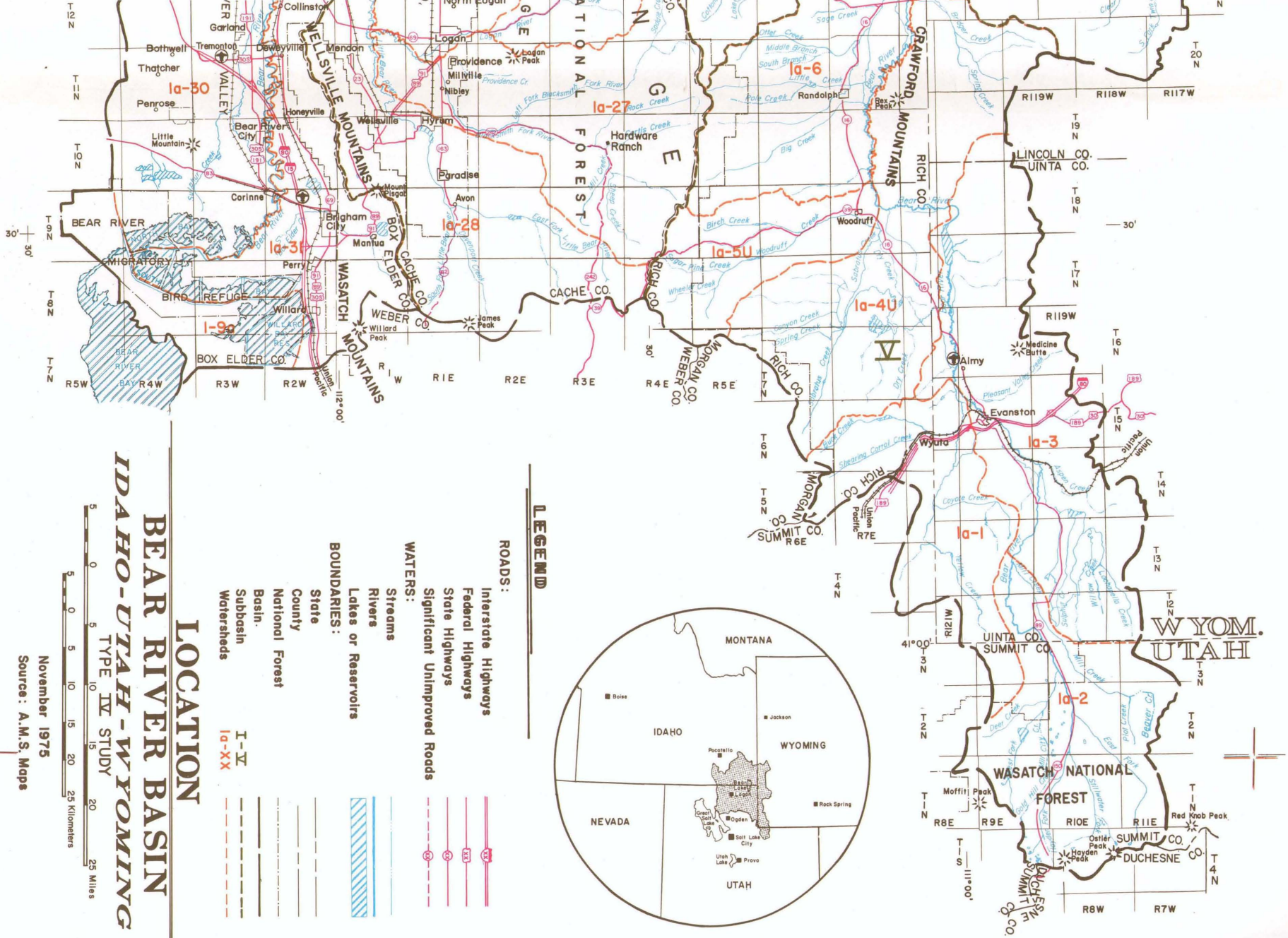
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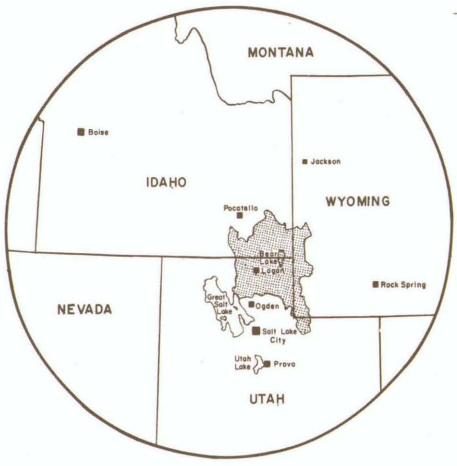
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November 1975
Source: A.M.S. Maps

LEGEND

- ROADS:**
- Interstate Highways
 - Federal Highways
 - State Highways
 - Significant Unimproved Roads
- WATERS:**
- Streams
 - Rivers
 - Lakes or Reservoirs
- BOUNDARIES:**
- State
 - County
 - National Forest
 - Basin
 - Subbasin
 - Watersheds
- I-V
Id-XX



LOCATION MAP

BIOTIC RESOURCES

APPENDIX III

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FOREWORD

The appendix of statistical material for Biota is presented in its two major divisions. These are:

1. Fauna; an inventory of current wildlife populations.
2. Flora; an inventory of plant communities and range conditions as they presently exist.

In the section on fauna, game bird and animal populations are measured in terms of annual harvest date, hunter days or hunter success. Although this is not a direct census, it is a representative unit of measure generally accepted by Wildlife Managers. In addition to statistics on population, narrative descriptions of habitats and wildlife movements are presented.

The section on flora presents a description of range sites found in the Basin and the range condition composition of the areas of suitable range in each watershed. Also shown is the basic quality rating assigned to each range site and the manner in which condition class values were applied to the site values to develop site-condition quality ratings.

Other flora material included is a listing of the plants included in the range site descriptions showing both their common and scientific names.

Concepts concerning trends in wildlife populations, design of the study, procedures and interpretations of data is presented in the general section of the inventory report.

INVENTORY AND ASSESSMENT

of the

NATIVE VEGETATION

and

ENVIRONMENTAL RELATIONS

Prepared for:

Utah Division of Water Resources

By:

B. W. Allred, Range Ecologist-Range Scientist

PLANT COMMUNITIES
and
ENVIRONMENTAL RELATIONSHIPS

HIGHLIGHTS

1. The Bear River provides habitats for a wide variety of plant communities. This variety gives protective cover and beauty to the landscape, produces the primal link in the food chain and functions to cleanse the air and stabilize water yield from the high snowsheds.

2. The composition of plant communities at specific sites provides the ecologist with a picture of past use, enables a determination of trends in quality and permits identification of sites and their potential for improvement.

3. The ecologic grand divisions of vegetation in the Bear River Basin are forest, grassland, and tundra, listed in order of their descending order of moisture requirements.

Local differences in physical conditions and historic use produce variations within these broad groups. They are further divided into sub-groups which include:

- a. Climax communities
- b. Sub-climax communities
- c. Development or Seral Communities
- d. Disclimax communities

4. Range sites are range classification units reflecting specific conditions of soil, slope, exposure, local climate and the plant community each site is capable of sustaining in the highest stage of development.

5. Range sites are further described in respect to their present condition as related to their potential. This relation is expressed in the range condition classes of Excellent, Good, Fair, and Poor.

6. The presence of certain plants in a range site provides obvious clues of both degeneration and regeneration. Plants reflecting these trends are classed as:

- a. Decreasers - those plants (usually desirable, high forage producers) which are the first to decrease under heavy grazing use.
- b. Increasers - those plants which initially multiply under heavy grazing use but which may eventually decrease under continued heavy use.
- c. Invaders - a group of invading plants which register the degree of decline in the climax and include such species as gumweed, poverty weed, tarweed, sunflower, cheatgrass, haogeton, and others.

7. Most range units still have sufficient climax plants to regenerate them, given sufficient time and corrective treatment. No native species have been completely eliminated from the area. Once threatened Reed's Canary-grass has now re-established itself in some wet meadows and shallow marshes of the Basin.

8. Soil and slope are important factors influencing productivity in different range sites.

- a. With slope constant, loamy soils are better producers than clay soils.
- b. Given the same soil, an increase in slope generally decreases production.

9. Differing slope exposures produce plant variety and contrast in the landscape. Such differences are the product of varying amounts and patterns of sunlight and moisture.

10. Natural plantscapes are a feature of the environment with esthetic qualities. Height of vegetation, variety contrast, such as are produced by intermingled bodies of conifer, aspen, and meadow, are a major esthetic factor.

11. Water is the greatest single economic yield from Basin ranges.

12. Seventy five percent of Basin ranges are in fair and poor condition. Only 3.5 percent are excellent. Currently, forage production is about 53 percent of potential.

13. Sometimes, ranges in fair and poor condition produce more foliage than similar sites yield when they are in excellent condition. For example, foliage yield on a High Mountain Loam range site in a favorable year may vary as follows:

Excellent Condition	2,200 to 2,750 lbs.
Good Condition	2,250 to 2,750 lbs.
Fair Condition	1,500 to 2,200 lbs.
Poor Condition	1,250 to 4,000 lbs.

However foliage quality and yield on poor condition ranges for grazing animals will usually be far inferior to edible forage from good and excellent condition ranges.

Perhaps the enduring significance of natural plant communities and their relationship to man's environment can be found in the following: U

The bunchgrass lands and fertile soils of the Bear River Basin valleys are described by General John Charles Fremont in September 12, 1843. He said, "The bottoms of this corner (Bear) and some of the creeks which I saw form a natural resting and recruiting station for travellers, now, and in all time to come. The bottoms are extensive; water excellent; timber sufficient; the soils good; and well adapted to the grains and grasses suited to such an elevated region....A civilized settlement would be of great value here; and cattle and horses would do well where grass and salt so much abound....All mountain sides here are covered with valuable, nutritious grass, called bunchgrass....The beasts of the Indians were fat upon it; our own found good subsistence; and its quantity will sustain any amount of cattle and make this truly a bucolic region."

General John C. Fremont, *Memoirs of My Life, Including Five Journeys of Western Exploration* (Chicago, 1887).

BEAR RIVER BASIN

Table II. Distribution of Suitable Range Acres
and Condition Classes

<u>Sub-Basin I</u>	<u>Watershed</u>	<u>No.</u>	<u>Condition Class</u>				<u>(100 ac.)</u>
			<u>(100 acres)</u>				
			<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u> ^{1/}	<u>Total</u>
	Upper Little Malad	1a-23	-	63	768	244	1,072
	Deep Creek	1a-24	-	94	172	55	321
	Plymouth-Portage	1a-29	-	4	154	62	220
	Bear River Valley	1a-30	-	-	560	215	775
	Brigham	1a-31	-	-	294	122	416
	Bear River Bay	1-9a	-	-	179	69	248
	TOTALS			161	2,127	767	3,055

^{1/} Includes Forest Service class "Very Poor".

BEAR RIVER BASIN

Table II. Distribution of Suitable Range Acres
and Condition Classes

<u>Sub-Basin II</u> <u>Watershed</u>	<u>No.</u>	<u>Condition Class</u> (100 acres)				<u>Poor</u> ^{1/}	<u>Total</u> (100 ac.)
		<u>Excellent</u>	<u>Good</u>	<u>Fair</u>			
Cottonwood Creek	1a-15	-	-	550	304	854	
Grace-Thatcher	1a-16	-	32	183	154	369	
Guis River	1a-17	-	33	513	222	768	
Battle Cr. - Deep Cr.	1a-18	1	48	524	134	707	
Five Mile Wash	1a-19	-	8	26	5	39	
Weston Creek	1a-20	1	39	226	62	328	
Subtotal		2	160	2,022	881	3,065	
Clarkston	1a-21	-	11	59	10	80	
Logan River	1a-22	24	146	273	280	723	
Lewiston-Trenton	1a-25	-	1	64	8	73	
North Cache	1a-26	-	4	328	82	414	
Blacksmith Fork	1a-27	-	66	586	511	1,163	
Little Bear	1a-28	-	27	817	118	962	
Subtotal		24	255	2,127	1,009	3,415	
TOTAL V		26	415	4,149	1,890	6,480	

^{1/} Includes Forest Service class "Very Poor".

BEAR RIVER BASIN

Table II. Distribution of Suitable Range Acres
and Condition Classes

<u>Sub-Basin III</u>		<u>Condition Classes</u> (100 acres)				<u>(100 ac.)</u>
<u>Watershed</u>	<u>No.</u>	<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u> ^{1/}	<u>Total</u>
South Bear Lake	1a1-1	-	51	902	213	1,166
Fish Haven-St. Charles	1a1-2	3	21	441	112	577
Liberty-Bloomington	1a1-3	14	104	605	199	922
Montpelier Creek	1a-10	10	63	119	65	257
Bennington	1a-11	4	22	78	34	138
Georgetown Creek	1a-12	8	33	105	56	202
Nounan-Eight Mile Creek	1a-13	11	69	268	117	465
Soda Springs	1a-14	32	37	170	220	459
TOTALS		82	400	2,688	1,016	4,186
 <u>Sub-Basin IV</u>						
Fossil Butte	1a-4W	122	954	679	-	1,755
Thomas Fork	1a-5W	112	440	453	33	1,038
Smith's Fork	1a-7	264	766	773	13	1,816
Wood Hollow	1a-8	-	241	485	249	975
Sheep-Pegram Cr.	1a-9	-	112	592	99	803
TOTALS		498	2,513	2,982	394	6,387

^{1/} Includes Forest Service class "Very Poor".

BEAR RIVER BASIN

Table II. Distribution of Suitable Range Acres
and Condition Classes

<u>Sub-Basin V</u>	<u>Watershed</u>	<u>No.</u>	<u>Condition Classes</u> (100 acres)				<u>(100 ac.)</u> <u>Total</u>
			<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u> ^{1/}	
	Yellow Coyote	1a-1	136	565	400	36	1,137
	Upper Bear	1a-2	28	145	509	80	762
	Evanston	1a-3	185	1,137	526	-	1,848
	Saleratus Creek	1a-4U	7	10	1,276	681	1,974
	Woodruff Creek	1a-5U	9	-	503	228	740
	Big Creek-Otter Creek	1a-6	8	-	738	399	1,145
	TOTALS		373	1,857	3,952	1,424	7,606

1/ Includes Forest Service class "Very Poor."

Table III. Comparative Productivity and Quality Ratings of
Range Sites in the Bear River Basin

<u>SRG'S</u>	<u>SOILS SLOPE</u>	<u>AUM PER ACRE EXCELLENT COND.</u>	<u>QUALITY RATING</u>
Wet	Wet Soils	1.93	10
HP	High Alt. Aspen	1.45	10
TCE	Mtn. Clay 0-30%	1.07	9
ULE	Upland Loam 0-30%	1.04	9
TLG	Mtn. Loam 30-60%	1.00	8
TCG	Mtn. Clay 30-60%	.93	8
TK	Mtn. Sandy Loam	.90	8
ULG	Upland Loam 30-60%	.90	8
UK	Upland Stony Loam	.80	7
UX	Upland Shallow Loam	.58	5
TX	Mtn. Shallow Loam 0-30%	.57	5
UCE	Upland Clay	.53	5
ZK	Semi-desert Stony Loam	.42	3
USE	Upland Sand 0-30%	.41	3
ZLE	Semi-desert Loam	.35	2.5
ZX	Upland Shallow Loam	.30	2
ZLD	Semi-desert Loam 30-60%	.30	2
ZLA	Semi-desert Alkali Flat 0-25%	.30	2
ZCA		.30	2

APPENDIX A

RANGE SITE DESCRIPTIONS

BEAR RIVER BASIN

The following section includes descriptions of the principal range sites found in the Basin and primarily apply to the non-forest range areas.

These descriptions of range site and condition classes includes lists of the major kinds of plants that are produced under local soil, slope, exposure and climatic conditions of each respective site. The departures from excellent condition are indicated by the composition of decreaser, increaser and invader plants in the Good, Fair and Poor classes.*

Range site descriptions and range condition guides shown in this section include:

- High Mountain Loam
- Wet Meadows
- Salt Meadows
- Semi-Wet Meadows
- Semi-Desert Alkali Flats
- Upland Shallow Loam
- Upland Stony Loam
- Semi-Desert Loam
- Mountain Stony Loam
- Mountain Loam
- Mountain Clay
- Mountain Shallow Loam
- Semi-Desert Shallow Loam
- High Mountain Loam (Aspen)
- Upland Loam
- Upland Clay

*Adapted from range site and condition guides prepared by the U. S. Soil Conservation Service, Utah State office and field personnel.

RANGE SITE DESCRIPTION 1.

1. Range Site Name: High Mountain Loam

2. Climate:

- a. The climate of the site is cool and humid with cold, snowy winters. The average annual precipitation varies from 22 to 50 inches. Distribution of this moisture is generally 23 to 35 percent during the plant growing season. Thus, most of the effective moisture comes from snowmelt from winter precipitation.
- b. Plant growth begins about May 10-20 and ends due to killing frosts about September 15 to October 1. Moisture and temperature are such that they are not limiting to plant growth during this period except some years a small moisture deficiency in July and August will slow down growth of herbage and may force grass and forb species into early maturity. The frost-free period is 65 to 90 days.

3. Topography and Elevation:

This site occurs on gently sloping to very steep mountain slopes. It is found on all exposures at the higher elevations, but occurs primarily on north and east slopes at the lower elevations adjacent to mountain sites which are found on the south and west exposures.

4. Soils:

- a. The soils of this site are deep, well-drained, "cool Prairie-like" soils. They have thick (13-24") very dark brown or very dark grayish brown, loamy A₁; and cobbly or gravelly medium to fine textured, neutral to medium acid B₂ horizons. They are forming on gently sloping to very steep mountain slopes and rolling or hilly plateaus in parent materials derived from sandstone, shale, limestone, quartzite and various igneous rocks. Infiltration and internal water movement are good. Roots penetrate the soil material readily. They have a high waterholding capacity ranging from about 10 to 14.5 inches in a six-foot profile. Amount of stone, cobble or gravel is variable throughout the profile but is less than 50% by volume.

5. Potential Native Plant Community:

- a. The potential vegetation of the site is a mixture of about 45% grass, 25% forbs, and 30% shrubs. Mountain brome will react as a decreaser under cattle grazing but an increaser with sheep grazing comprising up to 5%. Decreaser, grasses under both classes of livestock are bearded wheatgrass, blue wildrye, oniongrass, and slender wheatgrass making up about 30 to 35% of the total. Increaser grasses with both sheep and cattle grazing are Columbia needlegrass, dryland sedge, Great Basin wildrye, Kentucky bluegrass, king fescue, letterman needlegrass, prairie Junegrass, sheep fescue, and tall native bluegrasses. These will make up 10 to 20% of the composition. Forbs such as sweet anise

and edible valerian will be decreaseers under both cattle and sheep use and will make up 1 to 3 percent of the composition. Increaser forbs (both sheep and cattle use) are aster, balsamroot, lomatium, skeleton loco, drummond thistle, geranium, horsemint, houndstongue, little sunflower, peavine, senecio, lupine, tall larkspur, tarweed and yarrow will make up 20 to 25% of the total vegetation by weight. Shrubs such as big sagebrush, curleaf mountain, bitterbrush, snow-berry, oakbrush, silver (water) sagebrush and yellowbrush will comprise 20 to 30 percent of the composition.

Common invaders of this site are annual grasses and annual forbs.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25%- 0
Lbs Per Acre Air Dry	Favorable Yrs	2750-2200	2750-2250	2200-1500	4000-1250
Total Annual Yield	Unfavorable Yrs	1300-900	900-700	900-600	2100-900

RANGE SITE DESCRIPTION 2.

1. Range Site Name: Wet Meadows

2. Climate:

a. The climate of this site is characterized by cold snowy winters and warm dry summers. Average annual precipitation varies from 6 to 35 inches, but most common is 16 to 20 inches. However, most of the moisture for plant production on this site is obtained from a water table near the ground surface. This site differs from the semi-wet meadow in that water is near the surface most of the plant growth period (within 20 inches). During late summer and fall the soil surface may become dry, but usually moisture is within the root zone of the plants.

3. Wet Meadows

b. Plant growth begins from April 1 to May 1 depending upon the temperature. A water saturated soil causes plant growth to be delayed since soil temperatures remain cold until late in the season. Plant growth continues in most years until September 15 to October 30 depending on killing frosts.

The plant growth period is shorter at the higher elevations. Frost-free period is from 90 to 160 days. The optimum growth period is between May 1 to 10 and August 1 to 15.

4. Topography and Elevation:

This site occurs on flood plains, slight depressions on alluvial bottoms, fans, and lake terraces and on valley bottoms. Slopes vary from 0 to 10 percent, but most commonly are less than 3 percent. Elevation ranges from 4,250 to 10,000 feet.

5. Soils:

a. The soils in this site are deep and affected by wetness. The water table fluctuates during the growing season, generally above 20 inches. Drainage characteristics range from imperfectly to poorly, with the imperfectly drained soils having a higher water table than is common for the site. Surface soils are generally dark colored and high in organic matter. Textures of these soils range from moderately coarse to fine and are most commonly medium and moderately fine. Reactions range from neutral to moderately alkaline and from noncalcareous to strongly calcareous. These soils are forming in low lying areas on nearly level to gently sloping or undulating topography. Parent materials are derived from a wide range of parent rock and lacustrine sediments. Roots and water move readily through these soils above the water table. Waterholding capacity is moderate to high and is supplemented by upward capillary movement from the shallow water table. Erosion is not a serious hazard.

6. Potential Native Plant Community:

a. The potential vegetation consists primarily of water tolerant grasses and grass-like plants with a small percentage of water tolerant forbs and only a small percentage of water tolerant shrubs. Decreaser grasses and grass-like plants such as alpine timothy, bearded wheatgrass, blue wildrye, creeping wildrye, nodding brome, redtop, slender wheatgrass, trisetum, tall native bluegrass, timothy and tufted hairgrass will comprise 45 to 55 percent of the total composition by weight. Increaser grasses and grass-like plants such as Columbia needlegrass, Great Basin wildrye, field horsetail, Kentucky bluegrass, muhly grass, rushes, sedges, saltgrass, western wheatgrass and wiregrass will make up 30 to 40 percent of the composition. Decreaser forbs such as cow parsnip, native clover and white Dutch clover will comprise 3 to 6 percent of the composition. Increaser forbs such as arrowgrass, aster, bullthistle, cinquefoil, dandelion, goldenrod, mint, iris, plantain, rumex, shooting star, and senecio will comprise 5 to 10 percent of the total. Shrubs such as rose, shrubby cinquefoil, silver (water) sagebrush and willows will not make up over 2 percent of the cover.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

Percent of Potential		EXCELLENT	GOOD	FAIR	POOR
		100%-76%	75%-51%	50%-26%	25%-0
Lbs. Per acre	dry	6500-4000	6500-4000	7500-5000	5000-2000
	Favorable Yrs.				
Total Annual Yield	Unfavorable Yrs.	3500-3000	4250-3500	3500-2000	2250-1500

RANGE SITE DESCRIPTION 3.

1. Range Site Name: Salt Meadows

2. Climate:

- a. The climate is characterized by cold winters and warm dry summers. Average annual precipitation varies from 6 to 20 inches. Most of the moisture for plant production is obtained from a water table which is near the surface through most of the plant growth period. However, some fluctuation in the water table and variation in salinity affects kinds and amounts of vegetation produced. This site differs from the alkali bottoms site in that the water table is closer to the surface within 10 inches for most of the plant growth period and this site has salinity, but very little sodium (alkali) as is present in alkali bottoms. In late summer and fall the surface soil may become dry due to lowered water table. During the period June to October, evapo-transpiration rate exceeds precipitation. However, this factor does not influence plant growth on this site to any great extent because plant roots are in contact with a plentiful supply of moisture for most of the growing season.
- b. Plant growth period usually starts about April 1 to 15 and will continue until October 1 to 15. In water short years, the water table may drop and plant growth will slow down in late July and August. The optimum growth period is usually May 1 to July 15. Plant growth is affected by fluctuations in the salt content of the soil. The frost-free period fluctuates from year to year and from place to place where this site is located, however, this does not affect the kind and amount of vegetation greatly enough to be considered as more than one site. Frost-free period varies from 95 to 175 days, but is mostly 120 to 150 days.

3. Topography and Elevation:

This site occurs on low lake plains, broad low lake terraces, alluvial river bottoms and poorly drained flood plains usually adjacent to rivers, creeks and lakes. Slopes are flat or very gently ranging from 0 to 6 percent, but mostly less than 2 percent. Elevation ranges from 4,215 to 6,200 feet.

4. Soils:

- a. The soils in this site are deep and affected by wetness, salt and alkali. The water table fluctuates during the growing season and is generally within 20 inches of the surface. Drainage characteristics range from imperfectly to poorly drained, with the imperfectly drained soils having a shallow water table. Salt and alkali concentrations, along with the shallow water table depth characterize this site. Textures range from loam to clay. These soils may have a solonchalic horizon or they may lack these horizons and have only concentrations of sodium or salt. Calcium carbonate ranges from slightly calcareous to very strongly calcareous. These soils occur in low

lying areas on nearly level to sloping topography. Parent materials are derived from a wide range of parent rocks and lacustrine sediments. Salt and alkali restrict root development above the water table. Rate of water penetration is variable. Soils with high sodium percentages, solonchic or fine textures are very slowly permeable. Soils with low sodium content, high salt content and coarser textured are permeable. The high water table helps dilute the salt and sodium content as well as provide a source of moisture.

5. Potential Native Plant Community:

- a. The potential vegetation consists primarily of water tolerant grasses with only a small percentage of forbs and a very small percentage of salt and water tolerant shrubs. Decreaser grasses such as alkali bluegrass, alkali sacaton, creeping wildrye, alkali grass, alkali cordgrass, Great Basin wildrye, squirreltail, tufted hairgrass and western wheatgrass will comprise 60 to 70 percent of the total composition of air dry weight. Increaser grasses and grasslike plants such as foxtail, Kentucky bluegrass, meadow foxtail, rushes, saltgrass, sedges and wiregrass will make up 30 to 40 percent of the composition. Forbs such as arrowgrass, black medic, cinquefoil, daisy, native clovers, owlclover, pickleweed, and rumex will be present with a total of 5 to 7 percent. Shrubs such as big rabbitbrush, fourwing saltbush, Nuttals saltbush, greasewood, rose and willows will be present in from 0 to 5 percent of the total composition.

Common invaders of this site are annual atriplex, annual kochia, annual mustard, bassia, beeweed, cheatgrass, curlycup gumweed, poverty-weed, and Russian thistle.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Lbs. Percent of Potential		100%-76%	75%-51%	50%-26%	25%- 0
Lbs. Per Acre Air Dry	Favorable Yrs.	4000-1750	2000-1250	3750-1750	2500-1000
Total Annual Yield	Unfavorable Yrs.	2000-1000	1000-800	2500-1500	1500-750

RANGE SITE DESCRIPTIONS 4.

1. Range Site Name: Semi-Wet Meadows

2. Climate:

- a. The climate is characterized by cold winters and warm dry summers. Average annual precipitation varies from 12 to 35 inches, but is most commonly 16 to 20 inches. The important moisture supply for plant growth is from sub-irrigation or a moderately deep but fluctuating water table. The drop in water table during the latter part of the plant growth period affects the amount of herbage production and thus differs from the wet meadow site.

- b. Plant growth begins between March 15 and April 15 depending primarily on soil temperatures. Plant growth usually slows down during late July and early August due to warm temperatures and lowering of the water table. During dry years plant growth stops at this time as soil moisture becomes depleted. Frost-free period varies from 65 to 160 days at various locations. In years of adequate moisture plant growth stops about October 1 to 10 due to killing frosts.

3. Topography and Elevation:

This site occurs in mountain valleys, and on valley bottoms, flood plains low lake terraces and alluvial fans near water courses. Slopes are from nearly level to gently sloping from 0 to 10 percent, but mostly less than 3 percent. Elevation is from 4220 to 6500 feet in most localities.

4. Soils:

- a. The soils in this site are deep and affected by wetness. The water table fluctuates between 20 and 40 inches most of the growing season. Drainage characteristics range from moderately well to poorly, with the poorly drained soils having a lower water table than is common. Surface soils are generally dark colored and high in organic matter. Textures of these soils range from fine sand to clay, but are most commonly medium and moderately fine. Reactions range from neutral to moderately alkaline and from noncalcareous to strongly calcareous. These soils are forming in low lying areas on nearly level to gently sloping or undulating topography. Parent materials are derived from a wide range of parent rock and lacustrine sediments. Roots and water move readily through these soils above the water table. Waterholding capacity is low to high and is supplemented by upward capillary movement of water from the water table. Erosion is not a serious hazard on these soils.

5. Potential Native Plant Community:

- a. The potential vegetation will consist primarily of deep rooted perennial grasses with 5 to 15% forbs and 1 to 5% of shrubs. Decreaser grasses will make up 55 to 75 percent of the composition by air dry weight and will be alpine timothy, alkali bluegrass, bearded wheatgrass, blue wildrye, Great Basin wildrye, mountain brome, nodding brome, redtop, slender wheatgrass, tall native bluegrass, trisetum and tufted hairgrass. Increaser grasses such as alkali sacaton, field horsetail, Kentucky bluegrass, letterman needlegrass, rushes, sedges, western wheatgrass, and wiregrass will comprise 15 to 20 percent of the composition. Decreaser forbs such as native clover, cow cabbage and edible valerian will comprise 5 percent of the volume growth. Increaser forbs such as aster, bullthistle, cinquefoil, iris, peavine, senecio and yarrow will make up 5 to 15 percent of the composition. Shrubs such as rose, shrubby cinquefoil, silver or water sagebrush, yellowbrush and willows will make up 0 to 5 percent of the composition.

Common invaders of this site are annual weeds, big rabbitbrush, big sagebrush, cheatgrass, curlycup gumweed, dandelion, foxtail, greasewood, houndstongue, povertyweed, pussytoes, rumex, Russian thistle, and tarweed.

- b. Annual dry herbage yields on excellent condition ranges varies from 4200 pounds per acre in favorable years to 1750 pounds per acre in less favorable years.

RANGE SITE DESCRIPTION 5.

1. Range Site Name: Semidesert Stony Loam

2. Climate:

- a. The climate of this site is semi-arid and characterized by cold winters and hot summers. Precipitation is 8 to 12 inches with an average near 9 inches. Approximately 45% of the moisture comes during the period of plant growth between April and September. The moisture deficient period begins early in June when the evapo-transpiration rate is high. This and the accumulations of salt and alkali in the soil are factors which affect plant growth and reduce the productivity of this site. This site receives some run in moisture from adjacent sites but not enough to influence production materially. This site differs from salt meadow and alkali bottom sites because it does not have a water table.
- b. Plant growth begins about March 15 to April 1 and continues until June 5 to June 15 when plants mature or go dormant because of depletion of soil moisture and high temperatures. With summer precipitation and cooling temperatures some of the grasses and forbs green up during the early fall. Frost-free period varies from 100 to 150 days.

3. Topography and Elevation:

This site occurs on the higher portions of the gently sloping old alluvial fans and their more steeply sloping escarpments, on fans, foothills and benchlands. Slopes are from 1 to 60% but mostly less than 10%. Elevations range from 4500 to 6500 feet.

4. Soils:

- a. The soils in this site are moderately deep or deep, well-drained soils in the Sierozem soil zone. They have stony or very stony, dark, grayish brown or brown loamy surface horizons, usually 3 to 6 inches thick. These horizons are underlain by stony, cobbly or gravelly, medium, moderately fine or fine textured subsoils. Reactions range from mildly alkaline to strongly alkaline and from moderately to strongly calcareous. These soils are forming in a wide range of parent materials derived from sandstone, shale, limestone, quartzite and various igneous parent rocks. Infiltration and internal water movement are moderate to good. Root penetration is not a limitation. These soils have

a moderate water holding capacity but is usually adequate for holding the normal precipitation which falls. Under proper management, these soils have little runoff and erosion except from a few intense summer rain storms.

Zonal Zierozem and Calcisols constitute 80 to 90% of this range site. The surface inch or two is usually a platy crust with numerous closed pores (vesicular), is slightly lighter in color and infrequently lower in organic matter content than the next underlying horizon. The subsoil is usually finer textured and has a brighter color than the A horizons. Several of the soil series in this site also occur in the Semidesert limey loam site. They lack the stone content, when placed in the latter site.

5. Potential Native Plant Community:

- a. The vegetation of this site is about 50 to 70% grasses, 5 to 10% forbs, and slightly less than 20 to 25% shrubs.

Decreaser grasses with both sheep and cattle use are bluebunch wheatgrass and Thurber's needlegrass comprising 30 to 50% of the plant composition by weight. Sandberg bluegrass with 5 to 20% of the total will decrease under spring use by sheep but will increase with other use. Increaser grasses under both sheep and cattle use may make up 15 to 35% of the vegetation and include Indian ricegrass, squirreltail and needleandthread.

Decreaser forbs under cattle and sheep use include balsamroot, hawksbeard and globemallow making 3 to 8% of the composition. Increaser forbs making up 2 to 7% include aster, astragalus, daisy, gaillardia, wild buckwheat, little sunflower, others and phlox.

Decreaser shrubs under sheep and cattle use may make up 2 to 3% and include bud sagebrush, and spiny hopsage. Shrubs which decrease with sheep use but increase with cattle use include black sagebrush comprising 5 to 15% of the vegetation. Increaser shrubs under both sheep and cattle use may make up 5 to 20% of the composition and include big sagebrush, buckwheat, leptodactylon, gray molly, greasewood, phlox, rubber rabbitbrush, and yellowbrush.

Common invaders of this site are cheatgrass, sixweek's fescue, threeawn, annual mustard, other annual forbs, Russian thistle, and juniper.

- b. Total annual air dry yields on excellent condition ranges vary from 1250 pounds per acre in favorable years to 750 pounds per acre in less favorable years.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25%- 0
Lbs Per Acre Air Dry	Favorable Yrs	1250-750	900-400	700-600	600-500
Total Annual Yield	Unfavorable Yrs	750-500	550-275	550-450	450-400

RANGE SITE DESCRIPTION 6.

1. Range Site Name: Semidesert Alkali Flats

2. Climate:

- a. The climate of this site is semi-arid and characterized by cold winters and hot summers. Precipitation is 8 to 12 inches with an average near 9 inches. Approximately 45% of the moisture comes during the period of plant growth between April and September. The moisture deficient period begins early in June when the evapo-transpiration rate is high. This and the accumulations of salt and alkali in the soil are factors which affect plant growth and reduce the productivity of this site. This site receives some run in moisture from adjacent sites but not enough to influence production materially. This site differs from salt meadow and alkali bottom sites because it does not have a water table.
- b. Plant growth begins about March 15 to April 1 and continues until June 5 to 15 when plants mature or go dormant because of depletion of soil moisture and high temperatures. With summer precipitation and cooling temperatures some of the grasses and forbs green up during the early fall. Frost-free period varies from 100 to 150 days.

3. Topography and Elevation:

This site occurs in valley bottoms, flood plains, gently sloping alluvial fans, nearly level lake basins and low gently sloping lake terraces. Slopes vary from 0 to 10%, but are mostly 1 to 2%. Elevations range from 4500 to 6000 feet, but are mostly around 5000.

4. Soils:

- a. Deep Sierozem soils are characteristic of this site. They are solonchic, sodium affected and/or saline. The normal surface horizon is thin, light colored, crusty with numerous fine pores (vesicular) and low in organic matter. In disturbed areas this surface may be absent due to erosion. Where this has taken place, the surface is frequently hard or very hard and puddled. Subsoils may be medium, moderately fine or fine textured. Reactions are alkaline, but vary according to the amount of sodium and/or salt present. Parent materials are sandstone, shale, limestone, quartzite and various igneous rocks. Infiltration and internal water movement are restricted. Root penetration is restricted due to limited moisture, high sodium and/or salt. Water holding capacity is high but available moisture is limited. These soils frequently receive run in moisture, but intake is slow so runoff and erosion result.

5. Potential Native Plant Community:

- a. The vegetation is salt and alkali tolerant. Forbs make up less than 5% of the vegetation. Of the remainder 35 to 45% is grass and 45 to 55% is shrubs.

Decreaser grasses under both sheep and cattle use are alkali bluegrass, Indian ricegrass, squirreltail, and western wheatgrass which will make up from 45 to 55% of the composition by weight. Sandberg bluegrass (3 to 5%) will decrease with spring sheep use, but increase under other uses.

Only one forb is a decreaser on this site, globemallow making up only 0 to 3% of the total. Increaser forbs under both cattle and sheep use are astragalus, daisy and others, but these will not make up more than 0 to 3% of the vegetation.

Shrubs which decrease under both sheep and cattle use will make 10 to 20% of the composition and include nuttall saltbush and winterfat. Increaser shrubs under both sheep and cattle use will make up 25 to 40% and include big sagebrush, gray molly, greasewood, and yellow-brush.

Common invaders of this site are foxtail, threeawn, annual weeds, halogeton, povertyweed, Russian thistle, and pricklypear.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25%- 0
Lbs Per Acre Air Dry	Favorable Yrs	1500-600	1750-650	1750-800	1000-1600
Total Annual Yield	Unfavorable Yrs	500-300	500-400	500-300	900-800

RANGE SITE DESCRIPTION 7.

1. Range Site Name: Upland Shallow Loam

2. Climate:

- a. The climate is characterized by cold, snowy winters and hot, dry summers. The average annual precipitation is mostly 12 to 18 inches, but in a few instances is as high as 20 inches on south and west exposures. June is commonly the driest month in precipitation. Annual distribution varies from 20 to 45% during the plant growth period, May to October. However, this is usually not too effective in influencing plant growth since it comes as small intermittent showers which do not wet the soil very deeply, or as intense cloud bursts where considerable runoff occurs, especially in July and August. The effective moisture for plant growth is the 55 to 80% that falls during the winter plant dormant period.

- b. The plant growth period begins from March 15 to April 15 and grasses and forbs usually mature from June 15 to July 1 due to soil moisture deficiencies and hot temperatures later on. The optimum growth period is May and early June. Shrubs usually grow throughout July and August but at a much reduced rate and continue until October 1 to October 15. Grasses usually green up again in late August, September, and October when precipitation occurs and temperatures are cooler. The frost-free period ranges from 75 to 180 days, but is mostly 90 to 140.

3. Topography and Elevation:

This site occurs on ridges, foothills, slopes and rolling hills. Slopes vary from gently sloping to moderately steep from 5 to 60%, but mostly 5 to 30%. It is found on all exposures, but is dominantly on south and west ones. Elevation ranges from 4400 to 8000 feet, but mostly 5000 to 7000 feet.

4. Soils:

- a. These soils are shallow (less than 20 inches) to bedrock which may be limestone, sandstone, quartzite, or gneiss. They have medium to moderately fine textured top soil or very fine sandy loams to silt loams. They are mostly zonal soils of the Brown soils zone. The surface is dark brown (moist). Coarse fragments in the profile above the bedrock range from gravel to stone in size and from relatively stone free to approximately 40% of the soil volume in abundance. Intake rate into the soil is good unless vegetation is depleted. Internal water movement is fairly rapid. Moisture holding capacity is low from 1.5 to 2.5 inches except for the cracks in the bedrock which store some water for deep-rooted plants. Erosion is not excessive due to coarse fragments on the surface unless vegetation is excessively depleted.

5. Potential Native Plant Community:

- a. The potential native plant community consists of approximately 60 to 70% grass by weight, 5 to 10% forbs and 15 to 25% shrubs.

The dominant grass is bluebunch wheatgrass which decreases under excessive cattle use, but increases under sheep use and makes up 50 to 65% of the total annual weight. Sandberg bluegrass (2%) decreases under spring use by sheep but increases under other uses.

Increaser grasses making up 5 to 10% of the total annual yield are prairie Junegrass, Nevada bluegrass, Indian ricegrass, needleandthread, king fescue, oniongrass, squirreltail and Idaho fescue.

Balsamroot (1-3%) decreases under spring sheep use, but increases under other uses. Increaser forbs make up 5 to 10% of the total and include aster, death camas, astragalus, herbaceous sage, lupine, lomatium, mustard, peavine, phlox, pussytoes, and stoneseed.

Bitterbrush with 2 to 5% of the total is a decreaser shrub. Increaser shrubs are big sagebrush, black sagebrush, low sagebrush, maple, silver sagebrush, and yellow brush making 15 to 20% of the total annual yield.

Common invaders of this site are cheatgrass, annual forbs, peppergrass and rubber rabbitbrush.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25-- 0
Lbs Per Acre Air Dry	Favorable Yrs	2500-1750	2200-1000	1800-1000	1200-600
Total Annual Yield	Unfavorable Yrs	1500-700	900-200	900-250	600-200

RANGE SITE DESCRIPTION 8.

1. Range Site Name; Upland Stony Loam

2. Climate:

- a. The climate is characterized by cold, snowy winters and hot, dry summers. The average annual precipitation is mostly 12 to 18 inches, but in a few instances is as high as 20 inches on south and west exposures. June is commonly the driest month in precipitation. annual distribution varies from 20 to 45% during the plant growth period, May to October. However, this is usually not too effective in influencing plant growth since it comes as small intermittent showers which do not wet the soils very deeply or as intense cloud bursts where considerable runoff occurs, especially in July and August. The effective moisture for plant growth is the 55 to 80% that falls during the winter plant dormant period.
- b. The plant growth period begins from March 15 to April 15 and grasses and forbs usually mature from June 15 to July 1 due to soil moisture deficiencies and hot temperatures. The optimum growth period is May and early June. Shrubs usually grow throughout July and August but at a much reduced rate and continue until October 1 to October 15. Grasses usually green up again in late August, September, and October when summer precipitation occurs and temperatures are cooler. The frost-free period ranges from 75 to 180 days, but is mostly 90 to 140.

3. Topography and Elevation:

This site occurs on foothills, lake terraces, deltas, alluvial and colluvial fans, outwash plains, benchlands and rolling to steep hills on all exposures. At the higher elevations and in the northern districts, it is found dominantly on the south and west exposures. Slopes vary from 1 to 70%, but are mostly 5 to 30%. Elevation ranges from 4000 to 7500 with the higher elevations found in the southern districts.

4. Soils:

- a. The Brown and Chestnut soils in this site are deep and well drained. They have very dark grayish brown or dark brown loamy surface horizons, usually 6 to 10 inches thick and gravelly, cobbly or stony. These horizons are underlain by moderately coarse, medium or moderately fine textured subsoils. The upper subsoils are usually gravelly or cobbly and coarse fragments increase with depth. The lower subsoil, and below, have over 50% coarse fragments by volume. Reactions range from neutral to moderately alkaline. Some of these soils have lime horizons below 12 inches. They are forming on a wide range of slopes in parent materials derived from sandstone, shale, limestone, quartzite and various igneous parent rocks. Infiltration and internal water movement are good. Root penetration in the soil material is not a limitation. These soils have a moderate water holding capacity, 6 to 9 inches. Normal precipitation penetrates into the lower subsoil and coarse materials below. Under proper management these soils have little surface runoff and slight or no erosion.

Zonal soils constitute 80 to 90% and alluvial soils 10 to 20% of this range site. The zonal soils have developed horizons which are an expression of their environment. The surface horizons are as dark or darker than the B horizons and range in organic matter content from 1.75% to 4.5%. The B horizons are usually a brighter color and finer textured than the overlying (A₁) or the underlying (C) horizons. The zonal Brown soils have slightly thinner horizons than the zonal Chestnut soils because of lower precipitation. The organic matter content of the A₁ is slightly lower and the depth to any lime horizon is slightly less. The alluvial soils are recent soils and do not show horizon development except for a darkening of the surface color. The subsoils show little if any, alternation of parent materials.

5. Potential Native Plant Community:

- a. The vegetation of this site is 60 to 70% grasses, about 2 to 5% forbs, and 20 to 30% shrubs.

Bluebunch wheatgrass decreases under cattle use, but increases under sheep use and makes up 60 to 70% of the total yield. Sandberg bluegrass decreases under spring use by sheep, but increases under all other uses. It will make up about 0 to 2% of the vegetation. Increaser grasses under both cattle and sheep use will comprise 5 to 10% of the composition and include Columbia needlegrass, dryland sedge, Indian ricegrass, Kentucky bluegrass, needleandthread, oniongrass, prairie Junegrass, sand dropseed, squirreltail, tall native bluegrass and western wheatgrass.

Hawksbeard is the only decreaser forb under both sheep and cattle use and makes up about 0 to 1% of the total. Balsamroot decreases under sheep use, but increases with cattle use and makes up 0 to 3% of the composition. Increaser forbs with both cattle and

and sheep use make up 2 to 5% of the total and include aster, herbaceous sage, little sunflower, lomatium, lupine, mulesear dock, mustard, peavine, phlox, senecio, toadflax and yarrow.

Bitterbrush decreases under sheep use, but increases with cattle use and makes up 0 to 10% of the total. Increaser shrubs under both cattle and sheep use are big sagebrush, black sagebrush, leptodactylon, oakbrush, rock goldenrod, phlox, rubber rabbitbrush, serviceberry, winterfat, woody aster, yellowbrush and make up 20 to 30% of the composition.

Common invaders of this site are cheatgrass, annual forbs, ragweed, tarweed, and juniper.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25%-0
Lbs. Per Acre Air Dry	Favorable Yrs	2300-1400	2400-100	2500-800	2000-350
Total Annual Yield	Unfavorable Yrs	1400-750	1000-600	750-250	750-225

RANGE SITE DESCRIPTION 9.

1. Range Site Name: Semidesert Loam
2. Climate:
 - a. The climate of this site is semi-arid and characterized by cold winters and hot summers. Precipitation is 8 to 12 inches with an average near 9 inches. Approximately 45% of the moisture comes during the period of plant growth between April and September. The moisture deficient period begins early in June when the evapo-transpiration rate is high. This and the accumulations of salt and alkali in the soil are factors which affect plant growth and reduce the productivity of this site. This site receives some run in moisture from adjacent sites but not enough to influence production materially. This site differs from salt meadow and alkali bottom sites because it does not have a water table.
 - b. Plant growth begins about March 15 to April 1 and continues until June 5 to June 15 when plants mature or go dormant because of depletion of soil moisture and high temperatures. With summer precipitation and cooling temperatures some of the grasses and forbs green up during the early fall. Frost-free period varies from 100 to 150 days.
3. Topography and Elevation:

This site occurs on nearly level to gently rolling alluvial fans, lake terraces, benchland, flood plains, valleys, toe slopes, foothills, and low rolling hills. Much of it is on old abandoned farmlands. Slopes vary from 1 to 30 but is mostly less than 10. Elevations range from 4500 to 5500 feet.

4. Potential Native Plant Community:

- a. The vegetation of this site is 40 to 60% grass, 10 to 25% forbs and 15 to 25% shrubs.

Decreaser grasses under both sheep and cattle use will make up 10 to 50% of the plant composition by weight and includes needleandthread, Bluebunch wheatgrass and Thruber's needlegrass decrease under cattle use but increase under sheep use and may comprise 25 to 60%. Sandberg bluegrass may comprise 5 to 20% and decreases under spring sheep use but increases under other uses. Increaser grasses under both sheep and cattle use are Indian ricegrass, Prairie junegrass, sand dropseed, squirreltail and western wheatgrass which make up 10 to 25% of the total.

Globemallow and hawksbeard with 2 to 10% of the composition decreases under both sheep and cattle use. Balsamroot (5 to 15%) decreases under sheep use but increases under cattle use. Increaser forbs, making up 5 to 20% of the composition, will include aster, astragalus, drummond thistle, Indian paintbrush, lomatium, mustard, onion, others, penstemon, phlox, pussytoes, sego lily, stickseed and toadflax.

Decreaser shrubs under both sheep and cattle use may comprise 5 to 25% of the vegetation and include bitterbrush, bud sagebrush and winterfat. A shrub which decreases under sheep use but increases under cattle use is black sagebrush making 5 to 20%. Increaser shrubs and halfshrubs may make up 20 to 25% of the composition and include big sagebrush, fringed sagebrush, gray molly, horsebrush, low sagebrush, nuttall saltbush, pricklypear, shadscale, three tip sagebrush and yellowbrush.

Common invaders of this site are cheatgrass, fluffgrass, sixweek's fescue, African mustard (Malcomia), annual forbs, greasewood, halogeton, Russian thistle and juniper.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25%- 0
Lbs. Per Acre Air Dry	Favorable Yrs	1300-750	1250-750	1450-1150	1900-1200
Total Annual Yield	Unfavorable Yrs	700-300	900-400	1100-250	1000-225

RANGE SITE DESCRIPTION 10.

1. Range Site Name: Mountain Stony Loam
2. Topography and Elevation:

This site occurs on gently to steep mountain slopes, mesas, valley bottoms, and fans. It is usually above the high level of Lake Bonneville. It is found on all exposures, but is dominantly on south and west facing slopes. Slopes vary from 5-70%, but are mostly 20 to 40%. Elevation ranges from 4600 to 9000.

3. Soils:

- a. The soils in this site are deep, well drained and very gravelly, very stony or very cobbly (50% by volume) throughout the major part of the soil profile. The A₁ horizons are sandy loams and loams, very dark brown or very dark grayish brown in color and range from 8 to 12 inches in thickness. Below the surface, the soil profile ranges in texture from sandy loam to clay with 50% by volume of coarse fragments. Reactions range from slightly acid to mildly alkaline, and are generally non-calcareous. These soils are forming on gently sloping to very steep mountain slopes and hilly plateaus in alluvium and colluvium derived from sandstone, shale, limestone, quartzite, schist, gneiss, and various igneous parent rocks. Infiltration and internal water movement are good. Roots penetrate the soil material readily and are forced to detour around the coarse fragments. Waterholding capacity is moderate because of the high content of coarse fragments. Moisture penetrates deeply because of limited storage in the profile. Under proper management these soils have little surface runoff and slight or no erosion.

4. Potential Native Plant Community:

- a. The vegetation of this site is 65 to 75% grasses, from 5 to 10% forbs and 15 to 20% shrubs.

Decreaser grasses under both sheep and cattle use comprise 1 to 5% of the composition by weight and include bearded wheatgrass, Idaho fescue, oniongrass, slender wheatgrass and tall native bluegrass. Decreaser grasses under cattle use which increase under sheep use make 60 to 70% of the total and include bluebunch wheatgrass. Sandberg bluegrass (1-5%) will decrease under spring sheep use but increase under all other uses. Increaser grasses under both sheep and cattle use making up 10 to 15% of the composition are dryland sedge, Great Basin wildrye, Kentucky bluegrass, King fescue, prairie Junegrass.

Decreaser forbs, both sheep and cattle use, make up 2 to 3% of the total and include hawksbeard, cow cabbage and edible valerian. A decreaseer forb under sheep use which increases under cattle use is balsamroot making up 1 to 10% of the composition. Increaser forbs totaling 1 to 10% include aster, astragalus, buckwheat, herbaceous sage, Indian paintbrush, little sunflower, lupine, penstemon, phlox, muleseardock, stickseed, stoneseed, wild carrot and yarrow.

Bitterbrush (5 to 20%) is a decreaseer for both sheep and cattle. Serviceberry (1 to 5%) decreases under sheep use but increases with cattle use. Increaser shrubs under sheep use and cattle use make up 5 to 15% of the weight and consist of big sagebrush, buckwheat, chokecherry, horsebrush, Oregon grape, oakbrush, phlox, snowberry and yellowbrush.

Common invaders of this site are cheatgrass, annual weeds, knotweed, juniper, rubber rabbitbrush, and tarweed.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25%- 0
Lbs. Per Acre Air Dry	Favorable Yrs	2500-1750	2000-1350	1750-750	1500-1400
Total Annual Yield	Unfavorable Yrs	1000-750	1400-600	1000-500	900-450

RANGE SITE DESCRIPTION 11.

1. Range Site Name: Mountain Loam

2. Topography and Elevation:

This site occurs on gently to steep mountain slopes, fans, valley bottoms and mesas. It is usually found above the highest lake terrace of Old Lake Bonneville. Slopes vary from 2 to 70% but generally are from 10 to 50%. It occurs on all exposures, but at the lower elevations is mostly on the north and east exposures. Elevations range from 5000 to 9000 feet.

3. Soils:

a. The soils in this site are deep, well-drained, "cool Prairie-like" soils. They have very dark brown or very dark grayish loamy A₁ horizons, usually 8 to 12 inches thick, underlain by medium to fine textured B₂ horizons which may contain some gravel and cobble. Reaction ranges from slightly acid to mildly alkaline.

Some soils may have lime horizons below 36 inches, but the overlying soil is usually noncalcareous. They are forming on gently sloping to very steep mountain slopes and hilly plateaus in parent materials derived from sandstone, shale, limestone, quartzite, volcanic ash and various igneous rocks. Infiltration and internal water movement are good. Roots penetrate the soil material readily. These soils have a high waterholding capacity, ranging from about 10 to 14.5 inches in a six-foot profile. Coarse fragments are variable throughout the profile, but are less than 50% by volume. Some profiles have little or no coarse fragments. Stone or cobble may occur as a surface mantle. Under proper management, these soils have little surface runoff and slight or no erosion.

4. Potential Native Plant Community:

a. The vegetation of this site consists mostly of about 85% grasses with about 5% forbs and 10% shrubs. Decreaser grasses with both sheep and cattle use are bearded wheatgrass, Idaho fescue, Great Basin wildrye, oniongrass, slender wheatgrass, and tall native bluegrasses. These may comprise 1 to 5% of the plant composition by volume weight. Bluebunch wheatgrass, king fescue, mountain muhly, mountain brome, Columbia needlegrass, and nodding brome are decreaseers under cattle

use and increasers under sheep use. These grasses will make up 65 to 90% of the composition. Sandberg bluegrass is a decreaser under spring use by sheep, but otherwise is an increaser. It is only about 1% of the composition. Increaser grasses with both sheep and cattle use are squirreltail, dryland sedge, Indian ricegrass, Kentucky bluegrass, letterman needlegrass, needleandthread, prairie Junegrass, and western wheatgrass, and these will make up 1 to 5% of the total vegetation. Decreaser forbs under cattle and sheep use is hawksbeard making up approximately 2%. Balsamroot may comprise 1% and decreases under sheep use while increasing under cattle use. Increaser forbs under both cattle and sheep use comprising 1 to 5% of the composition are aster, astragalus, buckwheat, daisy, elkweed, geranium, horsemint, little sunflower, lupine, mulesear dock, peavine, penstemon, phlox, senecio, stoneseed, timber milkvetch and yarrow.

Bitterbrush decreases under sheep use but increases with cattle use and makes up 1 to 5% of the composition. Increaser shrubs under both cattle and sheep use comprising 5 to 10% of the composition are big sagebrush, buckwheat, chokecherry, elderberry, mountain laurel, oakbrush, rose, snowberry, and yellowbrush.

Common invaders of this site are cheatgrass, sixweek's fescue, threeawn, dandelion, houndstongue, knotweed, mullein, annual weeds, tarweed, juniper, and rubber rabbitbrush.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

	EXCELLENT	GOOD	FAIR	POOR
Percent of Potential	100%-76%	75%-51%	50%-26%	25%- 0
Lbs Per Acre Air Dry Favorable Yrs	2750-1750	3000-2000	2000-1500	2500-1700
Total Annual Yield Unfavorable Yrs	1750-1050	1750-900	1200-500	100-500

RANGE SITE DESCRIPTION 12.

1. Range Site Name: Mountain Clay.

2. Climate:

- a. The climate of this site is ordinarily cool and sub-humid with snowy winters. The driest month is June, but with soil moisture carry-over from winter there is usually enough moisture for plant growth through most of the summer. Average annual precipitation varies from 15 to 21 inches. Its distribution is from 30 to 45% during the spring and summer, May to September, so the majority of the precipitation falls during the fall and winter period.
- b. The plants of this site are cool season growers due to the winter moisture. Plant growth period begins from April 15 to May 10 and continues until September 20 to October 15. Most plant species on this site do not have a summer dormant period except in years of abnormally low moisture. They grow at a reduced rate, but continue to grow until killing frosts. The frost-free period varies from 70 to about 105 days.

3. Topography and Elevation:

This site is found in valley bottoms and on gently sloping to steep mountain slopes. In most districts it is found on all exposures with a tendency toward north and east slopes at its lower elevations. Slopes are from nearly level to 60%, but mostly from 5 to 40%. Elevations range from 5000 feet to 8000 feet, with the higher elevations in the southern parts.

4. Soils:

- a. The soils in this site are generally deep, but some moderately deep over bedrock are included. They are well drained, "cool Prairie-like" soils. They have very dark brown or very dark grayish brown fine or moderately fine textured A₁ horizons that are from 6 to 12 inches thick. The A₁ horizons are underlain by heavy clay loam or clay textured B₂ horizons. Coarse fragments may occur in the profile or as a surface mantle, but are less than 50% by volume. Reaction ranges from slightly acid to mildly alkaline and calcium carbonate from none in some soils to strong lime horizons below about 27 inches in others. These soils are forming on gently sloping to very steep mountain slopes and hilly plateaus in parent material derived from sedimentary and fine grained igneous rocks. Soil cracking occurs during the dry summer months, especially where the plant cover has been reduced. Root penetration is somewhat restricted due to the fine textures and reduced depth of moisture penetration. Waterholding capacity is high but the surface intake rate is restricted which reduces the effectiveness of precipitation due to runoff. Winter moisture in the form of snow has a better chance of entering these soils than spring rains, especially if the snow melts slowly. Fast melting snow and heavy spring rains contribute to runoff and erosion of these soils.

5. Potential Native Plant Community:

- a. The vegetation of this site consists of mostly grass with about 5% forbs and about 5% shrubs. Decreaser grasses under both cattle and sheep use are blue wildrye, Idaho fescue, oniongrass, slender wheatgrass and tall native bluegrass which comprise about 75 to 85% of the plant composition by weight. A grass which decreases under cattle and increases under sheep use is bluebunch wheatgrass which will comprise about 5% of the total. Sandberg bluegrass will decrease under spring use by sheep, but will increase under other types of uses and makes up 1-2% of the composition. Increaser grasses under both sheep and cattle use are Columbia needlegrass, Great Basin wildrye, Kentucky bluegrass, letterman needlegrass, prairie Junegrass, sheep fescue, squirreltail, and western wheatgrass which make up from 10 to 15% of the composition.

One decreaser forb under both cattle and sheep use is hawkbeard which may comprise about 1% of the cover. Increaser forbs under both sheep and cattle use may make up 1 to 5% of the composition and include geranium, herbaceous sage, little sunflower, lomatium, milesear dock, onion, peavine, senecio and yarrow.

Serviceberry and bitterbrush will decrease under sheep use but increase under cattle use and makes up about 2% of the total production. Increaser shrubs under both sheep and cattle use may make up 2 to 5% of the composition and include big sagebrush, chokecherry, low sagebrush, oakbrush, snowberry, and yellowbrush.

Common invaders of this site after excessive grazing use are cheatgrass, annual forbs, Canada thistle, dandelion, knotweed, gumweed, mullein, tarweed and verbena.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25%- 0
Lbs Per Acre Air Dry	Favorable Yrs	3500-1800	2250-1250	2150-1750	2500-1500
Total Annual Yield	Unfavorable Yrs	1750-1550	1750-750	1000-750	900 -800

RANGE SITE DESCRIPTION 13.

1. Range Site Name: Mountain Shallow Loam

2. Climate:

- a. The climate of this site is cool and quite humid with cold snowy winters and warm dry summers. The average annual precipitation varies from 16 to 22 inches with an average of around 19. Distribution is 55 to 60% during the plant dormant period (October to March). Lower precipitation and high evapo-transpiration rates during July, August, and September causes slowing down in growth of all plant species and dormancy in most of the grasses and forbs.
- b. Plants begin to grow from April 15 to May 1. The grasses have a dormancy period from July 15 to August 15, but grasses may green up again in September when fall rains occur. Shrub species grow until frost but at a reduced rate during summer months. Optimum growth period is during June. Frost-free period varies from 80 to 130 days.

3. Topography and Elevation:

This site is found on rolling to steep mountain slopes and ridges. It is found on all exposures, but most commonly on south and west facing ones and on ridge tops. Slopes vary from gentle to steep, from 5 to 30%. Elevation ranges from 5200 to 9000 feet.

4. Soils:

- a. Soils in this site are stony or cobbly, shallow over bedrock (10-20 inches) and well drained lithosolic "cool prairie-like" soils. They have very dark brown or very dark grayish brown loamy A₁ horizons, usually 8 to 12 inches thick and are stony or cobbly. The subsoils

are stony or cobbly and range from moderately coarse to fine textured. Reaction ranges from slightly acid to mildly alkaline. They are forming on strongly sloping to very steep mountain slopes and are derived from sandstone, shale, limestone, quartzite, and various igneous parent rocks. Infiltration and internal water movement are good above the bedrock.

5. Potential Native Plant Community:

- a. The vegetation of this site is 50% grasses with 5% forbs and 45% shrubs. Grasses which are decreasers with both sheep and cattle use will make up 5 to 10% of the vegetation by weight and include slender wheatgrass and tall native bluegrass. Grasses which are decreasers under cattle use, but increase under sheep use make up 25 to 35% of the vegetation. These include bluebunch wheatgrass and Indian ricegrass. Sandberg bluegrass making up 2% of the composition will decrease under spring use by sheep, but increases under other uses. Increaser grasses under both sheep and cattle use will comprise 15 to 20% of the vegetation and include Columbia needlegrass, Great Basin wildrye, king fescue, letterman needlegrass, others, prairie Junegrass, squirreltail, threeawn and western wheatgrass.

Hawksbeard and cow cabbage (1 to 3%) are forbs which decrease under sheep and cattle use and balsamroot (1 to 5%) decreases under sheep use only. Increaser forbs under sheep and cattle use making up about 1-5% of the composition are aster, buckwheat, Drummond thistle, flax, Indian paintbrush, little sunflower, oyster plant, peavine, phlox, stickseed, timber milkvetch and yarrow.

Shrubs which decrease under sheep use, but increase under cattle use make up 5 to 10% of the plant composition are rose and serviceberry. Bitterbrush making up about 35% is a decreaser with both sheep and cattle. Shrubs which increase with both sheep and cattle use may make up 10 to 15% of the composition. These increasers are big sagebrush, buckwheat, elderberry, oakbrush, Oregon grape, pricklypear, rubber rabbitbrush, snowberry and yellowbrush.

Common invaders of this site are cheatgrass, annual weeds, houndstongue, knotweed, mulesear dock, mullein, mustard and juniper.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100-76%	75%-51%	50%-26%	25%- 0
Lbs Per Acre Air Dry	Favorable Yrs	1750-1250	1800-1250	2500-1500	2700-1200
Total Annual Yield	Unfavorable Yrs	1000-550	900-600	1200-900	900-350

RANGE SITE DESCRIPTION 14.

1. Range Site Name: Semidesert Shallow Loam -10-12" pz

2. Climate:

- a. The climate is characterized by dry, cold winters and dry, hot summers. The average annual precipitation is 10 to 12 inches. The distribution is 50 to 55% during the plant growth period, April to September. Due to the character of the rainfall either as light intermittent showers or heavy summer cloudbursts, the summer precipitation influences plant growth only slightly.

June is generally the driest month and August has the greatest average monthly precipitation.

- b. Plant growth begins about March 15 to April 1 and continues until June 1 to 15 when evapo-transpiration and deficiency of soil moisture causes the forbs and grasses to mature or go dormant. They green up in late August and September in most years from August precipitation. Frost-free period is from 90 to 135 days.

3. Topography and Elevation:

This site occurs on foothills, low ridges and benches. Slopes vary from 1 to 15%, but are usually less than 5%. Elevations range from 4500 to 6000 feet.

4. Potential Native Plant Community.

- a. The vegetation of this site is 50 to 65% grasses, less than 5% forbs and 30 to 35% shrubs.

5. Decreaser grasses make up 50 to 60% of the total yield and include bluebunch wheatgrass, Indian ricegrass, needleandthread, squirreltail, and tall native bluegrasses. Sandberg bluegrass (2 to 7%) decreases under spring use by sheep but increases with other uses.

Globemallow is a decreaser forb making up 3 to 5% of the total weight. Increaser forbs making up less than 5% of the composition include loco, lomatium, others, penstemon, sandwort, and stickseed.

One decreaser half-shrub, winterfat, makes up 5 to 25% of the total. Black sagebrush decreases with sheep use but increases under cattle use and makes up 10 to 35% of the yield. Increaser shrubs comprise 15 to 25% and include bi; sagebrush, buckwheat, leptodactylon, and yellowbrush.

Common invaders of this site are cheatgrass, as well as, Russian thistle, and other annual forbs.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100 ₀ -76 ₀₀	75 ₀₀ -51 ₀₀	50 ₀₀ -26 ₀₀	25 ₀₀ - 0
Lbs Per Acre Air Dry	Favorable Yrs	1500-800	1350-600	775-450	500-200
Total Annual Yield	Unfavorable Yrs	800-500	500-200	400-200	225-50

RANGE SITE DESCRIPTION 15.

1. Range Site Name: High Mountain Loam (Aspen)
2. Climate:
 - a. The climate of this site is cool and humid with cold, snowy winters. The average annual precipitation varies from 22 to 40 inches. Distribution of this moisture is generally 23 to 35 percent during the plant growing season. Most of the effective moisture comes from snowmelt from winter precipitation.
3. High Mt. Loam (Aspen)
 - a. Plant growth begins about May 10-20 and ends due to killing frosts about September 15 to October 1. Moisture and temperature are such that they are not limiting to plant growth during this period except some years a small moisture deficiency in July and August will slow down growth of herbage and may force grass and forb species into early maturity. The frost-free period is 65 to 90 days.
4. Topography and Elevation:

This site occurs on gently sloping to very steep mountain slopes. It is found on all exposures at the higher elevations, but is primarily on the north and east exposures at the lower elevations where it is often adjacent to mountain sites which are found on the south and west exposures. It is often adjacent to or intermingled with the high mountain loam site and it will often become necessary to map these two sites as an association or complex. The slopes range from 5 to 70 percent, but mostly are from 5 to 40 percent. Elevation ranges from 6000 to 10,000 feet above sea level.
5. Potential Native Plant Community:

Decreaser grasses which make up about 20 percent of the total vegetation consist of bearded wheatgrass, blue wildrye, nodding bluegrass, oniongrass, and slender wheatgrass. Grasses which are decreaseers under cattle grazing and increaseers under sheep grazing will make up 15 to 20 percent of the vegetation and consist of mountain brome and nodding brome. Increaseer grasses with both classes of livestock are Columbia needlegrass and dryland sedge which will make up about 5 to 10% of the composition. Decreaser

forbs such as edible valerian and sweet anise will comprise 5 to 10 percent of the production. Forbs which act as decreasers under sheep grazing and increasers with cattle grazing are butterweed, cow cabbage and Jacob's ladder. These make up 1 to 5 percent of the composition. Increaser forbs such as aster, bluebell, descurainia, geranium, horsemint, meadowrue, peavine, poison vetch, senecio, stellaria, tall larkspur, violet, wild carrot, western coneflower, and yarrow will compose 5 to 15 percent of the vegetation. Shrubs and trees will make up about 40% of the total production and will be such species as aspen, elderberry, rose and snowberry. Aspen is a decreaser on sheep range and an increaser on cattle range. Common invaders of this site are annual grasses, annual weeds, big sagebrush, houndstongue, knotweed, mullen and tarweed.

This is one of the good sites in the Basin, producing over one AU of grazing per acre.

RANGE SITE DESCRIPTION 15.

1. Range Site Name: Upland Loam

2. Climate:

- a. The climate is characterized by cold, snowy winters and hot, dry summers. The average annual precipitation is mostly 12 to 18 inches, but in a few instances is as high as 20 inches on south and west exposures. June is commonly the driest month. Annual distribution varies from 20 to 45% during the plant growth period, May to October. However, this is usually not too effective in influencing plant growth since it comes as small intermittent showers which do not wet the soil very deeply or as intense cloud bursts where considerable runoff occurs, especially in July and August. The effective moisture for plant growth is the 55 to 90% that falls during the winter plant dormant period.
- b. The plant growth period begins from March 15 to April 15 and grasses and forbs usually mature from June 15 to July 1 due to soil moisture deficiencies and hot temperatures. The optimum growth period is May and early June. Shrubs usually grow throughout July and August but at a much reduced rate and continue until October 1 to October 15. Grasses usually green up again in late August, September, and October when summer precipitation occurs and temperatures are cooler. The frost-free period ranges from 75 to 130 days, but is mostly 90 to 140.

3. Topography and Elevation:

This site occurs on outwash plains, alluvial fans, intermediate and high Bonneville lake terraces, flood plains, slopes adjacent to stream bottoms, rolling foothills, basins, benches, mesas and rolling hills. Slopes vary from 1 to 40%, but most of the site has from 5 to 20 slopes. Elevation ranges from 4000 to 8000 but most common is 5500 to 7000 feet.

4. Soils:

- a. The soils in this site are deep and well-drained in the Brown and Chestnut soil zones. They have very dark brown, very dark grayish brown or dark brown loamy surface horizons, usually 6 to 10 inches thick. These horizons are underlain by medium, moderately fine or fine textured subsoils which may contain some gravel or cobble. Reactions range from neutral to moderately alkaline. Some of these soils have lime horizons below 12 inches. They are forming on a wide range of slopes in parent materials derived from sandstone, shale, limestone, quartzite and various igneous parent rocks.

Infiltration and internal water movement are good. Root penetration in the soil material is not a limitation. These soils have a high water holding capacity, adequate for holding all the normal precipitation which falls. Coarse fragments are variable, but are less than 50% by volume and may occur on the surface or within the soil profile. Under proper management, these soils have little surface runoff and slight or no erosion.

Zonal soils constitute 80 to 90% of the alluvial soils 10 to 20% of this range site. The zonal soils have developed horizons which are an expression of their environment. The surface horizons are as dark or darker than the B horizons and range in organic matter content from 1.75% to 4.5%. The B horizons are usually a brighter color and finer textured than the overlying (A₁) or the underlying (C) horizons. The zonal Brown soils have slightly thinner horizons than the Zonal Chestnut soils because of lower precipitation. The organic matter content of the A₁ is lightly lower and the depth to any lime horizon is slightly less. The alluvial soils are recent soils and do not show horizon development except for a darkening of the surface color. The subsoils show little, if any, alteration of parent materials.

5. Potential Native Plant Community:

- a. The vegetation of this site is about 60 to 80% grasses, slightly over 10% forbs, and 5 to 10% shrubs.

Decreaser grasses under both cattle and sheep use comprise only about 1 to 5% of the plant composition by weight and includes tall native bluegrasses. Grasses which decrease under cattle use but increase under sheep use comprise 65 to 75% of the composition and include bluebunch wheatgrass. Sandberg bluegrass (2 to 3%) decreases under spring use by sheep, but increases under other kinds of use. Increaser grasses such as Great Basin wildrye, Indian ricegrass, needleandthread, prairie Junegrass, sand dropseed, squirreltail and western wheatgrass will comprise 1 to 10% of the vegetation.

Forbs which decrease are hawksbeard (1 to 2%) under both sheep and cattle use. Balsamroot will decrease under sheep use but increase under cattle use (1 to 8%). Increaser forbs such as aster, astragalus, buckwheat, daisy, drummond thistle, herbaceous sage, houndstongue, little sunflower, lomatium, lupine, mustard, others, onion, peavine, phlox, pussytoes, skeleton loco, sego lily, penstemon, stoneseed, timber milkvetch, and yarrow may make up 5 to 10% of the vegetation.

Bitterbrush and winterfat decrease on this site making up 5 to 10% of the composition. Increaser shrubs are big sagebrush, wild buckwheat, pricklypear, rubber rabbitbrush, snowberry and yellowbrush which may make up 5 to 10% of the total vegetation.

Common invaders of this site are cheatgrass, threeawn, annual weeds, gumweed, and juniper.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25-- 0
Lbs Per Acre Air Dry	Favorable Yrs	2500-1300	2500-1400	1950-1200	2750-1150
Total Annual Yield	Unfavorable Yrs	1300-550	1400-550	1000-400	1150-300

RANGE SITE DESCRIPTION 16.

1. Range Site Name: Upland Clay

2. Climate:

- a. The climate is characterized by cold, snowy winters and hot, dry summers. The average annual precipitation is mostly 12 to 18 inches, but in a few instances is as high as 20 inches on south and west exposures. June is commonly the driest month in precipitation. Annual distribution varies from 20 to 45% during the plant growth period, May to October. However, this is usually not too effective in influencing plant growth since it comes as small intermittent showers which do not wet the soil very deeply or as intense cloud bursts where considerable runoff occurs, especially in July and August. The effective moisture for plant growth is the 55 to 80% that falls during the winter plant dormant period.
- b. The plant growth period begins from March 15 to April 15 and grasses and forbs usually mature from June 15 to July 1 due to soil moisture deficiencies and hot temperatures. The optimum growth period is May and early June. Shrubs usually grow throughout July and August but at a much reduced rate and continue until October 1 to October 15. Grasses usually green up again in late August, September, and October when summer precipitation occurs and temperatures are cooler. The frost-free period ranges from 75 to 110 days, but is mostly 90 to 140.

3. Topography and Elevation:

This site occurs on alluvial fans, outwash plains, benchlands, valley bottoms and moderately steep slopes on all exposures. Slopes vary from 1 to 30%, but are mostly 5 to 15%. Elevation ranges from 4500 to 7000 feet.

4. Potential Native Plant Community:

- a. The vegetation of this site is 85% grasses, about 5% forbs, and 10% shrubs.

Decreaser grasses under both cattle and sheep use make up less than 5% of the composition by weight. These include slender wheatgrass and needleandthread. Grasses which decrease under cattle use but increase under sheep use include bluebunch wheatgrass and Indian ricegrass and make up 60 to 80% of the total. Sandberg bluegrass decreases under spring sheep use but increases under all other uses and makes up 1 to 3% of the composition and include Columbia needlegrass, Kentucky bluegrass, sand dropseed, squirreltail, and western wheatgrass.

Globemallow decreases under sheep use but increases under cattle use and make up 1 to 2%. Increaser forbs under both sheep and cattle use are aster, astragalus, buckwheat, daisy, drummond thistle, little sunflower, mat loco, mustard, others, phlox, pussytoes, and stoneseed and make up less than 5% of the vegetation.

Winterfat is a decreaser half-shrub under both cattle and sheep use and makes up around 1% of the total. Rose decreases under sheep use, but increases under cattle use and makes up about 1%. Increaser shrubs comprising 5 to 10% of the composition include big sagebrush, buckwheat, curleaf mahogany, low sagebrush, phlox and yellowbrush.

Common invaders of this site are cheatgrass, annual forbs, juniper, gumweed, Russian thistle, and tarweed.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25%-0
Lbs Per Acre Air Dry	Favorable Yrs	1500-1250	1350-900	900-800	1100-850
Total Annual Yield	Unfavorable Yrs	900-750	750-600	600-300	350

ANNE STEEL DESCRIPTION 17.

1. Name Site Type: Upland Clay

2. Climate:

- The climate is characterized by cold, snowy winters and hot, dry summers. The average annual precipitation is mostly 12 to 18 inches, but in a few instances is as high as 20 inches on south and west exposures. June is commonly the driest month in precipitation. Annual distribution varies from 30" to 45" during the plant growth

period, May to October. However, this is usually not too effective in influencing plant growth since it comes as small intermittent showers which do not wet the soil very deeply or as intense cloud bursts where considerable runoff occurs, especially in July and August. The effective moisture for plant growth is the 55 to 80 that falls during the winter plant dormant period.

- b. The plant growth period begins from March 15 to April 15 and grasses and forbs usually mature from June 15 to July 1 due to soil moisture deficiencies and hot temperatures. The optimum growth period is May and early June. Shrubs usually grow throughout July and August but at a much reduced rate and continue until October 1 to October 15. Grasses usually green up again in late August, September, and October when summer precipitation occurs and temperatures are cooler. The frost-free period ranges from 75 to 180 days, but is mostly 90 to 140.

3. Topography and Elevation:

This site occurs on alluvial fans, outwash plains, benchlands, valley bottoms and moderately steep slopes on all exposures. Slopes vary from 1 to 30%, but are mostly 5 to 15%. Elevation ranges from 4500 to 7000 feet.

4. Potential Native Plant Community:

- a. The vegetation of this site is 85% grasses, slightly less than 5% forbs, and slightly over 10% shrubs.

Decreaser grasses under both cattle and sheep use make up less than 5% of the composition by weight. These include slender wheatgrass and needleandthread. Grasses which decrease under cattle use but increase under sheep use include bluebunch wheatgrass and Indian ricegrass and make up 60 to 80% of the total. Sandberg bluegrass decreases under spring sheep use but increases under all other uses and makes up 1 to 3% of the composition and include Columbia needlegrass, Kentucky bluegrass, sand dropseed, squirreltail, and western wheatgrass.

Globemallow decreases under sheep use but increases under cattle use and make up 1 to 2%. Increaser forbs under both sheep and cattle use are aster, astragalus, buckwheat, daisy, drummond thistle, little sunflower, mat loco, mustard, others, phlox, pussytoes, and stoneseed and make up less than 5% of the vegetation.

Winterfat is a decreaser half-shrub under both cattle and sheep use and makes up around 1% of the total. Rose decreases under sheep use, but increases under cattle use and makes up about 1%. Increaser shrubs comprising 5 to 10% of the composition include big sagebrush, buckwheat, curlleaf cholla, low sagebrush, phlox and yellowbrush.

Common invaders of this site are cheatgrass, annual forbs, juniper, gumweed, Russian thistle, and tarweed.

ESTIMATED YIELDS AND POTENTIAL IMPROVEMENT BY CONDITION CLASSES

		EXCELLENT	GOOD	FAIR	POOR
Percent of Potential		100%-76%	75%-51%	50%-26%	25%-0
Lbs Per Acre Air Dry	Favorable Yrs	1500-1250	1350-900	900-800	1100-950
Total Annual Yield	Unfavorable Yrs	900-750	750-600	600-300	350

RANGE APPENDIX B.

SCIENTIFIC AND COMMON NAMES OF PLANTS DISCUSSED IN THE
BEAR RIVER BASIN INVENTORY AND ASSESSMENT OF THE BIOTIC
RESOURCES

Grasses and Grasslike Plants

Scientific Name	Common Name
<i>Agropyron pauciflorum</i>	slender wheatgrass
<i>Agropyron riparium</i>	riverbank wheatgrass
<i>Agropyron smithi</i>	western wheatgrass
<i>Agropyron spicatum</i>	bluebunch wheatgrass
<i>Agropyron subsecundum</i>	bearded wheatgrass
<i>Agrostis alba</i>	redtop
<i>Aira caspitosa</i>	tufted hairgrass
<i>Aristida longista</i>	red threeawn
<i>Bromus anomolus</i>	nodding brome
<i>Bromus marginatus</i>	Mt. brome
<i>Bromus tectorum</i>	cheatgrass
<i>Carex spp</i>	sedges
<i>Distichlas stricta</i>	saltgrass
<i>Elymus cinereus</i>	basin wildrye
<i>Elymus glaucus</i>	blue wildrye
<i>Elymus triticoides</i>	creeping wildrye
<i>Festuca idahoensis</i>	Idaho fescue
<i>Festuca kingi</i>	king fescue
<i>Festuca octoflora</i>	sixweeks fescue
<i>Festuca ovina</i>	sheep fescue
<i>Festuca thurberiana</i>	Thurber fescue
<i>Hordeum jubatum</i>	foxtail
<i>Hordeum odosum</i>	nodding meadow barley
<i>Hordeum pusillum</i>	little barley
<i>Koeleria cristata</i>	prairie Junegrass
<i>Melica sp.</i>	oniongrass

Scientific Name	Common Name
Muhlenbergia sp.	muhlygrass
Munroa squarrosa	fluffgrass
Phalaris arundinacea	reed canarygrass
Oryzopsis hymenoides	Indian ricegrass
Puccinellia nuttalliana	nuttall alkaligrass
Phleum alpinum	alpine timothy
Phleum pratense	timothy
Phragmites communis	common reed
Poa alpina	alpine bluegrass
Poa annua	annual bluegrass
Poa juncifolia	alkali bluegrass
Poa Nevadensis	Nevada bluegrass
Poa pratensis	Kentucky bluegrass
Poa sandbergi	Sandberg bluegrass
Poa sp.	bluegrass
Puccinellia airoides	nuttall alkaligrass
Scirpus olneyi	olney bulrush
Setsria sp.	annual bristlegrasses
Setarian hystrix	bottlebrush squirreltail
Spartena pectinata	alkali cordgrass
Sporobolus airoides	alkali dropseed
Sporobolus cryptandrus	sand dropseed
Stipa columbiana	Columbia needlegrass
Stipa comata	needleandthread
Stipa lettermani	letterman needlegrass
Typha latifolia	common cattail

Woody Vegetation

Scientific Name	Common Name
<i>Abies concolor</i>	white fir
<i>Acer glabrum</i>	Rockymountain maple
<i>Acer grandidentatum</i>	Bigtooth maple
<i>Acer negundo</i>	boxelder
<i>Alnus tenuifolia</i>	thinleaf alder
<i>Amelanchier Utahensis</i>	Utah serviceberry
<i>Arctostaphylos uva-ursi</i>	bearberry
<i>Artemisia arbuscula</i>	low sagebrush
<i>Artemisia cana</i>	silver sagebrush
<i>Artemisia dracunculus</i>	tarragon
<i>Artemisia filifolia</i>	sand sagebrush
<i>Artemisia nova</i>	black sagebrush
<i>Artemisia spinescens</i>	bud sagebrush
<i>Artemisia tripartita</i>	threetip sagebrush
<i>Atriplex canescens</i>	fourwing saltbush
<i>Atriplex confertifolia</i>	shadscale
<i>Atriplex nutalli</i>	nutall saltbush
<i>Berberis repens</i>	Oregon grape
<i>Chrysanthamnus nauseosus</i>	rubber rabbitbrush
<i>Chrysanthamnus viscidiflorus</i>	yellowbrush
<i>Crataegus riverlaris</i>	river hawthorn
<i>Elaeagnus commutata</i>	silverberry
<i>Greyia spinosa</i>	spiny hopsage
<i>Juniperus osteosperma</i>	Utah juniper
<i>Juniperus scopulorum</i>	Rocky Mt. juniper
<i>Picea engelmann</i>	engelmann spruce
<i>Picea pungens</i>	Colorado bluespruce
<i>Pinus contorta</i>	lodgepole pine

Scientific Name	Common Name
<i>Pinus edulis</i>	pinion pine
<i>Pinus monophylla</i>	oneleaf pine
<i>Populus acuminata</i>	lanceleaf cottonwood
<i>Populus angustifolia</i>	narrowleaf cottonwood
<i>Populus fremonti</i>	Fremont cottonwood
<i>Populus nigra</i>	lombardy poplar
<i>Populus tremuloides</i>	quaking aspen
<i>Potentilla fruticosa</i>	shrubby cinquefoil
<i>Prunus virginiana</i>	chokecherry
<i>Pseudotsuga menziesii</i>	Douglas fir
<i>Purshia tridentata</i>	bitterbrush
<i>Quercus gambeli</i>	gambel oak
<i>Rhus trilobata</i>	squawbush
<i>Ribes</i> sp.	gooseberries & currants
<i>Rosa</i> sp.	wildrose
<i>Rubus ideaus</i>	red raspberry
<i>Rubus parviflorus</i>	thimbleberry
<i>Sheperdia argentea</i>	silver buffaloberry
<i>Salix</i> spp	willows
<i>Salix drummondi</i>	drummond willow
<i>Sambucus</i> sp.	elderberry
<i>Sarcobatus vermiculatus</i>	greasewood
<i>Spiraea</i> sp.	spiraea
<i>Symphoricarpos</i> sp.	snowberry
<i>Yucca</i> sp.	Yucca

Forbs and Halfshrubs

Scientific Name	Common Name
<i>Achillea lanulosa</i>	Yarrow
<i>Allenrolfea occidentalis</i>	pickleweed
<i>Allium</i> spp	wild onion
<i>Allyssum alyssoides</i>	pale allysum
<i>Amaranthus</i> spp	pigweed
<i>Ambrosia psilostachya</i>	western ragweed
<i>Antennaria</i> sp	pussytoes
<i>Arabis</i> sp.	rockcress
<i>Arenaria aberrans</i>	sandwort
<i>Artemisia campestris</i>	sagewort wormwood
<i>Artemisia ludoviciana</i>	Louisiana sagewort
<i>Artemisia frigida</i>	fringed sagewort
<i>Aster</i> spp	aster
<i>Astragalus</i> spp	loco
<i>Atriplex</i> sp.	saltweed
<i>Balsamorhiza saggitata</i>	arrowleaf balsamroot
<i>Bassia hyssopifolia</i>	smotherweed
<i>Brassica</i> sp.	mustard
<i>Calochortus nuttallii</i>	segolily
<i>Camassia leightline</i>	quamash
<i>Capsella bursa-bursa pastoris</i>	shepherds purse
<i>Chenopodium album</i>	lambsquarter
<i>Chichorium intybus</i>	common chicory
<i>Cirsium vulgare</i>	bullthistle
<i>Cleome serrulata</i>	Rockymountain beeplant

Scientific Name	Common Name
<i>Commandra pallida</i>	bastard toadflex
<i>Crepis</i> sp.	hawksbeard
<i>Cynoglossum officinale</i>	houndstongue
<i>Daucus carota</i>	wild carrot
<i>Delphinium</i> sp.	larkspur
<i>Discurania</i> sp.	tansymustard
<i>Dipsacus sylvestris</i>	teasel
<i>Draber</i> sp.	draber
<i>Eleocharis</i> sp.	spikerush
<i>Equisetum arvense</i>	field horsetail
<i>Erigeron</i> sp.	daisy
<i>Eriogonum</i> sp.	wild buckwheat
<i>Erysimum</i> sp.	wallflower
<i>Euphorbia</i> sp.	spurge
<i>Eurotia lanata</i>	whitesage
<i>Fragaria</i> sp.	wild strawberry
<i>Fraseria speciosa</i>	showy elkweed
<i>Gaillardia</i> sp.	gaillardia
<i>Galega officinalis</i>	goatsrue
<i>Galium</i> sp.	bedstraw
<i>Gaura</i> sp.	gaura
<i>Geranium</i> sp.	geranium
<i>Glycyrrhiza lepidota</i>	licorice
<i>Grindelia squarrosa</i>	curlcup gumweed
<i>Halogeton glomeratus</i>	halogeton
<i>Helianthella uniflora</i>	little sunflower
<i>Helianthus annuus</i>	common sunflower

Scientific Name	Common Name
<i>Heracleum lanatum</i>	cow cabbage or common parsnip
<i>Iva axillaris</i>	povertyweed
<i>Kochia vestita</i>	gray molly
<i>Kochia scoparia</i>	kochia
<i>Lappula</i> sp.	stickseed
<i>Lathyrus</i> sp.	peavine
<i>Lepidium compestre</i>	field peppergrass
<i>Lesquerella</i> sp.	bladerpod
<i>Lenum lewisi</i>	Lewis flax
<i>Lomatium</i> sp.	biscuitroot
<i>Leptodactylon</i> sp.	prickly gilea
<i>Lupinus</i> sp.	lupine
<i>Madia</i> sp.	tarweed
<i>Malcolinia africana</i>	African mustard
<i>Malva neglecta</i>	mallow
<i>Malvastrum exile</i>	slender falsemallow
<i>Medicago lupulina</i>	black medic
<i>Mentha spicata</i>	spearmint
<i>Mertensia</i> sp.	bluebell
<i>Monarda fistulosa</i>	horsemint
<i>Osmorhiza occidentalis</i>	sweetanise
<i>Oxytropis</i> spp	crazyweed
<i>Penstemon</i> spp	foxglove
Phlox	phlox
<i>Plantago</i> sp.	plantain

Scientific Name	Common Name
<i>Portulaca oleracea</i>	purslane
<i>Potentilla</i> sp.	cinquefoil
<i>Rumex</i> sp.	dock
<i>Sagittaria latifolia</i>	common arrowhead
<i>Salicornia rubra</i>	samphire
<i>Senecio</i> spp	groundsell, butterweed
<i>Sisymbrium altissimum</i>	tumble-mustard
<i>Solidago</i> sp.	goldenrod
<i>Sonchus oleraceus</i>	sowthistle
<i>Sphaeralcea coccinea</i>	scarlet globemallow
<i>Suaeda depressa</i>	seepweed, inkweed
<i>Thermopsis Montana</i>	goldenpea
<i>Tragapogon dubius</i>	Yellow salsify
<i>Trifolium repens</i>	white clover
<i>Trifolium</i> spp	clovers
<i>Valeriana edulis</i>	edible valerian
<i>Verbascum thapsus</i>	flannel mullein
<i>Verbena</i> spp	verbenas
<i>Vicia</i> spp	vetches
<i>Weyethea amplexicaulis</i>	mulesear dock
<i>Xanthium spinosum</i>	spiny cocklebur
<i>Zygadenus elegans</i>	Mt. deathcamas
<i>Zygadenus panniculatus</i>	foothill deathcamas
<i>Zygadenus venenosus</i>	meadow deathcamas

BIRDS OF CACHE COUNTY, UTAH

A Summary of Reports Prepared By;

DAVID J. AND ANN. L. SCHMIMPF

for the

BRIDGELAND AUDUBON SOCIETY

This information is based on the Christmas counts of 1970 and 72-75, Bridgerland Audubon records for 1975-76, and reports in American Birds since 1971.

The Numbers categories are listed as one(1), few(2-5), many (6 or more), or none (reported to be here, but no records in any of the aforementioned sources)

<u>Species</u>	<u>Numbers</u>	<u>Dates</u>
Common loon	Few	Nov.21, Apr.12,13
Horned grebe	Few	9/1,11/17,3/22,3/27
Eared grebe	Few	4/6,11/22,1/4
Western grebe	One	April 28
Pied-billed grebe	Many	Aug.12-March 5
White pelican	Few	March 8-May 17
Double-crested cormorant	Few	4/10-5/7,8/12-10/7
Great blue heron	Many	2/28-12/26
Cattle egret	One	May 6
Great (common) egret	One	August 7
Snowy egret	Many	April 10-Nov.26
Black-crowned night heron	Few	April 15-Aug.7
American bittern	Few	4/10,8/7,12/14
White-faced ibis	Few	April6-Aug.7
Whistling swan	Few	11/7-11/17, 3/20
Canada goose	Many	Feb.22-Dec. 14
Snow goose	Few	11/9-11/18
Mallard	Many	Some year round
Gadwall	Many	Some year round
Pintail	Many	3/6-1/4
Green-winged teal	Many	Some year round
Blue-winged teal	Few	4/26-August
Cinnamon teal	Many	3/20-1/23
American widgeon	Many	Some year round
Shoveler	Many	2/7-1/4
Redhead	Many	2/7-1/4
Ring-necked duck	Few	only Dec.sitings
Canvasback	Few	4/6-1/4
Greater scaup	One	Dec. 23
Lesser scaup	Few	11/14-1/4,3/8-4/6
Common goldeneye	Many	11/22-1/4,3/8-4/6
Barrow's goldeneye	One	Feb. 7
Bufflehead	One	Nov. 22
Ruddy duck	Few	Nov. 14, Apr.20
Hooded merganser	None	
Common merganser	Many	11/22-1/4,3/6-4/28
Red-breasted merganser	Few	Apr.12-28, Nov.22
Turkey vulture	Few	4/28-8/30
Goshawk	Few	Sept.-Jan.30
Sharp-shinned hawk	Few	Nov.19-Dec.16
Cooper's Hawk	Many	Mar. 6-Dec.29
Red-tailed Hawk	Many	Year round

<u>Species</u>	<u>Numbers</u>	<u>Dates</u>
Swainson's hawk	Many	Jan.4-Sept.30
Rough-legged hawk	Many	Dec.14-June26
Ferruginous hawk	None	
Golden eagle	Many	Year round
Bald eagle	Many	Nov.11-Mar.16
Marsh hawk	Many	Year round
Osprey	One	April 13
Prairie falcon	Few	March 6-May 29
Peregrine falcon	Few	Sept.28-Feb.20
Merlin	Few	June, Oct, 12/12-March
American kestrel	Many	Year round
Blue grouse	Few	Year round
Ruffed grouse	Few	Year round
Sharp-tailed grouse	None	
Sage grouse	Few	August, April
California quail	None	
Ring-necked pheasant	Many	Year round
Chukar	Few	Year round
Gray partridge	None	
Sandhill crane	Many	March22-Oct.9
Virginia rail	None	
Sora	One	May 17
American coot	Many	March22-Dec.29
Semipalmated plover	None	
Snowy plover	None	
Killdeer	Many	Year round
Mountain plover	None	
American golden plover	One	Oct.14
Black-bellied plover	One	Apr.26
Common snipe	Many	Year round
Long-billed curlew	Few	April 15-June 15
Whimbrel	None	
Spotted sandpiper	Few	April 28, Oct. 7
Solitary sandpiper	None	
Willet	Few	April6-Aug.7
Greater yellowlegs	Few	April 6-Aug.7
Lesser yellowlegs	None	
Red knot	One	May 5
Pectoral sandpiper	None	
Baird's sandpiper	None	
Least sandpiper	One	April 21
Dunlin	None	
Western sandpiper	None	
Sanderling	Few	April 28, Aug.7
Short-billed dowitcher	None	
Long-billed dowitcher	Few	April 21, Aug. 7
Marbled godwit	One	April 21
American Avocet	One	Oct. 16
Black-necked stilt	One	April 13
Wilson's phalarope	Few	April 26
Northern phalarope	None	
Herring gull	None	
California gull	Many	Feb. 28-December 20
Ring-billed gull	Few	March 8-28
Franklin's gull	Few	April, Sept., Oct.
Bonaparte's gull	One	Nov. 5-20
Forster's tern	One	April 13

<u>Species</u>	<u>Numbers</u>	<u>Dates</u>
Common tern	None	
Caspian tern	None	
Black tern	One	Aug. 12
Band-tailed pigeon	None	
Rock dove	Many	Year round
Mourning dove	Many	April 12-Jan.1
Yellow-billed cuckoo	None	
Barn owl	None	
Screech owl	Few	Year round
Flammulated owl	One	May 10
Great horned owl	Many	Year round
Pygmy owl	One	Nov.
Burrowing owl	None	
Long-eared owl	Few	Year round
Short-eared owl	Many	Year round
Saw whet owl	None	
Poorwill	Few	July
Common nighthawk	Many	May 23-Sept.1
Black swift	None	
White-throated swift	One	May 5
Black-chinned hummingbird	Few	May 23-June 26
Broad-tailed hummingbird	Many	May 11-Sept. 1
Rufous hummingbird	One	Sept. 1
Calliope hummingbird	One	May 14
Belted kingfisher	Many	Year round
Common flicker	Many	Year round
Lewis's woodpecker	One	Sept. 30
Yellow-bellied sapsucker	Few	May 14-July 6
Williamson's sapsucker	One	July 28
Hairy woodpecker	Many	Year round
Downy woodpecker	Many	Year round
Northern three-toed woodpecker	One	March 13
Eastern kingbird	None	
Western kingbird	Few	May 11-Aug. 6
Ash-throated flycatcher	None	
Say's phoebe	None	
Willow (traill's) flycatcher	Many	April 16-June 3
Hammond's flycatcher	None	
Dusky flycatcher	One	May 20
Gray flycatcher	None	
Western flycatcher	None	
Western wood peewee	None	
Olive-sided flycatcher	None	
Horned lark	Many	Nov. 22- March 22
Violet-green swallow	Few	April 21-Oct. 7
Tree swallow	Many	April 12- August 30
Bank swallow	Few	April 21- May 17
Rough-winged swallow	Few	April 21- May 17
Barn swallow	Many	April 18- August 30
Cliff swallow	Few	April 21, July 20
Purple martin	Few	May 10, Sept. 1
Gray jay	None	
Steller's jay	Many	Year round
Scrub jay	None	
Black-billed magpie	Many	Year round

<u>Species</u>	<u>Numbers</u>	<u>Dates</u>
Common raven	Many	Year round
Common crow	Many	Nov. 15- April 12
Pinon jay	None	
Clark's nutcracker	Many	Year round
Black-capped chickadee	Many	Year round
Mountain chickadee	Many	Year round
Plain titmouse	One	May 16
Bushtit	None	
White-breasted nuthatch	Few	Year round
Red-breasted nuthatch	Few	Year round
Brown creeper	Many	Year round
Dipper	Many	Year round
House wren	None	
Winter wren	Few	Oct. Jan.
Long-billed marsh wren	Many	Year round
Canyon wren	Few	June, July
Rock wren	Few	June3-30, Sept. 1
Gray catbird	One	July 5
Sage thrasher	None	
American robin	Many	Year Round
Hermit thrush	Few	May 5-Sept.
Swainson's thrush	Few	May 14-Aug., Jan.4
Veery	None	
Western bluebird	Few	March 27-Sept.
Mountain bluebird	Many	March 17-Sept. 28
Townsend's solitaire	Many	Year round
Blue-gray gnatcatcher	One	May 11
Golden-crowned kinglet	Many	Year round
Ruby-crowned kinglet	Many	Year round
Water pipit	Many	Dec. 23-Mar.27
Bohemian waxwing	Many	Nov. 8-Apr. 18
Cedar waxwing	Many	Jan. 2-July22, Oct. 6
Northern shrike	Many	Dec. 23-Apr. 6
Loggerhead shrike	Few	Nov. 22-Jan.4, Apr.6
Starling	Many	Year round
Solitary vireo	None	
Red-eyed vireo	None	
Yellow-throated vireo	One	June 11
Warbling vireo	Many	June-Sept. 1
Orange-crowned warbler	Many	April 28-Sept.1
Nashville warbler	None	
Virginia's warbler	Few	Aprl.28-Sept. 1
Yellow warbler	Many	April28-Sept.1
Yellow-rumped (Audubon's) warbler	Many	Apr.-Dec29, Feb.10
Black-throated gray warbler	One	
Townsend's warbler	Few	Sept.1
Northern waterthrush	None	
MacGillivray's warbler	Few	May 5-Sept.1
Common yellowthroat	None	
Yellow-breasted chat	Few	June
Wilson's warbler	None	
American redstart	None	
House sparrow	Many	Year round
Bobolink	Few	May 17-Sept.

<u>Species</u>	<u>Numbers</u>	<u>Dates</u>
Western meadowlark	Many	Year round
Yellow-headed blackbird	Many	Mar.17-Dec.26, Feb.28
Red-winged blackbird	Many	Year round
Northern(Bullock's)oriole	Few	Apr.28-May 17
Brewer's blackbird	Many	Year round
Brown-headed cowbird	Many	Year round
Western tanager	Many	May 6-July 22
Black-headed grosbeak	Many	May 18-Aug.2
Lazuli bunting	Many	May 11-Sept.1
Evening grosbeak	Many	Oct. 30-April 1
Purple finch	None	
Cassin's finch	Many	Mar. 8-Jan. 4
House finch	Many	Year round
Pine grosbeak	One	Feb. 15
Gray-crowned rosy finch	One	Oct. 10
Black rosy finch	None	
Common redpoll	One	Dec. 26
Pine siskin	Many	Year round
American goldfinch	Many	Mar. 8-Dec.29
Red crossbill	None	
Green-tailed towhee	Many	May5-Sept.7
Rufous-sided towhee	Many	Year round
Lark bunting	None	
Savannah sparrow	Few	Mar.6-30
Vesper sparrow	Few	Apr. 28-Sept. 1
Lark sparrow	None	
Sage sparrow	One	Mar. 6
Dark-eyed(Oregon and slate- -colored)junco	Many	Year round
Gray-headed junco	One	Feb.
Tree sparrow	Many	Year round
Chipping sparrow	Many	May8-Sept.1, Dec.
Brewer's sparrow	One	Apr. 28
Harris's sparrow	None	
White-crowned sparrow	Many	Year round
Golden-drowned sparrow	One	Apr.25-May 8
White-throated sparrow	None	
Fox sparrow	Few	Apr.1-20
Lincoln's sparrow	None	
Swamp sparrow	None	
Song sparrow	Many	Year round
McCown's longspur	None	
Lapland longspur	None	
Snow bunting	None	

REPORT

There is no well kept...

One of the earliest...

B I O T A
of the
B E A R R I V E R B A S I N

Sunday 1st May...

Monday 2nd...

I N V E N T O R Y A N D A S S E S S M E N T
of the
W I L D L I F E R E S O U R C E S

Tuesday 3rd...

wednesday 4th...

Friday 10th...

Prepared for:

Utah Division of Water Resources

By:

Utah Division of Wildlife Resources

In Cooperation With:

Idaho Fish and Game Department

Wyoming Game and Fish Department

In his "History of...
a brief account...
his "Donnerville...
tion, "Captain...
Bear River Valley...
the interesting...
trappers, the winter...
From Irving...
River...
was covered...
on the 13th...
four or five days...
found extremely...

EARLY HISTORY

There is no well kept record of wildlife populations which inhabited Bear River Basin prior to settlement, so one must rely on reports and journals of early explorers and trappers for a glimpse into the past.

One of the earliest written records is the "Journals of Peter Skene Ogden," who crossed the western part of Bear River Basin in 1825 with a body of fur trappers under the Hudson Bay Company. While his references deal primarily with numbers of beaver taken one gains the impression of abundant big game in places. Quoting from his journal:

Sunday 1st May -- "We raised camp early all safe so far well we had not proceeded more than three miles when we obliged to encamp the rain falling in torrents until the evening we have however a far Superior encampment than last night. Elk & Buffalo are most numerous in this quarter & the farther we proceed we find the leaves already large Flowers in blossom and every appearance of Summer. 40 Beavers this day." (Present day Thatcher)

Monday 2nd -- "Early this day started our route was over a hilly Country & progress very slow... Our hunt this day amounts to 74 Beavers & Pelican also taken in the traps a Strange sight to us all to see one of the latter in these remote quarters for in fact with the exception of a few Bustards, we have so far not seen Birds or Fowls of any kind Save except Ravens & Crows in abundance." (Near Oneida Narrows)

Tuesday 3rd -- "... which we reached early our course this day. East over a fine level plain covered with Buffalo & Many were killed." (Cub River)

Wednesday 11th -- "... the trappers inform me that they have some hopes of findings a few beaver if not I shall soon change my Course. Dis 6 miles. Buffalo scarce but grizzly Bears in abundance one of the men had a narrow escape three of them were killed. 70 Beavers this is convincing proof that there are Some remaining, it would appear the Americans trapped only the lower part of these Forks..." (Near Little Bear River, Cache County)

Friday 13th --- "Raised camp & took the middle Fork in ascending as nearly all the Traps are a head of us we had fine plains covered with Buffalo..." (Near present day Avon, Utah)

In his "History of the American Fur Trade of the Far West," Chittenden provides a brief account of Captain Bonneville in this area, also Washington Irving in his "Bonneville's Adventures" gives a more complete account. According to Chittenden, "Captain Bonneville himself spent the winter (1834) in the upper end of Bear River Valley. Buffalo were plenty and abundance reigned in camp, and with the interesting society of Indian bands and the occasional visit of some white trappers, the winter wore away in ideal hunter's fashion."

From Irving, "... Captain Bonneville now directed his course up along Bear River amusing himself occasionally with hunting buffalo, with which the country was covered..." Pursuing his course up Bear River Captain Bonneville arrived on the 13th of June at the Little Snake Lake (Bear Lake) where he encamped for four or five days that he might examine its shores and outlets. The latter he found extremely muddy and so surrounded by swamps and quagmires that he was

obliged to construct canoes of rushes with which to explore them. The mouths of all the streams which fall into the lake from the west are marshy and inconsiderable; but on the east side, there is a beautiful beach, broken occasionally by high and isolated bluffs, which advance upon the lake and heighten the character of the scenery. The water is very shallow, but abounds with trout and other small fish."

Irving continues, "The country lying to the southwest of the mountains and ranging down to California, was as yet almost unknown; being out of the buffalo range it was untraversed by the trapper, who preferred those parts of the wilderness where the roaming herds of that species of animals gave him comparatively an abundant and luxurious life. Still it was said the deer, elk, and the bighorn were to be found there. As a precaution however, the party halted on Bear River and hunted for a few days until they had laid in a supply of dried buffalo meat and venison; they then passed by the headwaters of Cassia River, and soon found themselves launched on an immense sandy desert."

Concerning the lower Bear River we have accounts from early explorers Fremont and Stansbury. Captain John C. Fremont and his party visited the delta of Bear River in 1843 and reported in part, "... The whole morass was animated with multitudes of waterfowl, which appeared to be very wild---rising for the space of a mile around about at the sound of a gun, with noise like distant thunder. Several of the people waded out into the marshes and we had tonight a delicious supper of ducks, geese, and plover."

Captain Howard Stansbury visited Bear River Bay and reported (Stansbury 1852), "...immense flocks of wild geese and ducks among which many swans were seen, being distinguishable by their size and whiteness of their plumage. I had seen large flocks of these birds before, in part of our country, and especially upon the Potomac, but never did I behold anything like the immense numbers congregated together. Thousands of acres, as far as the eye could reach, seemed literally covered with them, presenting a scene of busy animated cheerfulness, in most graceful contrast with the dreary, silent solitude by which we were immediately surrounded."

From these early records one pictures a region laced with many flowing streams, grown heavily to willows and cottonwoods, containing abundant beaver. The wealth of furs was such that the 2nd annual rendezvous of the fur trappers was held in present day Cache Valley, Utah in the year 1826.

Buffalo were common, particularly in the higher valleys, even though the Bear River Basin was evidently near the western and southern limits of their range at that time.

Elk, deer, and bighorn sheep were present in many locations and bear were abundant throughout. Present day Bear Lake was known as Black Bear Lake, and also Little Lake to distinguish it from Big Lake (Great Salt Lake.) Fish were evidently abundant in Bear Lake and tributary streams and were utilized by early Shoshoni tribes as evidenced by many remains of their campsites near the lake. They probably timed their visits to coincide with spawning runs into the lake shallows and tributaries.

Trappers did not tend to utilize native birds or waterfowl to any extent when big game was present so their comments are few. However, Sage grouse and sharp-tail grouse were plentiful in the valleys, and the marshes along upper Bear Lake and Bear River valley had great numbers of waterfowl in season.

CURRENT WILDLIFE CONDITIONS

Though habitats and wildlife populations are changed greatly from that earlier period, wildlife plays an important part in the life of Bear River Basin today. Habitat changes wrought by settlement reduced the native wildlife, setting the stage for introduction of exotic wildlife species many of which inhabit the basin today and support much of the fishing and hunting activities.

Partly due to these introductions, the variety of natural plant communities, the intensively developed marshlands, and interspersed croplands and natural vegetation, there is an unusual diversity of wildlife species in the Bear River Basin. These wildlife resources are a source of pleasure to the residents of the Basin and the visitor as well. Consumptive use of the wildlife resources for hunting and fishing is of paramount importance to basin residents but there is an important and growing interest in wildlife for non-consumptive enjoyment, particularly by out of basin residents. Many visitors come to Bear River National Wildlife Refuge to view and photograph bird life, and the large participation by the public in winter feeding of elk at Hardware Ranch are indicative of such interest.

Wildlife resources of the Bear River Basin can be grouped into two broad physiological classifications. At higher elevations in the basin, wildlife species are related to the Middle Rocky Mountains. At lower levels the species are those commonly associated with the Great Basin. Any attempt to list all the wildlife species found in the basin would be very time consuming and of somewhat doubtful value in this inventory. Only those wildlife groups which provide fishing and hunting opportunity, unique and endangered wildlife, and various fur bearing animals will be considered in depth. These groups receive intensive management and are highly regarded both esthetically and for their recreational values. Less attention will be afforded other wildlife groups for this reason.

This is not to say the multitude of non-game birds, mammals, and aquatic life is unimportant for it is an essential and enjoyable part of the natural fauna and adds immeasurably to the environmental values of the basin. Unquestionably it will command more attention within the near future.

Concerning the study area - it is very extensive and involves an array of wildlife resources, some of which are of national significance. Available inventory data for some of the groups is good. For others, particularly the non-game groups, data is inadequate or lacking. Data which is presented in this report is based upon reliable sources, principally state and federal wildlife agencies, and is a good base upon which to structure further intensive wildlife studies if this is deemed advisable.

An abbreviated list of the wildlife species of the basin is presented, giving a brief notation on their general habitat requirements, distribution, and Life Zones occupied. This will serve as an introduction to the more important existing wildlife resources of the basin, and identify those groups of wildlife species and associated habitat which would be of primary concern in relation to planning for development of the water and related land resources of the Basin.

Table 1.

COMMON NAME	SCIENTIFIC NAME	PRESENT DISTRIBUTION AND RELATIVE ABUNDANCE	GENERAL HABITAT PREFERENCE AND LIFE ZONES ACCORDING TO MERRIAM
<u>BIG GAME</u>			
MOOSE	<i>Alces alces shiras</i>	Rich Co. Utah, Lincoln Co. Wyoming, Upper Bear River, Utah-Wyo.- Increasing breeding population. Ida.	Alpine meadows, Stream bottom woodland, Sub-alpine ponds and marsh. Hud.-Can.-Tran.
ELK	<i>Cervus canadensis</i>	Common resident throughout higher elevations Idaho- Utah-Wyoming.	Sub-alpine forest and meadows, aspen woodlands, Mtn. brush-sagebru- grass lands Hud.-Can.-Tran.
MULE DEER	<i>Odocoileus hemionus</i>	Relatively abundant throughout entire area except irrigated crop land Idaho-Utah-Wyoming.	Forest, Meadow, aspen woodlands, Mtn. brush, Sagebrush grasslands, Pinyon-Juniper Hud.-Can.-Tran.- Up.Son.
PRONGHORN ANTELOPE	<i>Antilocapra americana</i>	Small population in local- ized area Uinta, Lincoln Co's Wyoming.	Desert shrub rangeland Tran.-Up.Son.
BIGHORN SHEEP	<i>Ovis canadensis</i>	Small reintroduced pop- ulation on Wellsville Range, Cache Co. Utah.	Sub-alpine forest and meadows, rocky aspect Hud.-Can.
BLACK BEAR	<i>Ursus americana</i>	Occurs sparingly higher elevation in Idaho-Utah- Wyoming.	Conifers, sub-alpine meadows, stream and aspen woodland Hud.-Can.-Tran.
MOUNTAIN LION	<i>Felis concolor</i>	Small numbers in rough terrain in Idaho-Utah- Wyoming. Not game animal in Wyoming.	Conifers, Mtn. brush, Pinyon- Juniper Rough, Rky. aspects. Can.- Tran.-Up.Son.

LIFE ZONES according to Merriam: Arctic Alpine, Hudsonian, Canadian, Transition, Upper Sonoran

UPLAND GAME WATERFOWL

GREEN-WINGED TEAL	<i>Anas carolinensis</i>	Uncommon breeder, abundant migrating populations, Idaho-Utah-Wyoming.	Marsh, ponds, streams. Trans.-Up. Son.
CINAMON TEAL	<i>Anas cyanoptera</i>	Common breeding populations and common migrant. Idaho-Utah-Wyoming.	Marsh, ponds, streams. Trans.-Up. Son.
RUDDY	<i>Oxyura jamaicensis</i>	Common breeder and abundant migrating populations - Idaho-Utah-Wyoming.	Deeper marsh and ponds, fresh and saline. Trans.-Up.Son.
CANADA GOOSE	<i>Branta canadensis</i>	Common nesting and migrating populations. Idaho-Utah-Wyoming.	Fresh water lakes, reservoirs, fresh and saline marshes, grain fields. Up. Son.-Trans.
SNOW GOOSE	<i>Chen hyperborea</i>	Common migrant, No breeding population. Idaho-Utah-Wyoming.	Fresh and saline marsh, reservoirs, grainfields. Up. Son.-Trans.
WHISTLING SWAN	<i>Olor columbianus</i>	Rare breeder, common migrant populations. Idaho-Utah-Wyoming. (Hunted only in Utah)	Fresh and saline marshes, ponds Trans.-Up. Son.
COOT	<i>Fulica americana</i>	Abundant breeding and migrant populations, Idaho-Utah-Wyoming.	Fresh and saline marsh and ponds. Trans.-Up. Son.
SNIPE	<i>Capella gallinago</i>	Occassional breeder, and migrant. Idaho-Utah-Wyoming.	Shallow marshes, streams and meadows Trans.-Up. Son.

FUR ANIMALS

BEAVER	<i>Castor canadensis</i>	Relatively abundant on streams with trees along banks. Idaho-Utah-Wyoming.	Large and small streams, marsh, Trans.-Can.-Hud.
MINK	<i>Mustela vison</i>	Scattered population in middle elevations. Idaho-Utah-Wyoming	Open streams and marshes. Trans.-Can.

UPLAND GAME AND WATERFOWL

RING-NECKED PHEASANT	<i>Phasianus colchicus</i>	Introduced and relatively abundant in irrigated area's of Idaho-Utah below Bear Lake.	Irrigated and dry croplands, marshes, stream woodland Tran.-Up. Son.
SAGE GROUSE	<i>Centrocercus urophasianus</i>	Localized populations in suitable habitat Idaho, Utah, Wyoming.	Open sagebrush-grassland plains and upland meadows Trans. Up. Son.
BLUE GROUSE	<i>Dendragapus obscurus</i>	Dispersed populations throughout conifer-aspen belts Idaho-Utah-Wyoming.	Conifers, Aspen woodland, open slash and burn. Tran.-Can.-Hud.
RUFFED GROUSE	<i>Bonasa umbellus</i>	Similar to Blue Grouse Idaho-Utah-Wyoming.	Conifers, Aspen, woodland, Stream side woodlands. Tran.-Can.-Hud.
SHARPTAIL GROUSE	<i>Pediocetes phasianellus</i>	Small isolated population in Idaho-Utah.	Open Grassland, Brushy slopes and hillsides. Tran.-Up. Son.
HUNGARIAN PARTRIDGE	<i>Perdix perdix</i>	Introduced and scattered populations in suitable habitat Idaho-Utah-Wyoming.	Open day grassland, open grain fields and brushy slopes. Tran.-Up. Son.
CHUKAR PARTRIDGE	<i>Alectoris gracea</i>	Introduced and found in local concentrations in preferred habitat. Idaho-Utah-Wyoming.	Semi-arid rocky canyons and grass slopes. Tran.-Up. Son.
CALIFORNIA QUAIL	<i>Lophortyx californicus</i>	Introduced and common in select habitat situations in lower elevations Idaho-Utah.	Irrigated farmlands, brushy stream bottoms Tran.-Up. Son.
MOURNING DOVE	<i>Zenaidura macroura</i>	Relatively abundant resident and migrant populations. Idaho-Utah.	Farmland, Brushy hillsides, Pinyon Juniper. Tran-Up. Son.
MOUNTAIN COTTONTAIL	<i>Sylvilagus nuttalli</i>	Common resident of moist, higher mountain country. Idaho Utah-Wyoming.	Cropland, sagebrush-grassland Brush, rocks Tran.-Up. Son.

UPLAND GAME AND WATERFOWL

DESERT COTTONTAIL	<i>Sylvilagus auduboni</i>	Found at lower elevations and dry situations. Utah.	Greasewood-salt-brush, sagebrush Up. Son.
PYGMY COTTONTAIL	<i>Sylvilagus idahensis</i>	Found in small numbers, Idaho-Utah in dry situations.	Sagebrush, Salt-brush Up. Son.
MALLARD	<i>Anas platyrhynchos</i>	Common breeder and resident populations and large numbers of migrants. Idaho-Utah-Wyoming.	Fresh and saline marsh, streams, dropland. Trans-Up. Son.
PINTAIL	<i>Anas acuta</i>	Common breeding populations, large numbers of migratns. Idaho-Utah-Wyoming	Fresh and saline marsh, shallow flooded upland Trans.-Up. Son.
GADWALL	<i>Anas strepera</i>	Abundant breeding populations, good migrant numbers, Idaho-Utah-Wyoming.	Fresh and saline marshes and ponds Trans.-Up. Son.
WIDGEON	<i>Marcea americana</i>	Uncommon breeder, good migrant populations Idaho-Utah-Wyoming	Fresh and saline marshes and ponds. Trans.-Up. Son.
REDHEAD	<i>Aythya americana</i>	Abundant breeding populations, good numbers migrants Idaho-Utah-Wyoming.	Deeper, open ponds and marshes, fresh and saline. Trans.-Up. Son.
CANVASBACK	<i>Aythya valisineria</i>	Uncommon breeder, common migrant Idaho-Utah-Wyoming.	Open fresh water ponds and lakes, deeper saline marshes. Trans.-Up. Son.
LESSER SCAUP	<i>Aythya affinis</i>	Rare breeder, common migrant Idaho-Utah-Wyoming.	Deeper, open, fresh and saline ponds and marshes. Trans.-Up. Son.
SHOVELER	<i>Spatula clypeata</i>	Common breeding populations abundant during migration. Idaho-Utah-Wyoming.	Fresh and saline marsh and ponds Trans.-Up. Son.
BLUE-WINGED TEAL	<i>Anas discors</i>	Common breeder, early migrant Idah-Utah-Wyoming.	Marsh, ponds, streams. Trans.-Up. Son.

FUR ANIMALS

MARTEN	<i>Martea americana</i>	Low populations at higher elevations. Idaho-Utah-Wyoming.	Coniferous forests, sub-alpine meadow. Can.-Hud.
MUSKRAT	<i>Ondatra zibethicus</i>	Abundant along most streams and permanent marshes. Idaho-Utah-Wyoming.	Fresh and Saline marsh, ponds and streams. Can.-Tran.-Up. Son.
SHORT TAIL WEASEL	<i>Mustela erminea</i>	Sparse populations throughout mountain area. Idaho-Utah-Wyoming.	Brushy mountain situation near water. Tran.-Can.-Hud.
LONG TAIL WEASEL	<i>Mustela frenata</i>	Common Throughout area. Idaho-Utah-Wyoming.	Found in wide spread locations not far from water. Tran.-Can.-Hud.
RACCOON	<i>Procyon lotor</i>	Sparse population at lower elevations. Idaho-Utah	Frequents streams and ponds in brushy country. Trans.-Up. Son.
STRIPED SKUNK	<i>Mephitis mephitis</i>	Ambundant throughout area. Idaho-Utah-Wyoming	Brushy situations, agricultural lands, Tran.-Up. Son.
BOBCAT	<i>Lynx rufus</i>	Common in rougher situations Idaho-Utah-Wyoming.	Rocky canyons situations, stream. Can.-Tran.-Up. Son.

PREDATOR - NON-GAME MAMMALS

COYOTE	<i>Canis latrans</i>	Common throughout area. Idaho-Utah-Wyoming.	Open woodlands, agricultural areas, rangelands. Hud.-Can.-Tran.-Up. Son.
RED FOX	<i>Vulpes fulva</i>	Moderate populations throughout area. Idaho-Utah-Wyoming	Rocky situations, forest margins, Pinyon-Juniper. Can.-Trans.-Up.Son.
BADGER	<i>Taxidea taxus</i>	Common and widespread in area Idaho-Utah-Wyoming.	Sub-alpine meadows, sagebrush-grassland, Pinyon-Juniper. Can.-Tans.-Up. Son.
WHITETAIL RABBIT	<i>Lepus townsendi</i>	Good numbers at mid and lower elevations. Idaho-Utah-Wyoming	Sagebrush-grassland, Pinyon-Juniper Trans.-Up. Son.

SNOWSHOE HARE	<i>Lepus americanus</i>	Common in highery forested areas. Idaho-Utah-Wyoming	Sub-alpine forest, stream woodland, Hud.-Can.-Trans.
SPOTTED SKUNK	<i>Spilogale putorius</i>	Common throughout mid elevations. Idaho-Utah-Wyoming.	Sagebrush-grassland-marshes, agricultural area. Trans.-Up. Son.

ENDANGERED - THREATENED - UNIQUE

PRAIRIE FALCON	<i>Falco mexicanus</i>	Treatened species. May nest in area, and winter migrant Idaho-Utah-Wyoming.	Canyons and Cliffs in open country, Nests on ledges. Can.-Trans.-Up. Son.
PEREGRINE FALCON	<i>Falco peregrinus</i>	Endangered species. Very rare in area. Idaho-Utah-Wyoming	Open, rough country. Nests on ledge or ground. Can.-Trans.-Up. Son.
SPOTTED BAT	<i>Euderma maculata</i>	Endangered species. Very rare in area. Idaho-Utah-Wyoming.	Semi-arid country. Occassionally enters building. Up. Son.
BALD EAGLE	<i>Haliaetus leucocephalus</i>	Wintering populations, uncommon resident. Idaho-Utah-Wyoming.	Along open rivers and streams with large trees. Can.-Tran.
GOLDEN EAGLE	<i>Aquila chrysaetos</i>	Scattered resident populations in open mountainous areas. Idaho-Utah-Wyoming.	Foothills, open canyons, mountains Can.-Tran.-Up. Son.
OSPREY	<i>Pandion haliaetus</i>	Uncommon nesting population. Winter migrant. Idaho-Utah-Wyoming.	Open lakes and rivers. Feed on fish. Can.-Trans.
SANDHILL CRANE	<i>Grus canadensis</i>	Nesting resident in localized area's, additonal migrants. Idaho-Utah-Wyoming.	Rvver bottom lands, large marsh areas, grain fields. Can.-Trans.-Up. Son.

COLD-WATER GAME FISH

CUTTHROAT TROUT	<i>Salmo clarkii</i>	Common to abundance. Both natural and stocked in good habitats. Idaho-Utah-Wyoming.	Prefers, clear, colder, high and mid-elevation streams, lakes and reservoirs. Alp-Hud.-Can.-Trans.
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COLD-WATER GAME FISH

RAINBOW TROUT	<i>Salmo gairdneri</i>	Introduced and abundant in most suitable streams, lakes, and reservoirs. Idaho-Utah-Wyoming.	Prefers waters around 65°, usually does best at mid-elevations. Can.-Tran.-Up. Son.
BROWN TROUT	<i>Salmo trutta</i>	Introduced and common in many mid and lower elevation streams and reservoirs. Idaho-Utah-Wyoming.	Often found in warmer, less suitable waters than other trout. Tran.-Up. Son.
BROOK TROUT	<i>Salvelinus fontinalis</i>	Introduced and common in higher elevation habitats were established. Idaho-Utah-Wyoming.	Prefers cool, clear head water lakes and streams. Alp.-Hud.-Can.
LAKE TROUT	<i>Salvelinus namaycush</i>	Introduced populations not great even in area of distribution. Idaho-Utah-Wyoming.	Found in larger, deeper lakes with cold temperatures. Can.-Trans.
KOKANEE	<i>Oncorhynchus nerka</i>	Introduced and limited population and narrow distribution. Idaho-Utah,	Stocked in Bear Lake and Porcupine Reservoir. Can.-Tran.
MOUNTAIN WHITE FISH	<i>Prosopium williamsoni</i>	Abundant in certain streams with suitable habitat. Idaho- Utah-Wyoming.	Usually found in larger streams with good permanent pools. Can.-Tran.
BONEVILLE WHITEFISH	<i>Prosopium spilonatus</i>	Fish found only in Bear Lake. Cisco percent in good numbers Idaho-Utah.	Adopted to cold lake situation provided by Bear Lake. Tran.
BEAR LAKE WHITEFISH	<i>Prosopium abyssicola</i>		
BONNEVILLE CISCO	<i>Prosopium gemmiterum</i>		

WARM-WATER GAME FISH

LARGE MOUTH BASS	<i>Micropterus salmoides</i>	Introduced rater limited in distribution through area. Idaho-Utah-Wyoming.	Prefers warmer, low elevation lakes and ponds. Trans.-Up. Son.
BLUEGILL	<i>Lepomis macrochirus</i>	Introduced abundant where introduced but is limited in distribution. Idaho-Utah.	Prefers clean water in small streams lakes, and ponds. Trans.-Up. Son.

WARM-WATER GAME FISH

WALLEYE	<i>Stizostedion vitreum</i>	Introduced localized in distribution and population. Utah.	Prefer cooler, cleaner water of streams and reservoirs. Up. Son.
CHANNEL CATFISH	<i>Ictalurus punctatus</i>	Introduced good numbers in lower elevation stream segments and selected reservoirs. Idaho-Utah.	Established in warmer, turbid streams below Bear Lake. Trans.-Up. Son.
BLACK BULLHEAD	<i>Ictalurus melas</i>	Introduced common in certain ponds and reservoirs where introduced. Idaho-Utah.	Found in small warm ponds and reservoirs, sluggish streams. Trans.-Up. Son.

Fishes Identified by Electrofishing in Various Sections of Bear River

River Segment	Miles	Fish Species Present														
		CARP	C. CATFISH	B. BULLHEAD	G. SUNFISH	PERCH	WALLEYE	L.M. BASS	CHUBS	SUCKERS	WHITEFISH	SCULPIN	BROWN TROUT	RAINBOW T.	CUTTHROAT T.	BROOK T.
Refuge to Cutler Dam	61	X	X	X	X	X	X	X	X	X						
Cutler to Idaho Line	39	X		X	X	X	X	X		X						
Line to Mink Creek	26	X			X				X	X	X		X	X		
Mink Creek to Oneida Dam	8								X	X	X		X	X		
Oneida to Black Canyon	24	X								X	X		X			
Black Canyon to Grace	5								X	X	X		X			
Grace to Alexander Dam	6	X							X	X	X		X			
Alexander Res. to Bear Lake Canal	33	X								X	X		X	X		
Bear Lake Canal to Border	46								X	X	X		X	X		
Border to State Line	36								X	X	X	X	X	X		
Rich County Utah	45									X	X	X	X	X		
State Line to Evanston Div. Dam	24								X	X	X	X	X	X		
Evanston Dam to Utah Line	16									X	X	X	X	X		
Line to Forks of Bear River	15										X	X	X	X	X	



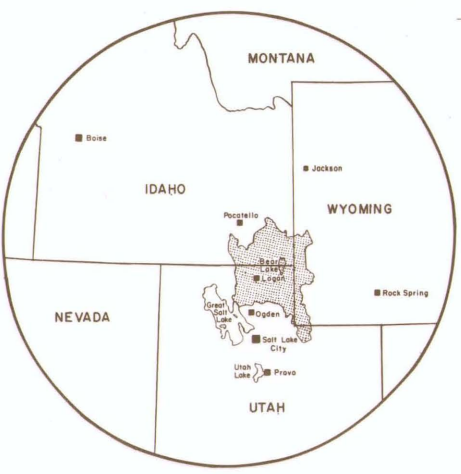
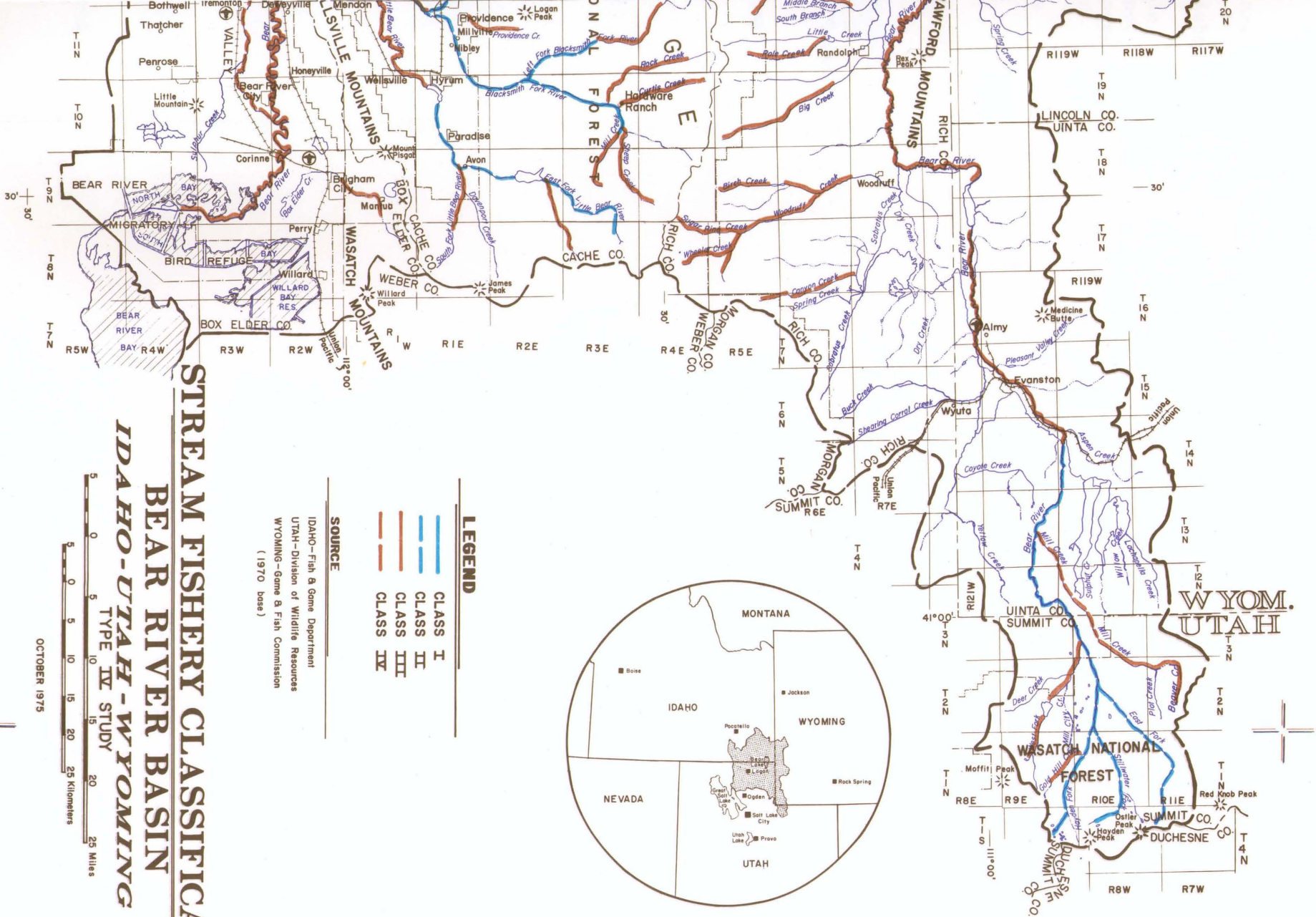
IDAHO
UTAH

WYOMING
IDAHO

LINCOLN CO.

T 20 N

42°00'



LOCATION MAP

LEGEND

CLASS	TYPE
CLASS I	Blue line
CLASS II	Light blue line
CLASS III	Orange line
CLASS IV	Dark orange line

SOURCE

- IDAHO - Fish & Game Department
- UTAH - Division of Wildlife Resources
- WYOMING - Game & Fish Commission (1970 base)

**STREAM FISHERY CLASSIFICATION
BEAR RIVER BASIN
IDAHO-UTAH-WYOMING**



OCTOBER 1975



FISHERIES RESOURCES

The sport fishery resource of the Bear River Basin is derived largely from introduced species of fish. Some of the more important introduced species are rainbow, brook, and Brown trout. Largemouth black bass, walleye, bluegill, and channel catfish are others which were introduced and have become established.

Cutthroat trout are still prominent, particularly in upper reaches of suitable streams and in the higher elevation lakes and certain reservoirs. This is not the pure native cutthroat species however, but is a mixed strain of many generations. Mountain whitefish are prominent in suitable sections of the larger streams in the basin and in Bear Lake the Bonneville whitefish, Bear Lake whitefish, and Bonneville cisco are native fishes. None of the known fishes of the Bear River Basin is considered endangered or threatened.

Stream habitat has been greatly altered since white mans' habitation of the basin. This is evident particularly in the lower reaches of most streams, which historically were probably the most productive portions. Diversions have depleted and dewatered the flows in many of the streams, and channelization, pollution, and erosion has further degraded many additional miles. High turbidities in the Bear River is the one most important factor which limits the sport fishery, according to John Heimer, Fishery Manager, Idaho Fish and Game Department.

Streams producing or supporting a sport fishery are classified according to esthetics, availability, and productivity and given a biological rating. They are then ranked by class. Class I is often referred too as a "Blue Ribbon Stream," while Class IV and V are considered marginal habitat but could be improved by one means or another.

Class I water in the Bear River Basin totals only 25 miles out of the 1,330 miles of classified fishing stream within the basin. The reduction in stream qualities is clearly evident in comparing these to figures.

Class II streams total 255 miles and Class III streams add another 533 miles. These stream mileages are the backbone of the stream fishery resources of the basin. According to Glen Dunning, Area Fisheries Biologist, Wyoming Fish and Game Commission, Class III tributary streams are very important to the fisheries program. They support a substantial part of the fishing pressure, and in many instances are the spawning and nursery areas for the lakes and reservoir's and larger stream segments. (*See Stream Fishery Classification Map*)

Lakes and reservoirs are not similarly classified basin-wide. They are classified according to cold-water, warm-water, and combination fishery, however. There is 75,475 surface acres of cold water with Bear Lake making up 70,400 acres. Combination waters total 2,382 surface acres and warm-water areas add 7,492 surface acres. These acreages are at normal operating levels and represent maximum rather than minimum available fishery habitat.

Fishing use is relatively heavy in the basin and is growing at a rate of about 3 percent per year. Complete figures for 1970 indicate a total of 572,000 fisherman days were expended on basin waters. Of this amount an indicated 243,000 angler days were spent on stream fishing.

Lakes and reservoirs received about 330,000 angler days of use of which all but 10,000 were trout fishing, or combination trout and warm water fishing.

Bear Lake dominates the flat water fishery habitat because of its immense size. Bear Lake is not considered a highly productive cold water fishery resource but it does harbor large Cutthroat and Lake trout which attract the trophy fisherman. The Bonneville cisco offers a unique fishing experience when it is dip-netted during its winter spawning runs. This is a growing attraction for both Utah and Idaho fishermen.

Bear Lake with its vast surface could support many additional man-hours of fishing and offers one of the major fishing enhancement opportunities in the basin. Present fishery management efforts are directed toward improvement of the fishing resources of the lake, particularly by the Utah Division of Wildlife Resources.

To meet the sport fishing demands with a satisfactory return to the creel requires annual stocking from the hatcheries of fry, fingerling and catchable trout. Grace Hatchery in Idaho which supplies the basin waters stocked 98,000 lbs. of trout in its distribution area in 1970. Production for the period October 1969 to September 1970 was 1,130,771 rainbow trout weighing 102,705 lbs., and 1,120,805 cutthroat weighing 2,374 lbs. Logan Hatchery in Utah which distributes trout to basin waters produced 1,172,606 rainbow trout weighing 110,013 lbs., cutthroat fry totaling 553,403, and 29,204 fingerling brown trout from July 1970 to July 1972.

A new trout hatchery is presently under construction at Mantua, Utah where operations will be geared to enhancement of the trout fishery program at Bear Lake. This new facility will add substantially to fish production in the basin. No comparable figures are available for Wyoming.

UTAH PORTION OF BASIN

There is 455 miles of cold-water fishing stream in the Utah portion of the basin and 160 miles of warm water. Cold-water lakes and reservoirs total 50,900 surface acres at normal operating levels and 7,464 acres provides warm-water fishing. Demand for fishing measured in angler days of use totaled 423,100 fisherman days in 1970.

Utah has some very fine tributary stream segments with the tops being located on Blacksmith Fork River. Blacksmith Fork contains 15 miles of Class I fishing waters lying within an overall section of the river which has been designated a "quality fishing area." This is probably the No. 1 tributary stream in the basin and should be preserved at all costs.

Other high quality tributary stream segments are the upper forks of Bear River which drain the north slopes. These tributaries remain largely unaltered by diversions up to the present. East, West, Hayden, and Stillwater Forks are fine fishing streams containing cutthroat and rainbow trout, and attract many anglers during the summer season.

Logan River is a beautiful stream in its canyon reaches, and though modified by power and irrigation diversions, it is one of the states' most popular fishing areas. Another stream worthy of note is Little Bear River whose middle and upper reaches retain many good qualities. A minimum release from Porcupine Reservoir preserves the qualities of this particular section of the Little Bear

The uppermost 15 miles of Bear River in Utah below the forks is an excellent stream with a good base flow in an attractive forest setting. Only the limitation on public fishing access because of private land ownership detracts from its overall qualities. This section of the Bear River should be preserved for its fishery and recreational values.

The lengthy segment of Bear River in Rich County Utah is somewhat of an unknown quantity from the fishery standpoint. It has not received a great deal of attention from the fisherman for various reasons. The land on both sides of the river throughout the county is privately owned and public use is limited. Habitat conditions are best at the upper end where the river is less sluggish than further downstream. Woodruff Narrows Reservoir is located just upstream of the State Line and a minimum flow release for maintenance of the fishery habitat is assured through storage purchase by the Division of Wildlife Resources. This reservoir acts as a settling basin for turbid flows which improves the quality of the downstream releases. This is a Class III trout water, and with the upper 15 miles constitutes the entire cold-water sport fishery on the main stem in Utah.

By the time Bear River re-enters Utah in Cache Valley it no longer supports a cold-water fishery. At this point the river has become very sluggish and exceedingly turbid. The bottom is characterized by a shifting, unstable condition which stifles aquatic life. Habitat is unsuitable for trout and only marginal for warm water sport fishes. This is considered a Class IV stream section down to Cutler Reservoir.

Cutler Reservoir acts as a settling basin for much of the silt carried by the river and the downstream flow is completely controlled at the Cutler Dam. Most of the river flow is cut off during the irrigation season and it is the fluctuating flow of the river which is one of the primary limiting factors on the sport fishery according to Arnold Bangerter, Fishery Biologist, Utah Division of Wildlife Resources. With the reduction in turbidity afforded by the reservoir a better flow pattern could enhance the downstream fishery prospects.

During the non-irrigation season the flows in this section are conditioned upon the daily power releases. This provides suitable conditions for a warm-water sport fishery. The upper stream mileage supports a variety of warm water fishes including such desirable species as Walleye and Large Mouth bass. Lower down on the stream the predominant warm water fish are channel catfish, carp, and suckers. This is year around fishing water and is attracting an increasing number of anglers who evidently desire to just "get out fishing."

Approximately half the fishing in the basin occurs on lakes and reservoirs. Bear Lake which was discussed earlier is the major Utah water and because of the storage which has been superimposed on the lake is subject to considerable drawdown when needed for power and irrigation. There is no question from an objective standpoint that the drawdown and associated exchange in the lake is a limiting factor on the sport fishery resources.

Porcupine Reservoir on Little Bear River is a major fishing water providing trout and kikanee, and Hyrum Reservoir is a popular fishing water close to the Cache Valley population center. Mantua Reservoir is an improved trout fishery close to Brigham City which has become increasingly popular. Cutler Reservoir is strategically located to the Logan area but the fishery is poor quality and its use is negligible.

Several popular fishing lakes are located in upper Logan Canyon and are heavily visited during the summer season. Whitney Reservoir is situated on West Fork of Bear River in Summit County but has not realized its expected potential as a fishery. A new road is under construction to this rather isolated reservoir and the visitor use is certain to increase upon its completion. The most unique flat-water fishery resources in the Utah portion are undoubtedly the jewel-like natural lakes located in the very headwaters of Bear River on the north slopes of the Uinta's. Thirty of the approximately fifty natural lakes scattered across the head of the basin produce trout fishing. These lakes which were essentially barren were brought into production by stocking of brook and cutthroat trout.

Excellent trout fishing is found in several of these lakes and most must be reached by foot or horseback. A few are difficult to reach and may be seldom visited by fishermen. However, the last few years has seen an increasing visitation to these out-of-the way spots and the day when a lake was "all to yourself" is rapidly disappearing.

IDAHO PORTION OF BASIN

There is 552 miles of classified stream within the Idaho portion of the Bear River Basin. Approximately 150 miles is located on the main stem and 400 is represented by tributary streams. Ten miles of the upper Cub River is Class I which constitutes the only mileage in this category. Class II is found on 55 miles and 198 miles is Class III. The remainder totaling 289 miles is Class IV and V.

Cold water lakes and reservoirs total 32,723 surface acres with Bear Lake making up 28,000 surface acres of the total. Another 2,382 surface acres provides cold-water fishing and also supports warm-water species which are readily taken by the angler. Only 28 surface acres are classified solely as warm water fishing.

Approximately 137,200 fisherman days were expended on these waters during 1970 and usage has increased since then. Extensive fishing use is made of the combination reservoir fishing waters scattered throughout the irrigated valley areas. It is estimated about 40 percent of the fishing use is exerted on the streams based upon a comparison of the record.

A good picture of the sport fishery resource of the Bear River in Idaho can be gained from studies conducted by John Heimer during 1972, '73, and '74. He conducted an angler count-interview creel census along the entire fishable length of the Bear River in Idaho.

There appears to be little or no fishing in the Bear River from the Wyoming State Line to the Highway 89 bridge west of Montpelier. Virtually all the flow of Bear River is diverted at Stewart Dam into Bear Lake.

From the Highway 89 bridge to Alexander Reservoir the estimated annual hours of fishing is 520, including some winter activity. The catch is estimated as 415 Cutthroat and 253 rainbow trout.

Alexander Reservoir receives an estimated 1,500 hours of fishing annually with an associated catch of 100 rainbow trout and 2,000 yellow perch.

From Alexander Dam to Grace Dam anglers fished 500 hours during the year and caught 400 rainbow trout and 25 yellow perch. In the stretch of river from Grace Dam to the Cheese Plant anglers put in about 5,600 hours of fishing and caught about 6,600 rainbow trout.

Bear River from the Cheese Plant to Cleveland Bridge, Highway 34 receives little fishing pressure. Anglers spend about 400 hours fishing this entire area and catch about 400 rainbow trout and 400 whitefish annually.

It is interesting to note of the 352 anglers checked fishing between Grace Dam and the Cheese Plant 126 or 35.8 percent were from Utah. Utah fishermen were also prominent on other sections of the stream.

From Cleveland Bridge to Oneida Dam the river is impounded. Estimated total hours fished on Oneida Reservoir was 518, with a catch of 2,400 perch and 9 bluegill. Below Oneida Dam downstream to within one fifth mile of Mink Creek there was an estimated 2,980 fishing hours expended with a creel of 1,600 rainbow trout, 23 cutthroat trout, and 746 mountain whitefish.

From this point on Bear River downstream to the Highway 91 bridge there was an estimated 658 hours fished with a catch of 90 cutthroat trout and 658 whitefish. Below this point downstream to the Utah State line there is virtually no fishing pressure at any time of the year.

The origin of anglers on this portion of the Bear River in Idaho was heavily represented by Utah people in that 61 percent of the total fishermen interviewed were from there.

The two quality sections of Bear River are below the Grace Power Dam and the Oneida Power Dam. Bear River at Grace Dam is diverted to the Grace Power Plant during the fishing season which would ordinarily destroy the fishery. However, below Grace Dam in the Black Canyon a substantial flow of water from springs creates suitable trout habitat. This is a very popular fishing area at this time and it is felt could be further enhanced by a limited additional release of water past the Grace Dam and Powerplant.

Oneida Dam to Mink Creek is another quality stream segment but fishing opportunity is curtailed when high flows are released for power purposes. This is a peaking operation and the river is subject to violent fluctuations in flow. Fishing could be greatly improved on this stretch if power operations were limited to week days, and on week-ends and holidays the power operations curtailed.

Tributaries presenting good sport fishery resources are the aforementioned upper segment of Cub River which contains an excellent population of Eastern brook trout and rainbow trout. The middle section of Cub River is steeper and swifter with large instream boulders but very few pools and riffles thus providing less suitable habitat than the upper reach.

Cutthroat trout are common in Thomas Fork Creek and some Eastern brook, while Montpelier Creek contains Cutthroat, rainbow and brown trout.

Table 2. Irrigation Reservoirs: Malad and Bear River Drainage - Idaho

Name	Acres	Game Fish
Little Deep Creek Res.	22	Cutthroat
Deep Creek Res.	180	Rainbow, Cutthroat
Crowthers Res.	40	Rainbow, Cutthroat
St. Johns Res.	35	Rainbow
Pleasantview Res.	32	Rainbow
Daniels Res.	375	Rainbow
Twin Lakes Res.	520	Rainbow, Perch, LM Bass, Bullhead
Treasureton Res.	156	Rainbow, Cutthroat
Condie Res.	118	Rainbow, LM Bass, Bluegill
Winder Res.	85	Rainbow
Foster Res.	180	Rainbow, Cutthroat
Glendale Res.	232	Rainbow, Cutthroat
LaMonte Res.	195	Rainbow, Cutthroat
Weston Res.	112	Rainbow, LM Bass, Perch
Oxford Res.	18	LM Bass
Johnson Res.	45	Rainbow, Cutthroat, LM Bass, Perch
Tingey Res.	9	Rainbow, LM Bass, Bluegill
Oxford Res. No. 2	10	LM Bass
Montpelier Res.	105	Rainbow, Cutthroat

Note: The acreage shown is with a full reservoir whereas some of the impoundments are completely drawn down in the irrigation season.

Snowslide Creek is a noteworthy tributary to Montpelier Creek because of its high population of brown trout in the lower quarter mile. This is a key spawning and nursery area for brown trout inhabiting Montpelier Creek and should be preserved at all costs.

Battle Creek has no sport fishery of significance but is one of the main sources of turbidity in the Bear River above the Utah State line. The raw, erosive banks of this stream are a constant pollutant to the main river causing further degradation of an already despoiled stream segment.

Both Cottonwood Creek and its tributary Shingle Creek contain good populations of wild cutthroat trout, the highest in fact of any tributary to Bear River in Idaho. Cottonwood Creek has excellent streambank cover and contains little silt which probably accounts for its good quality habitat.

Eight Mile Creek is an excellent trout stream containing populations of cutthroat, rainbow, and Eastern brook trout. It is about 12 miles in length and receives about 2,300 angler days use annually.

St. Charles Creek also rates high in value receiving in the neighborhood of 5,000 angler days use annually. This stream is about 7 miles in length and contains rainbow and brook trout.

All told there are about 50 medium size and small tributary streams in the Idaho portion of the basin. These are located throughout all portions of the area and provide fishing almost at the doorstep of most residents. Nowhere does the fisherman have to travel over a few miles to reach a fishing stream.

The Idaho portion of the basin has very few natural fishing lakes but is liberally supplied with small reservoirs most of which provide some fishing. These small irrigation reservoirs ranging in size from 500 surface acres down to 5 surface acres are managed primarily for cold-water fishing, but many also contain warm-water sport fishes.

These combination fisheries present the angler with cutthroat and rainbow trout, and Largemouth bass, Bluegill, and perch often in the same body of water. Ten of these small reservoirs are cold water only, two are warm water, and the remaining eight are combination. This provides a varied opportunity for fishing to the local anglers.

Oneida and Alexander Reservoirs, the two largest, are power reservoirs on Bear River. These reservoirs contain both trout and warm water species but the return to the creel is predominantly non-trout. Production and quality of the habitat for trout in these impoundments is undoubtedly limited by turbidities from inflowing waters.

WYOMING PORTION OF BASIN

In the Wyoming portion there is about 75 miles of fishable stream on the main Bear River and another 246 miles of tributary streams. Lakes and reservoirs supporting a fishery total 2,400 surface acres at normal operating levels. Cold water alpine lakes make up 423 surface acres of the total and cold water lowland reservoirs the rest.

There are four natural alpine lakes, one alpine reservoir, and five lowland reservoirs all managed as cold-water fisheries. These are productive bodies of water from the fishing standpoint as indicated by the average rate of catch of 0.5 fish per hour.

Woodruff Narrows Reservoir is located on Bear River just upstream of the Utah State line and is the largest body of water. This reservoir is encompassed by private lands but the Wyoming Fish and Game Commission has acquired a fishing easement which insures free public fishing on the reservoir. Woodruff Narrows contains rainbow, cutthroat, and Brown trout.

Lake Alice is a 400 surface acre alpine lake situated in the headwaters of Smiths Fork above Cokeville. This is an attractive cold-water fishing lake which is popular with residents and non-residents as well. The lake is managed primarily for cutthroat and Eastern brook trout.

Sulphur Creek Reservoir in Uinta County is 300 surface acres in extent at normal operating pool level. Sulphur Creek Reservoir supports rainbow, cutthroat, and brown trout.

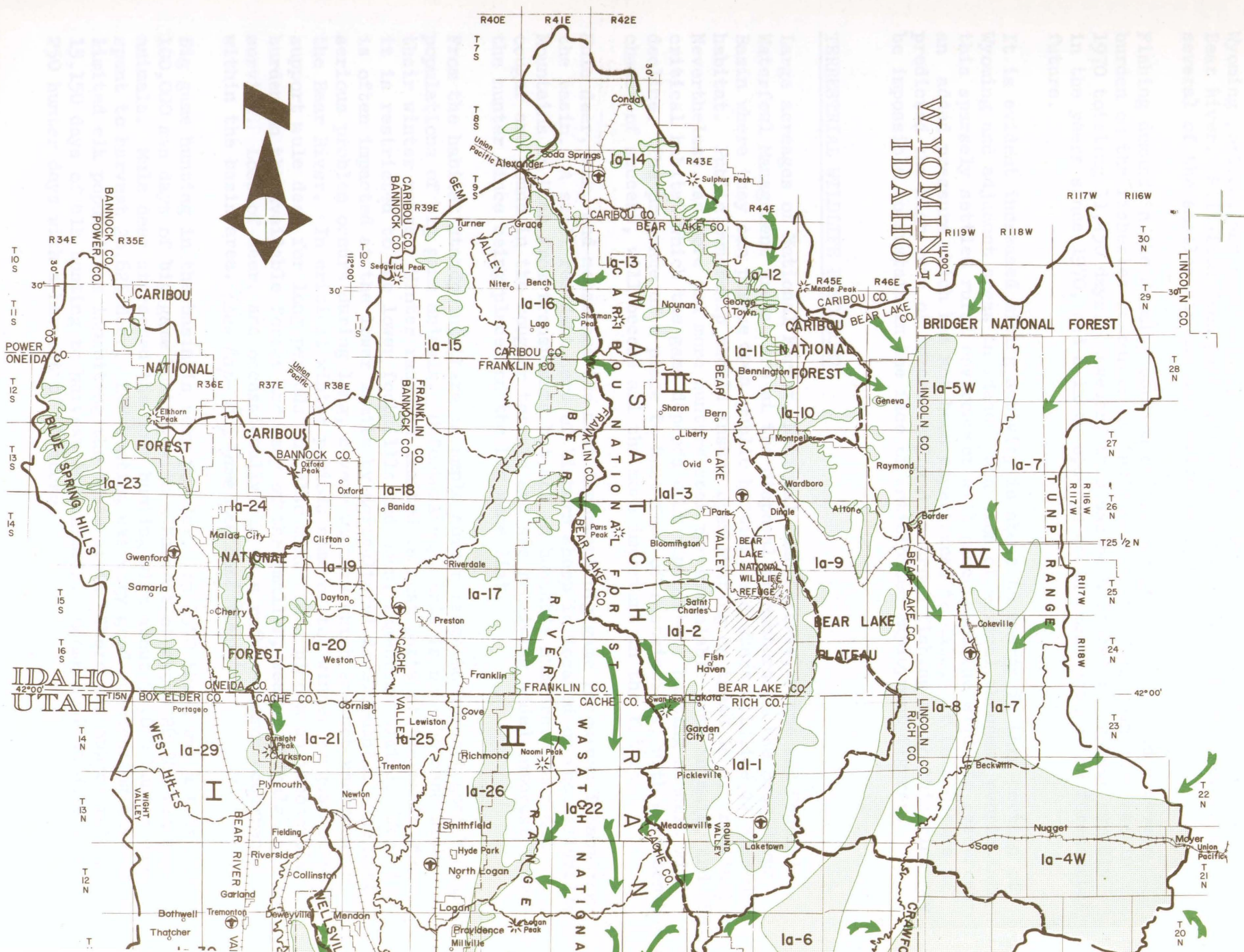
The remaining lakes and reservoirs which are managed as cold water fisheries are small with Travis, Crystal, and Huff lakes totaling 23 surface acres, and Meyers and Crompton Reservoirs 152 acres.

There is no Class I stream mileage in the Wyoming portion of the basin but it contains 60 miles of Class II stream and 92 miles of Class III. One of the better quality stream segments is the 16 miles of Bear River from the Wyoming-Utah line down to the Evanston water intake. This is a downstream extension of the 15 miles of Class II in Utah. Overall, there is 31 miles of continuous Class II stream on this segment of the Bear River. The section of stream in Wyoming supports rainbow, cutthroat, and Brown trout, as well as whitefish. The remaining mileage of Bear River in Wyoming is Class III.

Fish species in the upper portion of the Class III stream segment are similar to the Class II segment but productivity is lower and fishing usage is reduced. The further downstream one progresses the more the habitat quality tends to degrade, until at the Idaho-Wyoming State line near Border the stream depreciated to a lower Class III rating.

There are several tributaries but most are small. However, two of the larger tributaries are noteworthy and are rated Class II. Smiths Fork in Lincoln County near Cokeville contains 33 miles of Class II stream below the forest boundary. All four trout species are found in this stream along with whitefish. Most of this is bordered by private ranch lands. Salt Creek, tributary to Thomas Fork, presents 12 miles of Class II stream. This is a headwater stream providing considerable numbers of stream bred trout. It is a spawning and nursery area for Thomas Fork and should be preserved.

There are 11 small Class III fishing streams which are also an important part of the overall fisheries resources of the area. In addition, there are a large number of small Class IV streams which are more or less marginal for cold-water fisheries management.



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Considerable stream habitat is being reduced in quality by channel work in the Wyoming portion, and particularly on Smith's Fork and the upper segment of Bear River. Siltation from past over grazing has reduced the fisheries in several of the smaller streams and destroyed others.

Fishing demand in the Wyoming portion of the basin has not placed a severe burden on the fisheries resources as indicated by the fisherman days use in 1970 totaling 11,450 days. However, this has been increasing rather rapidly in the years since 1970, and a large upsurge could occur within the foreseeable future.

It is evident increased mining activity is about to emerge in this portion of Wyoming and adjacent areas in Idaho. Addition of several thousand people into this sparsely settled rural environment will place upon the wildlife resources an added pressure which has not been experienced to date. If this occurs as predicted the high rate of success enjoyed in trout fishing up to this time may be impossible to sustain in the face of anticipated employment figures.

TERRESTRIAL WILDLIFE RESOURCES

Large acreages of National Forest, National Land Reserve, State and Federal Waterfowl Management Areas are at the disposal of hunters in the Bear River Basin where they can pursue open public hunting, and where wildlife is afforded habitat. Public ownership should insure open hunting on these lands indefinitely. Nevertheless, as more and more hunters seek the available game animals, and the critical habitat which the game depends upon diminishes, hunting success will decline. The presence of a place to hunt free of restrictions, with a reasonable chance of success, will become all the more important in the future.

Mule deer, elk, and moose are the most important big game resources inhabiting the basin. A small resident herd of bighorn sheep is located on the Wellsville Mountains in Utah from transplants but not in huntable numbers. Bear and cougar are found in the rougher terrain and are receiving added interest from the hunter since being placed on the big game list.

From the habitat standpoint there is ample summer range to support good huntable populations of big game animals. Unfortunately, this is not the case with their winter range. Winter range is limited in most parts of the basin where it is restricted to the lower foothills and open, sagebrush plains. Here it is often impacted at the lower limits by agricultural developments. The most serious problem occurs during long, severe winters which are not uncommon in the Bear River. In critical winter periods some of the winter ranges not only support mule deer for long periods but also elk. This places an impossible burden on the available forage and many of the smaller, weaker animals fail to survive. Loss of deer, and occasionally elk is a rather common occurrence within the basin area. *(See Map- Big Game (critical Range)*

Big game hunting in the basin is very popular. In 1970 there was a total of 100,000 man days of big game hunting with a harvest of about 26,300 big game animals. Mule deer attracted the most hunting with about 94,000 hunter days spent to harvest 26,625 deer. Elk hunting was very good considering the rather limited elk populations inhabiting the basin area. There was approximately 15,150 days of elk hunting to harvest 640 animals. Moose hunting attracted 250 hunter days with a harvest of 46 moose.

The deer harvest has declined on most of the hunting units in the basin since 1970. This is displayed in the comparative harvest figures in the table.

Table 3. COMPARARISON OF DEER HARVEST BY UNIT: 1970-1973

<u>UTAH</u>	Harvest 1970	Harvest 1973*
Unit 2 - Cache	4597	1663
Unit 3 - Mantua	837	932
Unit 4 - Wellsville	396	233
Unit 5 - Woodruff	1259	1810
Unit 24 - Blacks Fork (Part)	459	201
<u>IDAHO</u>		
Unit 73 - Malad (Part)	1505	756
Unit 74 - Cottonwood (Part)	975	504
Unit 75 - Eight Mile	2123	1050
Unit 76 - Caribou (Part)	6017	4332
Unit 77 - Cub River	453	239
Unit 78 - Bear Lake	1899	966
<u>WYOMING</u>		
Lincoln Unit (Part)	2796	678
Unita Unit (Part)	2312	654

* Idaho 1973 harvest calculated on assigned percentage of total statewide harvest.

There is heavy participation in upland game hunting in the basin, particularly in the Utah portion, as indicated by the total hunter days of about 200,000 in 1970. This hunting resulted in a bag of approximately 175,000 animals. Pheasants are the most popular game bird and occupy most of the diversified valley agricultural lands in the basin.

Native sage grouse is a much prized bird and is heavily hunted in localized situations where suitable habitat is present. Some of the base populations of sage grouse occur in the Sagebrush-Saltbush type in the Wyoming portion of the basin. Blue and ruffed grouse are found throughout the montane forest with locally high populations. Forest grouse have increased in importance to the hunter in recent years and could support additional harvest, particularly in years of high populations.

Cottontail rabbit hunting has grown in popularity since seasons have been established and the species declared a game animal. Cottontails are subject to wide swings in their populations from year to year in common with most of the upland game species. In some parts of the basin increasingly clean farming is eliminating much needed rabbit habitat.

Mourning doves furnish considerable hunting in view of the diversity of upland game hunting available. One of the reasons is the early season which opens well ahead of other traditional upland game species. If good numbers of mourning doves are still present during the season in these northern locations the birds are avidly hunted.

Waterfowl hunting in the basin is very attractive for both ducks and geese. The extent and quality of the waterfowl habitat and waterfowl numbers can hardly be overstated. Populations of waterfowl breeding and migrating within the basin number in the millions. Marshes at the terminus of Bear River in the delta of Great Salt Lake rate among the best on the continent. Marshlands along upper Bear River from the vicinity of Bear Lake and extending into Wyoming and Utah support good numbers of ducks and Great Basin Canada geese. This is a distinct breeding population of the dark geese and is accorded special attention by management biologists. The Greater Sandhill Crane, *Grus canadensis tabida*, is a prominent breeder and migrant in the upper basin representing one of the main continental populations of this scarce bird.

Waterfowl hunters in the basin spent about 300,000 man days in pursuit of ducks and geese in 1970. They harvested approximately 147,900 birds during the season. These total figures must be qualified somewhat since they include more than the basin exclusively. Figures for Idaho include the counties of Bannock, Bear Lake, Bingham, Caribou, Clark, Franklin, Oneida, and Power, only part of which are within the basin. No accurate allocation to the basin could be made from the regional figures so they were left intact.

ENDANGERED, THREATENED AND UNIQUE WILDLIFE SPECIES

Only one species of endangered wildlife (as set forth in the official government listing) is found within the basin. This is the American peregrine falcon, *Falco peregrinus anatum*. The peregrine is a crow-sized bird which has a nearly world wide distribution. It inhabits open, canyon country, and is often found near open water bodies and marsh. This falcon is no longer thought to breed within the basin but migrants do occur. A recent sighting was made of a peregrine at the Bear River National Wildlife Refuge near Brigham City.

The official listing of threatened wildlife species has not been released, but at least two species which may occur within the basin are under consideration. One is a mammal, the Spotted bat, *Enderma maculata*. The other is a falcon, *Falco mexicanus*, prairie falcon. The Spotted bat would be considered rare in occurrence within the basin. The prairie falcon may still remain as a breeder and is a known migrant within the area.

The Greater Sandhill crane could also be included on the threatened list. If so, one of the main concentrations of this unique bird is found within the upper basin in Idaho, Utah and Wyoming. While there is presently some agricultural damage occurring from crane depredations in localized spots the Idaho Fish and Game Department and Fish and Wildlife Service are attempting to acquire land where crops will be grown to encourage on site use by these birds.

Other interesting and unique forms of wildlife too numerous to mention are found within the basin. Many of these species are associated with the water and marsh birds so common during migrational movements through this area. Coyotes and

bobcats are not uncommon and may be observed unexpectedly most anywhere in the basin where conditions are suitable for their habitation. Bald eagles are frequent winter visitors and Golden eagles nest and winter at various locations within the area. Though reduced in numbers due to habitat losses, disturbance, and pesticides, several species of raptors both breeding and migrant are found throughout the basin. The most common are Sparrow hawks, Marsh hawks, Roughleg hawks, and Swainson hawks.

Participation by residents and visitors in non-consumptive uses of wildlife resources is growing each year. Bear River National Wildlife Refuge is nationally known as an area for "birders" to enjoy and photograph bird life in a natural setting. Visitor use records for 1970 at Bear River Wildlife Refuge indicate at least 20,000 persons came to the area to view wildlife. Until the recent gasoline problems this use was increasing regularly each year.

Hardware Ranch Wildlife Management Area is another key visitation area for non-consumptive enjoyment of wildlife. At Hardware Ranch during the months of January and February 1970 there were approximately 33,000 visitors who participated directly or indirectly in the elk feeding program. In addition, there were countless other visitors to the area who were unrecorded during the year. This is an extraordinary participation under any comparison when considered in light of the remoteness and the season of the year. These are typical examples but they display the growing utilization of wildlife resources in all its forms.

A variety of non-game birds, mammals, and reptiles inhabit the Bear River Basin. These groups are an important source of non-consumptive wildlife enjoyment, and each contributes in some way to over-all environmental values. Some have a negative influence upon man's economic pursuits.

Type and numbers of non-game wildlife are often closely associated with particular vegetative zones. In the Bear River Basin, at least seven broad vegetal types can be identified.

Conifer-Aspen Forests: These are high elevation forest lands interspersed with meadows and streams. They are inhabited by many species of birds and non-game mammals. Small mammals common to these areas are snowshoe hare, squirrels, chipmunks, marmots, pika, and ground squirrels. Representative birds in season are Sharpshinned and Coopers hawks, owls, woodpeckers, flicker, Stellar and Canada jay, nutcracker, chickadee, bluebird, warblers, grosbeak, Pine siskin and Dipper.

Pinyon-Juniper: This woodland type is frequented by rabbits, bobcat, and coyote along with several bats, skunk, badger, porcupine, and chipmunks. Birds often found in the area are vulture, sparrows, red-tailed and Swainson hawk, kingbird, pinon and scrub jay, mockingbird, and shrike. Gopher snakes are common residents.

Mountain Brushlands: Common non-game animals are bats, coyote, fox, and skunk. Birds encountered here are wrens, hummingbirds, flycatcher, towhee, and several of the warblers and sparrows.

Northern Desert Shrub: Sagebrush is the predominant plant. Common resident mammals are rabbits, badger, gophers, and ground squirrels. Burrowing owls are indigenous to this type, and horned lark, meadowlark, thrasher, shrike, magpie, and various sparrows are common.

Salt Desert Shrub: These areas support a sparse non-game population in relation to other vegetative types. Lizards, snakes, and small rodents are the principal vertebrate forms. Hawks are frequent visitors and various species of sparrows reside here.

Croplands: This is the domain of the pheasant. Non-game mammals such as ground squirrels, gophers, skunk, and mice are prevalent. Typical birdlife includes robin, bluebird, kingbird, blackbird, meadowlark, swallow, starling, and raven.

Marsh and Wetlands: This is home for a multitude of non-game water and shore-birds. Herons and bitterns, plover, sandpiper, gulls and terns, marsh wren, blackbird, and goldfinch are only a few of the avian species. Common mammals are muskrat, weasel, skunk, shrew, and mink. Amphibians and reptiles are found in abundance. Hawks and eagles are often found here in winter.

Many of these animals are nocturnal in their habits and are seldom observed. They are still a source of pleasure to nature lovers, children, and many others who may simply take their presence for granted in everyday life.

UTAH PORTION OF BASIN

Big Game Resources

There are four Deer Herd Management Units within the basin in Utah and small parts of two others. One Elk Herd Management Unit is located within the basin boundary and a part of the North Slope Moose Management Unit. As previously mentioned, there is ample summer range for these big game herds but winter range which is the key to the overall habitat carrying capacity is in short supply. Winter range acreages on these units is displayed in the tabulation according to the area available in normal winters, and the area available in critical winters, which is a constricted portion of the normal winter range. On the portion of Blacks Fork Unit in Summit County within the basin there is no deer winter range since these deer migrate south and east to winter. A small area in eastern Box Elder County lies within the basin but it contains no winter range of significance.

Table 4.	Deer Herd Unit	Normal Winter Range	Critical Winter Range
	Unit 2 - Cache	186,957	50,200
	Unit 3 - Mantua, Willard	25,366	8,928
	Unit 4 - Wellsville	23,906	9,141
	Unit 5 - Woodruff	143,466	24,460

Elk winter in many of the same locations as deer. At the Hardware Ranch Wildlife Management Area which consists of 19,000 acres of range and bottom-land hay meadows the emphasis is on wintering Elk primarily. This area is

operated by the Utah Division of Wildlife Resources and upwards of 400 head of Elk are wintered annually. In December elk begin to move onto the winter range at the ranch as snow forces them off the higher terrain. Elk come from long distances on the Cache National Forest extending north into Idaho to winter at Hardware Ranch. They remain on the feedlots and are fed harvested hay until March or April depending on the weather before gradually moving off to forage for themselves.

An important winter range for Moose is located on upper Bear River within Utah and Wyoming. The area used by moose extends about three miles on either side of the Utah-Wyoming state line mainly along the drainages. Moose move into the extensive willow-bottoms found along the streams to winter and snow depth does not seem to seriously hamper their movement. They prefer a species of willow, identified as Drummond's Willow, which is prevalent along the water courses in this area.

About half of the total big game hunting which takes place in the basin occurs in the Utah portion. Mule deer hunting is very popular and attracted about 7,550 hunters that year. In 1973 the harvest was reduced on the hunting units with buck only hunting but hunter days actually increased. Based on recent trends it appears there will be a lower percentage of success on deer while man days of hunting continue to increase. At what point the reduced success will curtail increased hunting activity is difficult to predict.

Elk hunting is becoming increasingly popular in Utah and the Cache Unit is no exception. During 1970 about 300 head of elk were harvested on this unit involving approximately 9,300 hunter days afield. By 1974 elk harvested had risen to 342, whereas the hunters jumped to 2,826, and the associated man days of hunting increased to 12,498.

Moose are increasing noticeably in suitable habitat throughout the mountainous areas. Good numbers are present on upper Bear River and are increasing in Rich County. Recently moose have been observed in Cache County as well. In 1970, 24 moose were taken within the basin area in about 246 man days of hunting. Nearly 100 percent success is common on these large game animals which do not exhibit the wariness one associates with elk and deer.

Big game resources appear in favorable condition at this time within the Utah portion of the basin but the remaining winter range must be closely guarded. Developments and land use changes which will depreciate the quantity and quality of these critical habitat areas must be carefully monitored and where possible avoided. Continuation of upgrading and enhancing the available big game winter range where possible will insure welfare of the big game herds and provide a quality of hunting which the residents have come to expect.

Upland Game Resources

Annual hunting and harvest on pheasants in Box Elder and Cache counties places them in the top three counties in the state. Rich County, on the other hand, contains no huntable pheasant numbers. In the 1970 season, Box Elder County supported 9,610 pheasant hunters who spent 30,000 hunter days

to, bag about 37,500 ringnecks. The major part of this total harvest for the county occurred within the basin proper. For Cache County the comparable figures were 8,360 hunters who spent 26,000 days afield to harvest 33,700 pheasants.

Pheasants are found throughout the irrigated and dry croplands wherever suitable habitat is present. Pheasant populations in the irrigated valleys are surprisingly stable from year to year. However, suitable habitat is becoming increasingly deficient in parts of Box Elder and Cache counties and populations are declining. Clean farming activities, conversion of large blocks to sprinkler irrigation and concrete lining of canals are eliminating favored spots for pheasants. Coupled with these on-farm reductions is an increasing spread of urban development into agricultural areas, with extension of highways, airports, and golf courses into former pheasant habitat.

If this trend is not reversed, and a feasible way found to replace the lost habitat, the future of pheasant hunting in these counties is not overly optimistic. Mitigation of pheasant habitat losses has been minor. The creation of small, isolated parcels of habitat has had little or no impact upon the total pheasant habitat situation.

In addition to pheasants there is a wealth of other upland game species within the Utah sector. The table gives a breakdown of hunting and harvest on upland game species other than pheasants for 1970 in Box Elder, Cache, and Rich counties, and a small area of Summit county within the basin.

Table 5.

Species	Hunters*	Hunter Days*	Harvest*
Sage Grouse	4,220	5,525	5,034
Forest Grouse	4,120	8,532	11,893
Chukar Partridge	7,166	19,848	17,974
Hungarian Partridge	3,235	7,666	6,902
California Quail	607	412	1,602
Mourning Dove	17,971	56,069	71,092
Cottontail	12,699	28,335	7,312

* Includes figures for all of Box Elder County.

Many of the same habitat ills which effect pheasants also apply to the other upland game. Sage Grouse habitat is under pressure from agricultural activities particularly sagebrush chemical spraying. Cottontail rabbits and California quail suffer from elimination of habitat used by pheasants. Sharp-tail grouse habitat is marginal at best and the remainder must be preserved and upgraded if at all possible. Forest grouse habitat conditions are probably the most stable of all the upland game species. Mourning doves also appear to be in good condition habitat-wise.

Waterfowl and Fur Animals Resources

Waterfowl resources in the Utah sector of the basin are equal to anywhere in the country. Most of this high value waterfowl habitat is located on the delta of Bear River and adjacent wetlands in Box Elder county. A comprehensive

survey of wetlands in Utah has been completed by Clair Jensen, Division of Wildlife Resources, giving values for developed and undeveloped marshlands. In the Bear River Basin in Utah there is about 91,254 acres of public developed marsh, and 124,217 acres of private marsh both developed and natural.

Developed marshes in Box Elder County include the following. Salt Creek State Waterfowl Management Area located south of Tremonton which contains 4,584 acres of first magnitude marsh. The water supply is from Salt Creek. This area provides several hundred days hunting for upland game and 3,100 trips for duck hunting and 352 trips for geese. Hunter's harvest and average of 7,800 ducks and 220 geese annually.

Public Shooting Grounds Area located south of the Salt Creek Area contains 11,775 acres of first magnitude marsh. The water supply is from Salt Creek, Coyote Creek, and Painted Rock Creek. The area produces many ducks and also Canada geese. It receives in excess of 4,000 waterfowl hunter days with over 1,000 trips by goose hunter's alone. The harvest amounts to an average annual bag of about 6,500 ducks and geese. Over 3,678,000 waterfowl days use annually is provided by this marsh area.

Bear River National Wildlife Refuge is the largest managed waterfowl area in the state. This area contains 64,895 acres of first magnitude marsh. Water for Bear River Refuge is primarily from Bear River. With its large open water areas and associated marsh Bear River Refuge supports over 20,000,000 duck days use annually and over a million days of goose and Whistling Swan use. One of the largest concentrations of Whistling Swans in the nation is found on the refuge with numbers approaching 40,000 birds at times. With these large concentrations of waterfowl excellent hunting is provided on the designated hunting areas. There is an average of 7,447 hunting trips annually on Bear River Refuge resulting in an average annual harvest of 22,587 ducks. Goose hunters take an average of 378 geese per year and make 1,024 trips for goose hunting. Additional hunting and harvest occurs on Whistling Swans during the prescribed season.

Box Elder County also contains some outstanding private duck clubs. These clubs are clustered around the Bear River Delta. Their general location and area is shown below. These clubs produce as many waterfowl per acre as the State and federal managed marshes and support many added hunter days which relieves the pressure on the public hunting areas.

Table 6.

Name of Club	Acreage	Location
Bear River Club	9,600	Bear River Delta
Chesapeaks Club	2,900	" " "
Duckville Club	1,200	" " "
Knudsons Duck Club	3,000	West of Brigham
Pioneer Duck Club	1,200	South of Corinne
Sagebrush Club	1,000	West of Corinne
Sweet Grass Gun Club	156	South of Corinne
Widgeon Club	160	South of Corinne

In addition to the public and private developments there is an additional significant acreage of natural marsh. It is calculated at about 40,760 acres of first magnitude natural marsh, and 31,830 acres of second magnitude. Most is located in the general area of the Bear River Delta.

In Cache County the primary waterfowl habitat is located on Cutler Reservoir. Cutler Reservoir and adjacent marsh area supports over 300 brooding and moulting Canada geese and 50 or more broods of Mallard, Redhead, and Pintail annually. There is about 2,014 acres of bulrush and cattail and 2,217 acres of upland marsh plants associated with the open water on this reservoir.

Cache County supports over six percent of the total waterfowl hunting state-wide. Waterfowl hunter use in Cache County averages 13,300 hunter days with a harvest of about 22,000 birds annually. The major part of this hunting activity occurs on Cutler Reservoir and surrounding marshlands. Other hunting occurs on the various rivers and streams in the area. In Cache Valley there is 11,415 acres of first magnitude marsh, 3,645 acres of second magnitude marsh and 988 acres of third.

In Rich County there is 15,000 acres of third magnitude wetlands bordering the Bear River. This habitat supports breeding of 75 to 100 nesting pairs of Canada geese and several hundred ducks. This is also a staging area for Greater Sandhill Cranes during spring and fall migrations. Counts show nearly 1,000 cranes use the marshes along Bear River each fall. About 50 pair of these cranes remain to nest in the area.

Another important waterfowl area is Neponset Reservoir which contains 1,043 acres. It is used by 20 to 30 pair of nesting Canada geese. Hundreds of geese come to the area to moult each year. Several hundred ducks are also produced on the area.

Round Valley south of Bear Lake contains 2,000 acres of second magnitude marsh which produces and supports good numbers of waterfowl and a few cranes. The area also provides hunting.

Fur animal resources of the three-county area are reflected in the annual take of furs. Established seasons are set for trapping Beaver, Mink, and Marten. The muskrat is no longer considered a protected fur bearer so total harvest records are unavailable, but trapping is controlled on state management areas by the Refuge Manager where records are kept.

Beaver are taken primarily by licensed trappers but a few are removed by Department trapper's when a damage complaint is involved. The 1970 beaver record for the area is as follows:

Table 7. Unit No.	Population Census	Beaver Taken
N. Box Elder - 1a	No change	0
N. Cache - 2	Decrease	43
Rich - 3	Decrease	138
S. Box Elder - 4	Increase	0
S. Cache - 5	Decrease	21

Mink trapping season usually coincides with the beaver season. There is no bag or possession limit set on mink. Mink harvest and numbers of trappers in the area in 1970 is as follows:

Table 8.

County	No. Trappers	No. Mink Taken
Box Elder	1	5
Cache	6	14
Rich	2	7

Most drainages in the Bear River Basin in Utah contain small, static populations of mink but total numbers are difficult to determine without a census.

Marten trappers must obtain a permit at no cost. The trapper is required to report all marten caught, and must complete a questionnaire whether he captures an animal or not. Three trappers reported taking five marten in 1970 of which four were taken in Summit County. The exact place of capture is unknown but animals are present in the basin area of Summit County.

Muskrats are no longer protected fur-bearing animals but on state area's trapping is controlled by the Refuge Manager. On Salt Creek Waterfowl Management Area 2 trappers harvested 2,698 muskrats in 1970, while on Public Shooting Grounds Area 2 trappers reported taking 1,392 muskrats that year. This only a modest part of the total muskrats taken, however. Coyotes, Bobcats, Skunks, and Badgers add to the total peltagage but no accurate records are available for the counties in the Basin.

A predator survey conducted in 1972 and 1973 by the U.S. Fish and Wildlife Service in the Western States indicates a moderate level of predators in the basin area of Utah based on their established survey lines.

Possibly a more definitive picture of predator populations is displayed by the bounties on Coyotes and Bobcats for a recent three year period in the basin counties. It must be kept in mind that figures are for all of Box Elder county where a major predator population exists in the western part.

County		1972	1973	1974
Box Elder	Coyote	885	1900	1808
	Bobcat	192	262	86
Cache	Coyote	60	35	50
	Bobcat	41	1	0
Rich	Coyote	81	125	135
	Bobcat	30	57	0

IDAHO PORTION OF BASIN

Big Game Resources

Idaho has three Deer Herd Management Units within the basin and part of three others. There are two Elk Management Units within and one partially in the basin. Part of a Moose Management Unit is within the very northern portion of the basin area. Big Game habitat conditions in Idaho are similar in many respects to the Utah portion of the basin. There is ample summer range for big game but the winter range is localized and in scattered blocks. In some locations where agricultural development has encroached upon the historical wintering area's the situation is critical.

In comparison to the total range available for big game animals in the Idaho portion of the basin only about 64,000 acres is considered satisfactory winter range. Little of this is contained in continuous blocks where large numbers of game can concentrate. Loss of deer to winter conditions is not uncommon particularly on some of the northernmost winter ranges in the basin. The Idaho Fish and Game Department has acquired limited acreages of dry land farming area's and converted this to winter range to alleviate the depredation problems which occur in most winters.

Big Game hunting in the Idaho portion of the basin is not so intensive as in Utah, due in part to its more rural nature. Big Game hunters spent about 24,000 hunter days in pursuit of deer in the Idaho portion of the basin in 1970. Elk hunters added another 870 days in the field and 35 days were devoted to moose hunting. The harvest of big game animals during this period amounted to approximately 7,825 deer, 92 Elk, and 5 Moose. The deer harvest for 1970 compared with prior years was up while Elk harvest was slightly down. Since 1970 the deer harvest on the Idaho Management Units has dropped in common with others throughout the basin area.

Future demand for big game hunting in the Idaho sector is expected to grow. The rate of growth could be substantial if phosphate developments which are planned for the northern part of the basin expand as anticipated. These developments will not only impact the wildlife habitat directly but the rapid increase in people will place an increased burden upon the huntable game populations. Relatively uncrowded big game hunting conditions in this part of Idaho which residents have come to enjoy may not be available much longer.

A comparison of deer and elk harvest for the units associated with the basin area for recent years provides an indices to the changing pattern of deer hunting success in the Idaho portion. For the years 1969 through 1970 three of the units had extra deer tags but during the 1973 season no extra deer tags were issued on any of these.

Table 9. Comparison of Deer and Elk Harvest By Management Unit

Unit	1968		1969		1970		1973*	
	Deer	Elk	Deer	Elk	Deer	Elk	Deer	Elk
No.73 - Malad	928	closed	1044	closed	1505	closed	756	closed
No.74 - Cottonwood	748	"	673	"	975	"	504	"

Table 9 (con't) Unit

	1968		1969		1970		1973*	
	Deer	Elk	Deer	Elk	Deer	Elk	Deer	Elk
No. 75 - Eight Mile	1080	14	1674	17	2123	32	1050	17
No. 76 - Caribou	4439	149	4320	152	6017	144	4332	100
No. 77 - Cub River	292	0	244	0	453	3	239	22
No. 78 - Bear Lake	503	19	676	27	1899	14	966	7

* Calculated on assigned percentage of total statewide harvest for 1973.

Based upon hunter return report cards for the 1973 deer hunting season the hunting and harvest by county of residence can be determined. This data is indicative of the interest and pressure by the county residents in relation to the statewide hunting effort. Figures for the major counties in the basin area of Idaho are as follows:

Table 10. County

County	Reported Harvest Deer		Percent of State Harvest	Percent Success
	Males	Females		
Bear Lake	105	102	1.4	74
Caribou	124	80	1.4	70
Franklin	109	77	1.2	70
Oneida	38	19	0.4	70

Of the 44 counties in Idaho 19 rank above Bear Lake, Caribou and Franklin counties in reported deer harvest which places these basin counties midway in statewide ranking. Oneida county is placed in the lowest six counties statewide on reported harvest of deer.

Based on similar reports by hunters for elk hunting, Bear Lake county is 0.8 percent of the statewide elk harvest, Caribou 1.1 percent, Franklin 1.1 percent and Oneida only 0.1 percent of the statewide total.

A 1965 biological report dealing with the Elk Management Units within the basin by Dale Jensen, Game Biologist, Idaho Fish and Game Department sheds light on the problems even though dated. Elk Management Unit 76 occupies the extreme northern part of the basin with about 40 percent of the entire unit within the basin and the remainder out. Units 77 and 78 are within the basin entirely.

Elk Unit 78 has been managed under controlled hunts with bulls only in most general seasons and short either sex hunts in certain years. Elk are forced to concentrate on exposed ridges and open slopes during period of deep snow. Consequently overuse of browse species is characteristic of winter ranges throughout this unit. In area's where livestock use is also heavy the situation becomes critical since the available forage has been removed by livestock before the elk move onto the winter range.

Elk Management Unit 78 has a considerably greater drift of elk between Idaho and Utah than in Unit 77. Considerable hunter interest is shown for the elk hunt on this unit and it is evident a substantial number of deer are harvested incidental to the elk hunting. Very few of these elk winter in Idaho and

apparently pass through the deer winter range in Idaho enroute to their wintering area in Utah.

Moose Management Unit No. 376-2 is the only moose hunting unit within the basin in Idaho. This is part of a larger unit for which 5 permits were issued in 1970. The 5 permittees each harvested a bull moose for 100 percent success.

Upland Game Resources

The ringneck pheasant is the most important game bird in the Idaho area. In 1970 hunters were permitted to take one hen pheasant in the daily bag during the last two days of the season in southeastern Idaho. Hunting of hens was resumed on this limited basis after four years of closure.

Hunting and harvest data on pheasants, and for other upland game species in Idaho, is compiled on a regional basis and is not broken down by counties as in Utah. The southeastern area which incorporates the basin counties includes Bingham, Power, Oneida, Bannock, Caribou, Franklin, and Bear Lake. There is no open season on pheasants in Bear Lake county since it does not contain huntable numbers.

A comparison of pheasant check station results for the opening weekend of the pheasant season in the southeastern region displays the hunting interest and harvest on this species for the period 1966-1970. It is significant that a large percentage of the total season hunting and harvest on pheasants occurs on the opening weekend.

Table 11.

Year	No. Hunters	No. Pheasants	Hours	Birds Per Hunter	Hours Per Bird
1966	2625	2614	10906	1.00	4.2
1967	1967	1888	9317	0.96	4.9
1968	2368	3530	10915	1.49	3.1
1969	2427	2680	10722	1.10	4.0
1970	1585	2190	6105	1.38	2.8

Sage grouse are contributing an increasing amount of hunting in the eastern region of Idaho but the primary populations are located in the Snake River drainage. The Bear River basin contains good numbers of Sage grouse in spots but the habitat is not wide spread. In order to obtain management data grouse spring booming ground counts are made each year which gives an indication of the breeding population. For 1970 the booming ground counts indicated Sage grouse populations were down slightly in southeastern Idaho.

Sage grouse harvest is checked by means of opening weekend hunter check stations. The results of the check stations for 1970 in the eastern region as compared to previous years provides an index to general success in the basin area.

Table 12.

Year	Season Length	No. Hunters	No. Birds	Birds/Hunter
1965	2 days	174	97	0.56
1966	5 "	291	240	0.83
1967	5 "	290	264	0.91
1968	9 "	460	299	0.65
1969	9 "	515	431	0.83
1970	9 "	325	303	0.92

Forest grouse hunting in southeastern Idaho is primarily by big game hunters during their hunts for big game. The check station results for forest grouse indicated the 1970 harvest was down somewhat from previous years. Data collected at the Mink Creek check station in the basin also indicated the harvest was reduced.

Table 13. Mink Creek Check Station, Opening Weekend 1970

Day	Hunters	Blue Grouse	Ruffed Grouse	Birds/Hunter	Hours/Bird
Saturday	73	7	31	0.52	5.6
Sunday	52	0	12	0.32	10.6

Hunting for Chukar and Hungarian partridge in the counties within the basin is limited because populations of these birds are scattered. Checks by conservation officers in 1970 for Oneida and Bear Lake counties indicated only a modest hunting effort is present on these birds.

Dove hunting is quite popular and the ratio of dove hunting and hunter success by counties for 1970 derived from hunter bag checks in the field by conservation officers provides an index to the total hunting and harvest.

Table 14.

County	No. Hunters Checked	Doves	Birds/Hunter	Hours/Bird
Bear Lake	14	78	5.6	0.2
Caribou	21	25	1.2	1.3
Franklin	3	11	3.6	0.6
Oneida	10	16	1.6	1.4

The regular game farm operations at Jerome, Idaho provided pheasants for stocking in the southeastern region. Stocking of birds in 1970 was as follows. Brood stock release, 400 ringnecks and 1,005 summer hens. An additional 1,008 fall cocks were released making a total release of 2,413 pheasants for the southeast area in 1970.

Upland game habitat problems in the Idaho area are very similar to those in Utah according to Dale Jensen, Regional Game Manager. Modern farming

means "clean" farming which is keeping weeds and brush to a minimum. Fall plowing and other practices eliminate the necessary cover for the birds. Pheasants need cover for protection against inclement weather and from enemies. Public hunting area's managed solely for game bird habitat is of some help but is minimal in the overall habitat requirements of the pheasant.

Conversion to sprinkler irrigation on additional acreage in the basin in Idaho is reducing habitat for upland game. Pesticides and mercury have been implicated in reduction of pheasant populations in this area but it has not been so troublesome recently.

Sage grouse habitat is suffering reductions from chemical herbicide eradication of sage brush. Conversion of sage brush to grasslands and other forage crops is also having an effect. Sharptail grouse are still present in some of the same localities as Sage grouse. These remnant populations should be preserved through habitat protection and improvement.

Waterfowl and Fur Animal Resources

Waterfowl habitat in the Idaho area is scattered and generally confined to the Bear River flood plain and Bear Lake environs. Marshes along Bear River in Gentile and Gem Valley's provide important waterfowl habitat, as does the river from the vicinity of Bear Lake to the Wyoming State line. Waterfowl are produced along the river and migration is fairly significant.

A limited number of private marshes are found within the agricultural lands and these retain some of their production and migration value for waterfowl. Samaria Lake located near Malad is a privately owned marsh area where Canada goose production is good. The area produces about 200 gosling annually. Public hunting is restricted however.

Coulam Slough near the town of Clifton and Oxford Slough near Oxford are also of importance to the waterfowl resources. These marshes support some production, migration and hunting of waterfowl.

Coulam Slough historically consisted of about 1,500 acres of marsh and open water and was a high value waterfowl habitat. Through diversion of the inflow for local irrigation, and the partially successful drainage, it was greatly reduced in size and permanency. The remaining marsh is used to some extent by Canada geese but production has suffered by alteration of the marsh conditions. This area has a good potential for waterfowl habitat improvement if it could be acquired and managed primarily for waterfowl purposes.

The most important waterfowl marsh in the Idaho portion of the basin is the Bear Lake National Wildlife Refuge. The refuge proper includes the original Dingle Marsh and open-water lake known as Mud Lake which lies immediately north of Bear Lake.

The refuge contains 17,600 acres under management with about 14,000 acres of marsh and open water habitat. About 200 acres of upland is planted to barley principally to control cranes and geese from using nearby agricultural areas. The refuge is essentially roadless at this time and the plan is to keep it this way in the future.

It is an important habitat for the Greater Sandhill Crane with about 45,000 days use annually and a production of 45 young. Peak crane populations on the refuge are 450 birds annually. It is also important for Great Basin Canada geese. Production on geese has been as high as 2,400 goslings annually. Prior to administration by the Fish and Wildlife Service the Idaho Fish and Game Department constructed many goose nesting islands throughout Dingle Marsh and fabricated artificial goose nesting sites. These furnished protection for geese from the fluctuating water levels which are part of the normal operation.

Water supplies for the marsh are subject to irrigation demands but the marsh is drained only when water is badly needed for irrigation purposes. At normal lake storage levels the marsh is flooded but it is often subjected to drawdown in late summer and fall. The marsh is frozen over about four or five months each year.

The original Dingle Marsh probably supported a population of muskrats approaching 75,000 with 45,000 harvested annually. Goose production was high during this period since geese nested on the muskrat houses. In recent years muskrats have been greatly reduced in numbers because of the fluctuation in water levels. Stable water levels in the refuge would increase both the muskrat numbers and goose utilization.

The refuge does not presently attract many hunters from the outside the immediate area. Its distance from population centers and the early freeze-up are limiting factors on hunting. As hunting opportunities here become better known and the local population grows as anticipated several thousand hunters can be expected to use this area each hunting season.

There is no hunting and harvest record on waterfowl for the basin area proper by random field bag checks on waterfowl hunting in the southeastern district includes the basin counties. This is a reliable index to the yearly trends.

Table 15.

RANDOM WATERFOWL BAG CHECKS, SOUTHEASTERN AREA

Year	Hunters Checked	Ducks Taken	Geese Taken	Birds Per Hunter	Hours Per Bird
1970	548	1011	83	1.8	1.5
1969	1213	1767	255	1.7	
1968	1262	1948	175	1.7	1.7
1967	1662	2951	263	2.0	1.5
1966	983	1108	188	1.3	1.3
1965	1115	1375	153	1.4	2.4
1964	1586	2429	201	1.7	1.6

The Greater Sandhill Crane is one of the more important species inhabiting this part of the basin both from the national 2nd regional standpoint because of dwindling numbers. Eastern Idaho is the center of the breeding

population of cranes which extends into Montana, Utah and Wyoming. Habitat and population protection for this breeding flock is increasingly important in view of recent concern expressed for unique and threatened wildlife species.

Beaver populations in the Idaho portion of the basin are gradually being reduced by human developments along the streams which support beaver colonies. The 1970 beaver colony trend count indicated static conditions but the long term trend has been downward. The trend counts show an average of one beaver colony for each 2.5 miles of stream classed as beaver habitat. For those streams in the southeastern area classed as good the average is 1.9 per mile, 1.6 in fair quality habitat, and 1.3 in poor quality. Unsuitable habitat contained only 1 colony for each 8.5 miles of stream.

Beaver colony trend counts for the eastern region indicated a slight increase in numbers for 1970. The trend routes which were selected had 9 beaver colonies for 8 miles of stream checked. These same routes are checked annually and changes in beaver populations are considered indicative of the trend throughout the area, including the basin proper.

Beaver damage complaints have dropped significantly in the southeastern area during the last ten years indicating heavy removal of beaver from former habitat. In 1960 there was 241 beaver complaints within the area, 196 in 1961, 160 in 1962, 99 in 1963, and by 1970 the complaints had dwindled to 34.

Prices for furs fluctuate as do fur animal populations which has a direct bearing on the trapping. At present, long-haired fur is bringing relatively high prices and bobcats, coyotes, skunk, and raccoon are now trapped whereas only a short time ago these furs were undesirable.

Coyote numbers fluctuate from year to year and are closely related to rabbit and rodent populations. Predator trend counts by the Fish and Wildlife Service for the southeastern part of Idaho indicates a moderate population of predators existed in 1972 and 1973. This was based on comparative data for all the Western States.

WYOMING PORTION OF BASIN

Big Game Resources

Management of big game resources in the Wyoming portion of the basin includes two Deer Herd Management Units, two Elk Units, and two Moose Units. Portions of all these units overlap the basin proper so an allocation of data is necessary to apply it within the basin.

Total range for big game within the basin portion of Wyoming is substantially less in acreage than in Utah and Idaho. However, quality of the habitat within the Wyoming portion for wildlife populations is good, and ranks equal or superior in quality to any parts of the Bear River basin.

Elk, moose, and black bear are found in particularly good numbers within Lincoln county in the basin. Mule deer occupy most lands within the basin and though reduced in numbers from past years of high populations are still found in good numbers.

Summer range for big game animals within the basin area of Wyoming is generally unlimited but winter range is restricted as it is throughout the Bear River basin. Total winter range available for Mule deer and Elk within the Wyoming portion is about 43,775 acres. Deer and Elk which summer in the higher country depend upon winter range located in the Bear River Valley, and around Evanston and Sage Junction in particular. Winter range in the vicinity of Cokeville is very critical. In addition, deer which summer in nearby Idaho and Utah also migrate into this winter range. Deer also migrate from summer range in Idaho and Utah to winter in the Cokeville-Sage Junction area. During periods of severe winter weather heavy pressure is placed upon this winter range, and management problems are intensified by the interstate nature of the herds.

Elk winter to some extent upon the higher portion of the deer winter range where they often compete with deer for available winter forage, particularly when grass is unavailable. Elk have adequate summer range in the Wyoming forests but their numbers must be kept within the winter range carrying capacity. Most of the elk summer range is used jointly with cattle and sheep but no serious competition has developed for the available forage to the present time. Elk populations are in excellent condition and increasing interest is evident in elk hunting in Wyoming.

Moose in this area have increased from a few head to more than 300 in a relatively short time. Although moose habitat is generally thought of in terms of river and creek bottom type habitat, moose appear to be spreading into the general forest type in the Lincoln Management Unit. On the Unita Management Unit the habitat situation is not favorable for a spread in moose numbers because the suitable habitat is occupied by ranches.

Harvest of Mule deer, Elk and Moose within the basin area in 1970 is calculated at 745 animals with an associated hunting activity of about 11,550 hunter days. There is additional hunter days spent on bear but the figure is unknown. While this total hunting and harvest is considerably less than for Utah and Idaho it is proportionately high in relation to available land area.

Since 1970 deer hunting and harvest has declined somewhat in the Wyoming portion similar to the other states. Reduction in deer hunting and harvest has been primarily in non-resident participation rather than resident. A comparison of hunter's and hunting days for the two counties on Mule deer reflects the situation within the basin.

Table 16.

Deer Hunters and Hunter Days

	1970			
	Resident		Non Resident	
	Hunters	Hunter days	Hunters	Hunter days
Lincoln County	2,466	8,294	4,196	18,802
Unita County	1,641	4,810	1,206	2,847
	1974			
Lincoln County	3,433	11,236	1,486	5,318
Unita County	971	2,343	449	1,408

Elk hunting interest is high particularly in the Lincoln Management Unit. While non-resident hunting on Elk has declined somewhat it is still substantial and swells the total hunting effort on Elk each season. Elk hunting and harvest approaches that of Mule deer within the basin portion of Wyoming. Figures for Elk hunting and hunter's for the two counties mirrors the pattern for the basin proper.

Table 17. Elk Hunters and Hunter Days

	1970			
	Resident		Non Resident	
	Hunters	Hunter Days	Hunters	Hunter Days
Lincoln County	2,161	9,145	386	2,364
Unita County	215	654	10	10
	1974			
Lincoln County	1,206	7,616	152	1,525
Unita County*	924	3,834	59	293

* Additional open area in 1974.

Elk are occupying most all of the available winter range at the present time. Additional numbers of Elk would probably lead to increasing range and deperadation problems, and added competition with deer on their winter range. More Elk could be provided for hunters if sufficient quantity of winter range could be acquired and developed for their use.

The Lincoln Management Unit is one of the state's better moose hunting areas. Moose have been on the increase and harvest figures for the two counties reflect this upward trend in numbers and associated hunting.

Table 18. Management Unit

Management Unit	Number Permits	Hunters	Moose Harvested	Avg. Days Hunted
	1970			
Lincoln Unit	60	59	42	2.7
Unita Unit	16	16	6	5.2
	1974			
Lincoln Unit	100	98	97	2.1
Unia Unit	25	25	22	3.8

The harvest is expanding as moose numbers increase. The carrying capacity for moose is high and should continue to increase under present management programs. Ordinarily moose do not compete directly with deer or elk during the winter period which makes for a buildup in their numbers which is sustainable. The Lincoln Management Unit should continue to be one of the top moose locations in the future particularly if spraying and eradication of streamside woody vegetation is held to a minimum.

Most of the bear hunting occurs during the fall season coincident with hunting for elk and deer. Bear numbers appear to be increasing which may be due in part to lessening of predator control activities. Bears which are not eliminated by predator control furnish added recreational hunting for the sportsman. Indicative of the growing interest in bear hunting are the 1974 hunter days on black bear for the two basin counties.

Table 19. County	Hunter Days Fall Season	Hunter Days Spring Season
Lincoln	1,553	181
Uinta	107	0

A few head of antelope have recently drifted into the Sage Junction area and taken up residence. These antelope are presently wintering just north of Woodruff Reservoir on Bear River. Whether this small herd will develop into a huntable population under continued management will depend on favorable factors.

Upland Game Resources

In contrast to other parts of the basin where exotic upland game birds assume greatest importance, native grouse are most important in the Wyoming area. Sage grouse, and Blue and Ruffed grouse are found in relatively good numbers throughout suitable habitat in Lincoln and Uinta counties.

Other upland game species which inhabit the area are Mourning doves, cottontail rabbits, and Hungarian partridge. A few pheasants occur in the vicinity of Cokeville but are insufficient to permit hunting. Upland game hunting is not so intensive compared to the irrigated croplands, due in part to the sparse human populations. Another factor is that forest grouse have become a popular game bird only in recent years.

Average annual hunting on upland game within the Wyoming area in 1970 was about 2,000 hunter days with a harvest of approximately 2,500 upland game animals. A significant part of this total harvest was made up of the various grouse species.

Sage grouse inhabit the semi-arid sagebrush foothills and plains which are common to this part of Wyoming. Ruffed grouse occupy the open stands of aspen, willow, mountain maple, and chokecherry which borders the coniferous

forest in the mid-elevations. Blue grouse, the most widely distributed grouse in Wyoming, are found in nearly all coniferous forest habitats. Populations of these birds are in good condition throughout suitable range.

Sage grouse are very dependent upon good quality sagebrush habitat -- so much so that without it they will not nest and are unable to raise their young. Good quality sagebrush habitat is particularly vital to the continued welfare of this unique, native grouse species. Large scale sagebrush eradication is the most serious threat to this bird at the present time and this activity should be curtailed.

Habitat conditions for Sage grouse in the northern desert Sagebrush-Saltbush type up to about 8,500 foot elevation in both Lincoln and Uinta counties is good. It is considered to be some of the better quality Sage grouse habitat within the state. Because of the importance of the Sage grouse in the total upland game management program in Wyoming this habitat assumes a very high value for the future.

Blue grouse habitat is very good throughout the forest and higher foothill type in Lincoln county. Blue grouse habitat is also found in similar situations in Uinta county. Forest grouse habitat overlaps that of Sage grouse along the fringes of the foothills in the more mountainous sectors. Blue and Ruffed grouse habitat is receiving adverse impact from timber cutting and brushland eradication projects.

Cottontail rabbits are found in most locations in Lincoln and Uinta counties except higher elevations. Cottontails are present in best numbers in the Sagebrush-Saltbush type where Sage grouse are also found. Habitat preservation and enhancement for Sage grouse will therefore be highly beneficial to cottontails.

Hungarian partridge and pheasant habitat is localized along the valley of Bear River. Potential for expansion of these species is marginal and it is expected populations will remain at a low level.

Hunting activity on Blue and Ruffed grouse has increased in recent years with some localized spots in Lincoln and Uinta counties receiving fairly heavy hunting pressure. There are many locations, however, which are practically untouched by the hunter. Recent Sage grouse harvests have been very good with hunting pressure well distributed throughout suitable territory. Sage grouse are hunted more heavily than any of the other species although some spots still receive light hunting pressure.

Cottontails are hunted most heavily when populations are at a peak and harvest of rabbits is fairly substantial at these times. In some parts of the basin area in Wyoming cottontails are virtually unhunted and additional hunting pressure could be exerted.

Harvest and hunting activity on upland game for 1973 in Lincoln and Uinta counties is indicative of the situation within the basin proper.

Table 20.

Upland Game Hunters, Hunter Days, Harvest, 1973

Species	Hunters	Hunter Days	Harvest
Sage Grouse			
Lincoln Co.	719	2,043	4,127
Uinta Co.	521	1,258	2,351
Blue and Ruffed Grouse			
Lincoln Co.	562	2,350	2,128
Uinta Co.	Figures unavailable		
Mourning Doves			
Lincoln Co.	52	92	106
Uinta Co.	13	26	39
Cottontail			
Lincoln Co.	26	354	79
Uinta Co.	73	280	167

Sage grouse, Blue and Ruffed grouse, and Cottontails could all support an increased harvest particularly during their high population cycles. It is estimated upland game and small game are present in huntable numbers to support several hundred additional man days of hunting annually. Additional harvest of these surplus numbers would pose no threat to basic breeding populations in the foreseeable future.

The present trend in upland game and small game populations is static at a fairly high population level, with annual fluctuations in numbers related primarily to weather conditions. Continued attention to preservation of the quality habitat found in this area will insure good huntable populations of upland game and small game even in the face of human growth in this part of Wyoming.

Waterfowl and Fur Animal Resources

Waterfowl habitat within the basin portion of Wyoming is found primarily along Bear River in Lincoln and Uinta counties. This habitat serves principally as production for a variety of ducks and good numbers of Great Basin Canada geese.

Migrating ducks also use this habitat during spring and fall, but few waterfowl winter here. Bear River basin in Wyoming lies within the Pacific Flyway for management purposes and hunting seasons and bag limits are based upon Pacific Flyway regulations.

The total number of waterfowl hunters and hunter days for 1970-71 in Lincoln and Uinta counties reflects the situation found within the basin proper.

Table 21.

Total Number of Waterfowl Hunters and Hunter Days

County	Ducks		Geese		Total	
	Hunters	Days	Hunters	Days	Hunters	Days
Lincoln	550	3042	307	1015	857	4057
Uinta	115	720	41	443	156	1163

From waterfowl bag checks in the Pacific Flyway portion of Wyoming a picture is gained of the main species composition making up the total harvest. The Mallard is by far the predominant species harvested.

Table 22.

Species Composition of Harvest, Pacific Flyway Wyoming 1966-1970

Species	1966	1967	1968	1969	1970
Mallard	84	86	75	79	82
Gadwall	5	4	2	2	2
Widgeon	2	4	6	2	5
G. W. Teal	2	2	7	6	4
BW & Cinn. Teal	0	1	3	1	1
Shoveler	0.3	1	1	0	0
Pintail	1	1	5	2	4
Redhead	0	0	0	3	0
Canvasback	0.3	0	0	0	0
Lesser Scaup	0	0	0	0	0
Ringneck Duck	0.3	0	0.4	0	0
Goldeneye	4	2	1	4	1
Bufflehead	0.8	0	0	0	0

In the Pacific Flyway portion of Wyoming it is estimated each duck hunter spends approximately 5.7 days in the field. The average bag per hunter in this part of Wyoming is approximately 9.0 ducks per hunter per season. Goose hunters average 4.1 days afield and harvest of geese averages about 930 annually.

While the waterfowl resources could probably support additional hunting pressure it is important the harvest be carefully controlled, particularly on Canada geese, so over-hunting does not cut into the basic breeding population.

The portion of Bear River located in Lincoln county is part of the larger habitat complex of the breeding and migrating population of Greater Sandhill Crane. Crane's nest here to some extent and in fall large flocks gather to feed in the adjacent fields. Should this species be placed on the threatened wildlife list habitat in and around Cokeville will undoubtedly be included in habitat preservation efforts.

Hunting and trapping for fur animals is growing in interest as it is throughout the basin. No license is required in Wyoming at this time when pursuing predatory animals and considerable increased interest is evident among sport hunter's for this type of hunting. Recent high prices being paid for long-hair furs has stimulated increase hunting and trapping for species which were largely ignored.

No figures are available for fur animals taken within the basin but Wyoming fur dealer reports for the state to present a picture of trends in fur sales over a six year period.

Table 23.

Reports of Fur Dealers

Year	Jackrabbit	Beaver	Bobcat	Coyote	Fox	Mink	Rats	Raccoon
1968			2,983	801	384	785	3,844	613
1969	34,897	6,910	3,212	1,959	586	557	13,059	1,615
1970	15,836	5,285	3,053	1,768	626	292	10,156	724
1971	10,098	3,761	1,183	763	374	251	7,543	210
1972	6,140	2,326	873	1,295	394	211	7,194	392
1973	5,432	4,991	2,642	3,357	1,707	313	4,616	1,415

A present and expected human population increase in adjacent Green River basin, and nearby Idaho, will place increasing pressure upon the wildlife resources in this part of Wyoming. Present populations's of wildlife are good but added hunting pressure from outside could quickly havest any surplus in this rather localized basin area. Hunting pressure must be closely monitored to insure protection and conservation of the basic wildlife resources.

Big Game populations are probably supporting near maximum harvest considering the winter range carrying capacities. This situation will call for careful management in the face of any large buildup in human population nearby. Non-resident hunting has already been curtailed and a continued shift from non-resident to residents may be called for to protect the future welfare of big game resources.

SELECTED REFERENCES

Utah State Division of Wildlife Resources, Big Game Harvest Reports for 1970 and 1974.

_____, Big Game Range Inventory Report for 1970.

_____, Big Game Range Investigations and Management Recommendations for 1974.

_____, Upland Game Harvest Report for 1970.

_____, Utah Pacific Flyway Report, 1969-70.

_____, Utah Furbearers, Harvest Report and Management Recommendations, 1969-70.

_____, Evaluation of Existing Wetland Habitat in Utah, F. Clair Jensen, 1974.

_____, Carrying Capacity of Key Browse Species for Moose on the North Slopes of the Uinta's, David E. Wilson, 1971.

Utah State Division of Fish and Game, Utah Fishing Waters Inventory and Classification, 1970.

_____, Lakes of the High Uinta's, Bear River Drainage, Jon Gates and Al Regenthal, 1964.

_____, Bear River Investigations Cache and Box Elder counties, Arnold Bangerter, 1962-65.

_____, Biennial Report, July 1968 to July 1970, July 1970 to July 1972.

Idaho Fish and Game Department, Effects of Hunting Pressure in Deer and Elk Herd Management Units 70 to 78, Inclusive, Dale Jensen, 1965.

_____, Big Game Harvest Report, A. Errol Nielsen.

_____, Upland Game Harvest Report, Federal Aid Report, 1970.

_____, Idaho Pacific Flyway Report, 1969-70.

_____, Annual Report for 1970.

_____, Annual Report for 1973.

_____, Idaho Stream Classification, 1968.

Idaho Fish and Game Department, Returns of Rainbow Trout, Fishing Pressure and Catch in the Bear River, John T. Heimer, 1974.

_____, Fishing Pressure and Catch in Bear River in Franklin County, John T. Heimer, 1975.

Bear Lake National Wildlife Refuge, Report and Communication, Russel Hoffman, Refuge Manager, Fish and Wildlife Service, 1975.

Wyoming Game and Fish Department, Annual Report of Big Game Harvest, 1970.

_____, Annual Report of Big Game Harvest, 1973.

_____, Annual Report of Upland Game Harvest, 1970.

_____, Annual Report of Upland Game Harvest, 1973.

Wyoming Game and Fish Commission, Wyoming Fish and Wildlife Planning Report No. 4G, District No. 4, Game Division, 1971.

_____, Planning Report No. 9G, Current Status and Inventory of Waterfowl, 1972.

_____, Planning Report No. 4F, Management Area's 4 and 4A, Fish Division, 1973.

Wyoming Game and Fish Department, Annual Report, 1973.

Wyoming Game and Fish Commission, Wyoming Stream Fishery Classification, 1971.

Wyoming Game and Fish Department, Fisheries Communication, Glen Dunning, Area Fisheries Biologist, 1975.

_____, Fish Stocking Catalogue, Fish Division,

History of the American Fur Trade of the Far West, Reprint, Capt. Hiram Chittenden, 1954.

Adventures of Captain Bonneville in the Rocky Mountains of the Far West, Washington Irving, 1849.

Peter Skene Ogden's journals of his expeditions, 1825, Utah Historical Quarterly, Vol. 20, 1952.

Wildlife of the Intermountain West, Brown, Yocom, and Starbuck, 1958.

Wildlife of the Northern Rocky Mountains, Baker, Larrison, Yocom and Baxter, 1961.

Field Guide to Mammals, Burt and Grossenheider, 1964.

Field Guide to Western Birds, Roger Tory Peterson, 1969.

Fish and Wildlife Appendix, Great Basin Comprehensive Studies, 1970.

Predator Surveys, Western United States, 1972-73, Division of Wildlife Services, Fish and Wildlife Service.

