

0048

An example of Field Notes are attached
Complete copies of Notes where submitted
For Division Review.

09/83

FILE IN Expandable

Refer to Record No. 0048
in 10151025, 1983, incoming
for additional information

PARAMETER: Plant Cover	METHOD: 10-Point Frame	
LOCATION: Co-op Reference Area	EXAMINER: Germain + Waldvogel	
RANGE SITE: P5-grass (Agsp)	TRANSECT NO. 3	DATE: 8/6 + 8/7 1983
COMMENTS: Record weekly phenology data in column at right side of summary.		

1	2	3	4	5	6	7	8	9	10
				Litter	Litter		Litter		
B	B	B	R			4		V	R
11	12	13	14	15	16	17	18	19	20
R	V	R	R	R	B	R	R	R	R
21	22	23	24	25	26	27	28	29	30
				Agsp	Agsp	Agsp	Agsp		
B	V	V	R				R	R	R
31	32	33	34	35	36	37	38	39	40
			Spa				Agsp		Agsp
R	R	R		R	R	B		V	
41	42	43	44	45	46	47	48	49	50
R	V	R	R	R	R	R	R	R	R

SUMMARY		
Plant Symbols	Hits	% Total
Agsp	10	20
R	8	16
V	26	52
B	5	10
TOTAL		50

Symbol For Hits

Bare Soil
Rock
Litter
Live Plants

B
R
L
Plant
Symbol

Phenology Record

GRASSES

Stage 0 to 10 Leaf growth starts
Stage 10 to 20 Flower stalks appear
Stage 20 to 30 Heads full out
Stage 30 to 40 Anthesis
Stage 40 to 50 Dough
Stage 50 to 60 Hard seed
Stage 60 to 70 Dissemination starts
Stage 70 to 80 drying

SHRUBS

Stage 0 to 10 Leaf growth starts
Stage 10 to 20 Twig growth starts
Stage 20 to 30 Flower buds appear
Stage 30 to 40 First bloom
Stage 40 to 50 Full bloom
Stage 50 to 60 Brown over
Stage 60 to 70 Seed ripe
Stage 70 to 80 Dissemination over

Appendix 9-A

VEGETATION ANALYSIS - REFERENCE AREA

Melvin A. Coonrod
Co-Op Mining Company
P.O. Box 1245
Huntington, Utah 84528

August 20, 1983

Utah Division of Oil, Gas & Mining
Mr. James Smith
4241 State Office Building
Salt Lake City, Utah 84114

REF: ACR Commitment July 29th 1983
Vegetation Analysis-Reference Area
Co-Op Mining Co. Bear & Trail Canyon

Dear Jim:

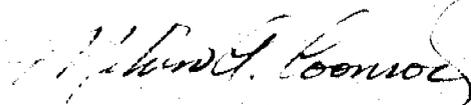
Please find attached: The data, work sheets and Summation on the Vegetation Reference Area. The area was selected in cooperation with Mr. Lynn Kunzler of the Division, and myself. The work was completed during August 6-7, 1983, and appears to be very representative of those areas which were disturbed in connection with mining activities in both Trail and Bear canyons.

The commitment to do this work was referenced in the Bear Canyon Scale modification, Bear Canyon Pad modification, and the Bear Canyon Apparent Completeness submittal. It was also referenced in the various reclamation plans I have submitted relative to the Co-Op's activities.

In view of this, I have attached eight copies. I would appreciate your assistance in disseminating this data.

I would again wish to express the Co-Op's appreciation for the Divisions' assistance in helping establish these areas.

Sincerely,


Melvin A. Coonrod
Permitting & Compliance Director
Co-Op Mining Company

Attachments: dup 8

CO-OP MINE REFERENCE AREA - SUMMATION

<u>AVERAGE COVER</u>	<u>% of VEGETATIVE COMPOSITION</u>	<u>GRASSES</u>	<u>SPECIES LIST</u>	<u>COMMON NAME</u>
19.5	68.37	Agsp	Agropyron spicatum	blue bunch wheat grass
		Orhy	Oryzopsis hymenoides	indian rice grass
		<u>FORBS</u>		
.05	.18	Hlyri	Hymenoxys spp.	
.05	.18	Stpi	Stanleya pinnata	prince's plume
.3	1.05	Arlu	Artemisia ludoviciana	louisiana sagewort
		Astra	Astragalus spp.	milkvetch
		Chdo	Chaenactis douglosii	false yarrow
		Erige	Erigeron spp.	fleabane
.05	.18	Haplo	Happlopappus spp.	goldenweed
.05	.18	Saka	Salsola kali	russian thistle
		<u>SHRUBS</u>		
.11	.39	Artr	Artemisia tridentata	big sagebrush
.5	1.75	Epvi	Ephedra viridis	mormon tea
5.4	18.93	Eriog	Eriogonum spp.	buckwheat
.9	3.16	Gusa	Gutierrezia spp.	snakeweed
1.4	4.91	Chna	Chrysothamnus nauseosus	rubber rabbit brush
.2	.71	Opun	Opuntia spp.	prickly pear
28.52	100	Roso	Rosa woodsii	woods rose
		Thtr	Rhus trilobata	skunk bush sumac
		Tape	Tamarix pentandra	tamarix
		<u>TREES</u>		
		Juos	Juniperus osteosperma	Utah juniper
		Jusc	Juniperus scopulorum	rocky mountain juniper
		Pied	Pinus edulis	pinyon pine
		Pipu	Picea purgans	blue spruce
		Cemo	Cercocarpus montanensis	true mountain mahogany

NUMBER ON SITE
GREATER THAN
CENSUS WALL

28.52	Total Vegetation
13.8	Bare ground
46	Rock
11.2	Other

* Riparian Bench (Co-Op Reference Area) (50' x 16' total size)

<u>GRASSES</u>	<u>25%</u>	<u>FORBS</u>	<u>10%</u>	<u>SHRUBS</u>	<u>20%</u>
Popr	3	ARLU	1	CHNA	5
Orhy	2	CLCO	5	ARTR	2
STCO	15	TRDU	<1	ARFR	1
BRTE	5	IPAG	<1	GUSA	1
		Castilleja spp.	<1	RUTR	10
		Cirsium spp.	<1	EPVI	<1
		HAFL	<1	CHVI	1
		Artemisia	2	OPUNT	<1
		dracunculus		SYMPH spp.	<1

TREES (overstory)

PIED
JUOS
JUSC

Total vegetative cover	55%
Bare ground	10%
Rock	20%
Litter	15%

* Riparian - Very narrow, steep slopes (Co-Op Reference Area)

<u>GRASSES</u>	<u>2%</u>	<u>FORBS</u>	<u>43%</u>	<u>SHRUBS</u>	<u>15%</u>
Juncus spp.	1	Circium	2	Rowo	14
Brma	<1	Equisetum spp.	25	RHTR	1
Agrostis spp.	1	CLCO	5		
Popr	<1	Lathyrus spp.	2		
		TAOF	<1		
		Smiliacena spp.	1		
		Apocynum	8		
		androsfe mifolum			

TREES

Salix spp.
 Pipu
 Pien
 Pofr
 Alnux spp.

Vegetative total	60%
Bare ground	5%
Litter	20%
Rock	15%

* The Riparian zone is so small that a sample adequacy was impossible to obtain in that there was insufficient area to run the desired and or minimum number of plots.

BEAR CANYON SITE - SIMILARITY COMPARISON

GRASSES

Agsp Agropyron spicatum
Orhy Oryzopsis hymenoides
Stipa Comata

SHRUBS

Arta Artemisia ludoviciana
Artr Artemisia tridentata
Chna Chrysothamnus nauseosus
Epvi Ephedra viridis
Saha Sarcobatus kali
Chra Chrysothamnus ^{Rouglasi} ~~nauseosus~~
Opun Opuntia spp.

TREES

Juos Juniperus osteosperma
Jusc Juniperus scopulorum
Pied Pinus edulis
Cemo Cercocarpus montanensis.

Bare ground

Rock (slightly more)

Litter

This area is very similar in coverage to the sampled reference area. The only difference is there is slightly more Artr and rock on this area.

All data and calculations were collected and compiled by Larry Germain, Paige Waldvogel in cooperation with Mel Coonrod.

NOTES ON SAMPLING METHODOLOGY

Plant Cover: 38-50 meter transects; using a ten point frame at every 10 meter interval.

Shrub Density: 24 - 1 x 50 meter transects, counting all shrubs rooted within the sampling area.

Formula for Sample Adequacy:

$$\left(\frac{s t}{(0.1) (\bar{x})} \right)^2 = \frac{s^2 t^2}{[(0.1)(\bar{x})]^2} = \begin{array}{l} \text{number} \\ \text{of} \\ \text{samples} \\ \text{needed} \\ \text{(n)} \end{array} \quad \text{where:}$$

t= 1.96 at 90% confidence (from t table)
s= standard deviation of sample
 \bar{x} = mean of sample

For Cover: (numbers from cover summary sheet)

$$= \left[\frac{(8.60)(1.96)}{(0.1)(28.52)} \right]^2 = \left[\frac{16.856}{2.852} \right]^2 = 34.93$$

For Shrub Density: (numbers from Density Summary sheet)

$$= \left[\frac{(4.05)(1.96)}{(0.1)(19.13)} \right]^2 = \left[\frac{7.938}{1.913} \right]^2 = 17.22$$

Example calculation for deriving % vegetative composition:

$$\text{Agsp} \quad \frac{742}{38 \text{ transects}} = 19.5 \quad \frac{19.5}{28.52} \times 100 = 68.37\% \text{ Agsp}$$

all species' averages + bare ground + rock + litter = 100%

* All species averages totaled = 28.52

Example calculation for % shrub composition:

$$\text{Chna} \quad \frac{73}{24 \text{ transects}} = 3.04 \quad \frac{3.04}{19.13} = 15.89\% \text{ composition}$$

* 19.13 derived by adding all species averages.

Shrub Density /ha = $\frac{N}{24 \text{ transects} \times 200}$

		<u>% of shrub composition</u>
Artr	16	.42
Chna	608	15.89
Epvi	566	14.79
Erioy	2108	55.10
Gusa	350	9.15
Juos	16	.42
Jusc	8	.21
Opunt	8	.21
Pied	75	1.96
Pipu	16	.42
Rowo	25	.78
Rhtr	16	.42
Tape	<u>8</u>	<u>.21</u>
		99.98%

Total shrubs /ha 3820

An example of Field Notes are attached
Complete copies of Notes where submitted
For Division Review.

09/83

SUMMARY OF FIELD SHEETS

LOCATION: Coop Reference Area

FIELD DATE: 8/6/83 + 8/7/83

VEGETATION TYPE: P5-gross (Agsp)

PARAMETER: Cover (10-point frame)

UNITS: _____

COMMENTS: page 1 of 2

TOTAL
AVERAGE
COMPOSITE

TRANSECTS

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL	AVERAGE	COMPOSITE
Agsp	18	20	12	24	30	18	18	14	14	20	20	16	26	10	30	28	24	34	14	30			
Grass																							
Forbs																							
Ar10																				12			
Hoplo																							
Tyri																				2			
Saka																							
Stpi																							
Shrubs																							
Artr																							
Chna								2		4		2		2									
Epui		2		2	4								8	8	8	2						8	
Eribg	6		6	10	10		4	4	16	8	6	6	4	4									
Gusk																							
Rutr																							
Background	16	8	16	16	12	10	24	28	4	18	10	14	14	12	22	8	18	20	12	22			
Rov	40	60	52	42	16	52	48	40	48	40	48	48	28	52	34	50	44	42	52	8	28		
...	20	10	12	6	22	14	6	12	18	10	10	14	18	12	6	10	14	4	8	8			
Average	24	22	20	36	44	18	22	20	30	32	32	24	40	24	32	32	24	34	28	42			

N= N90/10-

X=

S=

Summary By: _____

Summary Date: _____

Table
 PLANT SPECIES IDENTIFIED ON OR ADJACENT TO
 THE PERMIT AREA (7/82)

<u>PLANT SYMBOL</u>	<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
<u>GRASSES</u>		
Agsm	Agropyron smithii	western wheatgrass
Agtr	Agropyron trachycaulum	slender wheatgrass
Agin	Agropyron intermedium	intermediate wheatgrass
Agex	Agrostis exarata	red top
Avba	Avena barbata	wild oats
Bogr	Bouteloua gracilis	blue grama
Brma	Bromus marginatus	mountain brome
Brte	Bromus tectorum	cheat grass
Calam	Calamagrostis spp.	reed grass
Dagl	Dactylis glomerata	orchard grass
Elci	Elymus cinereus	basin wildrye
Elsa	Elymus salina	salina wildrye
Elgl	Elymus glaucus	blue wildrye
Hoju	Hordeum jubatum	foxtail
Hovu	Hordeum vulgare	barley
Kocr	Koeleria cristata	June grass
Orhy	Oryzopsis hymenoides	Indian ricegrass
Poa	Poa spp.	blue grass
Sihy	Sitanion hystrix	squirreltail
Stco	Stipa comata	needle and thread
<u>GRASS LIKE</u>		
Carex	Carex spp.	sedge
Scirp	Scirpus maritimus	bulrush
<u>FORBS</u>		
Anten	Antennaria spp.	pussy toes
Arco	Arnica cordifolia	heartleaf arnica
Ascle	Asclepias spp.	milkweed
Astra	Astragalus spp.	locoweed
Asco	Astragalus convallarius	narrowleaf vetch
Casti	Castilleja spp.	Indian paint brush
Ceras	Cerastium spp.	chickweed
Chdo	Chaenactis douglasii	false yarrow
Cirs	Cirsium spp.	thistle
Clco	Clematis columbiana	clematis
Coar	Convolvulus arvensis	bindweed
Cora	Cordylanthus ramosus	bird's beak
Erum	Eriogonum umbellatum	buckwheat
Erysi	Erysimum spp.	wallflower
Fraga	Fragaria spp.	strawberry
Galii	Galium spp.	bedstraw
Grsq	Grindelia squarrosa	gumweed
Haf1	Hackelia floribunda	false forget-me-not

FORBS CON'T

Hebo	Hedysarum boreale	sweet vetch
Heuch	Heuchera spp.	alum root
Hepa	Heuchera parvifolia	alum root
Ipag	Ipomopsis aggregata	scarlet gilia
Kosc	Kochia scoparia	summer cypress
Lala	Lathyrus lanzwertii	peavine
Lathy	Lathyrus spp.	peavine
Lygr	Lygodesmia grandiflora	skeleton weed
Meci	Mertensia ciliata	bluebells
Meof	Melilotus officinalis	sweet clover
Orfa	Orobanche fasciculata	broomrape
Osoc	Osmorhiza occidentalis	sweetanice
Oxytr	Oxytropis spp.	locoweed
Oxla	Oxytropis lambertii	locoweed
Penst	Penstemon spp.	penstemon
Peea	Penstemon eatonii	firecracker penstemon
Phace	Phacelia spp.	scorpion weed
Phid	Phacelia idahoensis	scorpion weed
Phau	Physaria australis	bladderpod
Saib	Salsola iberica	Russian thistle
Sedum	Sedum spp.	stonecrop
Sela	Sedum lanceolatum	stonecrop
Senec	Senecio spp.	oldman
Smst	Smilacina stellata	false soloman seal
Spco	Sphaeralcea coccinea	mallow
Stpi	Stanleya pinnata	prince's plume
Taof	Taraxacum officinale	dandelion
Thfe	Thalictrum fendleri	meadow rue
Trdu	Tragopogon dubius	oster plant
Vicia	Vicia spp.	vetch
Viola	Viola spp.	violet
Yucca	Yucca spp.	Yucca
Yuha	Yucca harrimaniae	Yucca

HALF-SHRUBS

Arfr	Artemisia frigida	fringe sagebrush
Atcu	Atriplex cuneata	mat saltbrush
Bere	Berberis repens	Oregon grape
Xasa	Xanthocephalum sarothrae (Gutierrezia sarothrae)	snake weed

SHRUBS

Amut	Amelanchier utahensis	service berry
Amal	Amelanchier alnifolia	serivce berry
Artr	Artemisia tridentata	sagebrush
Atco	Atriplex confertifolia	shadscale
Atcu	Atriplex cuneata	mat saltbush
Cela	Ceratoides lanata	winterfat
Chna	Chrysothamnus nauseosus	rubber rabbitbrush
Chvi	Chrysothamnus viscidiflorus	green rabbitbrush

SHRUBS CON'T

Epvi
Eriog
Opunt
Phmo
Putr
Rimo
Rowo
Sambu
Same
Save
Syva
Syal
Tape

Ephedra viridis
Eriogonum spp.
Opuntia spp.
Physocarpus monogynus
Purshia tridentata
Ribes montegeum
Rosa woodsii
Sambucus spp.
Sambucus melanocarpa
Sarcobatus vermiculatus
Symphoricarpos vaccinoides
Symphoricarpos albus
Tamarix pentandra

green mormon tea
buckwheat
prickly pear
nine bark
bitterbrush
currant
wild rose
elderberry
elderberry
greasewood
snowberry
snowberry
tamarix

TREES

Acgr
Abla
Cele
Cemo
Jusc
Juos
Pied
Pofr
Potr
Psme
Salix
Tape

Acer grandidentatum
Abies lasiocarpa
Cercocarpus ledifolius
Cercocarpus montanus
Juniperus scopulorum
Juniperus osteosperma
Pinus edulis
Populus fremontii
Populus tremuloides
Pseudotsuga menziesii
Salix spp.
Tamarix pentandra

maple
subapline fir
curlleaf mountain mahogany
true mountain mahogan
rocky mountain juniper
Utah juniper
pinyon pine
cottonwood
aspen
Douglas fir
willow
tamarix

Appendix 9-B



United States
Department of
Agriculture

Soil
Conservation
Service

350 North 4th East
Price, Utah 84501

September 26, 1983

Mel Coonrod
Co-op Mine
P. O. Box 358
Elmo, Utah 84521

Dear Mel,

Trail Canyon Reference Area:

Pinyon-Juniper Grass Site

The production is 650 lbs herbage production for this year. The range site condition is good.

Trail Canyon Riparian Reference Area:

The production is 2,650-3,000 lbs/acre. The condition is fair.

Bear Canyon Comparative Area:

Pinyon-Juniper Grass Site

The production is 600 lbs/acre. The range site condition is fair.


George S. Cook
Range Conservationist



Appendix 9-B



United States
Department of
Agriculture

Soil
Conservation
Service

350 North 4th East
Price, Utah 84501

September 26, 1983

Mel Coonrod
Co-op Mine
P. O. Box 358
Elmo, Utah 84521

Dear Mel,

Trail Canyon Reference Area:

Pinyon-Juniper Grass Site

The production is 650 lbs herbage production for this year. The range site condition is good.

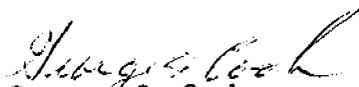
Trail Canyon Riparian Reference Area:

The production is 2,650-3,000 lbs/acre. The condition is fair.

Bear Canyon Comparative Area:

Pinyon-Juniper Grass Site

The production is 600 lbs/acre. The range site condition is fair.


George S. Cook
Range Conservationist





STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

September 4, 1985

CERTIFIED RETURN RECEIPT REQUESTED
(P402 457 228)

Mr. Glen A. Zumwalt
Vice President and General Manager
Utah Fuel Company
P. O. Box 719
Helper, Utah 84526

Dear Mr. Zumwalt:

RE: Conditional Approval, MRP Amendment, Bonding and Permit Area Change, Unit Train Loadout Facility Area, Skyline Mine, ACT/007/005, #3 and #5, Carbon County, Utah

The Division has completed the review of Utah Fuel Company's latest submission received August 12, 1985 which concerns a request to add an additional area of minor disturbance to the bonding and permit area for the Skyline Mine Complex.

The area of concern addresses a road at the Unit Train Loadout Facility which accesses the railroad trackage. This road is to be used by coal trucks to test the railroad loading scales and to load trucks should the need arise for a coal shipment. The Company anticipates that this road will seldom be used. The request is to include this road within the present permitted area and also to include the disturbed area between the road and the loadout building. Utah Fuel calculates the new area at 0.2 acres of additional disturbance. The Company has requested that the surface drainage from this additional disturbed area be exempted from the sedimentation pond criteria. The Company has proposed alternative sediment control measures to include the following:

Page 2
Mr. Glen Zumwalt
ACT/007/005
September 4, 1985

1. installation of the silt fencing material along the edge of the Utah Department of Transportation (UDOT) drainage ditch where drainage would leave the permitted area;
2. covering the disturbed area in question with a minimum of three inches of washed rock material;
3. utilize an existing catch basin with the outlet to be constructed with silt fencing material backed by straw bales.

The Company anticipates that the access road may at some point in the future be paved onto and off of the railroad trackage. The Division is prepared to issue its approval for this amendment. However, the following comments and conditions are included for clarification and finalization of this permitting activity:

The estimated runoff volume as computed by the operator on page 2 of the submission is incorrect. The southern parcel of the contributing watershed area will be 0.013 ac-ft, not 0.0011 ac-ft. The northern parcel of contributing watershed area should be 0.012, not 0.00096 ac-ft as calculated and reported in the plans.

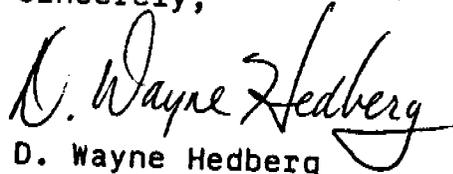
The operator must revise and update the bonded area map(s) and appropriate bonding text to include the fenced area. The revised text should also include a discussion on removal of the same upon final reclamation of the mine facilities. The operator is requested to provide this information by September 30, 1985. A possible alternative to this was verbally discussed between yourself and Randall Harden of the Division's technical staff. This alternative concerns Utah Fuel Company's proposal to provide a separate letter which would contain a formal Utah Department of Transportation (UDOT) request to leave the fence as part of the post mining land use for this area. This request should also include a commitment from UDOT to assume ultimate responsibility for the maintenance and future removal and restoration of the area effected by the fence when its use is no longer required.

As a condition to this approval, and in order to update all appropriate state and federal permit applications on file, please provide the Division fourteen (14) copies of the approved plans, revised maps and figures for direct insertion into the appropriate mine plans on file.

Page 3
Mr. Glen Zumwalt
ACT/007/005
September 4, 1985

The Division hereby approves the plans as proposed. Implementation of these approved plans should be accomplished by September 30, 1985. Thank you very much for your cooperation in these matters. Should you have any questions, please feel free to contact us at your earliest convenience.

Sincerely,



D. Wayne Hedberg
Permit Supervisor/
Reclamation Hydrologist

btb

cc: Allen Klein
Lowell Braxton
Randy Harden
Sue Linner
Sandy Pruitt
Rick Summers

8992R-91-93

Please remove the single page map at the end of Chapter 10 of the Bear Canyon MRP that is labeled Appendix 10-C, RAPTOR SURVEY, and insert this completed Appendix 10-C in its place.

Thank you

CHAPTER 10

WILDLIFE RESOURCES

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Application Section	Application Outline
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10.2.2	Terrestrial Resources
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10.3.2.1	Aquatic Wildlife Habitat and Value Determination
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Mammals, Amphibians, and Reptiles of
the Co-op Mine Permit Area

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Chapter 10

FISH AND WILDLIFE RESOURCES

10.1 Scope

The purpose of this report is to inventory the wildlife resources in the Co-op Permit Area and to evaluate the impact of the operation of the mine on those resources. The study includes birds, amphibians, reptiles, and mammals. Analysis entailed a review of the applicable literature, consultation with the relevant agencies, field analysis, and impact evaluation.

In sum, this study uncovers minimum impact on wildlife from continued operation of the mine. Since the Bear Canyon Mine has been worked intermittently since 1896, the ecosystem has already stabilized to some degree with mining.

10.2 Methodology

10.2.1 Aquatic Resources

All water within the permit area is intermittent (Class 6). Runoff from the permit area flows into the Huntington Creek drainage. This is the only drainage which could potentially be affected by Co-op's mining activities and the potential impact is expected to be insignificant. Bear Creek may receive some groundwater from the permit area while Huntington Creek eventually receives runoff from the disturbed areas. Surveys have been conducted of both of these streams although the potential for impact is considered to be minimal.

Huntington Creek

The aquatic resource description of Bear Creek consists of a review of available information from previous surveys. Water quality determinations were conducted by certified laboratories. A biological community most likely occurs in Bear Creek on an intermittent basis. Being present during a portion of those years when runoff is exceptionally high followed by wetter than usual summer and fall precipitation.

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10.2.2 Terrestrial Resources

This research was designed to qualitatively evaluate the terrestrial vertebrate components in habitats which may be affected by the proposed expansion of the Bear Canyon mine. The following methodologies were used:

1. Conduct a literature review and detailed analysis of Utah Division of Wildlife Resources' (UDWR) information and initial report and wildlife plan for the Bear Canyon Mine project and geographic area of concern.

A thorough literature review was conducted. The libraries at each of the major universities in Utah were surveyed. Special emphasis was given to location of published literature pertinent to the geographic area and habitat types in question. In addition, surrounding mine plans were reviewed for pertinent data.

Visits were also made to state and federal agencies that have jurisdiction or control over the study areas. All pertinent reports and management plans were reviewed, and appropriate personnel were questioned.

2. Contact the regulatory authorities to determine what wildlife information might be required.

The regulatory authorities were contacted by mail, phone, or personal visit to determine what wildlife information would be required.

3. Identify and cursorially inventory the terrestrial vertebrates by species for each of the habitats in the area of potential impact. Determine migratory utilization of the habitats.

Literature analysis and field observations were conducted to determine the probable and actual inhabitants of the area of potential impact and to identify habitats significant to their presence and/or persistence.

4. Categorize the status of each species and highlight those that deserve special attention because they are endangered or threatened or of economic or recreational value.

The methods and procedures essential to accomplishment of this objective involved basically two things. First, all of the species observed or known to inhabit the potential areas of impact were iden-

tified to species through Objectives 1 and 4 and listed phylogenetically in tabular form. Second, all species were categorized by (1) habitat (2) relative abundance, (3) resident species, (4) seasonal use, and/or (5) high interest species. The term "high interest species" designates those animals that require special attention by scientists and/or public management agencies because they are either endangered, threatened, protected game, or of economic or recreational value. The reasons for this high interest designation include: (1) ranges are small, thus restricting population to perhaps a few, (2) although populations may be numerically large, ranges may be small within the entire represented area, (3) irrespective of population numbers or range, little is known of the current status and in some cases information suggests that populations are declining, (4) species are sensitive to impact and may be in danger of abnormal declines, (5) species are relict or may have aesthetic or scientific value, (6) economic or recreational importance, and (7) combinations of the above.

5. Evaluate and discuss in report form the significant interactions on the terrestrial vertebrates present. High interest species are to be highlighted.

This objective is satisfied by discussions of the significant habitats, interactions, and potential results of the impacts on the terrestrial vertebrates. Appendix A outlines the procedures adopted by Co-Op as recommended by UDWR.

The Utah Division of Wildlife Resources has determined that the permit area is of critical value for the elk and mule deer.

10.3 EXISTING WILDLIFE RESOURCES

10.3.1 Wildlife Habitat in Mine Plan Area

The area of potential impact is covered by several important habitats that are used by species considered of "high interest" to various management agencies because of economic or recreation value. There are five major vegetation habitats from a faunal standpoint: pinyon-juniper, sagebrush, conifer, grass, and riparian.

10.3.2 Wildlife

10.3.2.1 Aquatic Wildlife Habitat and Value Determination

No perennial streams run through the Co-Op Mining Company's permit area. The ephemeral stream is Bear Creek which is within the Co-Op Permit area.

Because of the stream's quality, the impact will be minimal. In addition, all drainage from disturbed areas is passed through sedimentation ponds before discharge, reducing impact potential even further.

Bear Creek is a low-quality aquatic environment of little value to the aquatic resources of the area. Even if the mines were removed, natural conditions would be stressful to aquatic life. Within the permit area all water is ephemeral (Class 6). Huntington Creek does receive runoff and/or groundwater from the permit area or at some time during the year.

10.3.2.2 Terrestrial Wildlife and Habitat and Value Determination

Literature and field data were summarized for all terrestrial vertebrates of concern. The species were categorized to determine habitat affinities, high interest species status, and potential perturbation. These results are reported in Tables 10-1 and 10-2 through 10-8 and are listed according to their various ecological classification.* All species whose ranges appear to overlap any or all of the potential area of impact are listed.

Generally, the mine plan area could potentially be inhabited by 239 species of vertebrate wildlife as detailed in Appendix 10-A. Some of these are considered high interest species for the habitats and local area of concern. High interest wildlife are defined as all game species, any economically im-

Table 10-2

Species* List and Classification of Mammals Whose
Published Ranges Overlap the Expansion Area of
Co-op Mining Company

Mammal	Range					High-Interest Species
	<u>Pinyon/Juniper</u>	<u>Riparian</u>	<u>Sagebrush</u>	<u>Conifer</u>	<u>Grassland</u>	
Masked Shrew					UR	
Mirriam Shrew	UR	UR	UR		UR	
Dusky Shrew					UR	
Little Brown Myotis	CS	CS	CS		CS	
Fringed Myotis	US	US	US			
California Myotis	US	US	US			
Small-footed Myotis		US	US			
Silver-haired Bat					US	
Big Brown Bat					US	
Noary Bat					US	
Townsend's Big-eared Bat	US	US			US	
Brazilian Free-tailed Bat	US	US	US		US	
Muttall's Cottontail				UR	UR	X
Desert Cottontail	CR	CR	CR			X
Snowshoe Hare				CR	CR	X
White-tailed Jackrabbit		UR	UR		UR	X
Black-tailed Jackrabbit	CR	CR	CR			X
Least Chipmunk	AR	AR	AR	CR	CR	
Cliff Chipmunk	CR	CR			CR	
Uinta Chipmunk	AR	AR	AR	CR	CR	
Yellow-bellied Marmot				CR	CR	
White-tailed Antelope Squirrel		AR	AR			
Uinta Ground Squirrel					CR	
Rock Squirrel					CR	
White-tailed Prairie Dog		CR				
Red Squirrel				CR		
Northern Flying Squirrel				CR	CR	
Northern Pocket Gopher		CR	CR		CR	
Great Basin Pocket Mouse		CR	CR			

* Scientific names of species are listed in Appendix 10B.

Table 10-2 (cont.)

Mammal	Range					High-Interest Species
	Pinyon/Juniper	Riparian	Sagebrush	Conifer	Wetland	
Ord's Kangaroo Rat		CR	CR			
Western Harvest Mouse		UR	UR		UR	
Deer Mouse	AR	AR	AR	AR	AR	
Pinyon Mouse	CR					
Desert woodrat	CR	CR	CR			
Bushy-tailed Woodrat			CR	CR	CR	
Montane Vole				CR	CR	
Sagebrush Vole		UR	UR			
Porcupine	CR			CR	CR	
Coyote	CR	CR	CR	CR	CR	X
Red Fox		CaR	CaR		CaR	X
Gray Fox		UR	UR		UR	X
Black Bear				CaR	CR	X
Ringtail	UR	UR	UR	UR	UR	
Raccoon	Ca				Ca	
Marten				CaR		X
Ermine				UR		X
Long-tailed Weasel	CR	CR	CR	CR	CR	X
Badger	CR	CR	CR	CR	CR	X
Striped Skunk	CR	CR	CR	CR	CR	X
Mountain Lion (Cougar)	UR	UR	UR	UR	UR	X
Bobcat	CR	CR	CR	CR	CR	X
Wapiti or Elk					CR	X
Mule Deer	CR	CR	CR	CR	CR	X

A = Abundant
 C = Common
 U = Uncommon
 Ca = Casual or Rare
 R = Permanent Resident
 S = Summer Only
 W = Winter Only

Table 10-4

Species* List and Classification of Amphibians Whose
Published Ranges Overlap the Expansion Area of Co-op
Mining Company

<u>Amphibian</u>	<u>Range</u>					<u>High-Interest Species</u>
	<u>Pinyon/Juniper</u>	<u>Riparian</u>	<u>Sagebrush</u>	<u>Conifer</u>	<u>Grasses</u>	
Western Spadefoot Toad		C	CS			
Woodhouse's Toad		C	US			
Western Leopard Frog		C	CS			

* Scientific names of species are listed in Appendix 10B.

C = Common
U = Uncommon
S = Summer Only

Table 10-5

Species* List and Classification of Reptiles Whose
Published Ranges Overlap the Expansion Area of
Co-op Mining Company

Reptiles	Range					High-Interest Species
	Pinyon/Juniper	Riparian	Sagebrush	Conifer	Grassland	
Fence Lizard	US					
Sagebrush Lizard	CS	CS	CS			
Mountain Short-haired Lizard	CS	CS	CS	U		
Rocky Mountain Rubber Boa				US		
Wandering Garter Snake	US	US	US	US		US
Western or Yellow-bellied Racer	US	US	US			US
Striped Whipsnake	US	US	US			
Gopher Snake	CS	CS	CS			CS
Milk Snake	US	US	US			
Utah Mountain Kingsnake	US					US
Night Snake		US	US			
Midget Faded Rattlesnake	CS	CS	CS			CS

* Scientific names of species are listed in Appendix 10B.

C = Common
U = Uncommon
S = Summer Only

Table 10-5

Species* List and Classification of Reptiles Whose
Published Ranges Overlap the Expansion Area of
Co-op Mining Company

Reptiles	Range						Observed On Site	High-Interest Species
	Pinyon/Juniper	Desert Shrub	Sagebrush	Conifer-Aspen	Mixed Shrub & Grasses			
Fence Lizard	US						US	
Sagebrush Lizard	CS	CS	CS				CS	
Mountain Short-haired Lizard	CS	CS	CS	U			CS	
Rocky Mountain Rubber Boa				US				
Wandering Garter Snake	US	US	US	US			US	
Western or Yellow-bellied Racer	US	US	US				US	
Striped Whipsnake	US	US	US					
Gopher Snake	CS	CS	CS				CS	
Milk Snake	US	US	US					
Utah Mountain Kingsnake	US						US	
Night Snake		US	US					
Midget Faded Rattlesnake	CS	CS	CS				CS	

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Mining Company

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Western Spadefoot Toad		CS	CS				
Woodhouse's Toad		US	US				
Western Leopard Frog		CS	CS				

* Scientific names of species are listed in Appendix 10B.

C = Common
U = Uncommon
S = Summer Only

portant species, and any species of special aesthetic, scientific or educational significance. This included all federally listed threatened and endangered species of wildlife.

10.3.2.3 Mammals

The area of potential impact is likely to be inhabited by 84 species of mammals. The names of these animals and their habitat affinities are listed in Appendix A. They represent 6 orders and 15 families of mammals. Twenty-five species are considered high-interest species, 14 of which are protected by state or federal code. The conifer and high elevation mountain grass areas near the Northern extreme of the permit area are used as summer range and possibly calving areas for elk, as well as summer range and fawning areas for mule deer. They are also utilized by cougar, bobcat, and possibly bear.

The low elevation mountain grass and Pinyon-Juniper habitats in the foothills just above the Mine are utilized by elk, during winter and spring. The same area is used during spring,

(In consolidation, pages 8 and 13 were eliminated).

summer, fall and, as indicated by fallen antlers, during winter by a few of the larger deer. However the major winter area for mule deer is in the pinyon-juniper and sagebrush habitats, along the lower hills and the entire foothill area. In all habitats, water is a critical resource and is possibly the limiting factor. The high interest species will be discussed individually in Section 10.4 of this report. It is doubtful that the proposed expansion will seriously impact the other species.

10.3.2.4 Birds

The Bear Canyon Mining and Reclamation Plan site was examined in September 1983 in order to finalize the current draft report. Because most of the bird species of this area are summer residents only, additional field work will not be undertaken during the winter months. (See Appendix 10--Raptor Survey)

Two species of involved birds are on the endangered species list: the bald eagle (winter resident), and the peregrine falcon (thought to be a year-round resident in southeastern Utah). However, there are no known nesting sites for the peregrine falcon in this area. Because of the suspected transient

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nature of these birds, no problems are foreseen with the projected development. Further investigations were made during 1983 to confirm these assumptions. Potential areas of impact were pointed out and marked on a map. The areas designated for potential impact include: (1) Mine site location; (2) Haul road and utility corridor.

Mine Site Location

This area is approximately 10 acres and is one area where new construction will occur. It is covered primarily with pinyon and juniper trees, sagebrush, and rabbitbrush, with spruce trees in some of the side canyons. Basically it is a high, dry, desert environment.

The more important bird species of the area are listed in Table 10-3.

Haul Road and Utility Corridors

Haul road and Utility corridors are both described as having the same general habitat as the Mine site with the addition of a narrow band of riparian habitat along Bear Creek.

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Table 10-3
Birds of the Mine Site and Haul Road of the Expansion
 Area, Emery County, Utah

<u>Name</u>	<u>Season of Occupancy</u>	<u>Status</u>
Turkey vulture	spring, summer, fall	uncommon
Red-tailed hawk	all year	common
Swainson's hawk	spring, summer, fall	uncommon
Ferruginous hawk	spring, summer, fall	uncommon
Golden eagle	all year	uncommon
Bald eagle	winter	rare
Marsh hawk	all year	uncommon
Prairie falcon	all year	common
Peregrine falcon	all year	rare
Sparrow hawk	all year	common
Chukar	all year	unknown
Mourning dove	spring, summer	common
Great-horned owl	all year	uncommon
Poor-will	spring, summer	common
Common night hawk	spring, summer	common
Black-chinned hummingbird	spring, summer	common
Broad-tailed hummingbird	spring, summer	common
Common flicker	all year	common
Hairy woodpecker	all year	uncommon
Downy woodpecker	all year	uncommon
Western kingbird	spring, summer	common
Ash-throated flycatcher	spring, summer	common
Say's phoebe	spring, summer	common
Gray flycatcher	spring, summer	uncommon
Violet-green swallow	spring, summer	common
Horned lark	all year	common
Black-billed magpie	all year	common
Raven	all year	common
Crow	spring, fall, winter	common
Pinon jay	all year	common
Mountain chickadee	all year	common
Plain titmouse	all year	uncommon
Bushtit	all year	uncommon
Bewick's wren	spring, summer	uncommon
Robin	all year	common
Mountain bluebird	spring, summer, fall	uncommon
Blue-gray gnatcatcher	spring, summer	uncommon
Cedar waxwing	all year	uncommon
Loggerhead shrike	spring, summer	uncommon
Starling	spring, summer, fall	uncommon
Gray vireo	spring, summer	uncommon
Solitary vireo	spring, summer	uncommon
House finch	all year	common
Pine siskin	all year	common
Lark sparrow	spring, summer	common
Chipping sparrow	spring, summer	common
Sage grouse	all year	uncommon
Pigmy owl	all year	uncommon
Long-eared owl	all year	uncommon
Saw-whet owl	all year	uncommon
White-throated swift	spring, summer	uncommon
Cassin's kingbird	spring, summer	uncommon
Western flycatcher	spring, summer	uncommon
Scrub jay	all year	uncommon
White breasted nuthatch	all year	uncommon
Western bluebird	all year	uncommon
Townsend's solitaire	all year	uncommon
Black-throated gray warbler	spring, summer	common
Scott's oriole	spring, summer	uncommon
Rufous-sided towhee	all year	uncommon
Brewer's sparrow	spring, summer, fall	uncommon
Black-chinned sparrow	spring, summer	uncommon

10.3.2.5 Reptiles and Amphibians

The material used in this portion of the report was derived from literature and a discussion with Dr. W. W. Tanner (retired) an internationally known herpetologist specializing in the reptiles and amphibians of Utah.

Increasing elevation rapidly reduces the number and kind of reptiles and amphibians. In Utah, the more northern latitude reduces numbers of reptiles and amphibians in much the same way as does the increase in elevation.

The geographical and associated climatic factors have eliminated most desert species, leaving species that are adapted either to mountain habitats or montane type habitats developed in the more northern areas. Thus, the reptiles and amphibians of Utah, and particularly those inhabiting the areas under the consideration, have arrived in Utah by means of dispersal lanes coming from the northeast and the southeast. With few exceptions, the species listed have wide distribution and are versatile in their adaptive abilities.

Literature pertaining to the amphibians and reptiles is extensive, but much of it refers to species occurring in the desert areas and has only limited reference to forms inhabiting high elevations in Utah. Most of the publications dealing with species lists for the state are old.*

The most up-to-date listing for the area under consideration may well be a checklist of Utah amphibians and reptiles (Tanner, 1975), and Utah Division Publication No. 78-16 (Dalton, 1978) which references a contiguous and similar geographic area.**

* V. Tanner, Amphibians, 1931; Woodbury, Reptiles, 1931; and Pack, Snakes, 1930.

** Other recent literature pertinent to this report are:

Schmidt (1953); Stebbins (1954 and 1966); W. Tanner (1953, 1957a and b, 1966-with Banta, 1969-with Morris, and 1972-with Fisher and Willis); and Woodbury (1952).

Reptiles

Based on a review of the literature, it was determined that probably 18 species of reptiles (See App. 10-A). occupy the expansion area; this area is considered to be a substantial value habitat for all species. All reptiles have some protection under the Utah code, but since the species listed are all widespread throughout similar habitats in Utah, none are treated as high interest species and, therefore, are not individually discussed.

Amphibians

Based on the literature review, it was determined that probably six species of amphibians (see App. 10-A). inhabit the proposed area of concern which provides substantial value habitat for the three species listed. All amphibians are legally protected in Utah, but since the species listed are all widespread throughout similar habitats in Utah, none are treated as high interest species, and therefore, are not individually discussed.

10.3.3 Species of Special Significance

10.3.3.1 Threatened and Endangered Species

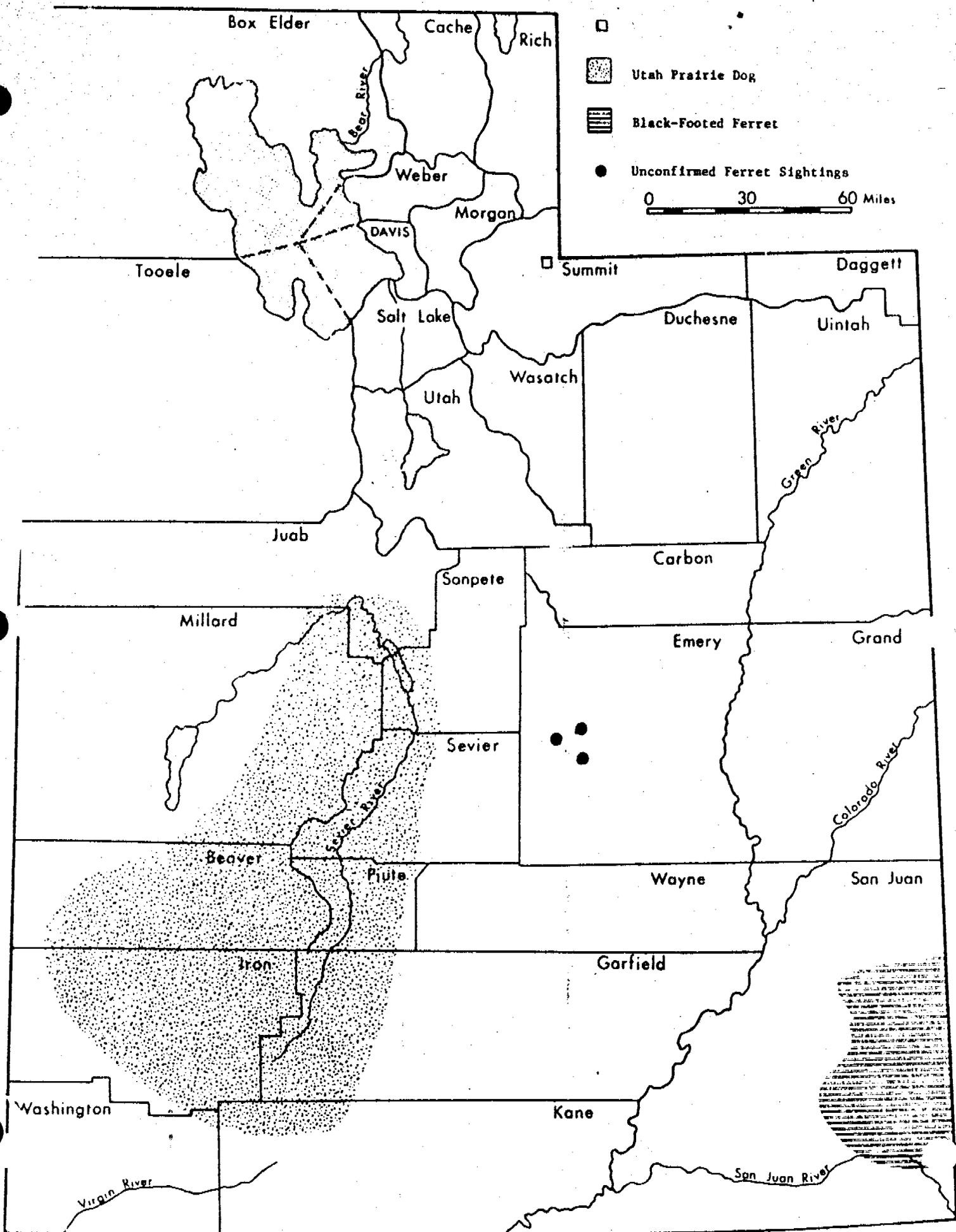


FIGURE 10-5. Endangered Mammalian Species in Relation to Proposed Impact Area

There are no endangered or threatened species of mammals in the mine plan area, nor are there any in proximity close enough to be considered (Figure 10-5). Co-Op is committed to notify the Division in the event any T & E species were observed on the permit area, as well as any critical habitat.

Official U.S. Fish and Wildlife Service Section 7 opinions relating to the aquatic resources of Huntington and Eccles Canyon drainages have indicated that no threatened or endangered species of fish or other aquatic organisms have been found in waters upstream of the lowest 2 or 3 mi of the Price or San Rafael rivers. The organisms of Trail Creek, as presently known, are all common and widely distributed throughout streams of Utah. The aquatic organisms of Bear Creek have representatives of several taxa limited to low quality environs, but none, as far as is presently known, are rare in the inter-mountain region.

10.3.3.2 Raptors

Two species of endangered raptors may be found in the mine plan area. These are the bald eagle and peregrine falcon. There are no known roosting trees or nesting sites within the permit area according to a survey conducted by the Raptor Biologist from the U.S. Fish and Wildlife Service.

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Additional studies will be made during the raptor breeding seasons in the year to come to confirm the absence of raptor nesting sites in the Permit area.

10.4 EXPECTED IMPACTS OF MINING OPERATIONS ON FISH AND WILDLIFE

10.4.1 Aquatic Wildlife

The mine is an existing mine and as such should have no additional impact on Bear Creek, which is furthermore of little value to the aquatic sources of the area. Natural conditions would be stressful to the aquatic life even if existing mining activities were removed.

Trail Creek is a marginal quality stream and as such should be protected. The only foreseeable impact from the Co-op Mine project would be from subsidence of source aquifers causing a reduction in the total flow. There are no new planned surface disturbances adjacent to Trail Creek. Minimal disturbance will occur at the Bear Canyon Mine area, which is within the drainage of Huntington Creek. Since the creek is a considerable distance from the mine and since the areas of disturbance will be small, the impact will be insignificant. Subsidence, if it should occur,

would have only a minor impact, and then not on
Huntington Creek itself.

10.4.2 Terrestrial Wildlife

Mammals

Only those mammals of major concern to management agencies are individually discussed briefly here and in more detail in Appendix 10-A.

Mule Deer

Mule deer on the Bear Canyon Mine and the proposed expansion area are considered part of herd unit 33 by UDWR. Historically, through 1977, this herd experienced the same general fluctuations as the other herd units of the state. Populations decreased in the early 1970's primarily due to severe climatic conditions, but took a general upswing through the summer of 1977. Then there were three consecutive years of decline wherein the deer were forced to the extreme lower limits of their winter range by abnormally deep and long-lasting snow.

The animals utilize the entire area of potential impact but seasonally concentrate in, and more

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The animals utilize the entire area of potential impact but seasonally concentrate in, and more

heavily utilize, specific habitat types. The high elevation mountain brush-grass and conifer-aspen habitats near the Northern edge of the permit area are used for summer range and fawning. The low altitude mountain brush, mixed desert shrub, and pinyon-juniper habitats are used as winter range during normal winters; during excessive snow the deer move off the impact area and go east well below the Permit Area. The browse in the wintering habitats in the impact area is in relatively good condition and can facilitate overwintering of deer in a normal year.

Cougar

The entire Bear Canyon Mine and Haul Road area provide yearlong habitat for cougar. Cougars could range throughout the area, but their movements are dictated by migration patterns, human disturbance, and availability of their primary food source, mule deer. Since cougars are not abundant and are known to be secretive, avoidance will be practiced when the females are accompanied by young learning to hunt and survive.

This period in the life cycle of the cougar, however, is difficult to determine since they are known to re-

produce yearround. If cougar populations in the area of potential impact were high, this would be of major concern, but, since numbers are low and ranges extensive compared to the area of potential impact, the cougars will continue to avoid human activity areas and there will be little impact on the overall cougar population.

Bobcat

The mine and proposed expansion and adjacent areas provide habitats for bobcats. Although little is known about the Utah bobcat, one sensitive period would be late February when parturition occurs. May and June would also be a sensitive period because young bobcats, when learning to hunt, are not as secretive as the cougar, making them less likely to avoid high human disturbance areas during these months. However, since this is an ongoing mining operation, impact on bobcats should be unchanged.

Black Bear

Only the breakout and ventilation shaft portion of the mine and proposed lease expansion areas provide potential habitat for black bear, which are neither

abundant nor active yearround. Sensitive periods in the life cycle of the black bear are February and March when the cubs are born and during the early summer when they accompany their mother on initial foraging expeditions. Since the parturition occurs within the winter den, disturbance in the black bear habitat will be limited and there will be little impact during this sensitive period. The same is true of the initial foraging forays.

Mountain and Desert Cottontails

The entire mine and proposed lease expansion areas provide substantial value, yearlong habitats for cottontail rabbits. The young are born between April and July, which is considered a sensitive period, but the proposed actions will in all probability not seriously alter reproductive potential of the populations. Hunting pressure most likely will not increase nor will illegal kill, however, this would not matter since the hunted rabbit populations are more healthy and stable than nonhunted populations. Subsidence could potentially create a problem, but since it is limited to relatively small areas at a time, little overall impact will occur. It should be noted that disturbed vegetation

leading to succession (if it occurs) would enhance reproductive potential of cottontail rabbits.

Snowshoe Hare

The snowshoe hare is present in and dependent upon the mixed conifer-aspen vegetation habitat year-round. This habitat type is limited in the mine and Permit area and the proposed actions will do little to harm the habitat type and the dependent hare populations. Although the sensitive period for reproduction is from April 1 to August 15, there will be no serious long term impact on the snowshoe hare and there will be little change in population. Subsidence will not harm the aboveground dweller as it potentially could the subterranean inhabitants. Hunting will be the most influential activity of man upon snowshoe hares but there should not be much difference from prior years and no longterm impact.

Furbearers

Limited portions of the proposed mine lease and adjacent areas provide substantial value habitats for a few species categorized by management agencies as furbearers: ermine, long-tailed weasel, badger, and

the striped skunk. Obviously, the breeding and rearing activities of these nonmigratory species occurs within the proposed impact area and their dens and burrow systems are important to maintenance of their populations; however, it is highly unlikely that there will be any serious long term impact created by the proposed actions of this specific project. After subsidence occurs, new burrows will be built or old ones reconstructed. These species are widespread and adaptable to the activities of man.

Small Mammals

Although small mammals do not qualify individually as high interest species, they represent a significant part of the ecosystem. The majority are herbivores and are the primary source of food for higher trophic levels, particularly raptorial birds, canids, and felids. This trophic importance warrants consideration. Since this mining project only involves the expansion of an ongoing operation, there will be little habitat loss due to construction and operation of additional surface facilities. Therefore, subsidence and its impact on underground burrow

systems is the primary concern. The potential exists for caving in burrows and/or changing burrow continuity due to fracturing of the strata. Although this would temporarily alter the population density and age structure, recovery would be imminent and rapid since the breeding population contiguous and within the localized area of impact would not be lost. Additionally, the population densities are more than adequate to supply the limited number of predators present, particularly raptorial birds, that utilize the resource.

Birds

The greatest impact on birds will occur at the Mine Site area. However, because of the vast area of this same habitat type in Emery County and the status of the birds involved, no serious impacts are anticipated. Since the high elevation sites included in the Permit area will be essentially undisturbed, no lasting impacts are expected.

Amphibians

Because of the wide distribution pattern of the six amphibian species that might inhabit the mine permit area, it is doubtful that the proposed action

systems is the primary concern. The potential exists for caving in burrows and/or changing burrow continuity due to fracturing of the strata. Although this would temporarily alter the population density and age structure, recovery would be imminent and rapid since the breeding population contiguous and within the localized area of impact would not be lost. Additionally, the population densities are more than adequate to supply the limited number of predators present, particularly raptorial birds, that utilize the resource.

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Amphibians

Because of the wide distribution pattern of the three amphibian species that might inhabit the mine permit area, it is doubtful that the proposed action

would seriously impact the whole population.

Reptiles

The reptiles that inhabit the area under discussion are also found in many similar habitats; therefore the proposed action would not seriously impact the reptilian populations. If a denning site for any reptile species were discovered during the construction of the mine or portals, it should be preserved until proper procedures to move the den site to a new location were implemented by the proper UDWR personnel. This is relatively easy to do and should cause little concern.

10.5 MITIGATION AND MANAGEMENT PLANS

Mitigation of mining impacts on and management of wildlife are usually considered and the plans for implementation approved prior to any perturbation. These actions often follow one of three general forms: (1) design of facilities and access or transportation modes to minimize impacts, (2) operation of the mine and associated facilities to minimize impact, and (3) enhancement of wildlife habitat both in the vicinity of and away from the mine

in order to mitigate losses that may occur.

Since no impact to the perennial waters of the permit area is expected in the foreseeable future, no special mitigation plan concerning Bear or Trail Creek is presented here. Both creeks were monitored for water quality condition for the past two years with monthly samplings in order to acquire a baseline description of the resource. This baseline will provide a solid ground for future impact analysis and mitigation planning if the need arises.

In new mine operations it is easy to suggest, provide and implement mitigative and management measures, but in the case of the Bear Canyon Mine, which is already in operation preconstruction design and associated mitigation and management does not apply. The terrestrial wildlife inhabiting and utilizing the area of concern are accustomed to the present facilities and have adjusted their behavior, including migration patterns, so that change would be of more impact than would retaining the status quo.

The new construction areas do warrant mitigation and management action. Construction and operation of the scalehouse, stockpile area and road could

potentially disturb wildlife. To minimize habitat disturbance and loss, surface activity will be kept to a minimum.

The mine activities will take into consideration potential conflict with deer and elk reproductive activity and the small acreage involved will be restored as quickly as possible by redistribution of topsoil within the disturbed area, with immediate reseeding and replanting of native seeds and vegetation. Because of the small size of the area, natural reseeding will also occur from the surrounding area. The seral stage habitat created will be beneficial to deer, who readily utilize seral stages of mixed conifer-aspen forest.

There will be minimal additional surface activity and disturbance of less than two acres which will reduce habitat loss and minimize human activity on the surface during the winter range.

The topsoil pile extension area is proposed for a site within mule deer wintering range. The area will be reseeded and revegetated with native species that are proven for their value as winter browse for mule

deer and as a bird habitat. The most successful methods known to management agencies will be used. Care will be taken to control detrimental wildlife use while the area is stabilizing.

Construction of the Mine Site and Haul Road would be sources of disturbance. Habitat would be lost temporarily during construction and permanently where the mine is located. Since this is in a wintering area the same community reestablishing and augmenting techniques would be used. The terrain is such that established trails do not exist.

Little riparian habitats exist within the area, there will be little impact by the proposed action. All water is intermittent but since water is such a limiting resource to game animals, care will be taken to prevent disturbance, erosion, or coal deposition in the ephemeral channels. Roads will be routed or acceptable crossings built to avoid disturbance or erosion. Coal will be wetted to prevent blowing if necessary.

As determined in consultation with UDWR, all hazards associated with the expansion and mine operation will be covered, buffered or fenced to prevent damage to wildlife of concern.

Since there are crucial critical periods in the life history of high interest species such as mule deer and elk, the applicant will communicate such to their employees who will be admonished to avoid all unnecessary disturbance and harrassment of wildlife species. In addition, all employees will be required to view the film " Coal Mining and Wildlife" as a tool to educate the mine personnel on their role in safeguarding Utahs wildlife.

In any situation noe previously mentioned where wildlife habitats are disturbed by this proposed action, reclamation will be implemented by the best available methods and agreeable to UDWR and the appropriate management agencies. The old road up Bear Creek is an example of mitigation which will be completed by October, 1984. Additional mitigation to be undertaken in 1985 is discussed in Appendix 10-D.

UDWR authorities will be consulted, in the event a need for pesticides become necessary to control rodents or insects during reclamation. No control measures will be used without prior approval by all parties concerned.

Raptor nests will be safeguarded from subsidence by maintaining a minimum of a 100' barrier to the outcrop.

10.6 STREAM BUFFER ZONE DETERMINATION BY DOGM

Current surface facilities are in the upper reaches of the

Bear Creek drainage, which is a tributary of Huntington Creek drainage. Appropriate sedimentation ponds have been constructed. This coupled with coal pile drainage ditches, clear water diversion, water bars, and wind erosion control measures within Co-OP disturbed areas, will assure protection from mining impact of aquatic resources far downstream from the mine. Thus, no aquatic biological community determinations have been made relative to surface activities. Stream buffer zones are detailed on Page 3-119.

10.7 FISH AND WILDLIFE MONITORING

Bear Creek does not warrant a biological or habitat monitoring effort since it is naturally of poor quality

Trail Creek is a marginal quality stream and as such should have a baseline description of its quality. Data collected will be correlated with water quality and hydrology measurements discussed in Chapter 7. If subsidence should become evident in the drainage area that contributes to Bear Creek, or Trail Creek monitoring of aquatic macroinvertebrates and habitat changes will be enstated using approved methodology to collect data as the base for impact evaluation.

Co-Op has committed to monitor all existing power transmission lines in order to determine use by raptors. In the event use is observed, Co-Op will take all necessary measures to ensure the poles and/or structures are safe. All new poles and power

transmission facilities will be constructed to be raptor protected. See Appendix 10-C.

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APPENDIX 10B

Scientific Names for Mammals, Amphibians and
Reptiles of the Plateau Mine Permit Area

COMMON NAMESCIENTIFIC NAMEMammals

Badger	Taxidea taxus
Bat, big brown	Eptesicus fuscus
Bat, Brazilian free-tailed	Tadarida brasiliensis
Bat, hoary	Lasiurus Cinereus
Bat, silver-haired	Lasionycteris noctivagans
Bat, Townsend's big-eared	Plecotus townsendi
Bear, black	Ursus Americanus
Bobcat	Lynx rufus
Chipmunk, cliff	Eutamias dorsalis
Chipmunk, least	Eutamias minimus
Chipmunk, Uinta	Eutamias umbrinus
Cottontail, desert	Sylvilagus audoboni
Cottontail, Nuttall's	Sylvilagus Nuttalli
Coyote	Canis latrans
Deer, mule	Odocoileus hemionus
Elk (wapiti)	Cervus elaphus
Ermine	Mustela erminea
Fox, gray	Urocyon cinereoargenteus
Fox, red	Vulpes fulva
Gopher, northern pocket	Thomomys talpodes
Hare, snowshoe	Hepus Americanus
Jackrabbit, black-tailed	Hepus Californicus
Jackrabbit, white-tailed	Hepus townsendi
Lion, mountain	Felis concolor
Marmot, yellow-billed	Marmota flaviventris
Marten	Martes americana
Mouse, deer	Peromyscus Maniculatus
Mouse, Great Basin pocket	Perognathus parvus
Mouse, pinyon	Peromyscus truei
Mouse, western harvest	Reithrodontomys megalotis

COMMON NAME

SCIENTIFIC NAME

Mammals (con't)

Myotis, California	Myotis californicus
Myotis, fringed	Myotis thysanodes
Myotis, little brown	Myotis lucifugus
Myotis, small-footed	Myotis leibii
Porcupine	Erethizon dorsatum
Prairie dog, white-tailed	Cynomys leucurus
Raccoon	Procyon lotor
Rat, Ord's kangaroo	Dipodomys ordi
Ringtail	Bassariscus Astutus
Shrew, dusky	Sorex obscurus
Shrew, masked	Sorex cinereus
Shrew, Mirriam's	Sorex mirriami
Skunk, striped	Mephitis mephitis
Squirrel, northern flying	Glaucomys sabrinus
Squirrel, red	Tamiasciurus hudsonicus
Squirrel, rock	Spermophilus variegatus
Squirrel, Uinta ground	Spermophilus armatus
Squirrel, white-tailed antelope	Ammospermophilus leucurus
Vole, Montane	Microtus Montanus
Vole, sagebrush	Lagurus curtatus
Weasel, long-tailed	Mustela frenata
Woodrat, bushy-tailed	Neotoma cinerea
Woodrat, desert	Neotoma lepida

Amphibians

Frog, western leopard	Rana pipiens
Toad, Woodhouse's	Bufo woodhousei
Toad, western spadefoot	Scaphiopus hammondi

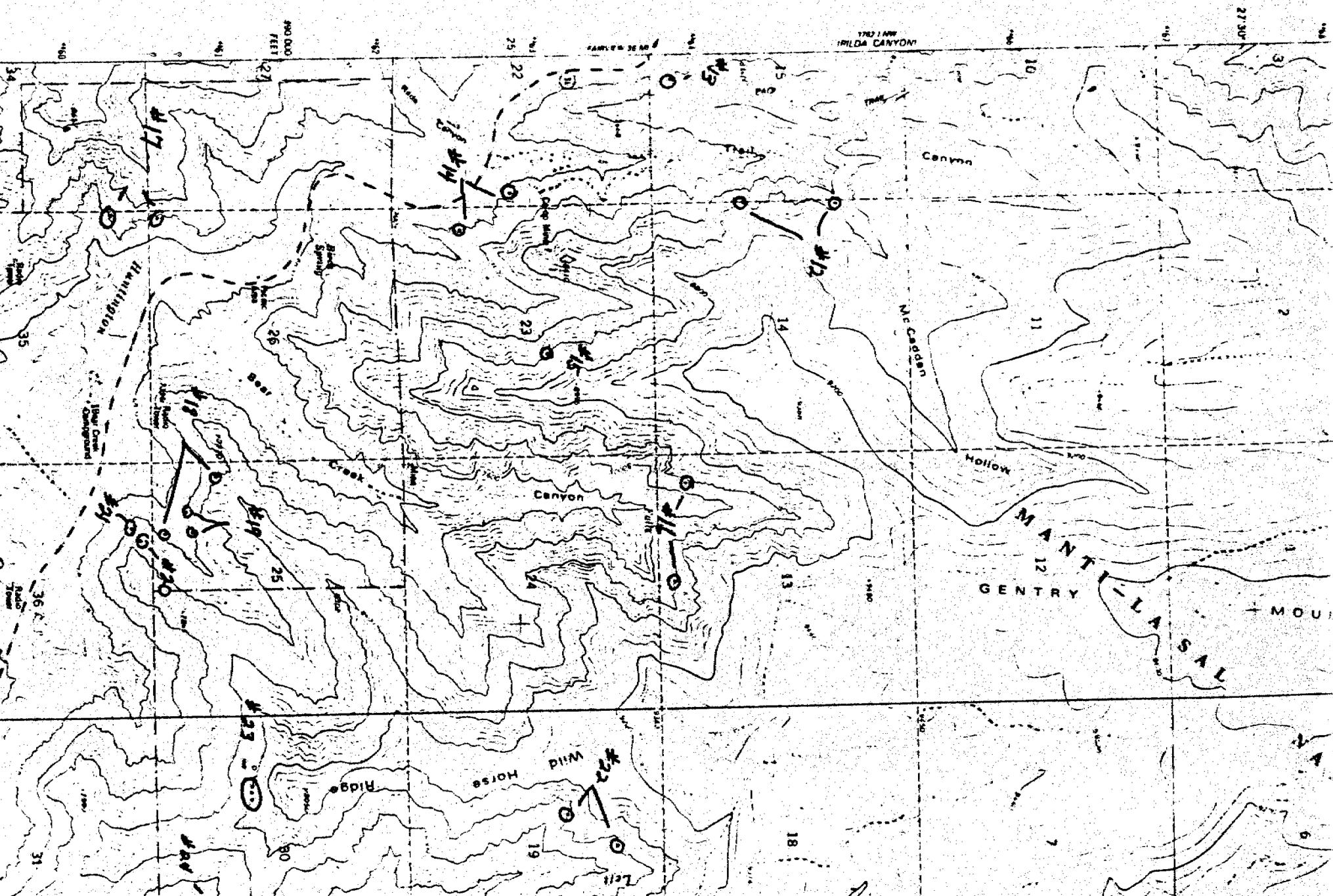
COMMON NAME

SCIENTIFIC NAME

Reptiles

Boa, Rocky Mountain rubber	Charina bottae
Kingsnake, Utah mountain	Lampropeltis pyromelana
Lizard, fence	Sceloporus undulatus
Lizard, sagebrush	Sceloporus graciosus
Lizard, mountain short-haired	Phrynosoma douglasi
Racer, western or yellow-bellied	Coluber constrictor
Rattlesnake, Midget faded	Crotalus viridus
Snake, gopher	Pituophis melanoleucus
Snake, milk	Lampropeltis triangulum
Snake, night	Hypsiglena torquata
Snake, wandering garter	Thamnophis elegans
Whipsnake, striped	Masticophis taeniatus

10
Raptor Survey



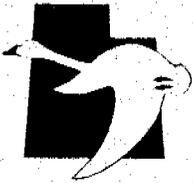
APPENDIX 10-C

RAPTOR SURVEY

RECEIVED

NOV 18 1983

**DIVISION OF
OIL, GAS & MINING**



DIVISION OF WILDLIFE RESOURCES

DOUGLAS F. DAY
Director

EQUAL OPPORTUNITY EMPLOYER

1596 West North Temple/Salt Lake City, Utah 84116/801-533-9333

November 17, 1983

Reply To SOUTHEASTERN REGIONAL OFFICE
455 West Railroad Avenue, Box 840, Price, Utah 84501
(801) 637-3310

Melvin A. Coonrod
Co-op Mining Company
P. O. Box 1245
Huntington, UT 84523

Dear Mel:

In regard to the September 20, 1983 helicopter survey for raptors of the Co-op Mining Company's mine plan area in Trail Canyon and Bear Creek Canyon, the following is offered for your information.

The survey was conducted at approximately 8:30 a.m. Weather conditions were ideal for conducting such a survey. A Jet Ranger helicopter was utilized and participants in the survey were Larry Dalton, Resource Analyst for Utah Division of Wildlife Resources; Mel Coonrod—Environmental and Permit Coordinator for Co-op Mining Company, and Wendall Owens, also representing Co-op Mining Company. The survey was initiated in Trail Canyon and proceeded southeasterly along the escarpment toward Bear Creek Canyon. As you know, over the years this same area has been surveyed by helicopter. The first survey was in 1981 and was conducted by the U.S. Fish & Wildlife Service. A second survey was conducted in 1982 again by the U.S. Fish & Wildlife Service. Both surveys were conducted during the spring season when the birds were on nest. Figure 1 and Table 1 identify the nest locations, their annual use status, and condition. Over the years a total of 7 nests have been identified. All of the nests originally appeared to be those of Golden Eagles. However, re-evaluation in 1982 and again in 1983 show that it is quite likely that nest #7 is a Buteo, rather than a Golden Eagle nest. During the last 3 years the only nest to show evidence of activity was nest #7. It had greenery in it this fall, which is indicative that it was active during the 1983 breeding season. Since activity at the nest has only been observed during the fall season, it cannot be determined whether or not the egg produced young during the 1983 nesting period.

Mel, I want to express the Division's appreciation to Co-op Mining Company for extending the opportunity to use their helicopter to look over the nesting situation in the Trail and Bear Creek Canyons. Again, thank you for your cooperation and consideration of Utah's Wildlife Resource.

Sincerely,

John Livesay
GOVERNOR
Scott M. Matheson

DEPT. OF NATURAL RESOURCES
Gordon E. Hamston
Exec. Director

WILDLIFE BOARD
Roy L. Young - Chairman
Lewis C. Smith
Warren T. Harward
L. S. Skiff
Chris H. Johnson

Table 1. Annual use status and nest condition for Golden Eagle nests associated with the Co-op Mining Company's Trail Canyon and Bear Creek canyon coal mines.

<u>Nest Location</u>	<u>1981¹</u>	<u>1982¹</u>	<u>1983²</u>
1	Inactive ³	Inactive ³	Not found
2	Inactive ³	Inactive ³	Not found
3	Inactive ⁴	Not found	Not found
4	Inactive ⁴	Not found	Not found
5	Inactive ⁴	Not found	Not found
6	Inactive ⁴	Inactive ⁴	Not found
7	Inactive ⁴	Inactive ^{4,5}	Active ⁵

1. Helicopter survey during spring season - U.S. Fish and Wildlife Service personnel.
2. Helicopter survey during fall season - Utah Division of Wildlife Resources personnel and mine personnel.
3. Dilapidated condition.
4. Condition not noted.
5. Nest is small and may be a Buteo rather than Golden Eagle.
6. Nest was in good repair and showed evidence of greenery placed during 1983 nesting season. It is a small nest and may be a Buteo. Since this was a fall survey, it cannot be concluded if the nest produced young during 1983.

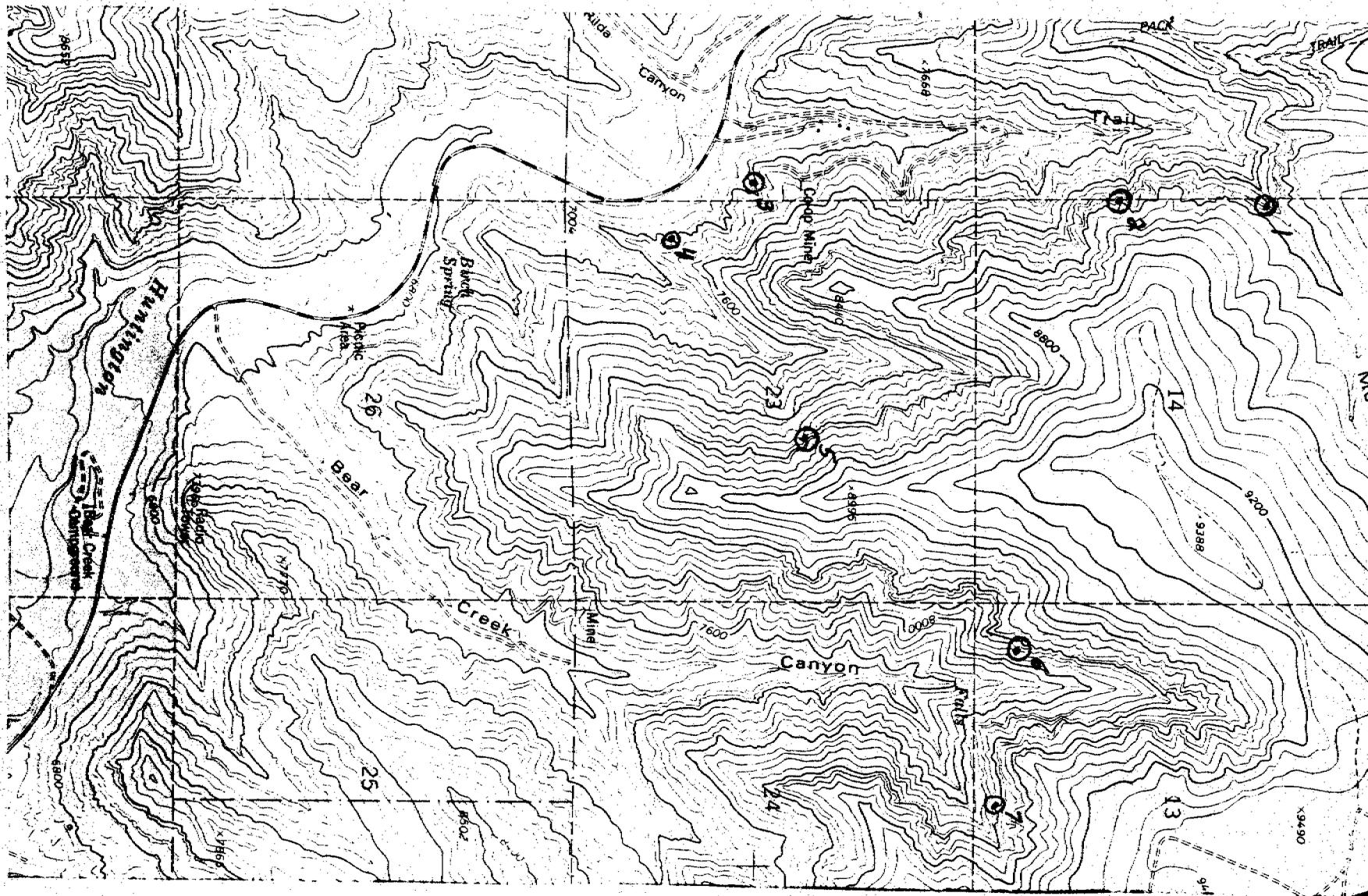
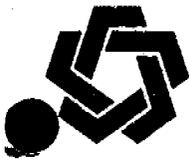


Figure 1. Raptor cliff nest locations associated with the Co-op Mining Company's Bear Creek Canyon coal mines in Township 16 South, Range 7 East, Emery County, Utah.



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dianne R. Nielson, Ph.D., Division Director

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

April 11, 1984

CERTIFIED RETURN RECEIPT REQUESTED
P396 996 958

Mr. Wendell Owen
Co-Op Mining Company
P. O. Box 1245
Huntington, Utah 84528

RE: Raptor-proofing of Power
Poles and Technical
Deficiencies under UMC 817.97
(March 1984 DOC/TD Document)
Co-Op Mining Company
Bear Canyon Mine
ACT/015/025, Folder No 2 & 13
Emery County, Utah

Dear Mr. Owen:

On July 27, 1983, the Division of Oil, Gas and Mining (Division) sent a letter to Co-Op Mining Company requiring all power poles associated with mining in Bear Canyon to be modified regarding raptor-proofing. Prior to this letter, a survey (June '83) was conducted by the U. S. Fish and Wildlife Service (USFWS) and the Division to determine whether or not power poles were raptor-safe and/or whether or not expected raptor use of the Bear Canyon area warranted pole modification. It is apparent that confusion has arisen with regards to the results of the June 1983 and the July 27, 1983 letter to Co-Op. This present communication will serve as clarification regarding Co-Op's needs for raptor proofing power poles at the Bear Canyon Mine.

The USFWS wrote a letter to the Division, July 6, 1983, summarizing the June '83 survey of Co-Op's power poles. This letter stated the following:

Mr. Wendell Owen
ACT/015/025
April 11, 1984
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Mr. Lynn Kunzler, Mr. Joe Helfrich, and Ms. MaryBoucek accompanied by Ron Joseph met with Co-Op Mine officials on June 14, 1983, to assess raptor powerline conflicts. Most of the powerlines examined are three-phase configurations energized with 12.8 Kv of electricity. The design is not an approved raptor safety configuration as specified in REA bulletin 61-10 or "Suggested Practices for Raptor Protection on Powerlines... The State of the Art 1981". However, the Fish and Wildlife Service (FWS) does not recommend that these lines be modified to conform with raptor protective designs because it is unlikely that eagles and hawks will perch on the crossarms. Members of both agencies examined the base and crossarm of several poles and could not observe evidence of raptor use. Two major factors contribute to the lack of raptor use on Co-op mine powerlines. The lines are located at the bottom of the canyon and are not the most elevated perch structures from which an eagle or hawk can scan the surrounding terrain. The canyon ridges are heavily wooded and offer a greater array of perch sites and hunting habitat than afforded by the powerlines.

However, on July 27, 1983, the Division wrote a letter requiring all poles be modified due to the fact that Co-Op had never responded to the Division's original requirements for pole modification or pole survey (through the Division) prior to April 30, 1982. On April 6, 1984, Division biologists and field inspectors met to discuss resolution of this problem, i.e. whether or not Co-Op should indeed be required to modify power poles in Bear Canyon. At this meeting it was decided that the Division will adopt USFWS recommendations that power poles not be modified and thus, negate the July 27, 1983 requirement for all poles to be modified. It should be emphasized, however, that all new power poles or existing poles which are replaced must be constructed according to REA Bulletin 61-10 or "Suggested Practices for Raptor Protection on Powerlines... The State of the Art (1981)." Co-Op must make the commitment in the Bear Canyon MRP, as previously noted on p.19 (UMC 817.97 (c)) of the March, 1984 DOC/Technical Deficiency document. It should also be noted that if raptor use of the Bear Canyon area increases in the future to the point where the regulatory authorities determine that a problem exists with the power poles, Co-Op will at that time be required to modify any existing poles deemed a hazard to raptors by the regulatory authority.

In regards to the DOC/Technical Deficiency document, March 1984, the Division is amending certain informational requirements as listed on page 19 of the document, under UMC 817.97(a), as follows:

1. 2nd paragraph - There is no need to supply the June 1982 USFWS raptor survey in the MRP. Information from UDWR contained in chapter 10 of the MRP summarizes both 1981 and 1982 USFWS data as well as 1983 DWR data and is sufficient for permitting purposes.

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2. 3rd paragraph - There is no need to provide a new map delineating raptor survey results. The map currently appearing in Appendix 10 is adequate for permitting purposes. Therefore, this paragraph is expunged.

Should you have any questions, please do not hesitate to contact Steve Cox or Mary Boucek of the Division.

Sincerely,

Mary M. Boucek
Mary M. Boucek
Reclamation Biologist/
Permit Supervisor

MMB/jvb
83900

cc: Joe Helfrich, DOGM
Ken Wyatt, DOGM
Steve Cox, DOGM
Lynn Kunzler, DOGM
Ev Hooper, DOGM

APPENDIX 10-D

WILDLIFE MITIGATION

Co-Op Mining Company, in order to mitigate the loss of approximately 10 acres of Mule deer winter range in association with the construction of the Bear Canyon Mine, has agreed to the following course of action with the Utah Division of Wildlife Resources:

1. The reclamation of a major portion of the abandoned Bear Canyon county road approximately 2 acres (completed Fall 1984).

2. Contemporaneous reclamation of portions of Bear Canyon permit area - topsoil stockpiles, down slopes, power line corridor, etc. Approximately 3.2 acres (started Fall 1983, completion Fall 1985).

3. Enhancement of Bear Creek off permit. This work is to be accomplished in 1985 and will constitute the enhancement of approximately 7 acres of stream channel. The work will involve the installation of velocity dissipaters, planting of willows, and compatible wildlife browse species in the stream channel.

In addition, Co-Op has agreed that in the event that escarpment failure due to subsidence impacts any raptor nests within the permit area, that Co-Op will notify the U.D.W.R. and the U.S. Fish and Wildlife Service and take whatever action is recommended in order to mitigate such loss. At this time no raptor nests are at risk due to their absence from all areas of potential impact.

APPENDIX A

SPECIES LIST OF VERTEBRATE WILDLIFE
THAT INHABIT SOUTHEASTERN UTAH

Compiled by

Larry B. Dalton
C. Brent Farnsworth
Randall B. Smith
R. Craig Wallace
Roger B. Wilson
Samuel C. Winegardner

PUBLICATION NO. 78-16

UTAH STATE DIVISION OF WILDLIFE RESOURCES

Douglas F. Day, Director

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 Table 2. Classification of the 466 Species of Vertebrate Wildlife.	 67

Holden (1973), Bailey et al. (1970), Eddy (1969) and Sigler and Miller (1963) were consulted for preparation of the list of fishes.

The status of reptiles and amphibians was determined through discussion with local herpetologists. The phylogenetic listing is after Stebbins (1966). Tanner (1975) was consulted for species inhabiting Utah.

The following code letters are given for each species to describe its status.

- K Status unknown - It is believed that these species are present, but little is known of their population dynamics.
- C Common - These species are widespread and abundant.
- U Uncommon - These species are widespread, but not abundant.
- R Rare - These species are seldom identified during any one year.
- O Occasional - These species are periodically identified during a long term period--10-50 years.
- A Accidental - Distribution for these species does not normally include this area. Sightings are as far between as 50 to 100 years.
- E Endangered - These species are endangered with extinction or extirpation from wildland in Utah.
- T Threatened - These species are threatened with becoming endangered in Utah.
- L Limited - These species are common but restricted to a particular use area or habitat type in Utah.
- X Extirpated - These species have disappeared from wildland habitats in Utah.
- P Protected - These species are protected by state or federal laws in Utah.
- N Nonprotected - These species are not protected by any laws in Utah.

The following terminology is used to describe the seasonal status for avian species.

Transient - These species pass through southeastern Utah twice a year during their migratory travels.

Resident - These species occur yearlong in southeastern Utah.

Summer Resident - These species breed in southeastern Utah and migrate elsewhere for the winter.

Winter Resident - These species breed elsewhere but winter in southeastern Utah.

Note, the species marked with an asteric (*) are of high interest to the State and those marked with an exclamation mark(!) have potential to inhabit the environs of the project area. (High interest species are those defined as being of economic importance from either a consumptive or non-consumptive perspective, or having special aesthetic; scientific; educational or ecological significance.)

SPECIES LIST OF VERTEBRATE WILDLIFE
THAT INHABIT SOUTHEASTERN UTAH

Utah is believed to be inhabited by 734 species of vertebrate wildlife. Four hundred forty-five of these species are protected: 2 amphibians, 2 reptiles, 26 mammals, 58 fish and 357 birds. One hundred of the protected species are game species: 10 species of big game; 20, fish; 10, furbearers; 43, migratory game birds; 5, small game mammals; and 12, upland, small game birds. Table 1 provides a comparison of inhabitation by game species between Utah Division of Wildlife Resource's five regions.

Southeastern Utah is inhabited by 466 species of vertebrate wildlife in six biogeographic areas (Table 2). Three hundred forty-three of these species are protected: 2 amphibians, 26 mammals, 38 fish and 277 birds. Seventy-nine of the protected species that inhabit southeastern Utah are game species: 9 species of big game; 13, game fish; 9, furbearers, 35, migratory game birds; 4, small game mammals; and 9, upland, small game birds.

Southeastern Utah has been divided into six biogeographic areas. Each area allows an overlap of wildlife species that inhabit contiguous low and high elevation areas. This procedure was utilized to reduce any controversy that would normally arise from a "sharp line" drawn on a map.

- A- Wasatch Plateau extending east from Skyline Drive to Highway 10 and bounded on the north by Highway 6 and on the south by Interstate 70.
- B- West Tavaputs Plateau including all drainages into the Price River drainage from Soldier's Summit east along Reservation Ridge and including the drainages into Argyle, Nine Mile and Minnie Maud creeks; bounded on the east by the Green River and south and west by Highway 6.
- C- East Tavaputs Plateau bounded on the east by the Colorado-Utah state line; on the south by Interstate 70; on the west by the Green River and on the north by Uintah-Ouray Indian Reservation and the Uintah-Grand county line.
- D- San Rafael Swell and San Rafael Desert bounded by Highway 6 on the north; Highway 10 on the west; the Green River on the east and the Emery-Wayne county line on the south.
- E- Henry Mountains and Burr Desert bounded on the north by Emery-Wayne county line; the Green and Colorado rivers on the east; Lake Powell on the south and Capitol Reef National Park and the Waterpocket Fold on the west.
- F- Mountains and deserts of Grand and San Juan counties south of Interstate Highway 70 and north of the San Juan River bounded on the east by the Utah-Colorado border and on the west by the Green and Colorado rivers and Lake Powell.

Each species is listed by common name followed by the generic and specific nomenclature. The status for each species was determined by the authors after evaluation and consultation from several sources. The listing for mammals was developed from Sparks (1974), Burt and Grossenheider (1976) and Durrant (1952). The primary sources consulted in compiling the bird list were Behle and Perry (1975) and Hayward et al. (1976) although, Peterson (1969), Robbins et al. (1966) and Udvardy and Rayfield (1977) were also used.

	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
* Leatherside Chub (<u>Gila copel</u>)	A, E	C-P	Stable	Pool and riffle areas
* Humpback Chub (<u>Gila cypha</u>)	B	E-P	Decreasing	Eddies and backwaters
* Bonytail Chub (<u>Gila elegans</u>)	B, C, F	E-P	Decreasing	Main channels of large rivers
Roundtail Chub (<u>Gila robusta</u>)	B, C, D, E, F	C-P	Stable	Riffles and stagnant backwater
Red Shiner (<u>Notropis lutrensis</u>)	B, C, D, E, F	C-P	Increasing	Riffles, pools, backwaters, and eddies
San Shiner (<u>Notropis stramineus</u>)	F	C-P	Increasing	Riffles, pools, backwaters, and eddies
Fathead Minnow (<u>Pimephales promelas</u>)	B, C, D, E, F	C-P	Stable	Pools and backwaters
* Colorado Squawfish (<u>Ptychocheilus lucius</u>)	B, C, D, E, F	E-P	Decreasing	Slow waters, eddies, backwater and large pools
* Longnose Dace (<u>Rhinichtys cataractae</u>)	A	K-P	Unknown	Pools and riffles
Speckled Dace (<u>Rhinichtys oculus</u>)	A, B, C, D, E, F	C-P	Stable	Pools and riffles
Redside Shiner (<u>Richardsonius balteatus</u>)	A, B, D	C-P	Stable	Lakes, creeks and rivers
Family Catostomidae				
White Sucker (<u>Catostomus commersoni</u>)	E, F	U-P	Unknown	Unknown
Bluehead Sucker (<u>Catostomus discobolus</u>)	A, B, C, D, E, F	C-P	Unknown	Pools, riffles and lakes

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Fishes -- 38 species in southeastern Utah				
Family Clupeidae				
Threadfin Shad (<u>Dorosoma petenense</u>)	E,F	L-P	Stable	Lake-pelagic areas
Family Salmonidae				
! * Cutthroat Trout (<u>Salmo clarki</u>)	A,B,D,F	C-P	Stable	Lakes-rocky shores, deep pelagic water; river-pools, riffles, and overhanging banks
! * Rainbow Trout (<u>Salmo gairdneri</u>)	A,B,E,F,	C-P	Stable	Lake-littoral and pelagic areas; rivers-pools, riffles, overhanging banks
! * Brown Trout (<u>Salmo trutta</u>)	A,B,E,F	C-P	Stable	Lake-pelagic and littoral areas; rivers-pools, riffles, and overhanging banks
* Brook Trout (<u>Salvelinus fontinalis</u>)	A,F	L-P	Stable	Lake-pelagic and littoral areas
Family Esocidae				
* Northern Pike (<u>Esox lucius</u>)	E,F	L-P	Unknown	Lake-littoral areas with submerged trees and brush
Family Cyprinidae				
Longfin Dace (<u>Agosia chrysogaster</u>)	E,F	K-P	Unknown	Unknown
Carp (<u>Cyprinus carpio</u>)	A,B,C,D,E,F	C-P	Stable	Lakes-littoral areas; quiet water areas in rivers, ponds, sloughs, creeks, and irrigation ditches
Utah Chub (<u>Gila atraria</u>)	A,B	L-P	Abundant	Irrigation ditches, ponds, sloughs, creeks, rivers, and lakes

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Flannelmouth Sucker <u>(Catostomus latipinnis)</u>	B,C,D,E,F	C-P	Stable	Pools and riffles
! Mountain Sucker <u>(Catostomus platyrhynchus)</u>	A	L-P	Stable	Pools and riffles
* Humpback Sucker <u>(Xyrauchen texanus)</u>	B,C,D,E,F	R-P	Decreasing	Large rivers with strong currents
Family Ictaluridae				
* Black Bullhead <u>(Ictalurus melas)</u>	B,C,D,E,F	C-P	Stable	Pools, quiet water and lakes
* Yellow Bullhead <u>(Ictalurus natalis)</u>	E,F	R-P	Stable	Quiet water areas and lakes
* Channel Catfish <u>(Ictalurus punctatus)</u>	B,C,D,E,F	C-P	Stable	Pools, riffles, quiet water areas and lakes
Family Cyprinodontidae				
Plains Killifish <u>(Fundulus kansae)</u>	F	R-P	Stable	Quiet water areas
Family Poeciliidae				
Mosquito fish <u>(Gambusia affinis)</u>	F	R-P	Stable	Quiet water areas
Family Cottidae				
!* Mottled Sculpin <u>(Cottus bairdi)</u>	A	C-P	Stable	Rocky riffles and pool areas
Family Percichthyidae				
* Striped Bass <u>(Morone saxatilis)</u>	E,F	C-P	Increasing	Lake-pelagic areas
Family Centrarchidae				
Green Sunfish <u>(Lepomis cyanellus)</u>	B,C,D,E,F	C-P	Stable	Quiet backwaters and lakes
* Bluegill <u>(Lepomis macrochirus)</u>	E,F	C-P	Stable	Lakes-littoral areas with rocky shores and submerged brush

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
* Largemouth Bass (<u>Micropterus salmoides</u>)	A,B,C,D,E,F	C-P	Stable	Rivers-quiet water areas; lakes-littoral rocky areas, with submerged brush
* Black Crappie (<u>Pomoxis nigromaculatus</u>)	E,F	C-P	Stable	Lake-littoral zone around submerged brush and trees, and pelagic areas
Family Percidae				
* Perch (<u>Perca flavescens</u>)	F	U-P	Unknown	Unknown
* Walleye (<u>Stizostedion vitreum</u>)	E,F	C-P	Stable	Lake-deep water around rocky bottoms
Amphibians -- 11 species in southeastern Utah				
Family Ambystomatidae				
[* Tiger Salamander (<u>Ambystoma tigrinum</u>)	A,B,C,D,E,F	K-P	Unknown	Quiet water of ponds, reservoirs, lakes, temporary rain pools and streams from arid sagebrush plains to rolling grasslands, mountain meadows and forests
Family Pelobatidae				
! Great Basin Spadefoot Toad (<u>Scaphiopus intermontanus</u>)	A,B,C,D,E,F	C-P	Unknown	Sagebrush flats, pinion-juniper woodlands to high elevations in spruce-fir communities

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Western Spadefoot Toad <u>(Scaphiopus hammondi)</u>	F	K-P	Unknown	Washes, alkali flats, foothills, mountain valleys, in open vegetation and shortgrass, where soil is sandy and/or gravelly
Family Bufonidae				
! Western Toad <u>(Bufo boreas)</u>	A	K-P	Unknown	Desert streams, springs, grasslands, woodlands, and mountain meadows
Red Spotted Toad <u>(Bufo punctatus)</u>	D,E,F,	C-P	Unknown	Open grassland and rocky canyons
! Woodhouse's Toad <u>(Bufo woodhousei)</u>	A,B,C,D,E,F	C-P	Unknown	Grassland, sagebrush flats, woods, desert streams, valleys, flood plains, farms, and city backyards
Great Plains Toad <u>(Bufo cognatus)</u>	C,D,E,F,	C-P	Unknown	Prairies, deserts, quiet water of streams, grasslands and sagebrush plains
Family Hylidae				
! Chorus Frog <u>(Pseudacris triseriata)</u>	A,B,C,D,F	C-P	Unknown	Grassy pools, lakes, and marshes of prairies or mountains

cc/ls

	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Eastern Fence Lizard (<u>Sceloporus undulatus</u>)	A,B,C,D,E,F	C-P	Unknown	Forest, woodlands, prairie, brushy flatlands, sand dunes, rocky hillsides and farmlands
Desert Spiny Lizard (<u>Sceloporus magister</u>)	D,E,F	C-P	Unknown	Shadscale deserts, pinion-juniper woodland, willows and cottonwoods.
! Sagebrush Lizard (<u>Sceloporus graciosus</u>)	A,B,C,D,E,F	C-P	Unknown	Variety of habitat types; sagebrush, pinion-juniper, low desert shrub and rocklands
! Tree Lizard (<u>Urosaurus ornatus</u>)	A,B,C,D,E,F	C-P	Unknown	Trees and rocks
! Side-blotched Lizard (<u>Uta stansburiana</u>)	A,B,C,D,E,F	C-P	Unknown	Inhabits a variety of habitat types; sandy washes with scattered rocks and low growing shrubs
Desert Horned Lizard (<u>Phrynosoma platyrhinos</u>)	E	K-P	Unknown	Along washes at the edge of dunes in saltbrush and sagebrush areas
! Short-horned Lizard (<u>Phrynosoma douglassi</u>)	A,B,C,D,E,F	C-P	Unknown	Desert grassland, sagebrush, pinion-juniper, pine-spruce and spruce-fir associations, extending from desert shrub to mountain habitats

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Family Xantusiidae * Utah Night Lizard (<u>Xantusia vigilis</u>)	E, F	L-P	Unknown	Dead clumps of yucca plants and woodrat middens
Family Teiidae Plateau Whiptail (<u>Cnemidophorus velox</u>)	F	K-P	Unknown	Mountains in piñon-juniper woodland and lower edges of ponderosa pine forests
Western Whiptail (<u>Cnemidophorus tigris</u>)	A, B, C, D, E, F	C-P	Unknown	Desert shrub communities where plants are sparse and there are open areas for running
Family Scincidae Many-lined Skink (<u>Eumeces multivirgatus</u>)	E, F	K-P	Unknown	Shortgrass prairie that extends into the mountains; often vacant lots, city dumps and backyards
Western Skink (<u>Eumeces skiltonianus</u>)	C	K-P	Unknown	Grasslands, woodlands and forests in rocky habitat near streams with abundant cover
Family Boidae Rubber Boa (<u>Charina bottae</u>)	A	C-P	Unknown	Grasslands, woodlands, and forests with rotting logs; often found under rocks and under the bark of fallen or standing dead trees

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Family Colubridae				
Smooth Green Snake <u>(Ophiodrys vernalis)</u>	F	K-P	Unknown	Damp grassy environment
! Striped Whipsnake <u>(Masticophis taeniatus)</u>	A,B,C,D,E,F	C-P	Unknown	Brushlands, grasslands, sagebrush flats, pinion-juniper woodlands and open pine forests
Coachwhip <u>(Masticophis flagellum)</u>	E,F	K-P	Unknown	Utilizes a variety of habitats but avoids dense vegetation; rodent burrows, rocks and branches are used
! Racer <u>(Coluber constrictor)</u>	A,B,C,D,E,F	C-P	Unknown	Meadows, sparse brush and forest openings with semi-arid and moist areas; grassy places near rocks and logs are preferred
Corn Snake <u>(Elaphe guttata)</u>	F	K-P	Unknown	Stream and river bottoms, rocky wooded hillsides, coniferous forests, and farmland with rodent burrows, rocks and logs
! Ringneck Snake <u>(Diadophis punctatus)</u>	A	K-P	Unknown	Moist habitats usually in the mountains or along stream and river bottoms

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Gopher Snake <u>(Pituophis melanoleucus)</u>	A,B,C,D,E,F	C-P	Unknown	Lowlands to high mountains including desert, coniferous forest and farmland types; grassland and open brushland are prescribed
! *Milk Snake <u>(Lampropeltis triangulum)</u>	A,B,C,F	L-P	Unknown	Variety of habitats from lowlands to mountains; rotten logs and stumps are preferred
Common Kingsnake <u>(Lampropeltis getulus)</u>	E,F	K-P	Unknown	Variety of habitats from lowlands to mountains with rock outcrops and clumps of vegetation under rotting logs or rocks
! *Sonora Mountain Kingsnake <u>(Lampropeltis pyromelana)</u>	A	L-P	Unknown	Mountains, pinion-juniper woodlands, mountain brush, coniferous forests with rocks, logs and dense clumps of vegetation
Long-nosed Snake <u>(Rhinocellus lecontei)</u>	F	K-P	Unknown	Prairies, brushland and irrigated parts of deserts
! Western Terrestrial Garter Snake <u>(Thamnophis elegans)</u>	A,B,C,D,E,F	C-P	Unknown	Variety of terrestrial and aquatic habitats from lowlands to mountains
! Common Garter Snake <u>(Thamnophis sirtalis)</u>	A,F	K-P	Unknown	Variety of habitats, usually near water

Black-necked Garter Snake <u>(Thamnophis cyrtopsis)</u>	F	K-P	Unknown	Desert and grasslands
Western Black-headed Snake <u>(Tantilla planiceps)</u>	E,F	K-P	Unknown	Grasslands, woodlands and deserts; often found under rocks and logs
! Night Snake <u>(Hypsiglena torquata)</u>	A,B,C,D,E,F	C-P	Unknown	Plains, sagebrush flats, desert and woodlands; often found under rocks and surface litter
Family Crotalidae				
Hopi Rattlesnake <u>(Crotalus viridis nuntius)</u>	E	U-P	Unknown	Prefers rock piles and rodent burrows on grasslands, brushlands, woodlands and forests; avoids sparsely vegetated deserts
Prairie Rattlesnake <u>(Crotalus viridis viridis)</u>	F	U-P	Unknown	Prefers rock piles and rodent burrows on grasslands, woodlands and forests; avoids sparsely vegetated deserts
! Midget Faded Rattlesnake <u>(Crotalus viridis concolor)</u>	A,B,C,D,E,F	C-P	Unknown	Prefers rock piles and rodent burrows on grasslands, brushlands, woodlands and forests; avoids sparsely vegetated deserts

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Species -- 278 species in southeastern Utah				
Order Gavliiformes				
Family Gavliidae				
Common Loon (<u>Gavia immer</u>)	A, B, C, D, E, F	U-P transient and winter resident	Stable	Lakes of coniferous forests, open lakes, reservoirs and bays
Order Podicipediformes				
Family Podicipedidae				
Horned Grebe (<u>Podiceps auritus</u>)	A, B, C, D, E, F	R-P transient and summer resident	Stable	Lakes, ponds and reservoirs
Eared Grebe (<u>Podiceps nigricollis</u>)	A, B, C, D, E, F	C-P summer resident	Stable	Lakes, bays and reservoirs
* Western Grebe (<u>Acchmophorus occidentalis</u>)	A, B, C, D, E, F	K-P summer resident	Unknown	Sloughs, bays and reservoirs and lakes with emergent vegetation for nesting
Pied-billed Grebe (<u>Podilymbus podiceps</u>)	A, B, C, D, E, F	C-P summer resident	Stable	Ponds, lakes, streams and marshes
Order Pelecaniformes				
Family Pelecanidae				
* White Pelican (<u>Pelecanus erythrorhynchos</u>)	A, B, C, D, E, F	L-P transient and summer resident	Stable	Larger shallow bodies of water and large rivers
Family Phalacrocoracidae				
* Double-crested Cormorant (<u>Phalacrocorax auritus</u>)	A, B, C, D, E, F	K-P summer resident	Unknown	Bays, lakes and rivers

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Order Ciconiiformes				
Family Ardeidae				
*Great Blue Heron (<u>Ardca herodias</u>)	A,B,C,D,E,F	K-P resident	Unknown	Marshes, shallow reservoirs, rivers, streams, shores and irrigation ditches
Green Heron (<u>Butorides striatus</u>)	B,E,F	R-P transient	Unknown	Marshes, wooded streams, rivers, small ponds and lake margins
Cattle Egret (<u>Bubulcus ibis</u>)	E,F	O-P transient	Unknown	Marshes, lake margins, and irrigated lands
Snowy Egret (<u>Egretta thula</u>)	A,B,C,D,E,F	C-P summer resident	Stable	Marshes, ponds, lake margins and irrigated land
Black-crowned Night Heron (<u>Nycticorax nycticorax</u>)	A,B,C,D,E,F	C-P summer resident	Stable	Marshes, lake margins and shores
Least Bittern (<u>Ixobrychus exilis</u>)	D,E,F	U-P transient	Unknown	Densely vegetated marshes
American Bittern (<u>Botaurus lentiginosus</u>)	A,B,C,D,E,F	U-P summer resident	Stable	Densely vegetated marsh
Family Ciconiidae				
Wood Stork (<u>Mycteria americana</u>)	D,E,F	O-P transient	Unknown	Marshes, ponds and lake margins
Family Threskiornithidae				
*White-faced Ibis (<u>Plegadis chihi</u>)	A,B,C,D,E,F	K-P summer resident	Unknown	Marshes and irrigated land

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Order Anseriformes				
Family Anatidae				
* Whistling Swan (<u>Olor columbianus</u>)	A,B,C,D,E,F	O-P winter resident C-P transient	Stable	Lakes, large rivers and fields
* Trumpeter Swan (<u>Olor buccinator</u>)	B,C,D,E,F	R-P transient	Unknown	Lakes and large rivers
* Canada Goose (<u>Branta canadensis</u>)	A,B,C,D,E,F	C-P resident and transient	Increasing	Lakes, bays, marshes, rivers and grainfields
* White-fronted Goose (<u>Anser albifrons</u>)	A,B,C,D,E,F	R-P transient	Stable	Marshes, fields, lakes and bays
* Snow Goose (<u>Chen caerulescens</u>)	A,B,C,D,E,F	U-P transient	Stable	Marshes, grainfields, reservoir, ponds and bays
* Ross' Goose (<u>Chen rossii</u>)	A,B,C,D,E,F	O-P transient	Stable	Marshes, grainfields, prairies, ponds and bays
* Mallard (<u>Anas platyrhynchos</u>)	A,B,C,D,E,F	C-P resident and transient	Stable	Marshes, irrigated land, grainfields, ponds, river lakes, bays and reservoir extending from lowlands mountains
* Gadwall (<u>Anas strepera</u>)	A,B,C,D,E,F	C-P resident and transient	Stable	Lakes, ponds, rivers and marshes
* Pintail (<u>Anas acuta</u>)	A,B,C,D,E,F	C-P resident and transient	Stable	Marshes, grainfields, ponds, lakes and reservoirs

<u>Species</u>	<u>Biogeographic Area Inhabited</u>	<u>Status</u>	<u>Population Trend</u>	<u>Habitat Use Area</u>
*Green-winged Teal (<u>Anas crecca</u>)	A,B,C,D,E,F	C-P resident and transient	Stable	Marshes, lakes, ponds, rivers and bays
*Blue-winged Teal (<u>Anas discors</u>)	A,B,C,D,E,F	U-P resident and transient	Stable	Ponds and marshes
*Cinnamon Teal (<u>Anas cyanoptera</u>)	A,B,C,D,E,F	C-P resident and transient	Stable	Stock ponds, rivers, marshes and lakes
*American Widgeon (<u>Anas americana</u>)	A,B,C,D,E,F	C-P resident and transient	Stable	Marshes, irrigated land, ponds, lakes and bays
17 * Northern Shoveler (<u>Anas clypeata</u>)	A,B,C,D,E,F	C-P resident and transient	Stable	Marshes, ponds and sloughs
*Wood Duck (<u>Aix sponsa</u>)	A,B,C,D,E,F	R-P transient	Stable	Wooded rivers and ponds
*Redhead (<u>Aythya americana</u>)	A,B,C,D,E,F	C-P resident and transient	Stable	Marshes with some deep water, lakes and reservoirs
*Ring-necked Duck (<u>Aythya collaris</u>)	A,B,C,D,E,F	U-P transient	Stable	Coniferous lakes, wooded ponds, marshes and reservoirs
*Canvasback (<u>Aythya valisineria</u>)	A,B,C,D,E,F	C-P transient R-P summer resident	Stable	Marshes, lakes and reservoirs

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
* Greater Scaup (<u>Aythya marila</u>)	A,B,C,D,E,F	U-P transient	Stable	Lakes, rivers and ponds
* Lesser Scaup (<u>Aythya affinis</u>)	A,B,C,D,E,F	C-P transient	Stable	Marshes, ponds and lakes
* Common Goldeneye (<u>Bucephala clangula</u>)	A,B,C,D,E,F	U-P transient	Stable	Lakes and rivers
* Bufflehead (<u>Bucephala albeola</u>)	A,B,C,D,E,F	U-P transient	Stable	Lakes, ponds and rivers
* White-winged Scoter (<u>Melanitta deglandi</u>)	D	O-P transient	Stable	Large lakes and reservoirs. Recorded occurrence at Desert Lake WMA
* Ruddy Duck (<u>Oxyura jamaicensis</u>)	A,B,C,D,E,F	C-P resident and transient	Stable	Marshes, ponds, rivers and reservoirs
* Hooded Merganser (<u>Mergus cucullatus</u>)	A,B,C,D,E,F	R-P transient	Stable	Wooded lakes, ponds, rivers and reservoirs
* Common Merganser (<u>Mergus merganser</u>)	A,B,C,D,E,F	C-P transient U-P winter resident	Stable	Wooded lakes and rivers in summer; in winter, open rivers, lakes and ponds
* Red-breasted Merganser (<u>Mergus serrator</u>)	A,B,C,D,E,F	C-P transient	Stable	Lakes, reservoirs and rivers

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Order Falconiformes				
Family Cathartidae				
! *Turkey Vulture (<u>Cathartes aura</u>)	A, B, C, D, E, F	C-P summer resident	Stable	Usually seen in sky or perched on dead trees, posts, carrion or on ground
! California Condor (<u>Gymnogyps californianus</u>)	A, B, C, D, E, F	X-P	Extirpated	Usually seen in sky or perched on dead trees, posts, carrion or on ground
Family Accipitridae				
! *Goshawk (<u>Accipiter gentilis</u>)	A, B, C, D, E, F	U-P resident	Stable	Mountain woodlands
[*Sharp-shinned Hawk (<u>Accipiter striatus</u>)	A, B, C, D, E, F	U-P resident and transient	Stable	Forests, thickets, scruboak, desert riparian, mountain woodlands and aspen
! *Cooper's Hawk (<u>Accipiter cooperii</u>)	A, B, C, D, E, F	C-P summer resident and transient R-P winter resident	Stable	Broken woodlands, dry wooded canyons, riparian areas, pinion-juniper and conifers
! *Red-tailed Hawk (<u>Buteo jamaicensis</u>)	A, B, C, D, E, F	C-P resident	Stable	Open country, woodlands, mountains and deserts
*Red-shouldered Hawk (<u>Buteo lineatus</u>)	C, F	A-P transient	Unknown	Broken woodlands, primarily along lowland rivers and often close to cultivated fields
! *Swainson's Hawk (<u>Buteo swainsoni</u>)	A, B, C, D, E, F	U-P summer resident	Stable	Dry plains and rangeland with hills; open forest or alpine meadows with sparse trees

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
* Rough-legged Hawk (<u>Buteo lagopus</u>)	A,B,C,D,E,F	C-P winter resident	Stable	Open country, woodlands, deserts and marshes
* Ferruginous Hawk (<u>Buteo regalis</u>)	A,B,C,D,E,F	U-P summer resident R-P winter resident	Stable	Open desert; infrequently marshes and farmlands are utilized
!* Golden Eagle (<u>Aquila chrysaetos</u>)	A,B,C,D,E,F	C-P resident	Stable	Open mountains, foothills, canyons and deserts
!* Bald Eagle (<u>Haliaeetus leucocephalus</u>)	A,B,C,D,E,F	E-P winter resident	Increasing	Lakes, rivers and marshes surrounded by open country with available perching sites
* Marsh Hawk (<u>Circus cyaneus</u>)	A,B,C,D,E,F	C-P resident	Stable	Marshes, fields and prairies
Family Pandionidae * Osprey (<u>Pandion haliaetus</u>)	A,B,C,D,E,F	U-P transient	Stable	Rivers, lakes and large bodies of water
Family Falconidae !* Prairie Falcon (<u>Falco mexicanus</u>)	A,B,C,D,E,F	C-P resident	Stable	Canyons, open habitat in mountains, plains and deserts
!* Peregrine Falcon (<u>Falco peregrinus</u>)	A,B,C,D,E,F	E-P resident	Unknown	Canyons, high cliffs, rivers, marshlands and deserts
* Merlin (<u>Falco columbarius</u>)	A,B,C,D,E,F	K-P winter resident	Unknown	Open country and foothills; often associated with flocking passerines

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
* American Kestrel (<u>Falco sparverius</u>)	A,B,C,D,E,F	C-P summer resident U-P winter resident	Stable	Open country, prairies, deserts, wooded streams, farmland and cities
Order Galliformes				
Family Tetraonidae				
! * Blue Grouse (<u>Dendragapus obscurus</u>)	A,B,C,D,E,F	C-P resident	Stable	Coniferous forests, aspen, mountain brush, open slash and burns
! * Ruffed Grouse (<u>Bonasa umbellus</u>)	A,B	C-P resident	Stable	Aspen and coniferous forests near stream courses
! * Sage Grouse (<u>Centrocercus urophasianus</u>)	A,B,C,F	C-P resident	Stable	Sagebrush plains associated with pasture lands; sagebrush parks associated with wet meadows
Family Phasianidae				
* California Quail (<u>Lophortyx californicus</u>)	A,B,D,E,F	C-P resident	Stable	Mountain brush, woodland edges and farmlands near river bottoms
* Gambels Quail (<u>Lophortyx gambelii</u>)	D,E,F	C-P resident	Stable	Desert thickets, usually near water
* Chukar (<u>Alectoris chukar</u>)	A,B,C,D,E,F	C-P resident	Stable	Rocky, grassy or brushy slopes in arid mountains and canyons
* Ring-necked Pheasant (<u>Phasianus colchicus</u>)	A,B,C,D,E,F	C-P resident	Decreasing	Irrigated cropland, pastureland, wetlands and desert washes

* White-winged Pheasant
(Phasianus colchicus)

E,F

L-P
resident

Decreasing

Irrigated cropland,
pastureland and wetland;
near Hanksville and
Bluff, Utah

Family Meleagrididae

* Merriam's Turkey
(Melcagris gallapavo)

F

L-P
resident

Stable

Mountainous regions with
Ponderosa pine, mixed
conifer and aspen wood-
lands or mountain brush

Order Gruiformes

Family Gruidae

* Sandhill Crane (Grus canadensis)

A,B,C,D,E,F

L-P
transient

Stable

In winter, prairies
grainfields and marshes
in summer, mountain
meadows and marshes

Family Rallidae

* Virginia Rail (Rallus limicola)

A,B,C,D,E,F

C-P
resident

Stable

Marshes

* Sora Rail (Porzana carolina)

A,B,C,D,E,F

U-P
resident

Stable

Marshes and wet meadows

* Common Gallinule
(Gallinula chloropus)

A,D

R-P
transient

Unknown

Marshes, wet meadows,
lakes with bulrush or
cattails and sedges

* American Coot (Fulica americana)

A,B,C,D,E,F

C-P
resident and
transient

Stable

Ponds, lakes, marshes,
and agricultural lands
adjacent to wetland
habitats.

Order Charadriiformes

Family Charadriidae

Semipalmated Plover

(Charadrius semipalmatus)

A,B,C,D,E,F

U-P
transient

Stable

Shores of marshes,
reservoirs and mudflats

	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Solitary Sandpiper <u>(Tringa solitaria)</u>	A, B, C, D, E, F	U-P transient	Stable	Stream sides, ponds and marshes
Greater Yellowlegs <u>(Tringa melanoleuca)</u>	A, B, C, D, E, F	U-P transient	Stable	Open marshes, mudflats, streams and ponds
Lesser Yellowlegs <u>(Tringa flavipes)</u>	A, B, C, D, E, F	C-P transient	Stable	Marshes, mudflats, shores and pond edges
Pectoral Sandpiper <u>(Calidris melanotos)</u>	A, B, C, D, E, F	U-P transient	Stable	Prairie pools and marshy shores
Baird's Sandpiper <u>(Calidris bairdii)</u>	A, B, C, D, E, F	U-P transient	Stable	Rainpools, pond margins mudflats and shores
Least Sandpiper <u>(Calidris minutilla)</u>	A, B, C, D, E, F	C-P transient	Stable	Grassy marshes, rain- pools, shores and alkal mudflats
Western Sandpiper <u>(Calidris mauri)</u>	A, B, C, D, E, F	C-P transient	Stable	Shores, beaches, mud- flats and open marshes
Sanderling <u>(Calidris alba)</u>	A, B, C, D, E, F	U-P transient	Stable	Lake shores
Short-billed Dowitcher <u>(Limnodromus griseus)</u>	A, B, C, D, E, F	U-P summer resident and transient	Stable	Mudflats, open marshes and ponds
Long-billed Dowitcher <u>(Limnodromus scolopaceus)</u>	A, B, C, D, E, F	C-P summer resident and transient	Stable	Mudflats, shallow pools and wetlands

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
* Snowy Plover (<u>Charadrius alexandrinus</u>)	A,B,C,D,E,F	K-P transient	Unknown	Alkali and sand flats
Killdeer (<u>Charadrius vociferus</u>)	A,B,C,D,E,F	C-P summer resident and transient	Stable	Fields and pastures, lawns, riverbanks, irrigated land, shores, plowed fields, alkali flats and gravel roads
! Mountain Plover (<u>Charadrius montanus</u>)	A,B,C,F	R-P transient	Stable	Semi-arid grasslands, plains and plateaus
American Golden Plover (<u>Pluvialis dominica</u>)	A,B,C,D,E,F	U-P transient	Stable	Prairies, mudflats and shores
Black-bellied Plover (<u>Pluvialis squatarola</u>)	A,B,C,D,E,F	C-P transient	Stable	Mudflats, open marshes and shores
Family Scolopacidae				
* Common Snipe (<u>Capella gallinago</u>)	A,B,C,D,E,F	C-P resident	Stable	Marshes, irrigation ditches, stream sides, and wet meadows
* Long-billed Curlew (<u>Numenius americanus</u>)	A,B,C,D,E,F	K-P summer resident and transient	Unknown	Meadows, pastures and wetlands
* Willet (<u>Catoptrophorus semipalmatus</u>)	A,B,C,D,E,F	K-P summer resident and transient	Unknown	Marshes, wet meadows and muddy shores
! Spotted Sandpiper (<u>Tringa macularia</u>)	A,B,C,D,E,F	C-P summer resident and transient	Stable	Pebbly lake shores, ponds and stream sides

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Franklin's Gull (<u>Larus pipixcan</u>)	A, B, C, D, E, F	C-P summer resident	Stable	Prairies, marshes, lakes and plowed fields
Bonaparte's Gull (<u>Larus philidelphia</u>)	A, B, C, D, E, F	U-P transient	Stable	Rivers, lakes and open marshes
Forsters Tern (<u>Sterna forsteri</u>)	A, B, C, D, E, F	C-P summer resident and transient	Stable	Marshes, lakes and reservoirs
Common Tern (<u>Sterna hirundo</u>)	A, B, C, D, E, F	U-P transient	Stable	Lakes and reservoirs
Black Tern (<u>Chlidonias niger</u>)	A, B, C, D, E, F	C-P summer resident and transient	Stable	Marshes, lakes and reservoirs
Caspian Tern (<u>Hydroprogne caspia</u>)	A, B, C, D, E, F	U-P transient	Stable	Large lakes and reservoirs
Order: Columbiformes				
Family: Columbidae				
! * Band-tailed pigeon (<u>Columba fasciata</u>)	A, E, F	U-P summer resident and transient	Stable	Forests, canyons and foothills near mountains, brush (acorns) and agricultural lands
! Rock Dove (<u>Columba livia</u>)	A, B, C, D, E, F	C-N resident	Stable	Cities, farms and cliffs
! * Mourning Dove (<u>Zenaidura macroura</u>)	A, B, C, D, E, F	C-P summer resident and transient	Stable	Farmlands, towns, open woods, grassland and deserts
White-winged Dove (<u>Zenaidura asiatica</u>)	E, F	A-P summer resident and transient	Unknown	Open woods and river bottoms

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Marbled Godwit (<u>Limosa fedoa</u>)	A,B,C,D,E,F	C-P transient	Stable	Grasslands and meadows near lakes and shallow lake margins
Family Recurvirostridae				
American Avocet (<u>Recurvirostra americana</u>)	A,B,C,D,E,F	C-P summer resident and transient	Stable	Marshes, mudflats, alkaline lakes, shallow ponds and sloughs
Black-necked Stilt (<u>Himantopus mexicanus</u>)	A,B,C,D,E,F	C-P summer resident and transient	Stable	Grassy marshes, alkali mudflats, pools and shallow lakes
Family Phalaropodidae				
Wilson's Phalarope (<u>Phalaropus tricolor</u>)	A,B,C,D,E,F	C-P summer resident and transient	Stable	Shallow lakes, marshes, pools, shores and mudflats
Northern Phalarope (<u>Phalaropus lobatus</u>)	A,B,C,D,E,F	C-P summer resident and transient	Stable	Lakes and ponds
Family Laridae				
Glaucous Gull (<u>Larus hyperboreus</u>)	D	R-P transient	Stable	Recorded using marshlands at Desert Lake WMA
Herring Gull (<u>Larus argentatus</u>)	A,B,C,D,E,F	U-P transient	Stable	Lakes, farmlands and dumps
California Gull (<u>Larus californicus</u>)	A,B,C,D,E,F	C-P summer resident	Stable	Lakes, rivers, farmlands and dumps
Ring-billed Gull (<u>Larus delawarensis</u>)	A,B,C,D,E,F	C-P winter resident	Stable	Lakes, rivers, refuse dumps, fields and cities

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Order Cuculiformes Family Cuculidae ! * Yellow-billed Cuckoo <u>(Coccyzus americanus)</u>	A, B, C, D, E, F	K-P summer resident	Unknown	River thickets and willows
Order Strigiformes Family Tytonidae ! * Barn Owl (<u>Tyto alba</u>)	A, B, C, D, E, F	K-P resident	Unknown	Woodlands, fields, farms, towns, canyons, cliffs and dirt banks
Family Strigidae ! * Screech Owl (<u>Otus asio</u>)	A, B, C, D, E, F	U-P resident	Stable	Riparian communities and wooded canyons
! * Flammulated Owl (<u>Otus flammeolus</u>)	A, B, C, D, E, F	K-P summer resident	Unknown	Open pine and fir forests in mountains
! * Great Horned Owl (<u>Bubo virginianus</u>)	A, B, C, D, E, F	C-P resident	Stable	Ubiquitous
! * Pygmy Owl (<u>Glaucidium gnoma</u>)	A, B, C, D, E, F	K-P resident	Unknown	Wooded canyons in open coniferous, mixed woodlands and pinion-juniper forests
* Burrowing Owl (<u>Speotyto cunicularia</u>)	A, B, C, D, E, F	L-P resident	Declining	Open grassland, prairies, dikes, desert, farms and prairie dog colonies

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
* Spotted Owl (<u>Strix occidentalis</u>)	C, E	L-P Unknown	Unknown	Wooded canyons with narrow side canyons in the desert
! * Long-eared Owl (<u>Asio otus</u>)	A, B, C, D, E, F	C-P resident	Stable	River woodlands, pinon-juniper forests, willow thickets and Russian olive trees
* Short-eared Owl (<u>Asio flammeus</u>)	A, B, C, D, E, F	C-P resident	Stable	Marshes, prairies, irrigated land and open country with short vegetation
! * Saw-whet Owl (<u>Aegolius acadicus</u>)	A, B, C, D, E, F	K-P resident	Stable	Forest, conifers and groves
Order Caprimulgiformes Family Caprimulgidae ! Common Nighthawk (<u>Chordeiles minor</u>)	A, B, C, D, E, F	C-P summer resident	Stable	Treeless plains to mountains with open pine woods; often seen in flight over country side or town
Lesser Nighthawk (<u>Chordeiles acutipennis</u>)	E	R-P summer resident	Unknown	Arid open scrub, dry grasslands, pastures and desert washes
! Poor-will (<u>Phalaenoptilus nuttallii</u>)	A, B, C, D, E, F	C-P summer resident	Stable	Arid uplands with open pinon-juniper and sparse brush; riparian areas and roadsides

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Order Apodiformes				
Family Apodidae				
! *Black Swift (<u>Cypseloides niger</u>)	A, B, C, D, E, F	U-P summer resident	Unknown	Open areas in mountain country
! White-throated Swift (<u>Acronautus saxatilis</u>)	A, B, C, D, F	C-P summer resident.	Unknown	Open areas; wide ranging and breeds mainly in dry mountain canyons
Family Trochilidae				
! Black-chinned Hummingbird (<u>Archilochus alexandri</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Semi-arid country near water; semi-wooded canyons and slopes, mountain brush and riparian woodlands
29 ! Broad-tailed Hummingbird (<u>Selasphorus platycercus</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Ubiquitous
! Rufous Hummingbird (<u>Selasphorus rufus</u>)	A, B, C, D, E, F	C-P summer resident and transient	Unknown	Forest edges, thickets in coniferous and deciduous forests, mountain brush and alpine meadows
! Calliope Hummingbird (<u>Stellula calliope</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	High mountains, canyons and forest openings
Rivoli's Hummingbird (<u>Eugenes fulgens</u>)	E, F	U-P summer resident	Unknown	High mountain forest openings, pine-oak forests and canyons

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Order Coraciiformes Family Alcedinidae ! * Belted Kingfisher <u>(Megasceryle alcyon)</u>	A, B, C, D, E, F	K-P resident	Unknown	Rivers, ponds and lakes
Order Piciformes Family Picidae ! Common Flicker <u>(Colaptes auratus)</u>	A, B, C, D, E, F	C-P resident	Stable	Deciduous or mixed woodlands, open forest, farms, towns, canyons and semi-open country
* Pileated Woodpecker <u>(Dryocopus pileatus)</u>	F	K-P resident	Unknown	Mature coniferous and mixed forests with many snags
30 Red-headed Woodpecker <u>(Melanerpes erythrocephalus)</u>	B	R-P resident	Unknown	Groves, farm country, riparian areas, towns and scattered trees
! Yellow-bellied Sapsucker <u>(Sphyrapicus varius)</u>	A, B, C, D, E, F	C-P resident	Unknown	In summer woodlands and aspen groves; in winter orchards and other trees
* Williamson's Sapsucker <u>(Sphyrapicus thyroideus)</u>	F	U-P summer resident	Unknown	Higher coniferous forests and burns
* Lewis Woodpecker <u>(Asyndesmus lewis)</u>	F	K-P summer resident and transient	Unknown	Scattered or logged forests, burns, cotton-wood groves and ponderosa pine
! Hairy Woodpecker <u>(Dendrocopos villosus)</u>	A, B, C, D, E, F	C-P resident	Unknown	Mountain forests, woodlands and river grove

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Downy Woodpecker <u>(Dendrocopos pubescens)</u>	A, B, C, D, E, F	C-P resident	Unknown	Broken or mixed forest, willows, poplars, riparian woodlands, orchards and shade trees
! Northern Three-toed Woodpecker <u>(Picoides tridactylus)</u>	A, B, C, E, F	U-P resident	Unknown	Coniferous forests
Order Passeriformes Family Tyrannidae Western Kingbird <u>(Tyrannus verticalis)</u>	A, B, C, D, E, F	C-P summer resident	Stable	Open country with scattered trees, farms and roadsides
! Cassin's Kingbird <u>(Tyrannus vociferans)</u>	A, B, C, D, E, F	U-P summer resident	Unknown	Semi-open high country, scattered trees, pine-oak mountains and ranch groves
Eastern Kingbird <u>(Tyrannus tyrannus)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Wood edges, parklands, riparian areas, farms, shelter belts, orchards and roadsides
! Ash-throated Flycatcher <u>(Myiarchus cinerascens)</u>	A, B, C, D, E, F	C-P summer resident	Stable	Semi-arid country, deserts, brush, pinion-juniper and open woods
Black Phoebe <u>(Sayornis nigricans)</u>	F	C-P resident	Unknown	Streamside woodlands, farmyards and towns with cliffs near water
Says Phoebe <u>(Sayornis saya)</u>	A, B, C, D, E, F	C-P resident	Unknown	Open arid country, deserts, bushy plains, prairie farm canyon

	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Willow (Traill's) Flycatcher <u>(Empidonax traillii)</u>	A,B,C,D,E,F	C-P summer resident	Unknown	Breeds in willow thickets in low valleys, along canyons or in high mountain meadows
! Hammond's Flycatcher <u>(Empidonax hammondi)</u>	A,B,C,E,F	U-P summer resident	Unknown	High coniferous forests
! Dusky Flycatcher <u>(Empidonax oberholseri)</u>	A,B,C,D,E,F	C-P summer resident	Unknown	Breeds in mountain brush with a scattering of trees
! Gray Flycatcher <u>(Empidonax wrightii)</u>	A,B,C,D,E,F	K-P summer resident	Unknown	Breeds in sagebrush and pinion-juniper woodlands
! Western Flycatcher <u>(Empidonax difficilis)</u>	A,B,C,D,E,F	C-P summer resident	Unknown	Moist woods, mixed or coniferous forests, canyons, groves; must have water and shade
! Western Wood Peewee <u>(Contopus sordidulus)</u>	A,B,C,D,E,F	C-P summer resident	Unknown	Woodlands, pine-oak forests, open conifers and river groves
! Olive-sided Flycatcher <u>(Contopus borealis)</u>	A,B,C,D,E,F	U-P summer resident	Unknown	Coniferous forests, burns and clearings; in migration habitats used are varied; usually seen on tip of dead tree or branch

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Family Alaudidae ! Horned Lark <u>(Eremophila alpestris)</u>	A, B, C, D, E, F	C-P resident	Unknown	Plains, desert, prairies, fields, sparse sagebrush flats, dirt roads, shores, alpine meadows, alkali flats and areas of sparse vegetation
Family Hirundinidae ! Violet-green Swallow <u>(Tachycineta thalassina)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Widespread when foraging; when nesting, open forests, foothill woods, mountains, canyons, cliffs and towns
! Tree Swallow (<u>Iridoprocne bicolor</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Open country near water, marshes, mountain meadows, streams, lakes and wires; when nesting requires dead trees and snags, preferably near water
! Bank Swallow (<u>Riparia riparia</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Usually near water; over fields, marshes, streams and lakes
! Rough-winged Swallow <u>(Stelgidopteryx ruficollis)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Near streams, lakes and washes
Barn Swallow (<u>Hirundo rustica</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Open or semi-wooded country, farms, ranches, fields, marshes and lakes; usually near man's habitation

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Cliff Swallow <u>(Petrochelidon pyrrhonota)</u>	A,B,C,D,E,F	C-P summer resident	Unknown	Open to semi-wooded country, near farms, cliffs, canyons, rivers or lakes
! * Purple Martin <u>(Progne subis)</u>	A,B,C,E,F	K-P summer resident	Unknown	Open forests of aspen and conifers
Family Corvidae				
! Steller's Jay <u>(Cyanocitta stelleri)</u>	A,B,C,D,E,F	C-P resident	Unknown	Conifers and pine-oak forests
! Gray Jay <u>(Perisoreus canadensis)</u>	A,B,C,E,F	R-P resident	Unknown	Coniferous forests
! Scrub Jay <u>(Aphelocoma coerulescens)</u>	A,B,C,D,E,F	C-P resident	Unknown	Foothills, oaks, mountain brush, river woods and pinion-juniper woodlands
! Black-billed Magpie <u>(Pica pica)</u>	A,B,C,D,E,F	C-P resident	Unknown	Foothills, ranches, sagebrush, river thickets, shelterbelts and prairie brush
! Common Raven <u>(Corvus corax)</u>	A,B,C,D,E,F	C-P resident	Unknown	Mountains, deserts, canyons and cliffs
! Common Crow <u>(Corvus brachyrhynchos)</u>	A,B,C,D,E,F	O-P transient	Unknown	Deciduous, mixed and open coniferous woodlands, farmlands and river groves
! Pinon Jay <u>(Gymnorhinus cyanocephala)</u>	A,B,C,D,E,F	C-P resident	Unknown	Pinion-juniper woodlands, but ranges into sagebrush
! Clark's Nutcracker <u>(Nucifraga columbiana)</u>	A,B,C,E,F	C-P resident	Unknown	High mountains in conifer near tree line

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Family Paridae				
! Black-capped Chickadee <u>(Parus atricapillus)</u>	A, B, C, D, E, F	C-P resident	Unknown	In summer aspen-conifer, mixed woodlands and forest edges; in winter woodlands along valley streams and tree rows
! Mountain Chickadee <u>(Parus gambeli)</u>	A, B, C, D, E, F	C-P resident	Unknown	In summer mountain forests and conifers; in winter riparian woodlands at lower elevations
! Plain Titmouse <u>(Parus inornatus)</u>	A, B, C, D, E, F	K-P resident	Unknown	Pinion-juniper woodlands
! Bushtit (<u>Psaltriparus minimus</u>)	A, B, C, D, E, F	C-P resident	Unknown	Oak woodlands, mountain brush, broad-leaved and mixed woods and pinion-juniper forest
Family Sittidae				
! White-breasted Nuthatch <u>(Sitta carolinensis)</u>	A, B, C, D, E, F	C-P resident	Unknown	Coniferous forests, pinion-juniper woodlands, oak brush, and riparian woodlands
! Red-breasted Nuthatch <u>(Sitta canadensis)</u>	A, B, C, E, F	C-P resident	Unknown	Coniferous forests
! Pygmy Nuthatch (<u>Sitta pusilla</u>)	A, B, C, D, E, F	C-P resident	Unknown	Ponderosa pines and Douglas fir

Class	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Family Certhidae				
! Brown Creeper (<u>Certhia familiaris</u>)	A,B,C,E,F	C-P resident	Unknown	In summer mature montane mixed and coniferous forests; lower elevations in winter
Family Cinclidae				
! Dipper (<u>Cinclus mexicanus</u>)	A,B,C,D,E,F	C-P resident	Unknown	Fast-flowing streams in or near mountains; lower levels in winter
Family Troglodytidae				
! House Wren (<u>Troglodytes aedon</u>)	A,B,C,D,E,F	C-P summer resident	Unknown	Woodlands of mountains and valleys
! Rock Wren (<u>Salpinctes obsoletus</u>)	A,B,C,D,E,F	C-P resident	Unknown	Desert to high mountain areas with talus slopes and cliffs
! Canyon Wren (<u>Catherpes mexicanus</u>)	A,B,C,D,E,F	C-P resident	Unknown	Rocky cliffs, crevices, and rock slides
! Bewick's Wren (<u>Thryomanes bewickii</u>)	A,B,C,D,E,F	C-P resident	Unknown	Under brush and pinion-juniper woodlands
Long-billed Marsh Wren (<u>Cistothorus palustris</u>)	A,B,C,D,E,F	L-P resident	Unknown	Cattail marshes
Family Mimidae				
Mockingbird (<u>Mimus polyglottos</u>)	A,B,C,D,E,F	U-P transient and summer resident	Unknown	Towns, farms, ranches, roadsides, brush and desert streambanks
Gray Catbird (<u>Dumetella carolinensis</u>)	A,B,C,D,E,F	U-P summer resident	Unknown	Undergrowth, brush or thickets along valley streams

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Brown Thrasher (<u>Toxostoma rufum</u>)	D,E,F	R-P resident	Unknown	Brushy places and thorny thickets
Bendire's Thrasher (<u>Toxostoma bendirei</u>)	F	R-P resident	Unknown	Desert scrub and farmlands
! Sage Thrasher (<u>Oreoscoptes montanus</u>)	A,B,C,D,E,F	C-P resident	Unknown	Sagebrush, rabbit-brush, brushy slopes and mesas
Family Muscicapidae				
! American Robin (<u>Turdus migratorius</u>)	A,B,C,D,E,F	C-P resident	Unknown	In summer towns, lawns, farmland, open forests, streamsides and any wooded habitat; in winter berry-bearing trees
Varied Thrush (<u>Ixoreus naevius</u>)	E,F	O-P winter resident	Unknown	Deciduous and coniferous forests usually near water
! Hermit Thrush (<u>Catharus guttatus</u>)	A,B,C,D,E,F	C-P summer resident and transient	Unknown	In summer mixed woodlands and open coniferous forest in winter woods, thickets and parks
! Swainson's Thrush (<u>Catharus ustulatus</u>)	A,B,D	C-P summer resident	Unknown	Willow thickets, river woodlands, aspens, forest undergrowth and conifers
! Veery (<u>Catharus fuscescens</u>)	A,B	U-P summer resident	Unknown	Streamside woodlands

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
] * Western Bluebird (<u>Sialia mexicana</u>)	A,B,C,D,E,F	K-P summer resident	Unknown	Scattered trees, open conifers, forests and farms
] * Mountain Bluebird (<u>Sialia currucoides</u>)	A,B,C,D,E,F	K-P resident	Unknown	In summer open areas where mountain meadows and pastures are interspersed with loose stands or single coniferous trees; in winter lower elevations, often open areas with available perching sites
! Townsend's Solitaire (<u>Myadestes townsendi</u>)	A,B,C,D,E,F	C-P resident	Unknown	In summer open coniferous forests in the mountains; in winter canyons, brushy slopes and junipers
Family Sylviidae				
! Blue-gray Gnatcatcher (<u>Polioptila caerulea</u>)	A,B,C,D,E,F	C-P summer resident	Unknown	Open mixed woods, streamside thickets, mountain brush and pinion-juniper woodlands
! Golden-crowned Kinglet (<u>Regulus satrapa</u>)	A,B,C,D,E,F	U-P resident	Unknown	In summer coniferous forests; in winter pinion juniper and brush in low elevations
! Ruby-crowned Kinglet (<u>Regulus calendula</u>)	A,B,C,D,E,F	C-P resident	Unknown	In summer coniferous forests; in winter other woodlands and thickets

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Family Motacillidae Water Pipet (<u>Anthus spinoletta</u>)	A, B, C, D, E, F	C-P resident	Unknown	In summer alpine zone; in migration and winter plains, bare fields, shores and irrigated field
Family Bombycillidae ! Bohemian Waxwing (<u>Bombycilla garrulus</u>)	A, B, C, D, E, F	U-P winter resident	Unknown	Widespread and feeds on berries
! Cedar Waxwing (<u>Bombycilla cedrorum</u>)	A, B, C, D, E, F	C-P winter resident	Unknown	Open woodlands, Russian olive and other fruiting trees or orchards
Family Laniidae ! Northern Shrike (<u>Lanius excubitor</u>)	A, B, C, D, E, F	U-P winter resident	Unknown	Semi-open country or open country with look- out posts
Loggerhead Shrike (<u>Lanius ludovicianus</u>)	A, B, C, D, E, F	C-P resident	Unknown	Deserts and other open country with lookout posts, wires, scattered trees and low scrub
Family Sturnidae Starling (<u>Sturnus vulgaris</u>)	A, B, C, D, E, F	C-P resident	Unknown	Cities, fields, orchards and woodlands
Family Vireonidae Gray Vireo (<u>Vireo vicinior</u>)	D, E, F	U-P summer resident	Unknown	Brushy mountain slopes, scrub oak and junipers
! Solitary Vireo (<u>Vireo solitarius</u>)	A, B, C, D, E, F	U-P summer resident	Unknown	Streamside woodlands, pinion-juniper and Ponderosa pine forests

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Warbling Vireo (<u>Vireo gilvus</u>)	A,B,C,D,E,F	C-P summer resident	Unknown	Deciduous and mixed aspen woodlands near mountain and valley streams
Family Parulidae				
! Orange-crowned Warbler (<u>Vermivora celata</u>)	A,B,C,D,E,F	C-P summer resident and transient	Unknown	Brushy woodland clearings, hillsides, aspens and mountain brush; in migration streamside woodlands
! Nashville Warbler (<u>Vermivora ruficapilla</u>)	A,B,C,D,E,F	U-P transient	Unknown	Open mixed woods with undergrowth and at forest edges
! Virginia's Warbler (<u>Vermivora virginiae</u>)	A,B,C,D,E,F	C-P summer resident	Unknown	Oak canyons, brushy slopes and pinion-juniper brushland
Lucy's Warbler (<u>Vermivora luciae</u>)	E,F	U-P summer resident	Unknown	Along desert streams in willows and cottonwoods
! Yellow Warbler (<u>Dendroica petechia</u>)	A,B,C,D,E,F	C-P summer resident	Unknown	Willows, aspens, streamside trees and shrubs or town shade trees
* Grace's Warbler (<u>Dendroica graciae</u>)	E,F	U-P summer resident	Unknown	Ponderosa pine-oakbrush communities of the mountains
! Magnolia Warbler (<u>Dendroica magnolia</u>)	A,B,C,D,E,F	U-P transient	Unknown	Coniferous forests

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Hermit Warbler <u>(Dendroica occidentalis)</u>	E, F	U-P summer resident and transient	Unknown	Coniferous forests; in migration other trees
! Yellow-rumped Warbler <u>(Dendroica coronata)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	In summer coniferous and mixed forests; in winter varied woods, river thickets, brush and gardens
! Black-throated Gray Warbler <u>(Dendroica nigrescens)</u>	A, B, C, D, E, F	K-P summer resident	Unknown	In summer dry oak slopes, pinion-juniper woodlands, open mixed woods; in migration varied trees and brush
! Townsend's Warbler <u>(Dendroica townsendi)</u>	A, B, C, D, E, F	U-P transient	Unknown	Coniferous forests
Northern Waterthrush <u>(Seiurus noveboracensis)</u>	B, C, D, E, F	U-P transient	Unknown	Swampy or wet woods, streamsides and lake- shores; in migration thickets
! MacGillivray's Warbler <u>(Oporornis tolmiei)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Low dense undergrowth and shady, damp thickets
Yellowthroat <u>(Geothlypis trichas)</u>	A, B, C, D, E, F	L-P summer resident	Unknown	Cattail and bulrush marshes, willow thickets and streamsides
! Yellow-breasted Chat <u>(Icteria virens)</u>	A, B, C, D, E, F	C-P	Unknown	Dense brush along

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Wilson's Warbler <u>(Wilsonia pusilla)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Deciduous shrubbery or thickets, streamside growth, willows and fir thickets in the mountains
! American Redstart <u>(Setophaga ruticilla)</u>	A, B, C	U-P transient	Unknown	Open secondary deciduous woodlands and riparian woodlands
Family Ploceidae House Sparrow <u>(Passer domesticus)</u>	A, B, C, D, E, F	C-P resident	Unknown	Cities, farms and houses
Family Icteridae Western Meadowlark <u>(Sturnella neglecta)</u>	A, B, C, D, E, F	C-P resident	Unknown	Open fields, meadows and plains
Yellow-headed Blackbird <u>(Xanthocephalus xanthocephalus)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Marshes with cattail and bulrushes; forages in fields and open country
Red-winged Blackbird <u>(Agelaius phoeniceus)</u>	A, B, C, D, E, F	C-P resident	Unknown	Breeds in marshes with emergent aquatic vegetation, forages in cultivated land and at the edge of water
! Northern Oriole <u>(Icterus galbula)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Open woodlands, cottonwoods or other shade trees and riparian areas

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
* Scotts Oriole (<u>Icterus parisorum</u>)	C,D,E,F	U-P summer resident	Unknown	Pinion-juniper woodlands of desert mountains, oak slopes and cottonwood trees in canyons
! Rusty Blackbird (<u>Euphagus carolinus</u>)	A	O-P transient	Unknown	Wooded marshes and riparian woodlands
Brewer's Blackbird (<u>Euphagus cyanocephalus</u>)	A,B,C,D,E,F	C-P resident	Unknown	Varied open country, lakeshores, irrigated pastures, feed lots, parks and cities
! Common Grackle (<u>Quiscalus quiscula</u>)	A,B,D	A-P transient	Unknown	Farms, fields, stream-sides and wet woodlands
! Brown-headed Cowbird (<u>Molothrus ater</u>)	A,B,C,D,E,F	C-P resident	Unknown	Farms, fields, barnyards wood edges and riparian woodlands
Family Thraupidae ! Western Tanager (<u>Piranga ludoviciana</u>)	A,B,C,D,E,F	C-P summer resident	Unknown	Open coniferous, aspen or mixed forests; widespread in migration
Family Emberizidae Rose-breasted Grosbeak (<u>Pheucticus ludovicianus</u>)	F	O-P summer resident	Unknown	Broadleaf riparian areas and aspens
! Black-headed Grosbeak (<u>Pheucticus melanocephalus</u>)	A,B,C,D,E,F	C-P summer resident	Unknown	Edges of second growth deciduous woods, pinion, riparian areas, orchards and parks

	Geographic Area Inhabited	Status	Population Trend	Habitat Use Area
Blue Grosbeak (<u>Guiraca caerulea</u>)	B, C, D, E, F	C-P summer resident	Unknown	Brushy and weedy places, willows and river thickets and other riparian areas
Lapland Longspur (<u>Calcarius lapponicus</u>)	A, B, C, D, E, F	R-P winter resident	Unknown	Fields, grasslands, saline flats, desert shrub; often seen with horned larks
! Indigo Bunting (<u>Passerina cyanea</u>)	A, B, D	R-P summer resident	Unknown	Brush, farm lands and streamsides
! Lazuli Bunting (<u>Passerina amoena</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Mountain brush, stream-side shrubs and farmland tree rows
! Green-tailed Towhee (<u>Chlorura chlorura</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Low mountain brush, greasewood and pinion-juniper woodlands
! Rufous-sided Towhee (<u>Pipilo erythrophthalmus</u>)	A, B, C, D, E, F	C-P resident	Unknown	Mountain brush, forest edges and city shrubs
! Lark Bunting (<u>Calamospiza melanocorys</u>)	A, B, C, D, E, F	O-P transient	Unknown	Plains, prairies, desert shrub and sagebrush
Savannah Sparrow (<u>Passerculus sandwichensis</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Grasslands, fields, saltgrass meadows and open country
* Grasshopper Sparrow (<u>Ammodramus savannarum</u>)	A, B, C, D, E, F	K-P transient	Unknown	Dry grasslands
LeConte's Sparrow (<u>Ammodramus leconteii</u>)	F	A-P transient	Unknown	Tall grass, weedy meadows and marshes

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Vesper Sparrow <u>(Poocetes gramineus)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Alfalfa and grain fields, meadows, sagebrush and desert shrub
! Lark Sparrow <u>(Chondestes grammacus)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Open country in sagebrush and desert shrub with available perch sites
! Sage Sparrow (<u>Amphispiza belli</u>)	A, B, C, D, E, F	U-P summer resident	Unknown	Sagebrush, greasewood and other desert shrubs
! Dark-eyed Junco (<u>Junco hyemalis</u>)	A, B, C, D, E, F	C-P resident	Unknown	In summer openings and edges of coniferous and mixed woodlands; in winter greasewood and undergrowth
45 ! Gray-headed Junco (<u>Junco caniceps</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Coniferous, mixed forest and mountain brush
! Tree Sparrow (<u>Spizella arborea</u>)	A, B, C, D, E, F	U-P winter resident	Unknown	Willow thickets and brushy areas
! Chipping Sparrow (<u>Spizella passerina</u>)	A, B, C, D, E, F	C-P summer resident	Unknown	Mountain coniferous and deciduous woodlands, valley woodlands, farms, orchards, parks and brushlands
! Brewer's Sparrow <u>(Spizella breweri)</u>	A, B, C, D, E, F	C-P summer resident	Unknown	Sagebrush, greasewood and other desert shrubs or brushy areas
! Harris Sparrow <u>(Zonotrichia querula)</u>	A, B, C, D, E, F	U-P winter resident	Unknown	Brushy edges of open woodlands, Russian olives and willows

! White-crowned Sparrow <u>(Zonotrichia leucophrys)</u>	A, B, C, D, E, F	C-P resident	Unknown	In summer forest edges and clearings, low brush and mountain thickets; in winter widespread in the valleys, along fence row, willows, brushy areas, corn and greasewood
White-throated Sparrow <u>(Zonotrichia albicollis)</u>	E, F	R-P winter resident	Unknown	Coniferous and mixed woodlands, woodland undergrowth thickets and brush
Golden-crowned Sparrow <u>(Zonotrichia atricapilla)</u>	E, F	R-P winter resident	Unknown	Mountain brush and brushy areas in the lower valleys
Swamp Sparrow <u>(Zonotrichia georgiana)</u>	F	U-P winter resident	Unknown	Marshes; in migration weedy fields
! Fox Sparrow <u>(Zonotrichia iliaca)</u>	A, B, C	K-P summer resident and transient	Unknown	Valley and mountain woodlands and brushy areas usually near water
! Lincoln's Sparrow <u>(Zonotrichia lincolni)</u>	A, B, C	U-P summer resident R-P winter resident	Unknown	In summer willow thickets, brushy bogs; in winter lowland thickets, tall weeds and bushes
! Song Sparrow <u>(Zonotrichia melodia)</u>	A, B, C, D, E, F	C-P resident	Unknown	Woodland edges, grasslands, cattail marshes, thickets and brushy fence rows

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Black-throated Sparrow <u>(Amphispiza bilineata)</u>	A, B, C, D, E, F	U-P summer resident	Unknown	Pinion-juniper, mountain brush and sagebrush
Family Fringillidae Evening Grosbeak <u>(Coccothraustes vespertinus)</u>	A, B, C, D, E, F	C-P winter resident	Unknown	Boxelders, Russian olive trees and fruiting shrubs
! Cassin's Finch <u>(Carpodacus cassinii)</u>	A, B, C, D, E, F	C-P summer resident U-P winter resident	Unknown	In summer, open conifer forests of high mountains in winter valleys
! House Finch 47 <u>(Carpodacus mexicanus)</u>	A, B, C, D, E, F	C-P resident	Unknown	Varied habitats; towns, ranches, open woods, mountain scrub, canyons, deserts and riparian area
! Pine Grosbeak <u>(Pinicola enucleator)</u>	A, B, C, E, F	U-P resident	Unknown	In summer coniferous forests; in winter mixed woods and fruiting trees
Rosy Finch <u>(Leucosticte arctoa)</u>	A, B, C, D, E, F	C-P resident	Unknown	In summer alpine tundra, meadows and snowfields; winters in lowlands
! Pine Siskin <u>(Carduelis pinus)</u>	A, B, C, D, E, F	C-P resident	Unknown	Coniferous forests, along edges of second growth deciduous forests; in migration seen in large flocks in the lower valley

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
American Goldfinch <u>(Carduelis tristis)</u>	A, B, C, D, E, F	C-P resident	Unknown	Riparian woodlands, willows, cottonwoods, orchards, roadsides and sunflowers
Lesser Goldfinch <u>(Carduelis psaltria)</u>	A, B, C, D, E, F	C-P resident	Unknown	Open brushy country, open woods, wooded streams and gardens
Red Crossbill <u>(Loxia curvirostra)</u>	A, B, C, E, F	U-P summer resident	Unknown	Coniferous forests
Mammals -- 103 species in southeastern Utah				
Order Insectivora				
Family Soricidae				
87 * Dwarf Shrew <u>(Sorex nanus)</u>	B, C, D, E, F	L-N	Unknown	Open grass-covered areas which may have scattered brush, marshes, coniferous forests and openings in woods
North Water Shrew <u>(Sorex palustris)</u>	A, B, C, E, F	C-N	Unknown	Along nearly all permanent streams in mountainous areas
Merriam Shrew <u>(Sorex merriami)</u>	A, B, C, D, E, F	U-N	Unknown	Arid sagebrush or grassland areas, mountain mahogany, coniferous forests, aspens and cottonwoods
Vagrant Shrew <u>(Sorex vagrans)</u>	A, B, C, F	C-N	Unknown	Marshes, bogs, wet meadows and along streams in forests

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Masked Shrew (<u>Sorex cinereus</u>)	A, B, D, E	C-N	Unknown	Moist sites in forests, open country and brushland
! Dusky Shrew (<u>Sorex obscurus</u>)	A, B, C, F	C-N	Unknown	Marshes, coniferous forests and dry hillsides
* Gray (Desert) Shrew (<u>Notiosorex crawfordi</u>)	E, F	L-N	Unknown	Arid alluvial fans, brushy slopes, sagebrush and other low desert shrub communities
Order Chiroptera				
Family Vespertilionidae				
49 ! Little Brown Myotis (<u>Myotis lucifugus</u>)	A, B, C, D, E, F	C-N	Unknown	Caves, mine tunnels, hollow trees or buildings usually near water
! Fringed Myotis (<u>Myotis thysanodes</u>)	A, B, C, D, E, F	U-N	Unknown	Caves, old buildings, rock crevices, pinion-juniper and desert shrub
! Long-eared Myotis (<u>Myotis evotis</u>)	A, B, C, D, E, F	C-N	Unknown	Coniferous forests in high mountains, around buildings or trees and occasionally caves
! Long-legged Myotis (<u>Myotis volans</u>)	A, B, C, D, E, F	C-N	Unknown	Buildings, small pockets, crevices in rock ledges and trees

	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Yuma Myotis (<u>Myotis yumanensis</u>)	A, B, C, D, E, F	U-N	Unknown	Caves, tunnels and buildings in arid areas
California Myotis (<u>Myotis californicus</u>)	A, B, C, D, E, F	C-N	Unknown	Mine tunnels, hollow trees, loose rocks, buildings, bridges; chiefly a crevice dweller (up to 6,000 feet in elevation)
! Small-footed Myotis (<u>Myotis leibii</u>)	A, B, C, D, E, F	U-N	Unknown	Caves, mine tunnels, crevices in rocks and in buildings
! Silver-haired Bat (<u>Lasionycteris noctivagans</u>)	A, B, C, D, E, F	C-N	Unknown	Forest areas, occasionally in caves or buildings
! Western Pipistrelle (<u>Pipistrellus hesperus</u>)	A, B, C, D, E, F	C-N	Unknown	Caves, under loose rocks, crevices, in cliffs, buildings; arid areas near water courses
! Big Brown Bat (<u>Eptesicus fuscus</u>)	A, B, C, D, E, F	C-N	Unknown	Caves, tunnels, crevices, hollow trees, buildings and wooded areas
! * Red Bat (<u>Lasiurus borealis</u>)	A, B, C, D, E, F	I-N	Unknown	Wooded areas; roosts in trees and occasionally enters caves
! Hoary Bat (<u>Lasiurus cinereus</u>)	A, B, C, D, E, F	U-N	Unknown	Wooded areas
! * Western Big-eared Bat (<u>Plecotus townsendii</u>)	A, B, C, D, E, F	C-N	Unknown	Caves, mine tunnels and buildings utilized for roosting; inhabits arid western desert shrub, pinion-juniper and pine forests

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Mexican Big-eared Bat (<u>Plecotus phyllotis</u>)	F	L-N	Unknown	Caves in pine-oak forests between 5,000 to 8,500 feet elevation
*Spotted Bat (<u>Euderma maculata</u>)	Unknown	L-N	Unknown	Arid country; it occasionally enters buildings and caves.
! Pallid Bat (<u>Antrozous pallidus</u>)	A, B, C, D, E, F	C-N	Unknown	Caves, mine tunnels, crevices in rocks, buildings and trees are utilized for roosts; inhabits scattered desert shrub and pine-oak forests below 6,500 feet elevation
Family Molossidae				
Mexican Free-tailed Bat (<u>Tadarida brasiliensis</u>)	A, B, C, D, E, F	C-N	Unknown	Caves and buildings are utilized for roosts; inhabits lower and upper Sonoran Life Zones
Order Lagomorpha				
Family Ochotonidae				
Pika (<u>Ochotona princeps</u>)	A, B, C, E, F	C-N	Unknown	Talus slopes and rock-slides above 8,000 feet elevation
Family Leporidae				
! White-tailed Jackrabbit (<u>Lepus townsendii</u>)	A, B, C, D	C-N	Stable	Open, grassy or sage-brush areas at medium elevation
! *Snowshoe Hare (<u>Lepus americanus</u>)	A, B, C	L-P	Cyclic	Coniferous forests and aspen, riparian and brush types near conifers

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Black-tailed Jackrabbit <u>(Lepus californicus)</u>	A, B, C, D, E, F	C-N	Stable	Open grassland, sagebrush and desert shrub areas at low to medium elevations
! *Mountain Cottontail <u>(Sylvilagus nuttallii)</u>	A, B, C, E, F	C-P	Stable	Thickets, sagebrush, loose rocks, cliffs and forests
! *Desert Cottontail <u>(Sylvilagus audubonii)</u>	A, B, C, D, E, F	C-P	Stable	Open plains, foothills and low valleys with grass, sagebrush or scattered pinion-juniper
Order Rodentia Family Sciuridae				
^S Zuni Prairie Dog <u>(Cynomys gunnisoni)</u>	F	C-N	Stable	Mountain valleys, 5,000-12,000 feet elevation; open to slightly brushy country with scattered pinion-juniper
White-tailed Prairie Dog <u>(Cynomys leucurus)</u>	A, B, C, D, E, F	C-N	Stable	Valleys and flatlands where vegetation is sparse
*Abert Squirrel <u>(Sciurus aberti)</u>	F	L-P	Stable	Ponderosa pines
! Red Squirrel <u>(Tamiasciurus hudsonicus)</u>	A, B, C, F	C-N	Stable	Coniferous forests in the mountains

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
*Spotted Ground Squirrel (<u>Spermophilus spilosoma</u>)	F	L-N	Unknown	Open forests, scattered brush and grassy areas with sandy soil is preferred
! Rock Squirrel (<u>Spermophilus variegatus</u>)	A, B, C, D, E, F	C-N	Stable	Rocky canyons with boulder strewn slopes, riparian woodlands, and ditchbanks
! Uintah Ground Squirrel (<u>Spermophilus armatus</u>)	A, B	C-N	Stable	Meadows and edges of fields near green vegetation up to 8,000 feet elevation
5! Golden-mantled Ground Squirrel (<u>Spermophilus lateralis</u>)	A, B, C	C-N	Stable	Mountain brush, open pine and spruce-fir forests to above timberline
Whitetail Antelope Squirrel (<u>Ammospermophilus leucurus</u>)	A, B, C, D, E, F	C-N	Stable	Arid areas of low desert and foothills with sparse vegetation
! Yellow-billied Marmot (<u>Marmota flaviventris</u>)	A, B, C, E, F	C-N	Stable	Rocky sites or talus slopes along valleys or in foothills 5,000 to 9,000 feet elevation
! Northern Flying Squirrel (<u>Glaucomys sabrinus</u>)	A, B, C, F	K-N	Unknown	Coniferous and mixed forests in high mountains

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Ord Kangaroo Rat (<u>Dipodomys ordii</u>)	A, B, C, D, E, F	C-N	Unknown	Desert shrub, pinion-juniper and tamarisk communities; sandy soils preferred but found on hard soils
Baird Pocket Mouse (<u>Perognathus flavus</u>)	F	C-N	Unknown	Prefers short grass areas with sandy or rocky soils
! Great Basin Pocket Mouse (<u>Perognathus parvus</u>)	A, D	C-N	Unknown	Sagebrush or greasewood and other desert shrub communities and pinion-juniper
55 Apache Pocket Mouse (<u>Perognathus apache</u>)	C, D, F	C-N	Unknown	Sparse brushlands and scattered pinion-juniper, usually 5,000-7,200 feet elevation
Family Castoridae				
! * Beaver (<u>Castor canadensis</u>)	A, B, C, D, E, F	C-P	Increasing	Streams, lakes and irrigation systems with poplars, birch or willows on the bank
Family Cricetidae				
! Western Harvest Mouse (<u>Reithrodontomys megalotis</u>)	A, B, C, D, E, F	C-N	Unknown	Grasslands, open desert, wetlands, irrigated farmland of dense vegetation near water
! Canyon Mouse (<u>Peromyscus crinitus</u>)	A, B, C, D, E, F	C-N	Unknown	Rocky canyons and slopes with mountain brush

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Deer Mouse <u>(Peromyscus maniculatus)</u>	A, B, C, D, E, F	C-N	Unknown	All dry-land habitat and irrigated farmland within its range
! Brush Mouse <u>(Peromyscus boyleyi)</u>	A, B, C, D, E, F	C-N	Unknown	Brushy areas of arid and semi-arid regions; prefers rocky sites
! Pinion Mouse <u>(Peromyscus truei)</u>	A, B, C, D, E, F	C-N	Unknown	Rocky terrain in pinion-juniper areas
Northern Grasshopper Mouse <u>(Onychomys leucogaster)</u>	C, F	U-N	Unknown	Open country of grass, sagebrush or greasewood and sandy or gravelly soil
56 *White-throated Wood Rat <u>(Neotoma albigula)</u>	F	K-N	Unknown	Brushland with rocky cliffs and shallow caves
! Desert Wood Rat <u>(Neotoma lepida)</u>	A, B, C, D, E	C-N	Unknown	Desert floors and rocky slopes with low desert vegetation or arid mountain brush
*Mexican Wood Rat <u>(Neotoma mexicana)</u>	F	K-N	Unknown	Rocks, cliffs and mountains
! Bushy-tailed Wood Rat <u>(Neotoma cinerea)</u>	A, B, C, D, E, F	C-N	Unknown	High mountains with rimrock, rock slides and pines
! Muskrat <u>(Ondatra zibethicus)</u>	A, B, C, D, E, F	C-N	Stable	Marshes, edge of ponds, lakes, streams and irrigation canals

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! Meadow Vole <u>(Microtus pennsylvanicus)</u>	A, D	C-N	Unknown	Moist areas with dense growth of grasses
! Mountain Vole <u>(Microtus montanus)</u>	A, B, D, E	C-N	Unknown	Dense vegetation in sagebrush-grass communities
! Richardson's Vole <u>(Microtus richardsoni)</u>	A	C-N	Unknown	Creekbanks and marshes in mountains to above timberline
! Longtail Vole <u>(Microtus longicaudus)</u>	A, B, C, D, E, F	C-N	Unknown	In summer streambanks, mountain meadows with dry sites; in winter brushy areas
Sagebrush Vole <u>(Lagurus curtatus)</u>	C, F	C-N	Unknown	Scattered sagebrush with loose soil and arid conditions
Family Muridae				
! Black Rat <u>(Rattus rattus)</u>	A, B, C, D, E, F	C-N	Unknown	Buildings and dumps
! Norway Rat <u>(Rattus norvegicus)</u>	A, B, C, D, E, F	C-N	Unknown	Burrows along building foundations and beneath rubbish piles
! House Mouse <u>(Mus musculus)</u>	A, B, C, D, E, F	C-N	Unknown	Buildings and occasionally in fields

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
Family Zapodidae				
! Western Jumping Mouse <u>(Zapus princeps)</u>	A	C-N	Unknown	Low meadows near streams with lush growth of grasses and forbs; found in various land habitats
Family Erethizontidae				
! Porcupine <u>(Erethizon dorsatum)</u>	A, B, C, D, E, F	C-N	Stable	Forested areas, occasionally away from trees if brush is available
Order Carnivora				
Family Canidae				
! Coyote <u>(Canis latrans)</u>	A, B, C, D, E, F	C-N	Stable	Ubiquitous
! * Red Fox <u>(Vulpes fulva)</u>	A, B, C, D, E, F	K-N	Unknown	Forest and open country preferred
* Kit Fox <u>(Vulpes macrotis)</u>	A, B, C, D, E, F	K-N	Unknown	Open level, sandy ground preferred with low desert vegetation
! Gray Fox <u>(Urocyon cinereoargenteus)</u>	A, B, C, D, E, F	C-N	Stable	Brush and open forests

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! *Gray Wolf (<u>Canis lupus</u>)	A, B, C, D, E, F	E-P	Decreasing	Wilderness forests
Family Ursidae				
! *Black Bear (<u>Ursus americanus</u>)	A, B, C, E, F	C-P	Increasing	Mountainous areas
! *Grizzly Bear (<u>Ursus horribilis</u>)	A, B, C, E, F	X-P	Extirpated	Remote mountainous regions
Family Procyonidae				
! Ring-tailed Cat (<u>Bassariscus astutus</u>)	A, B, C, D, E, F	C-N	Stable	Near water on slopes with mountain brush, rocky ridges and cliffs
! *Raccoon (<u>Procyon lotor</u>)	A, B, C, D, E, F	K-N	Unknown	Along streams, lake borders and near wooded areas or rock cliffs
Family Mustelidae				
! *Short-tailed Weasel (<u>Mustela erminea</u>)	A, B, C, F	K-P	Unknown	Brushy or wooded areas not far from water
! *Long-tailed Weasel (<u>Mustela frenata</u>)	A, B, C, D, E, F	C-P	Stable	All land habitat types near water
! *Mink (<u>Mustela vison</u>)	A, B, C, F	L-P	Unknown	Along streams and lakes
! *Wolverine (<u>Gulo luscus</u>)	A, B	L-P	Unknown	Remote mountain regions
*Black-footed Ferret (<u>Mustela nigripes</u>)	A, B, C, D, F	E-P	Unknown	Prairie dog towns
! *Marten (<u>Martes caurina</u>)	A, B, C, F	R-P	Unknown	Coniferous forests at high elevations

	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
! * Badger (<u>Taxidea taxus</u>)	A, B, C, D, E, F	C-P	Stable	Open grasslands, deserts and high mountain forests where prey is available
! * Striped Skunk (<u>Mephitis mephitis</u>)	A, B, C, D, E, F	C-P	Increasing	Semi-open country of prairie, brushlands or mixed woodlands within two miles of water
! * Spotted Skunk (<u>Spilogale gracilis</u>)	A, B, C, D, E, F	C-P	Stable	Prairies or grasslands with brushy or sparsely wooded areas along streams with boulders
* River Otter (<u>Lutra canadensis</u>)	A, B, C, D, E, F	L-P	Unknown	Along streams and lake borders
Family Felidae				
! * Bobcat (<u>Lynx rufus</u>)	A, B, C, D, E, F	L-P	Unknown	Rimrock and mountain brush areas
! * Canada Lynx (<u>Lynx canadensis</u>)	A, B, C, E, F	L-P	Unknown	Forested areas in the mountains
! * Cougar (<u>Felis concolor</u>)	A, B, C, D, E, F	C-P	Stable	Rugged mountains with forests, cliffs and ledges
Order Artiodactyla				
Family Cervidae				
! * Mule Deer (<u>Odocoileus hemionus</u>)	A, B, C, D, E, F	C-P	Increasing	Coniferous forests, desert shrub, mountain brush, grassland with shrubs and other habitats where browse species are present

Species	Biogeographic Area Inhabited	Status	Population Trend	Habitat Use Area
* Moose (<u>Alces alces</u>)	A	L-P	Increasing	Mountainous areas, forests, mountain brush and willow bottoms
* Rocky Mountain Elk (<u>Cervus canadensis</u>)	A, B, C, E, F	C-P	Increasing	Semi-open forests, mountain meadows (in summer), foothills, plains and valleys
Family Antilocapridae * Pronghorn Antelope (<u>Antilocapra americana</u>)	B, C, D, E, F	L-P	Stable	Open prairies and sagebrush or desert shrub plains
19 Family Bovidae * Desert Bighorn Sheep (<u>Ovis canadensis nelsoni</u>)	D, E, F	L-P	Increasing	Precipitous terrain on mountain and canyon slopes and rims with sparse growth of trees
* Rocky Mountain Bighorn Sheep (<u>Ovis canadensis canadensis</u>)	B, C	L-P	Increasing	Precipitous terrain on mountain and canyon slopes and rims with sparse growth of trees
* Bison (<u>Bison bison</u>)	E	L-P	Stable	Desert shrub plains of the Burr Desert and mountain brush forest habitats associated with steep mountain slopes of the Henry Mountains

Table 1. List of Species and Region of Inhabitation Within Utah.

Game Species of Utah	REGION				
	Southeastern	Southern	Central	Northeastern	Northern
10 BIG GAME SPECIES					
Bison	x	x			
Black Bear	x	x	x	x	x
Cougar	x	x	x	x	x
Desert Bighorn Sheep	x	x			
Elk	x	x	x	x	x
Moose	x		x	x	x
Mountain Bighorn Sheep	x		x	x	x
Mountain Goat			x		
Mule Deer	x	x	x	x	x
Pronghorn Antelope	x	x	x	x	x
Subtotal	9	7	8	7	7
20 GAME FISH SPECIES					
Arctic Grayling		x		x	x
Black Bullhead	x	x	x	x	x
Black Crappie	x	x	x	x	x
Bluegill	x	x	x	x	x
Bonneville Cisco					x
Brook Trout	x	x	x	x	x
Brown Trout	x	x	x	x	x
Channel Catfish	x	x	x	x	x
Cutthroat Trout	x	x	x	x	x
Golden Trout			x	x	
Kokanee Salmon				x	x
Lake Trout		x	x	x	x
Largemouth Bass	x	x	x	x	x
Mountain Whitefish			x	x	x
Northern Pike	x	x			
Perch	x	x	x	x	x
Rainbow & Albino Trout	x	x	x	x	x
Smallmouth Bass			x	x	x
Striped Bass	x	x			
Walleye	x	x	x	x	x
White Bass					
Subtotal	13	16	16	17	17

Game Species of Utah	REGION				
	Southeastern	Southern	Central	Northeastern	Northern

9 FURBEARER SPECIES

Badger	x	x	x	x	x
Beaver	x	x	x	x	x
Long-tailed Weasel	x	x	x	x	x
Marten	x	x	x	x	x
Mink	x	x	x	x	x
River Otter	x	x	x	x	x
Short-tailed weasel	x			x	x
Spotted Skunk	x	x	x	x	x
Striped Skunk	x	x	x	x	x
Subtotal	<u>x</u> 9	<u>x</u> 8	<u>x</u> 8	<u>x</u> 9	<u>x</u> 9

43 MIGRATORY GAME BIRD SPECIES

American Widgeon	x	x	x	x	x
Band-tailed Pigeon	x	x	x		x
Barrows Goldeneye	x	x	x	x	
Black Brant		x			x
Black Duck		x			x
Blue-winged Teal	x	x	x		x
Bufflehead	x	x	x	x	x
Canada Goose	x	x	x	x	x
Canvasback	x	x	x	x	x
Cinnamon Teal	x	x	x	x	x
American Coot	x	x	x	x	x
Common Gallinule	x	x	x	x	x
Common Goldeneye	x	x	x		x
Common Merganser	x	x	x	x	x
Common Snipe	x	x	x	x	x
European Widgeon			x	x	x
Fulvous Tree Duck			x		x
Gadwall		x			x
Greater Scaup	x	x	x	x	x
Green-winged Teal	x	x	x	x	x
Harlequin Duck		x	x	x	x

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Game Species of Utah	REGION				
	Southeastern	Southern	Central	Northeastern	Northern
Hooded Merganser	x	x	x	x	x
Lesser Scaup	x	x	x	x	x
Mallard	x	x	x	x	x
Mourning Dove	x	x	x	x	x
Old Squaw		x	x		x
Pintail	x	x	x	x	x
Red-breasted Merganser	x	x	x	x	x
Redhead	x	x	x	x	x
Ring-necked Duck	x	x	x	x	x
Ross Goose	x	x			x
Ruddy Duck	x	x	x	x	x
Sandhill Crane	x	x	x	x	x
Shoveler	x	x	x	x	x
Snow Goose	x	x	x	x	x
Sora Rail	x	x	x	x	x
Surf Scoter			x		x
Trumpeter Swan		x	x		x
Virginia Rail	x	x	x	x	x
Whistling Swan	x	x	x	x	x
White-fronted Goose	x	x	x	x	x
White-winged Scoter	x	x	x		x
Wood Duck	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>
Subtotal	35	40	39	31	42

5 SMALL GAME-MAMMAL SPECIES

Abert Squirrel	x				
Desert Cottontail	x	x	x	x	
Mountain cottontail	x	x	x	x	x
Pigmy Cottontail		x	x		x
Snowshoe Hare	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>
Subtotal	4	4	4	3	3

Game Species of Utah	REGION				
	Southeastern	Southern	Central	Northeastern	Northern

12 SMALL GAME-UPLAND BIRD SPECIES

Blue Grouse	x				
California Quail	x	x	x	x	x
Chukar	x	x	x	x	x
Gambels Quail	x	x	x	x	x
Hungarian Partridge		x			
Merriam's Turkey	x		x		x
Ring-necked Pheasant	x	x			
Ruffed Grouse	x	x	x	x	x
Sage Grouse	x	x	x	x	x
Sharp-tailed Grouse		x	x	x	x
White-tailed Ptarmigan					x
White-winged Pheasant				x	x
Subtotal	<u>9</u>	<u>9</u>	<u>7</u>	<u>7</u>	<u>9</u>
<hr/>					
100 Total Game Species in Utah	78	83	81	73	86

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Table 2. Classification of the 466 species of vertebrate wildlife that inhabit six biogeographic areas within Southeastern Utah.

	Biogeographic Areas ¹					
	A	B	C	D	E	F
FISH	14	20	15	15	24	31
Protected-Threatened	(0)	(1)	(1)	(1)	(1)	(1)
Protected-Endangered	(0)	(3)	(2)	(1)	(1)	(2)
Protected-Nongame	(10)	(11)	(9)	(10)	(12)	(16)
Protected-Game	(4)	(5)	(3)	(3)	(10)	(12)
AMPHIBIANS	6	5	6	7	7	10
Protected-Nongame	(1)	(1)	(1)	(1)	(1)	(2)
Unprotected-Nongame	(5)	(4)	(5)	(6)	(6)	(8)
REPTILES	18	14	15	14	21	28
Unprotected-Nongame	(18)	(14)	(15)	(14)	(21)	(28)
BIRDS	242	244	242	235	251	262
Protected-Extirpated	(1)	(1)	(1)	(1)	(1)	(1)
Protected-Threatened	(0)	(0)	(0)	(0)	(0)	(0)
Protected-Endangered	(2)	(2)	(2)	(2)	(2)	(2)
Protected-Nongame	(199)	(202)	(202)	(193)	(208)	(217)
Protected-Game	(39)	(38)	(36)	(38)	(39)	(41)
Unprotected-Nongame	(1)	(1)	(1)	(1)	(1)	(1)
MAMMALS	84	80	80	65	66	90
Protected-Threatened	(0)	(0)	(0)	(0)	(0)	(0)
Protected-Endangered	(1)	(1)	(1)	(1)	(0)	(1)
Protected-Extirpated	(2)	(2)	(2)	(0)	(2)	(2)
Protected-Game	(18)	(19)	(19)	(12)	(16)	(19)
Unprotected-Extirpated	(0)	(0)	(0)	(0)	(0)	(0)
Unprotected-Nongame	(63)	(58)	(58)	(52)	(53)	(62)
Total Protected Species	277	286	279	263	293	317
TOTAL:	364	363	358	336	369	421

¹ Biogeographic areas of southeastern Utah
A- Wasatch Plateau east of Skyline Drive
B- West Tavaputs Plateau
C- East Tavaputs Plateau
D- San Rafael Swell and Desert
E- Henry Mountains and Burr Desert
F- Mountains and Deserts south of I-70 in Grand and San Juan counties

VERTEBRATE SPECIES OF WILDLIFE HAVING HIGH INTEREST TO THE
STATE OF UTAH

Class of Animal	Number of species		
	Statewide ¹	SER ²	Coop--Trail and Bear Canyons
Fish	33	20	4
Amphibians	3	2	1
Reptiles	10	4	2
Birds	104	95	25
Mammals	61	40	26
TOTAL	211	161	58

- Utah Division of Wildlife Resources as the state of Utah's wildlife authority recognizes 211 species of vertebrate wildlife that inhabit the state as being of high interest. High interest wildlife represent all game species and all species having significant economic importance from either a consumptive or nonconsumptive perspective or special aesthetic, scientific or educational values. This list includes all federally listed threatened or endangered species of wildlife.
- Evaluation of data presented in Utah Division of Wildlife Resources publication No. 78-16, "Species List of Vertebrate Wildlife That Inhabit Southeastern Utah" shows that 161 of the 211 species of the state's high interest wildlife inhabit the Southeastern Region (SER) of the state on occasion or during different seasons of the year.

Game Species of Utah	REGION				
	Southeastern	Southern	Central	Northeastern	Northern

12 SMALL GAME-UPLAND BIRD SPECIES

Blue Grouse	x				
California Quail	x	x	x	x	x
Chukar	x	x	x	x	x
Gambels Quail	x	x	x	x	x
Hungarian Partridge		x			
Merriam's Turkey	x		x		x
Ring-necked Pheasant	x	x	x		
Ruffed Grouse	x	x		x	x
Sage Grouse	x	x	x	x	x
Sharp-tailed Grouse		x	x	x	x
White-tailed Ptarmigan					x
White-winged Pheasant				x	x
Subtotal	<u>x</u> 9	<u>x</u> 9	<u>x</u> 7	<u>x</u> 7	<u>x</u> 9

100 Total Game Species in Utah	78	83	81	73	86
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UMC 783.20; FISH AND WILDLIFE RESOURCE INFORMATION
COOP MINE COMPANY, TRAIL AND BEAR CANYON MINING PROJECTS

General Wildlife Resource Information--All Species of Vertebrate Wildlife

The mine plan area encompasses a portion of the Wasatch Plateau in Emery County, Utah. This area drains into the Huntington Creek and onto the San Rafael River, which flows into the Green River and ultimately into the Colorado River at a point upstream from Lake Powell. Generally speaking, the Wasatch Plateau is encompassed by cold desert (upper Sonoran life zone), submontane (Transition life zone) and montane (Canadian, Hudsonian and Alpine life zones) ecological associations. These life zones could be inhabited on occasion and during different seasons of the year by about 364 species of vertebrate wildlife--14 fish species, 6 amphibian species, 18 reptile species, 242 bird species and 84 mammal species. It is interesting to note that 83 percent of these species are protected.

The mine plan area itself is represented by the Transition and Canadian life zones and provides habitat for approximately 239 species of wildlife--5 fish species, 6 amphibian species, 17 reptile species, 136 bird species and 75 mammal species. Fifty-eight of these species are of high interest to the State of Utah.

The Division Publication No. 78-16 "Species List of Vertebrate Wildlife that Inhabit Southeastern Utah" is appended (Appendix A) to this report since it represents a low level of study for the wildlife species listed. It identifies those species having potential to inhabit the region as well as those inhabiting the environs of the mine plan area. Appendix A also identifies which species are considered to be of high interest for the habitats and local area represented.

High interest wildlife are defined as all game species; any economically important species; and any species of special aesthetic, scientific or educational

significance. This definition would include all federally listed, threatened and endangered species of wildlife.

A ranking and display of wildlife habitats and use areas relative to high interest species of vertebrate wildlife has been developed (Table 1 and 2 and the attached map). Critical wildlife use areas followed in respective importance by high-priority, substantial value and limited value wildlife use areas require various levels of protection from man's activities and developments. Wildlife habitats and use areas are ranked as being of critical or high-priority value to wildlife should be protected from surface disturbance, subsidence impacts and human or industrial disturbance. This can be accomplished through development and implementation of a wildlife plan.

Critical wildlife use areas are "sensitive use areas" necessary to sustain the existence and perpetuation of one or more species of wildlife during crucial periods in their life cycles. These areas are restricted in area and lie within high-priority wildlife use areas. All stream sections, reservoirs, lakes and ponds identified by Utah Division of Wildlife Resources as Class 1 or 2 are classified as being critical. Biological intricacies dictate that significant disturbances cannot be tolerated by the members of an ecological assemblage on critical sites. Professional opinion is that disturbance to critical use areas or habitats will result in irreversible changes in species composition and/or biological productivity of an area.

High-priority wildlife use areas are "intensive use areas" for one or more species of wildlife. "Intensive use areas" are not restricted in area and in conjunction with limited value use areas form the substantial value distribution for a wildlife species. All stream sections, reservoirs, lakes and ponds identified by Utah Division of Wildlife Resources as Class 3 are classified as being of high-priority. In addition, wildlife use areas where surface disturbance or

underground activities may result in subsidence that could interrupt underground aquifers and result in a potential for local loss of ground water and decreased flows in seeps and springs should be considered as being of high-priority to wildlife.

Substantial value wildlife use areas are "existence areas" for one or more species of wildlife. "Existence areas" represent a herd or population distribution and are formed by the merging of high-priority and limited value wildlife use areas for a species. All stream sections, reservoirs, lakes and ponds identified by Utah Division of Wildlife Resources as Class 4 are classified as being of substantial value.

Limited value wildlife use areas are "occasional use areas" for one or more species of wildlife. "Occasional use areas" are part of the substantial value wildlife use area for a species. All stream sections, reservoirs, lakes and ponds identified by Utah Division of Wildlife Resources as Class 5 or 6 are classified as being of limited value.

MAPPING

Vegetation and Wildlife Habitats

It is recommended that the Company's primary effort be placed on identifying species of vegetation in each wildlife habitat within the various wildlife use areas for purposes of reclamation. The Division does not have site specific information relative to vegetation types at the mine plan area. However, there are nine wildlife habitats present--riparian or wetland types, cliffs and tallus, sagebrush, pinion-juniper forest, shrubland, aspen forest, ponderosa forest, parkland and spruce-fir forest. The Company should identify each of these habitat associations on appropriately scaled maps.

It is believed that if satisfactory reclamation is achieved and man's disturbance does not continue or become a factor, that most species of wildlife dis-

placed from the mine plan area will return. Without doubt, the key to success for enhancing or restoring wildlands will be development of habitats so that the postmining condition as compared to the premining condition will have similar species, frequency and distribution of permanent plants in each vegetative type this will allow for natural plant succession. Additionally, other habitat features that represent the various life requirements for local wildlife must be provided.

Wildlife Use Areas

There are maps available for you to copy at our Southeastern Regional Office in Price, Utah, that display high value use areas for high interest wildlife on or adjacent to the mine plan areas. This display includes stream sections and bodies of water, if any, utilized by high interest fish species. Also displayed are known seeps, springs, wetlands, and riparian zones. All vertebrate species of high interest wildlife and their distributions are discussed in the following narrative.

Water

Due to demands of state and federal coal mining regulations, the company will probably be required to identify and appropriately monitor all surface waters for potential impacts from subsidence. This information should be correlated with the wildlife use area information due to the value of water to wildlife.

FISH AND WILDLIFE INVENTORY

Aquatic Use Areas

Macrophytes

From a position of the aquatic wildlife resource it is believed that there is no practicality for information relative to macrophytes to be addressed by the mine permit application; such information is not generally available.

Macroinvertebrates

The results from studies of macroinvertebrates may be required for purposes of determining need for stream buffer zones (UNC 817.57) in stream sections supporting biological communities. Since historic impacts from this mine's operation have impacted Huntington Creek and Trail Creek data relative to macroinvertebrates as a pollution index or a forage base for fishes or other predators dependent upon the aquatic resource need be presented.

Note, impact avoidance procedures that would protect the integrity of the aquatic resource need to be included with the mine permit application. Of importance would be facility designs and operational plans that will preclude further impacts on both streams and identification of procedures that will be utilized to keep any form of coal sediments or other pollution from entering Trail Creek and Huntington Creek. Snow removal is a significant contribution of sediments to local riverine systems. Deposition of coal particles in the aquatic system could have a variety of negative impacts on invertebrate and fish populations.

The results from long-term studies of macroinvertebrates in Huntington Creek and Trail Creek would be of value for the Company to demonstrate when impacts that resulted from accumulations of coal and other sediments in each creek have ceased. Other sediments have resulted from encroachment of the road upon Trail Creek. These accumulations of sediments will likely continue until coal particles cease to enter either creek and the encroachment problems alleviated.

Studies relative to macroinvertebrates if desired or needed, must be conducted by a qualified, private consultant.

Fish--Species Occurrence and Use Areas

Aquatic habitats associated with the mine plan area support three species of game and two species of nongame fish; all of which are protected. Of these fish, four species have been determined to be of high interest to Utah (Appendix A and

reference the Division Publication No. 78-16).

The yellowstone cutthroat trout is an introduced species. It annually spawns between early May and mid-July. Most populations are sustained through natural reproduction; hatching is usually completed by mid-July.

The rainbow trout is an exotic species. Within Utah there are several different strains of this species. Generally speaking they spawn from mid-March through June; hatching is normally completed by late June. It is important to note that natural reproduction by this species is almost non-existent, since it is managed as a stocked population. This management scheme has resulted since their catchability is higher than other trout and the life expectancy of hatchery fish is short.

The brown trout is an exotic species. Its spawning period begins as early as mid-October and is normally completed by late December; hatching of eggs begins in the spring and is usually completed by late May. Most populations are sustained through natural reproduction and supplemental plantings of fingerling brown trout.

The spawning period represents a crucial period for maintenance of trout populations; spawning areas are ranked as being of critical value. Such areas are characterized by clean, gravel zones that are at least six inches deep. These zones must also be covered by a minimum of six inch deep water flowing at a velocity of not less than one foot per second. These physical parameters are necessary for optimum spawning success.

Once the cutthroat or rainbow trout have spawned their eggs incubate in the redds approximately 30 to 50 days--water temperatures ranging from 45 to 50 F. Brown trout eggs incubate throughout the winter which lasts approximately 100 to 150 days--water temperatures ranging from 35 to 40 F. During this crucial period water temperature affects the rate of embryonic develop--the warmer the water the more quickly incubation is completed. It is also during this period

that ongoing sedimentation can result in suffocation of the eggs. Fluxuations in stream flow also negatively affects incubation; wherever practicable, maintenance of a constant flow of water during the spawning period enhances reproductive success.

The mottled sculpin is a native species. It annually spawns in the spring between February and May. All of their populations are sustained through natural reproduction. The spawning period represents a crucial period for maintenance of sculpin population; spawning areas (nest) are ranked as being of critical value. Such areas for sculpin are characterized as a nest scooped out beneath a stone or other submerged object. Spawning areas must have clean, gravel or rubble zones. Both the adult fish attend and defend the nest. They are known to spawn in water temperatures ranging from 45 to 48 F.

The reach of Huntington Creek adjacent to the project area (stream section 3) is ranked as being of high-priority to Utah's cold water fishery management program and is a Class 3 fishery. It supports natural reproduction of self-sustaining cutthroat and brown trout populations. Occasionally, fingerling transplants of both of these species supplement the population. The majority of trout in this stream section are hatchery planted, catchable sized rainbow trout. Section 3 of Huntington Creek is also inhabited by mottled sculpin and mountain sucker.

Although there are not fish in Trail Creek, its flow of water is of great value for reproductive success of spawning trout in the lower reaches of Huntington Creek for which it is a tributary water. Additionally, drift of macroinvertebrates from this stream represent an important contribution of forage to trout and other fishes in Huntington Creek.

If project operations are planned or develop that would alter, destroy or discharge polluting effluents into any perennial waters, appropriate state and federal permits, a mitigation plan and results from high level studies of the

salmonid fishery resource, if any, would be required of the Company. Achievement of mitigation would demand detailed studies of stream velocity correclated to flow, representatives of the stream channel profile, gradient, pool-riffle ratio, substrata types identifying percent representation of each type and surface water information required for SMC 779.16.

If modification of flows is anticipated, instream flow requirements must be considered to meet the needs of the existing fisheries, "biological community" and maintenance of existing riparian or wetland zones. Such baseline information would allow for development of mitigation or reclamation plans that would allow for avoidance, lessening or mitigation of impacts to the fishery and maintenance or re-establishment of unique habitat types. This baseline information is not generally available and would necessitate the services of a qualified private consultant and/or contracting Utah's Division of Wildlife Resources since special permits would be required.

It is important to note that no species of fish having relative abundances so low as to have caused them to be federally listed as threatened or endangered inhabit the mine plan or adjacent areas. The endangered humpback chub, bonytail chub and Colorado squawfish inhabit the Green and Colorado Rivers. Additionally, the humpback (razorback) sucker also inhabits those rivers; it is likely that this species will one day be federally listed as threatened. It is not believed that implementation and operation of the Company's project will impact any of these species.

Terrestrial Use Areas

Wildlife Habitat Types

Of the nine wildlife habitat types present on the mine plan area wetlands and riparian habitats are ranked as being of critical value to all wildlife. Such zones are normally associated with drainage bottoms (ephemeral or intermittent), or perennial streams (UNC 700.5), seeps and springs within the upper Sonoran,

Transition and Canadian life zones. Cliffs and their associated tallus areas that lie within the upper Sonoran and Transition life zones are ranked as being of high-priority value to all wildlife. When compared to all other wildlife habitats the aforementioned situations are considered to represent unique habitat associations (Table 1).

Riparian and wetland areas are highly productive in terms of herbage produced and use by wildlife as compared to surrounding areas. Experience has shown that as much as 70 percent of a local wildlife population are dependent upon riparian zones. Cliffs and tallus are of special importance to many high interest wildlife. These unique habitat types must be identified in the permit application and protected due to their high value for all wildlife.

Quantitative (acreage) and qualitative (condition, successional stage and trend) data concerning the wildlife habitats in each ecological association should be included as part of the mine permit application. It is important to note that each legal section of land represented by the mine plan and adjacent areas has been ranked as to its value for the total wildlife resource. Sections 13, 14, 15, 22, 23, 24, 25 and 26 of Township 16 South Range 7 East have been ranked as being of critical value to wildlife. These rankings were developed through an analysis of cumulative values for use areas of individual wildlife species inhabiting each legal section of land (Table 2).

Amphibians--Species Occurrence and Use Areas

Six species of amphibians, all of which are protected, are known to inhabit the biogeographic area in which the mine plan and adjacent areas are located. It is probable that all of these species inhabit the project area (reference the Division Publication No. 78-16). Only one species of the amphibians inhabiting the project area have been determined to be of high interest to the State of Utah (Appendix A).

The tiger salamander is a yearlong resident animal of the project area. The substantial value use area for the adult form is represented by any moist underground site or any similar habitat such as inside rotten logs, cellars or animal burrows. Such sites can be found within any wildlife habitat extending from the cold desert (upper Sonoran life zone) through the submontane (Transition life zone) and into the montane (Canadian life zone) ecological association. The larva form, often referred to as a mud-puppy, is a gilled animal that must remain in water within the above described ecological associations. It is interesting to note that the larva may fail to transform into an adult, even after their second season, and they can breed in the larva condition.

Once the larva is transformed into the adult form the animal is primarily terrestrial. Salamanders do migrate to water in the spring for breeding and may remain there during much of the summer. Such an intensive use area would be ranked as being of high-priority value to the animal. In September the newly transformed animals leave the water to find suitable places to spend the winter.

The tiger salamander breeds from March through June and is sexually mature after one year. The male deposits a small tent-shaped structure containing a myriad of sperm on the pool bottom. During courtship the female picks up this structure in her cloaca; then the eggs are fertilized internally before or just at the time they are laid. The eggs, singly or in small clusters, adhere to submerged vegetation; after 10 to 12 days they hatch. Obviously, a critical period for maintenance of the population is when breeding salamanders, eggs or their larva are inhabiting a water.

Post-embryonic development of a salamander's larval form progresses at a pace somewhat controlled by water temperature; in some cold waters the larva may not transform into an adult and drying up of a pool may hasten the process.

Migration to or from water usually occurs at night, during or just after a rain storm. When inhabiting terrestrial sites the tiger salamander is most active

at night, particularly on rainy nights, from March through September.

Larva, when small feed on aquatic invertebrates and become predacious to the point of cannibalism when they are larger. Food items for adults include insects, earthworms and occasionally small vertebrates.

No amphibians have relative abundances that are so low to have caused the animal to be federally listed as a threatened or endangered species.

Reptiles--Species Occurrence and Use Areas

Eighteen species of reptiles, all of which are protected, are known to inhabit the biogeographic area in which the mine plan and adjacent areas are located. It is probable that seventeen of these species inhabit the project area (Reference the Division Publication No. 78-16). Only two species of the reptiles inhabiting the project area have been determined to be of high interest to the State of Utah (Appendix A).

The Utah milk snake is a yearlong resident animal of the project area. Its substantial value use area encompasses all wildlife habitats extending from the upper Sonoran (cold desert life zone) through the submontane (Transition life zone) and into the montane (Canadian and possibly Hudsonian life zone) ecological associations. Although its use area spans a multitude of habitats, the animal is extremely secretive, mostly nocturnal and is often found inside or under rotten logs, stumps, boards, rocks or within other hiding places. At night they can be found in the open where they hunt for small rodents, lizards and other small snakes. Occasionally, the milk snake may take small birds or bird eggs.

The milk snake may live beyond twenty years and it becomes sexually mature during its third spring season. After mating, which occurs during spring or early summer when they are leaving the den, female milk snakes produce clutches which average seven eggs. The eggs are secreted in a moist warm environ and then abandoned; incubation lasts 65 to 85 days. The site where an individual snake has

deposited its clutch of eggs is of critical value to maintenance of the species.

The Utah mountain kingsnake is a yearlong resident animal of the project area. Its substantial value use area encompasses all wildlife habitats extending from the submontane (Transition life zone) into the montane (Canadian and possibly Hudsonian life zones) ecological association. Little is known concerning this animal except that it frequents areas of dense vegetation and that it is often found near water. Its life history and food habits parallel that described for the Utah milk snake.

To date snake dens, which are protected and of critical value to snake populations, have not been identified on or adjacent to the project area. It is important to note that inventory for such has not been attempted. If the Company at some later time discovers a den it should be reported to the Utah Division of Wildlife Resources. If a den(s) is currently known, its location must be included with the permit application.

No reptiles have relative abundances that are so low to have caused the animal to be federally listed as a threatened or endangered species.

Birds--Species Occurrence and Use Areas

Two hundred forty-two species of birds, all of which are protected, are known to inhabit the biogeographic area in which the mine plan and adjacent areas are located. It is probable that one hundred thirty-six of these species inhabit the project area (Reference the Division Publication No. 73-16). Twenty-five species of the birds inhabiting the project area have been determined to be of high interest to the State of Utah (Appendix A).

Ducks commonly known as waterfowl are not known to utilize the project area, but may on occasion or during different seasons of the year make limited use of the riparian area. All of these species are of high interest to the State of Utah (Appendix A). Generally speaking, the riparian and wetland habitats encompassed

by the project and adjacent areas provide substantial valued habitats for waterfowl. Each species has different life requirements and makes various uses of the riparian and wetland habitats.

For those waterfowl that nest locally, the period March 15 through July 15 is ranked as being of crucial value to maintenance of the population. Following incubation, which dependent upon the species may vary between 20 and 28 days and extend up until mid-August, the riparian and wetland habitats represent a high-priority brooding area. Additionally, the wetland habitat (large open water areas or dense marshland, none of which exist on the project area) is of high-priority for seclusion and protection of adult waterfowl during their flightless period when they moult. Males may begin the moult in early June and both sexes and the young are capable of flight by mid-August.

The project and adjacent areas provides substantial valued habitat for a multitude of raptors--turkey vulture, bald and golden eagles, four species of falcons (prairie, American and arctic peregrine falcons and American kestrel), five species of hawks (goshawk, sharp-shinned, Cooper's, red-tailed and Swainson's hawks) and seven species of owls (barn, screech, flammulated, great horned, pygmy, long-eared and saw-whet owls). Many of these species are of high federal interest pursuant to 43 CFR, 3461.1 (n-1). All of these species are of high interest to the State of Utah (Appendix A).

Realistically, nesting habitat does not exist on the project or adjacent areas for many of these species. However, if a species were to nest on or adjacent to the project area, it would have a specific crucial period during which the aerie would need protection from disturbance; this period of time lies between February 1 and August 15. Generally speaking, aeries represent a critical valued site and need protection from significant or continual disturbance within a one-half kilometer radius of the nest. This consideration need only be implemented during

the period of time that the nest is occupied. Species specific protective stipulations for aeries are available from the Utah Division of Wildlife Resources and the U.S. Fish and Wildlife Service.

The current level of data relative to site specific use of the area by raptors is unsatisfactory. Likely, there are aeries that have not been identified. Many of these species are highly sensitive to man's disturbances. Therefore, it is recommended that intensive surveys be initiated on the mine plan and adjacent areas for determination of locations for raptor aerie territories. Such data needs to be merged with information provided within this report.

Golden eagles are a common yearlong resident of the mine plan area. There are no known active aerie territories associated with the project. (Note, an aerie territory is utilized by one pair of eagles but may contain several nest sites).

It is believed that aerie territories for eagles may exist on the project area. This belief is based upon the fact that suitable nesting habitat is widespread on the mine plan area and throughout the local area. It is important to note that the regularity of golden eagle observations and the fact that their status is common has resulted in documentation of mostly opportunistic observations of aerie territories.

An active golden eagle nest site is extremely sensitive to disturbance within a one-half kilometer radius. This buffer zone is ranked as being of critical value to maintenance of the eagle population when the bird is actually utilizing the aerie; that period of time is normally between April 15 and June 15. The radius for a buffer zone may need to be increased to one kilometer if a disturbance were to originate from above and within direct line of sight to the eagle aerie.

To date there are no known high-priority concentration areas or critical roost trees for golden eagles on the project area. The mine plan and adjacent

areas have been ranked as being of substantial value to golden eagles.

The northern bald eagle is an endangered winter resident (November 15 to March 15) of the local area. To date there are no known high-priority concentration areas or critical roost trees for this species on or adjacent to the project. The mine plan area has been ranked as being of substantial value to wintering bald eagles. Note that no bald eagles are known to nest in Utah, however, historic data documents nesting activity by these birds in the State. There is no known historic evidence of the northern bald eagle nesting on the mine plan or adjacent areas.

The American peregrine falcon (relative abundance is endangered) and the prairie falcon (relative abundance is common) are yearlong residents of the mine plan and adjacent areas. Each of these species utilizes cliff nesting sites. To date there are no known aerie sites for cliff nesting falcons on the project area. However, suitable nesting habitat for the prairie falcon is widespread. Suitable nesting habitat for the American peregrine falcon cannot be found on the mine plan and adjacent areas. Since existence on the area by prairie falcons would not be unlikely, the project area has been ranked as being of substantial value to this cliff nesting falcon. However, the project area only is ranked as being of limited value to peregrine falcons.

For each falcon their aerie site while being utilized and a one-half kilometer radius would be ranked as being of critical value to maintenance of their populations. The falcon's period of use at the aerie site spans the spring and early summer period--prairie falcon, April 15 to June 30; peregrine falcon, March 1 to June 30.

The level of data relative to site specific use of the project area by cliff nesting falcons (not including the kestrel) is unsatisfactory and there could be aeries that have not been identified. Therefore, it is recommended that intensive surveys be initiated on the area for determination of locations for cliff falcon

aerie sites.

The endangered arctic peregrine falcon is a winter resident (November 15 through March 15) of the local area. This species has not been observed to utilize the environs on or adjacent to the mine plan area, however, its occasional presence would not be unlikely. Therefore, the project area is ranked as being of limited value to this species.

The blue grouse is a yearlong resident of the project area. Adult birds prefer open stands of conifers. During winter the blue grouse feeds exclusively upon needles and buds of douglas-fir and spruce trees. Thus, this wildlife habitat (spruce-fir forest) is ranked as being of critical value to over-winter survival of the population during the crucial period of December through February.

Blue grouse annually exhibit what has been termed a reverse vertical migration. That is, during the spring months, they migrate from the high elevation spruce-fir habitat to lower elevation sagebrush, pinion-juniper or shrubland habitats. This movement is caused by a need of the birds to feed on early developing vegetation. Such movement also facilitates successful breeding, nesting and brooding of their young. Then as the year progresses, they move to the higher elevations.

The males are polygamous and will set up and defend territories for booming and breeding activities against other breeding males. Such territories are critical to maintenance of the population during the crucial period of mid-March through mid-June.

After breeding the female develops a nest site which is secreted on the ground; the nest is of critical value to maintenance of the blue grouse population. Upon hatching, which occurs in late May and early June, the young accompanied by the hen immediately leave the nest. The young blue grouse while being brooded rely heavily on insects for their protein needs during the first several months

of development. The adult bird also shifts its diet during this period to include a high proportion of insects. Brooding areas are ranked as being of high-priority value to blue grouse. The crucial period extends from hatching into mid-August.

As summer progresses into the fall season the grouse consumes large quantities of berries.

The ruffed grouse is a yearlong resident of the project area. These grouse are usually found in the continuum of habitats extending from aspen to shrubland types. But, during winter they often roost in dense stands of conifers. Generally speaking ruffed grouse prefer habitats lying within 0.25 mile of a stream course; such areas are ranked as being of high-priority value to their population. During winter the ruffed grouse feeds exclusively upon staminate aspen buds. Thus, this wildlife habitat (aspen forest) is ranked as being of critical value to over-winter survival of the population during the crucial period of December through February. During the remainder of the year their diet shifts to include a wide variety of plant and insect material.

Ruffed grouse do not exhibit any type of seasonal migration.

The males are polygamous and will set up and defend territories against other breeding males. The focal point for breeding activity is the drumming log; all such logs are ranked as being of critical value to grouse since they represent sites of historical use. Such territories are critical to maintenance of the population during the crucial period of early March through May.

After breeding the female develops a nest site which is secreted on the ground and deep within an aspen grove; the nest is of critical value to maintenance of the ruffed grouse population. Upon hatching, which occurs in late May and early June, the young accompanied by the hen immediately leave the nest. The young ruffed grouse while being brooded rely heavily on insects for their protein needs during the first several months of development. The adult bird

also shifts its diet during this period to include a high proportion of insects. Brooding areas are ranked as being of high-priority value to ruffed grouse. The crucial period for brooding extends from hatching into mid-August.

The band-tailed pigeon is a summer resident of the project area. This bird is seldom observed to utilize the Wasatch Plateau, but when observed the species is only represented by a single bird, pairs or even less frequently a small flock. Since the band-tailed pigeon's use of the Wasatch Plateau is best described as "occasional", the environs associated with the project are only ranked as being of limited value to the bird. Nesting birds select their nest in trees within the spruce-fir wildlife habitat. Peak on-nest activity occurs in late July and early August.

Mourning doves normally inhabit the project and adjacent areas, which represents a substantial valued use area for these birds, between May 1 and September 15 each year. They nest throughout most of this period and each pair produces two clutches. The pinion-juniper and riparian habitats are ranked as being of high-priority value for nesting. Locally, mourning doves show two peaks in on-nest activity--early July and early August. Successful nesting activities and any water sources are critical to maintenance of the mourning dove population.

The yellow-billed cuckoo is a summer resident of the project area. This bird only nests in the riparian wildlife habitat, therefore, such areas are of critical value to maintenance of this species. Little is known concerning the yellow-billed cuckoo. Its nest is represented by a frail, saucer shaped structure of twigs and is always placed in bush or tree.

The black swift is a summer resident of the Wasatch Plateau. The montane ecological association represents the swift's substantial valued use area. Normally, the bird is associated with a small flock that represents a colony. Black swifts are usually observed soaring as pairs and they feed upon flying insects. A colony's nests are scattered along precipitous terrain where the nest is often

secreted behind a waterfall. Such a moist habitat is not known to exist on the project area. Cliff and tallus wildlife habitats are ranked as being of high-priority value to the black swift. There is evidence that pair bonds are long lasting and that a nest may be utilized in successive years.

The belted kingfisher is a yearlong resident of the project area. It is found only along riverine systems and its substantial value use area extends from the cold desert through the submontane and into the montane ecological associations. Therefore, the riparian wildlife habitat represents a high-priority valued use area for this bird. It feeds exclusively upon fish. The kingfisher's nest is always secreted within a burrow along stream banks, thus, dirt bank habitats along riparian areas are of critical value to this bird.

The pileated woodpecker is a species having high federal interest pursuant to 43 CFR 3461.1 (n-1). The spruce-fir and aspen wildlife habitats of the montane ecological association represent this birds substantial valued use area. It is important to note that the pileated woodpecker has never been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where the bird is known to exist, it is a yearlong resident with a relative abundance considered to be rare.

The Williamson's sapsucker is another species having high federal interest pursuant to 43 CFR 3461.1 (n-1). Typically, the substantial valued use area for this species is the spruce-fir habitat of the Hudsonian life zone in the montane ecological association. Therefore, the spruce-fir habitat of the Canadian life zone on the project site would only represent the substantial valued use area for the yellow-bellied sapsucker. The yellow-bellied sapsucker is a yearlong resident of the environs associated with the project area and it has a relative abundance considered to be common. Where as the Williamson's sapsucker has never

been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where the Williamson's sapsucker is known to exist, it is a summer resident with a relative abundance considered to be uncommon.

The Lewis woodpecker is also another species having high federal interest pursuant to 43 CFR 3461.1 (n-1). Its substantial valued use area is represented by riparian habitats characterized by cottonwood stands and ponderosa forests. These habitats do not exist on the project site. It is important to note that the Lewis woodpecker has never been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where the bird is known to exist, it is a summer resident or only a transient. Its relative abundance is unknown.

The purple martin is a summer resident known to inhabit the environs of the biogeographic area that surrounds the project site. In Utah its substantial valued use area is represented by open spruce-fir, aspen or ponderosa forest habitats of the montane ecological association. The purple martin feeds on flying insects and may secret its nest within any suitable above-ground cavity.

The western bluebird is an uncommon summer resident known to inhabit the environs of the biogeographic area that surrounds the project site. Where as the mountain bluebird is a common yearlong resident of the area. Both birds are cavity nesting species. The western bluebird nests from the pinion-juniper habitat of the submontane ecological association up into the lower forest habitats within the Canadian life zone of the montane ecological association. The mountain bluebird utilizes the same continuum of habitats for nesting, but also extends its nesting use across the Canadian and Hudsonian life zones and into the Alpine life zone. During winter both species show elevational and longitudinal migrations; they then utilize all habitats associated with the cold-desert ecological association. Therefore, the substantial valued use area for each species spans a

broad continuum of habitats. It is important to note that trees with cavities located on the project area can be of critical value to bluebirds.

Grace's warbler is a species having high federal interest pursuant to 43 CFR 3461.1 (n-1). Its substantial valued use area is shrublands and associated ponderosa forest habitats of the submontane and montane ecological associations. This bird's nest is built twenty or more feet above ground in a ponderosa tree. It is important to note that the Grace's warbler has never been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where it is known to exist, it is a summer resident with a relative abundance considered to be uncommon.

Scott's oriole is also a species having high federal interest pursuant to 43 CFR 3461.1 (n-1). Its substantial valued use areas are riparian habitats characterized by cottonwood stands and the continuum of habitats extending from the pinion-juniper forest into shrublands of the submontane ecological association. The oriole's nest is characterized as a grassy pouch and is hung in a tree. It is important to note that the Scott's oriole has never been documented to utilize the environs of the biogeographic area that surrounds the project site. In areas of the State where it is known to exist, it is a summer resident with a relative abundance considered to be uncommon.

Mammals--Species Occurrence and Use Areas

Eighty-four species of mammals, of which 25 percent are protected, are known to inhabit the biogeographic area in which the project and adjacent areas are located. It is probable that seventy-five of these species inhabit the project area (Reference the Division Publication No. 78-16). Twenty-six species of the mammals inhabiting the project area have been determined to be of high interest to the State of Utah (Appendix A).

The red bat is a summer resident of the biogeographic area that surrounds the project site. The animal roosts in wooded areas (riparian woods and pin-

ion-juniper forests) of the submontane ecological association. Such areas represent this animals substantial valued use area. An occasional individual has been known to utilize caves; those individuals could hibernate and remain over winter.

The western big-eared bat is a yearlong resident of the biogeographic area that surrounds the project site. This animal roosts and hibernates within caves, mine tunnels or suitable buildings located in the pinion-juniper, shrubland and low elevation spruce-fir habitats of the submontane and montane (Canadian life zone) ecological association. Such areas represent this bats substantial valued use area.

The snowshoe hare is a yearlong resident of the biogeographic area that surrounds the project site. Its relative abundance has been determined to be limited, since its substantial valued use area is restricted to the spruce-fir and nearby aspen and riparian habitats of the montane (Canadian and Hudsonian life zones) ecological association. Such areas are ranked as being of high-priority value to the animal during its breeding season which spans the period between early April and mid-August.

The cottontail rabbit (mountain cottontail inhabits sites lying between 7,000 and 9,000 feet in elevation and the desert cottontail inhabits sites lower than 7,000 feet in elevation) is a yearlong resident of the biogeographic area that surrounds the project site. The entire project area represents a substantial valued use area for cottontails. Their young are born between April and July. This is a crucial period for maintenance of the cottontail population.

The northern flying squirrel is a yearlong resident of the biogeographic area that surrounds the project site. Currently, its relative abundance is unknown. Its substantial valued use area is restricted to spruce-fir or other mixed conifer habitats of the montane (Canadian and Hudsonian life zones) ecological association.

This specie is the only nocturnal squirrel in Utah. The flying squirrel may build its nest within an old woodpecker hole or it may build an outside nest of leaves, twigs and bark. Mating occurs twice in each year--February through March and June through July. Afterwhich, two to six young are born after a gestation period of 40 days--April through May and August through September. These periods are of crucial value to maintenance of their populations. During winter flying squirrels are gregarious; 20 or more have been known to den together.

Beaver are yearlong inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area is restricted to riparian and adjacent aspen habitats (those located within 100 meters of the riparian zone) in the cold desert, submontane and montane (Canadian life zone) ecological associations. These animals construct a conical shaped lodge in which a family group lives throughout the year. The lodge is of critical value to maintenance of the beaver population. One litter of kits is produced each year; they are born between late April and early July after a gestation period of 128 days. Kits and yearlings coinhabit the lodge with the adult pair. When they attain 2 years of age they are forced to leave; females can breed at 2.5 years of age. Due to the animals dependency upon flowing water and the associated riparian vegetation, the riparian wildlife habitat is ranked as being of critical value to beaver populations.

The red fox is a yearlong inhabitant of the biogeographic area that surrounds the project site. The substantial valued use area for the red fox would include all wildlife habitats extending from the cold desert through the montane (Canadian life zone) ecological associations. Almost nothing is known of their population dynamics. Without doubt a crucial period for this specie is when they are caring for young in the den. Dens while being inhabited are a critical use area.

The gray wolf is a historic inhabitant of the biogeographic area that sur-

rounds the project site. Currently its relative abundance is so low that the animal is listed as endangered with extinction. The wolf's substantial valued use area would be represented by any remote habitat in any ecological association.

Black bears are inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area is represented by all natural wildlife habitats (excluding the pasture and fields and urban or parks types) extending from the submontane into the montane (Canadian and Hudsonian life zones) ecological associations. These animals go into a semi-hibernation during winter. During this crucial period, which may last from December through March, the animal secretes itself in a den in order to conserve body energy reserves. The young are born in the den during January or February. Dens while being inhabited represent a critical valued use area for bears.

Many of the members of the family mustelidae are known to inhabit the biogeographic area that surrounds the project site. They are all protected and classified as furbearers--short-tailed and long-tailed weasles, mink, wolverine, marten, badger, striped and spotted skunks. Additionally, raccoon and muskrat, although not furbearers, are also inhabitants of the biogeographic area that surrounds the project site. All of these species are of high interest due to their value in the fur market.

The substantial valued use area for short-tailed and long-tailed weasles, mink, muskrat and raccoons is the riparian habitat. Weasles, which are inhabitants of the project site, do make some use of other habitats that are proximal to riparian zones. Muskrats and raccoons are restricted to riparian habitats of the cold desert and submontane ecological association; thus, they are not found on the project area. The long-tailed weasle can be found from the cold desert up into the montane (Canadian and Hudsonian life zones) ecological associations. The short-tailed weasle and mink populations extend their use from the submontane into the montane ecological association. It is important to note that the weasle

is restricted to the Canadian life zone; where as the mink utilize the Canadian and Hudsonian life zones.

The substantial valued use area for marten and wolverine is the montane ecological association. The marten does not utilize the Alpine life zone but the wolverine can be found at that elevation. Both species could be found in the environs of the project site.

The substantial valued use area for badger and skunks span all wildlife habitats other than dense forests in the cold desert, submontane and montane (Canadian life zone) ecological associations. Skunks show some affinity for habitats proximal to water. Skunks and badgers are dependent upon a suitable prey source.

A crucial period for maintenance of all furbearers, raccoons and muskrat populations is when they have young in a nest, den or lodge. Such sites are critical for reproductive success.

Bobcat, Canada lynx and cougar are known to inhabit the biogeographic area that surrounds the project site. For all of these species a crucial period for maintenance of their population is when the female has her young secreted at a den site. Such sites are of critical value when being utilized. It is also crucial to their survival that a female accompanied by young not be killed or harassed.

The substantial valued use area for bobcats extends from the cold desert through the submontane and into the montane (Canadian life zone) ecological association. The bobcat is normally associated with precipitous terrain, but has been observed in every wildlife habitat within the aforementioned ecological associations. Their primary prey source is represented by small mammals and birds or any other small animal they can catch. It is important to note that bobcats occasionally do kill the young of big game animals.

The substantial valued use area for the Canada lynx is restricted to the

Canadian and Hudsonian life zones of the montane ecological association. Normally, this cat would only be expected to utilize riparian and forested wildlife habitats. The lynx is similar in predation habits to the bobcat.

The substantial valued use area for the cougar (locally known as mountain lion) extends from the submontane into the montane (Canadian and Hudsonian life zone) ecological association. Due to the dependency of the cougar upon mule deer as a prey source, a ranking of the lion's seasonal distribution parallels that of the deer.

Mule deer are inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area spans all wildlife habitats extending from the cold desert through the submontane and montane ecological associations. In some situations deer show altitudinal migrations in response to winter conditions. There are, however, habitats where deer reside on a yearlong basis (see attached map).

Migration of mule deer from summer range to winter range is initiated during late October; probably, the annual disturbance of the fall hunting season coupled with changing weather conditions is the initial stimulus. The onset of winter weather reinforces the deer's urge to migrate and continued adverse weather keeps the deer on the winter range.

A portion of the project site represents winter range for mule deer herd Unit 34. Winter ranges for mule deer are all ranked as being of high-priority value to the animal; these areas are usually inhabited between November 1 and May 15 each year. During winters with severe conditions the higher elevation portion of the winter range becomes unavailable to deer due to snow depth. Traditionally, some restricted portions of the winter range have shown concentrated use by the deer; these sites are ranked as being of critical value. It is important to note that all of the canyon bottoms associated with the project are of critical value to deer. Critical valued sites must be protected from

man's disturbance when the deer are physically present on the range.

Deer begin their migration back to summer range during mid-May and remain there throughout October. Summer ranges on the project area represent deer herd Unit 34. They are ranked as being of high-priority value to mule deer. In instances where extent of summer range is the major limiting factor for a deer herd, those summer ranges are ranked as being of critical value.

There are ranges that support mule deer on a yearlong basis. Most of these ranges are of limited value to deer. However, there are some areas supporting yearlong use that are ranked as being of high-priority value to deer. There are no yearlong ranges for mule deer on the project site.

Mule deer fawn during the month of June. The continuum of wildlife habitats extending from the pinion-juniper through the shrubland and into the aspen type probably represents the fawning area. All riparian areas are of critical value for fawning and maintenance of the deer population. To date no specific areas showing annual use for fawning are known. It is probable that such areas exist; they would be ranked as being of critical value to deer. It is important to note that June represents a crucial period for maintenance of deer populations.

Agriculture areas that are bisected by the access route to the project area are utilized yearlong by mule deer. Their use is sometimes intensified during the winter and spring periods.

Moose are inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area spans all wildlife habitats in the montane ecological association except those associated with the Alpine life zone. In some situations moose show altitudinal migrations in response to winter conditions. There are, however, habitats where moose reside on a yearlong basis (see attached map).

Migration of moose from summer range to winter range is initiated during late November; probably, changing weather conditions is the initial stimulus.

The onset of winter weather reinforces the moose's urge to migrate and continued adverse weather keeps the animal on the winter range.

A portion of the project site represents winter range for the Southeastern Utah moose herd--Huntington drainages. Winter ranges for moose that are characterized as riparian habitats are ranked as being of critical value, whereas the remainder of the winter ranges are ranked as being of high-priority value to the animal. Note that all riparian areas associated with the project have shown use by moose. Winter ranges are usually inhabited by moose between December 1 and May 15 each year. During winters with severe conditions the higher elevation portion of the winter range becomes unavailable to moose due to snow depth. Critical valued sites must be protected from man's disturbance when the moose are physically present on the range.

Moose begin their migration back to summer range during mid-May and remain there throughout November. Summer ranges on the project area support animals from the Huntington drainages of the Southeastern Utah moose herd. Those summer ranges are ranked as being of high-priority value.

Ranges that support moose on a yearlong basis are ranked as being of critical value.

Moose calf during late May and June. Calving takes place in the riparian or adjacent forest habitats. Without doubt, all riparian areas are of critical value for calving and maintenance of the moose population. To date no specific areas showing annual use for calving are known. It is probable that such areas exist; they would be ranked as being of critical value to moose. It is important to note that June represents a crucial period for maintenance of moose populations.

Rocky mountain elk are inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area spans all wildlife habitats

extending from the submontane through the montane ecological association. Elk do not show as strong of altitudinal migration as mule deer do in response to winter conditions, but they do migrate to wintering areas (see attached map).

Migration of elk from summer range to winter range is initiated during late October; probably, the annual disturbance of the fall hunting seasons coupled with changing weather conditions is the initial stimulus. The onset of winter weather reinforces the elk's urge to migrate and continued adverse weather keeps elk on the winter range.

A portion of the project site represents winter range for the Manti elk herd--Unit 12. Winter ranges for elk are all ranked as being of high-priority value to the animal; these areas are usually inhabited between November 1 and May 15 each year. During winters with severe conditions some portions of the winter range becomes unavailable to elk due to snow depth. Traditionally, some restricted portions of the winter range have shown concentrated use by the elk; these sites are ranked as being of critical value. The high ridges associated with the project are critical winter ranges for elk. Critical valued sites must be protected from man's disturbance when the elk are physically present on the range.

Elk begin their migration back to summer range during mid-May and remain there throughout October. Summer ranges on the project area support the Manti elk herd--Unit 12; they are ranked as being of high-priority value.

Elk calf during the month of June. Their preferred calving areas are best described as aspen forests with lush understory vegetation. All riparian areas on the summer range are of critical value for calving and maintenance of the elk population. To date no specific areas showing annual use for calving are known. It is probable that such areas exist; they would be ranked as being of critical value to elk. It is important to note that June represents a crucial period for maintenance of elk populations.

Currently, there are no other known high interest wildlife species or their habitat use areas on or adjacent to the project area. It is not unreasonable to suspect that in the future, some additional species of wildlife may become of high interest to the local area, Utah or the Nation. If such is the case, the required periodic updates of project permits and reclamation plans can be adjusted and appropriate recommendations made.

SMC 780.16 OR UMC 784.21; FISH AND WILDLIFE PLAN
COOP MINE COMPANY, TRAIL AND BEAR CANYON MINING PROJECTS

Mitigation and Impact Avoidance Procedures General to all Wildlife

Utah Division of Wildlife Resources provides the following recommendations in order to minimize disturbances and impacts on wildlife and their habitats that could be impacted during developmental, operational and reclamation operations at the Company's mining project. The recommendations address how enhancement of the wildlife resource and their habitats as discussed in UMC 783.20 can be achieved. They are also consistent with the performance standards of UMC 817.97. In instances where it would be necessary to restore or could be beneficial to enhance or develop high value habitats for fish and wildlife, recommended plant materials and rates of application are provided as "Appendix B" (UMC 817.97 and UMC 817.111 through 817.117). This list should prove useful in meeting the additional requirements to be imposed upon the operator if the primary or secondary land use will be for wildlife habitats (UMC 817.97 d 9). Additionally, "Appendix C" represents a list of commercial sources for plant materials.

The project and adjacent areas are represented by nine basic wildlife habitats which are inhabited on occasion and during different seasons of the year by about 239 species of vertebrate wildlife. The wildlife habitats and use areas for the "high interest" species from this group of wildlife have been ranked into four levels of importance. The most valuable to an individual species or ecological assemblage are the critical sites followed in respective importance by high-priority, substantial value and limited value sites. Each type of use area requires various and specific levels of protection from man's activities. Additionally, due to the variability of vegetation communities in each use area, various and specific tech-

nologies in site development will need to be evaluated for possible mitigations, enhancements of wildland habitats or the required level of reclamation. It is recommended that all land clearing impacts be designed so that irregular shaped openings are created in contrast to openings that would have straight edges.

It is recommended that the Company make significant efforts to educate all employees associated with their coal handling operation of the intricate values of the wildlife resource associated with the project and adjacent areas and the local area. Each employee should be advised not to unnecessarily or without proper permits harrass or take any wildlife. (Apprehension of wildlife violators has increased by nearly 250 percent during recent years in the region). It is especially important that wildlife not be harrassed during winter periods, breeding seasons and early in the rearing process. Exploration should be limited as much as possible during these crucial periods.

During winter wildlife are always in a depleted condition. Unnecessary disturbance by man causes them to use up critical and limited energy reserves which, often times, results in mortality. In less severe cases, the fetus being carried by mammals may be aborted or absorbed by the animal, thus reducing reproductive success of a population.

During breeding seasons, disturbance by man can negatively affect the number of breeding territories for some species of wildlife. Disturbance can also interrupt courtship displays and preclude timely interactions between breeding animals. This could result in reduced reproductive success and ultimate reductions in population levels.

Early in the rearing process, young animals need the peace and tranquility normally afforded by remote wildlands. It is also during this crucial period that young animals gain the strength and ability to elude man and other predators. This allows the young animal to develop in relatively unstressed situations and to

utilize habitats that are secure from predators. Disturbance by man can compromise this situation and result in abandonment of the young by the female, increased accidents that result in mortality to young animals or increased natural predation. It is recommended that employees be cautioned against disturbing young animals or females with young if accidentally located.

Employees associated with coal handling operations should be instructed that when wildlife are encountered during routine work that they not stop vehicles for viewing purposes. Moving traffic is less disturbing to wildlife than traffic that stops or results in out-of-the-vehicle activities. If viewing is desirable, the vehicle should only be slowed, but not stopped.

Hunting and other state and federal wildlife regulations must be adhered to by sportsmen utilizing the project area.

Mitigation and Impact Avoidance Procedures for Aquatic Wildlife

There are no recommendations for a wildlife plan that would enhance any fishery.

If ultimate operations are planned or occur that could physically or chemically impact any perennial stream beyond the impact of mere crossings, detailed reclamation plans will be required. Permanent culvert crossings exceeding a width of eight feet must have a natural bottom and devices for reducing stream velocity so that fish migration is not blocked. A reclamation plan for a stream or lake would have to provide for measurement of the physical characters of the water prior to disturbance. Such measurements should consider surface water information required in SMC 779.16, data on stream velocity, gradient, width, depth, pool-riffle ratio and substrata types.

Reclamation that would achieve development of a lake bed or stream channel similar in character to that which existed prior to disturbance should result in natural re-establishment of macroinvertebrates, macrophytes and a fish population. If merited, the Division could then introduce desired fishes into those waters.

This would adequately mitigate for disturbance and temporary loss of aquatic resources. There would be no mitigation for displacement and possible loss of other wildlife species dependent upon the aquatic wildlife as a prey source. It is believed that impacts on such species would not be significant.

It is also recommended that adequate precautions be taken to keep all forms of coal or other sediments from being inadvertently deposited along or within perennial stream channels. Similar precautions should be taken to preclude deposition of coal particles or sediments in or along other drainages from which the material could be transported during a precipitation event into a perennial stream. This would include blow-coal from haulage trucks, railroads or other transportation systems and storage piles. Control of larger coal particles from the above sources is equally important to control of fugitive dust. If needed, haulage vessels or storage sites should be covered, or the surface of the coal appropriately sprayed in order to solidify it against wind movement. Travel speeds of haulage vessels could be reduced so that coal is not allowed to leave the transportation system. The impacts of coal or other sediments on aquatic ecosystems are many and varied; therefore, sediments must be kept out of those systems.

Utah Division of Wildlife Resources reaffirms all of the recommendations in UMC 817.41 through 817.57 and UMC 817.126 for protecting the State's waters and their associated riparian and wetland zones along with the aquatic wildlife resource.

Mitigation and Impact Avoidance Procedures for Terrestrial Habitats

It is recommended that all wetland and riparian habitats be maintained. Roads and other facility developments should not destroy or degrade these limited, highly productive and unique habitats. Roads crossing through those areas should do so in a manner that is least damaging to the habitat. Wetlands and riparian habitats are ranked as being of critical value and are the most productive sites in terms of herbage and biota produced as compared to other local habitat types. It is probable

that a majority of the vertebrate wildlife that inhabit the project area make some use of riparian or wetland areas.

It is important to note that roads and other surface facilities to be constructed should as far as practicable be placed at sites where they will not compromise wildlife or their use areas. Also, surface facilities, including roads, should be screened if possible from wildlife use areas by vegetation or terrain.

In situations where wildland habitats have been or will be disturbed, reclamation is required. Also, there are sites where development or enhancement of wildland habitats through vegetation treatments and/or seedings and transplants of seedlings could benefit wildlife. "Appendix B" depicts the Division's recommendation for plant materials to be utilized for various wildlife habitats on wildland treatments that are intended to benefit wildlife. If circumstances arise where seed or seedling transplants for a recommended plant species are not available, suitable alternates are also recommended.

Seedling transplants from nursery stock as well as nearby rangelands would also be acceptable for some wildland treatments.

Appendix C represents an exhaustive list of commercial sources for plant materials for use in wildland treatments.

Temporary control of rodents may be required to ensure a successful rangeland treatment. It is recommended that the county agent be consulted in this area of concern. Poisoned oats are the most common and acceptable method for rodent control; however, only licensed persons may apply the treatment.

Currently, there are some new concepts in methodology for revegetation that are being successfully implemented in other parts of the nation and world. One promising method is a procedure where a large scoop removes, from a natural and stabilized site, a small area of earth intact with vegetation and subsurface soils for placement on a site to be restored. This same procedure can be utilized when disturbing pristine sites, except that the native vegetation is stored for use in

latent reclamation. Another meritorius method for stimulating natural revegetation, in combination with other reclamation techniques, is to plan facility developments so that islands of natural, native vegetation remain. This will allow for natural vegetation to spread from the islands. These techniques can also be useful for enhancement of poor quality sites that currently exist on the mine plan area.

Encapsulation of seed and fertilizer for several releases over a period of years after a single application is a new and possibly advantageous procedure. This technique along with soil stabilizing structures has been successfully used in South Africa. Dr. J. Van Wyk in the Department of Botany at Potchetstroom University in South Africa could provide additional information on this new technique.

There are also new specialized techniques coming to the forefront for stabilization of problem sites such as roadbanks and steep slopes. It is important that these sites be promptly and permanently revegetated in order to reduce siltation into local riverine systems. This will mitigate for damage to aquatic wildlife populations and habitats from siltation. Enhancement of existing problem sites or reclamation of disturbed sites can mitigate for salt loading of local river systems. It is believed that natural, nonpoint sources represent 50 percent of the salinity in the upper basin of the Colorado River system into which this mine plan area drains.

It is recommended the Company make numerous contacts with appropriate agencies, institutions and persons to ensure that enhancement or reclamation projects achieve the required degree of permanency, plant diversity, extent of cover and capability of regeneration to ensure plant succession. Generally speaking, seeding should be accomplished as late in the fall as possible. Seedling transplants need to be coordinated with local soil moisture conditions which are usually at optimum in the early spring just as the snow melts.

It is paramount that suitable vegetation be maintained and/or re-established if the life requirements of wildlife are to be satisfied in the postmining period. Success in this area of concern along with cessation of man's disturbances will likely result in a natural reinvasion and the resultant inhabitation by most wildlife species of an impacted site.

It is important to note that enhancement or reclamation projects that are to benefit wildlife must be properly designed so that all the life requirements of the target species are considered in conjunction with forage. Water must be provided or be present and thermal cover along with escape and hiding cover has to be in abundance. Loafing areas and travelways between the many types of use areas must also be provided. In order to meet these goals, a considerable degree of consultation will be required between the Company and Utah Division of Wildlife Resources.

As a service and also to ensure that the needs of wildlife are met, the various expertism within the Division of Wildlife Resources are available to the Company for consultation. For the most part, Larry Dalton, Resource Analyst, for the Southeastern Regional office at 455 West Railroad Avenue in Price, Utah 84501 (phone 637-3310) will coordinate any needed contacts. Richard Stevens, Wildlife Biologist, at the Great Basin Research Center, Box 704, in Ephraim, Utah 84627 (phone 283-4441) is available for consultation and site specific analysis concerning species for vegetation plantings, timing and techniques to achieve the best results.

In instances where revegetation projects are to be planned over coal waste areas, heavy metal uptake by the plants must be evaluated. It is recommended that the Company initiate an appropriate long-term monitoring program to determine the magnitude and resolutions, if needed, for this problem.

It is recommended that persistent pesticides not be utilized on the project area. Other alternate pesticides or forms of control should be utilized.

All hazards associated with the project operation should be fenced or covered to preclude use by wildlife; of special concern would be sites having potential to entrap animals or toxic materials.

Mitigation and Impact Avoidance Procedures for Amphibians and Reptiles

Enhancement or development of habitats that provides a diversity of vegetation will benefit amphibians and reptiles. It is important to note that all of these species are protected by Utah law. Due to the myriad and myths that surround these animals, it is urged that individual specimens not be destroyed. This is especially true for snakes since they are a valuable component of the ecosystem.

Snake dens are ranked as being of critical value to the population and are protected by law. If a den is located, it should be reported to the Utah Division of Wildlife Resources. Snake dens can be moved by the Division, but only with intensive efforts that may take a year or more (snakes are caught and removed in the spring and fall). Thus, construction of facility developments may take place in denning locations if there is sufficient lead time to relocate the occupants.

Mitigation and Impact Avoidance Procedures for Avifauna

It is recognizable that development and operation of a mining project will in some cases negatively impact many avian species through physical destruction of habitats and continual disturbance that makes other habitats unavailable or less desirable to an individual bird. It is also true that impacts that are negative to one species may be beneficial to another species. It is recommended that the Company plant native and/or ornamental berry producing shrubs around surface facilities. When mourning doves are a target species, sunflowers or blazing star should be planted. This will provide food and cover for many of the smaller species of birds, resulting in enhancement of their substantial value and high-priority habitats. This action would also mitigate for disturbances and destruction of avifauna habitats at other sites associated with project operations.

It is important to note that the nests of all avifauna (except the house sparrow, starling and rock dove) when active and their eggs are protected by federal (Federal Migratory Bird Treaty Act) or state laws (Utah Code 23-17-1 and 23-17-2). All avifauna utilize a nest during their reproductive process. Dependent upon the species, some nests are well developed while others may be represented by only a scrape on the ground. These sites when being utilized are critical to maintenance of individual bird populations; each species has a specific crucial time period in which the nest is occupied. It is during this crucial period that the nest must be protected from disturbance.

Several species of raptors frequent the project area. Their nests when active should not be disturbed and abandoned stick nests are never to be damaged. Every effort should be made to eliminate man's disturbance within visual sight or one-half kilometer radius of an active raptor nest. This distance would have to be increased to a one-kilometer radius if the cause for disturbance were to originate within view and from above the nest. This effort is demanded in the instance of golden eagles and cliff nesting falcons since they are sensitive to disturbance and could abandon the nest. Termination of man's use of a site would not be required if eagles or falcons constructed their nest after mining had been initiated, since it would demonstrate the individual bird's willingness to tolerate mining activities and the associated disturbance by man.

Roost trees for eagles, if located, must not be disturbed or destroyed. Similarly, activities planned for high-priority concentration areas of eagles must be designed and implemented so that they are not of significant disturbance to the birds.

As a general comment, whenever active raptor nests are observed or roost trees for eagles located, they need to be reported to the Utah Division of Wildlife Resources and the U.S. Fish and Wildlife Service.

Design and construction of all electrical power lines and other transmission facilities shall be designed in accordance with guidelines set forth in "Environmental Criteria for Electric Transmission System" published by the USDA and USDI in 1970 and/or the REA Bulletin 61-10 "Powerline Contacts by Eagles and Other Large Birds." It is also recommended that placement of utility poles over flat or rolling terrain be planned so that they are out of view of roads or at least 300 meters away from any roads. This will lessen opportunity for illegal killing of these valuable birds, since the poles can serve as suitable hunting perches for raptors. In some instances poles can result in an extension of raptor hunting territories, which would represent a beneficial impact.

During the crucial period of December through February spruce-fir forests and aspen forests need to be protected from man's disturbance so that blue grouse and ruffed grouse will not be impacted. Destruction of these wildlife habitats at any time of the year need be minimized due to their value to wildlife.

During the spring period (mid-March through mid-June) care needs to be taken that male blue grouse are not disturbed or precluded from establishing breeding territories. Similar precautions need be taken for male ruffed grouse (March through May) in the area of drumming logs.

Mature trees with natural cavities and dead snags need to be protected for use by cavity nesting birds. Trees with such a character are ranked as being of critical value to cavity nesting birds. The project should be planned so that three such trees are left standing per acre within 500 feet of forest openings or water and two such trees per acre in dense forested areas.

Mitigation and Impact Avoidance Procedures for Mammals

The lodges, nests and dens of all mammals or roosts in the instance of bat like mammals represent a critical use area for maintenance of their individual populations. The crucial period for any species is when the lodge, den, nest or roost is occupied. Therefore, such sites for any mammal must be protected from

disturbance during that period when it is being utilized.

Many species of mammals develop food caches in order to carry individual animals or family groups through periods when they cannot forage. Such sites are of critical value to maintenance of their populations and if located should not be destroyed or subjected to regular disturbance by man.

It is important to realize that within natural ecosystems there exists a predator-prey relationship. One species of animal may represent a prey source for other species. Therefore, it is important that project operations be designed and implemented so as to not unnecessarily disturb or destroy any wildlife or their habitats.

Big game ungulates--mule deer, moose and elk--each have seasonal use areas ranked as being of critical value to an individual herd. Such sites need to be protected from any of man's activities or developments that could result in destruction, loss or permanent occupancy of the site by man or has facility developments. If these types of impacts cannot be avoided the site must ultimately be reclaimed and revegetated. Also, critical valued areas need protection from disturbance during their appropriate crucial period.

High-priority valued use areas for all wildlife and particularly big game ungulates need to be protected from man's activities or facility developments. Actions that would result in loss or permanent occupancy of significant acreages (25 or more acres) of habitat are of special concern. In any event impacts to high-priority valued areas should be limited and ultimate reclamation planned. Many impacts can be avoided simply by precluding exploration, developmental or other activities during the period of time when a high interest specie is present.

Haulage of coal between the various mine projects and distribution points should be planned so that impacts to wildlife are lessened; of special concern is haulage of coal through wintering areas for big game. It is recommended that the

Company develop coal haulage contracts that require personnel involved with coal haulage to use extreme caution so that accidental collisions between motor vehicles and big game are reduced. Without doubt, a reduction in speed across winter ranges would alleviate this problem during the period between November 1 and May 15 each year.

At present the most successful and cost effective technique for reducing deer-highway mortality is a system of warning reflectors. This system (manufactured by Streiter Corporation, 2100 Eighteenth Avenue, Rock Island Illinois 61201 and known as "Swareflex") is only of value at night time, but it is during darkness that most deer-highway mortality occurs. Strieter Corporation describes the effect of the reflector system as follows: "The headlights of approaching vehicles strike the wildlife reflectors which are installed on both sides of the road. Unnoticeable to the driver, these reflect red lights into the adjoining terrain and an optical warning fence is produced. Any approaching wildlife is [are] alerted and stops or returns to the safety of the countryside. Immediately after the vehicle has passed, the reflectors become inactive, thereby permitting the animals to cross safely".

Installation of a wildlife warning reflector system, a reduction in speed of coal-haulage trucks and other mine related traffic and increased awareness of wildlife values by mine associated employees should result in a reduction of deer-highway mortality problems. Such a reduction would represent satisfactory mitigation.

In instances where conveyors, slurry lines or any other structure having potential to be a barrier to big game movement is to be developed, passage structures must be provided. Generally speaking overpass and underpass type structures are recommended in order to allow passage of big game to habitats either side of any barrier. These crossings should be placed at the points to be identified from in-

tensive study of big game movements in relation to the mine plan area. Such study would not be required if the structure was adequately elevated to allow uninhabited passage of big game along its entire length.

Underpasses should have a minimum clearance of three meters maintained across a span of at least five meters. Overpasses should be designed as a circular earthen ramp with the barrier bisecting the ramp into two equal halves as follows:

On either side of the conveyor a half-round ramp with a slope no greater than 3:1 on a five meters wide path placed at an angle 90 degrees to the conveyor and tapering around to a slope of 5:1 at paths adjacent and parallel to the conveyor. The platform over the conveyor should be concrete or some other material that would not echo when being crossed by big game and should be of character similar to rock or natural earth.

Soils associated with either crossing style should be of the A or B horizons to allow for development of vegetation. Vegetative cover must be established in association with all crossing sites. This will lessen anxiety of individual animals using the site through development of a natural appearing environment.

Mature pinion or juniper trees and an abundance of browse plants need to be placed proximal to crossing points in order to provide a safe travelway. The browse plants will also serve as a permanent attraction for big game to crossing points. Additionally, a mixture of grass and forb seeds should be broadcast over each crossing point to stabilize the soil and enhance the forage situation.

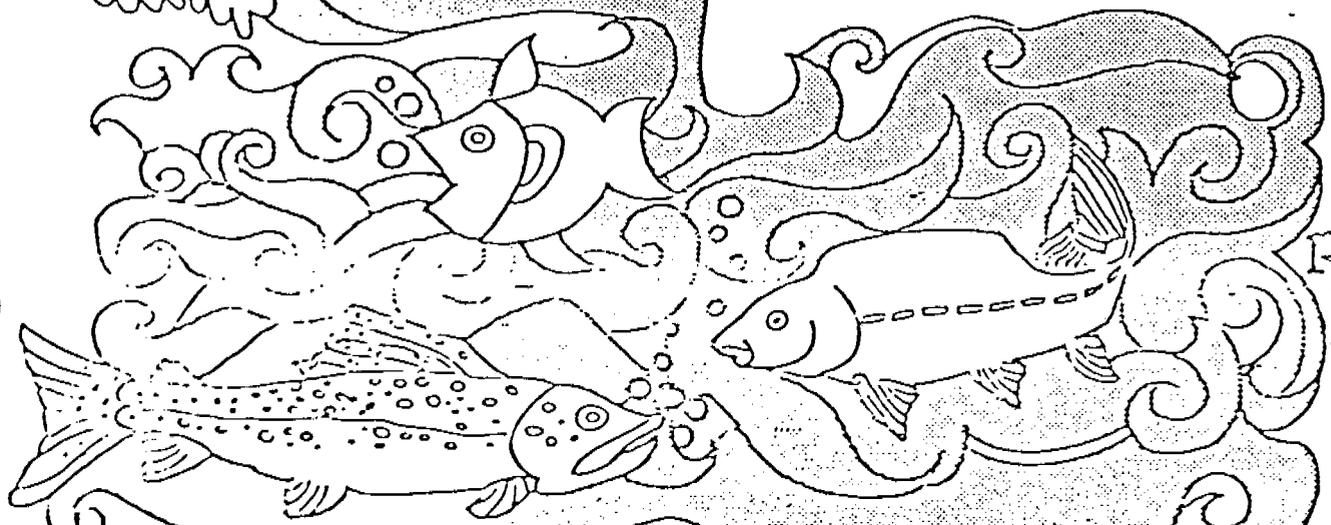
Appropriately sized boulders may need to be placed at crossing sites in order to control off-road vehicles utilized in outdoor recreation.

Industrial developments are encouraged on habitat use areas that are ranked as being of limited value to wildlife. It should be noted, however, that reclamation is ultimately expected on any wildlife use area, regardless of its value to wildlife.

APPENDIX A



Vertebrate
Species
of
Southeastern
Utah



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Agencies and individuals that have contributed information on species distribution within the southeastern region are acknowledged. Bureau of Land Management and U.S. Forest Service biologists provided information concerning local sightings and distribution of wildlife species. Species lists obtained from Arches and Canyonlands National parks were also helpful. Within the Utah Division of Wildlife Resources, local conservation officers and wildlife biologists provided valuable information on species within their districts or areas of experience. Thanks go to other Division personnel who assisted with review of this document.

The status and population trend for individual species is a product of the experience of the authors and others who have professional experience with the wildlife resource in southeastern Utah.

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CHAPTER 11

CLIMATOLOGY AND AIR QUALITY

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CHAPTER 11

CLIMATOLOGY AND AIR QUALITY

11.1 SCOPE

This chapter describes general climatology and air quality of the Co-op Mining Company Permit area and the effects of mining on ambient air quality. Fugitive dust emission sources are identified, and an estimate of uncontrolled emissions is made. Existing and proposed controls are discussed along with an estimate of controlled emissions. A precipitation and wind monitoring plan is briefly described.

11.2 METHODOLOGY

The climatological data obtained from the U.S. Weather Bureau at Hiawatha, Utah, were incorporated with the data from the Hydrologic Atlas of Utah (Jepson et. al, 1968). Wind information was gathered by personal communication with the Utah State climatologist. Uncontrolled fugitive dust emissions were estimated by using emission factors provided by the Environmental Protection Agency at Denver, Colorado. The best available control technology (BACT) was used to estimate the total emissions.

11.3 EXISTING ENVIRONMENT

The climate of the Bear Canyon Mine area is typical of subalpine areas in the central region of Utah. In general, the summer season is short with maximum temperature reading ($^{\circ}\text{F}$) in the 80's and minimum readings in the 40's. Fall and spring seasons are erratic in nature with snow precipitation occurring as early as September and as late as the first part of June. Winters in this subalpine area are often severe, with recorded temperatures of -20°F or below at times. Major snowfalls occur in the months of December, January, and February. Snow frequently remains on the ground from November until April in depths varying up to 6 ft. Winds are generally light to moderate with average speeds below 20 m.p.h. The prevailing wind direction within the general area of the mine site is from the southwest. Winds are generally parallel to the canyons except during storm periods. Wind speed varies from canyon to canyon.

Estimated annual average background total suspended particulate (TSP) in rural, central Utah is approximately 20 ug/m^3 (AeroVironment, 1977). Because of the proximity to the existing mine, background TSP could be higher than the average background total

for typical rural areas.

11.3.1 Precipitation

Precipitation varies greatly in the vicinity of the Plateau Mining permit area due to the Manti-LaSal Mountain Range. Local factors affecting precipitation in the lease area are altitude, topography, and geographic location relative to the west-to-east storm track. The normal annual precipitation at the center of the permit area is approximately 8 in to 10 in greater than it is near the office area.

The nearest weather monitoring station is at Hiawatha, located about 5 mi northeast from the center of the permit area. The annual precipitation recorded at Hiawatha station is 13.18 in. Table 11-1 shows the precipitations recorded from 1916 to 1975. An isohyetal map from the Hydrologic Atlas of Utah shows an annual precipitation of 22 in. at the center of the permit area. (This is the source of the discrepancy referenced in the OSM completeness determination.) Approximately 16 in. or 73% of this precipitation occurs as snow from October to April. The other 6 in. or 27% occurs from May to September as rainfall. Snow accumulation averages 4.5 ft; a maximum snow depth of 6 ft is to be expected.

TABLE 11-1

Precipitation Totals
(inches)

Month	Mean	Greatest Daily	Year	Snow		
				Mean	Maximum Monthly	Year
Jan	.87	.92	1944	21.3	59.0	1969
Feb	.98	1.29	1923	12.8	47.0	1969
Mar	.99	1.20	1935	9.7	39.5	1952
Apr	.91	1.33	1944	4.0	22.0	1965
May	1.05	2.00	1922	2.0	25.0	1964
Jun	1.04	2.14	1941	.2	1.0	1925
Jul	1.22	1.20	1973	.0	.0	-
Aug	1.92	2.05	1946	.0	.0	-
Sep	1.26	1.73	1961	4.2	11.0	1965
Oct	1.20	1.54	1941	1.3	14.0	1961
Nov	.73	1.35	1943	6.6	30.5	1951
Dec	1.01	1.53	1916	13.0	50.5	1951
Annual	13.18	2.14	Jun 1941	74.5	59.0	Jan 1969

Station: Hiawatha Longitude: 110° 01'
 Elevation: 7,220 Latitude: 39° 29'
 Period of Record: 1916-1975

11.3.2 Temperature

Temperature is seasonally variable and highly influenced by elevation. January temperatures vary from a mean minimum of approximately 13°F to a mean maximum of approximately 30°F. July temperatures vary from a mean minimum of 54°F to a mean maximum of 82°F (Jeppsen et al., 1968). Similar temperature ranges are recorded at Hiawatha Station. Table 11-2 shows the temperatures recorded between 1922 and 1975. The average annual temperature is 45°F. July is the warmest month (average 69°F) and January, the coldest (average 23°F). Wide daily temperature ranges are caused by relatively strong daytime warming and rapid nighttime cooling.

11.3.3/11.3.4 Evaporation and Relative Humidity

Potential evaporation is about 40 in/yr. Transpiration is less than 18 in/yr. Relative humidity ranges from a summer average of 45% to a winter average of 85%.

11.3.5 Wind Direction and Velocity

TABLE 11-2

Temperatures

Month	Means			Extremes			
	Daily Maximum	Daily Minimum	Monthly	Record Highest	Year	Record Lowest	Year
Jan	32.2	13.5	22.9	59	1971	-16	1971
Feb	36.2	17.4	26.8	59	1971	-18	1933
Mar	43.9	22.7	33.9	68	1966	-10	1964
Apr	54.5	31.1	42.9	80	1928	7	1975
May	64.8	39.9	52.3	86	1936	18	1965
Jun	74.7	48.9	61.7	93	1961	26	1943
Jul	82.0	56.2	69.1	95	1931	35	1968
Aug	79.0	54.5	65.4	93	1940	33	1968
Sep	71.3	46.6	59.0	92	1934	19	1965
Oct	59.0	36.6	47.8	78	1933	10	1972
Nov	43.5	24.1	33.8	63	1975	-2	1931
Dec	34.4	16.1	25.0	58	1959	-12	1924
Annual	56.3	34.0	45.1	95	Jul 1931	-18	Feb 1933

Station: Hiawatha Longitude: 110° 01'
 Elevation: 7,220 Latitude: 39° 29'
 Period of Record: 1922-1975

In general winds are light to moderate, with average speeds below 20 mph* Wind speed varies from canyon to canyon. At the Bear Canyon Portal area, the average wind speed is estimated at 10 mph, directed from west-southwest. Tornadoes are very rare, but strong winds may occur, particularly in these mountain passes and canyons. The highest gust in the vicinity of the mine site is expected to be more than 100 mph. The gust would occur under extremely unstable conditions with active fronts.

11.3.6 Air Quality

The permit area has been designated a Class II area for purposes of prevention of significant air quality deterioration. Particulates are the only pollutant that would contribute to air pollution as a result of mining activities. Increases in other pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, and photochemical oxidants would be negligible.

An annual average background level for total sus-

*Arlo Richardson, Utah State climatologist at Utah State University

pended particulates (TSP) in rural, central Utah areas of 20 micrograms per cubic meter (ug/m^3) has been estimated (AeroVironment, 1977) This is a significantly below the Federal secondary standard of $60 \text{ ug}/\text{m}^3$. Because of proximity to existing mines, background TSP levels at the site would be expected to be higher than average for rural areas. The short term (24 hours) National Ambient Air Quality Standard (NAAQS) can be exceeded in rural Utah as a result of windblown dust. TSP data from three near-by monitoring stations are shown on Table 11-3. The background visual range was estimated to be 37 mi (60km) based on the background TSP estimate (AeroVironment, 1977).

11.4 EFFECTS OF THE MINING OPERATION ON AIR QUALITY

11.4.1 Estimate of Uncontrolled Emissions

The following sources of dust emissions have been identified: (1) topsoil removal and storage, (2) access road, and (3) coal handling facilities. Table 11-4 shows an uncontrolled emission factor for each process operation. A total of 69.01 ton/yr of uncontrolled emissions is estimated from the mining activities at the maximum coal production rate of 400,000 ton/yr.

TABLE 11-3

TSP Readings at Stations Near the Lease Area

<u>Location</u>	<u>Period of Observation</u>	<u>Maximum¹ 24-Hour Average</u>	<u>AGM² (ug/m³)</u>
Price	6/75 - 12/75	181	72
Huntington Canyon	1975	191	22
Bear Creek Canyon	1974	222	21

¹National Ambient Air Quality Standards for maximum 24-Hour particulate concentrations are 150 mg/m³ and 260 ug/m³ for the secondary and primary standards, respectively.

²National Ambient Air Quality Standard for the annual geometric mean (AGM) is 60 ug/m³ for the primary standard.

Source: Adapted from Table II-13 on page II-37 of the Draft Environmental Statement Development of Coal Resources in Central Utah, prepared by the U.S. Department of the Interior.

Table 11-4

Co-op Mining Company - Dust Control (Bear Canyon)

	<u>Uncontrolled</u>		<u>Factor</u>	<u>Controlled</u>	
Haul Roads	23.17 T. per year		85%	3.476 T. Per Year	
Access Roads	3.59	"	85%	.54	"
Coal Storage	5.25	"	50%	2.625	"
Conveyors	20.	"	99%	.2	"
Crusher	2.	"	99%	.02	"
Screens	10.	"	99%	.1	"
Product Removal	<u>5.</u>	"	50%	<u>2.5</u>	"
TOTAL	69.01	"		9.461	"

11.4.2 Description of Control Measures - Fugitive
Dust Control Plan

The following subsections describe in detail the fugitive dust control measures that are in effect or are planned for the mine plan for each of the listed sources.

Topsoil removal and Storage Pile

The operator currently implements a water spray program during operations involving topsoil removal and stockpiling. Revegetation of stockpile areas is initiated after topsoil has been replaced.

Access Roads

To determine control measures most appropriate in the suppression of access road fugitive dust.

Frequently Used Access Roads

The roads leading to material supply and storage areas and the connecting road from the Bear Canyon Portal area to the coal loading area will experience

frequent use. If necessary, a soil stabilizing agent would be worked into the upper layer of the roadbed. A road grader would be used periodically to remove accumulations of spilled materials from the roadbeds. Vehicular speed would be limited to a maximum of 30 mph. Periodically, or as necessary during the operating life of the mine, the roads may be treated with water and/or nontoxic dust suppressants.

Coal-Handling Facilities

Principal sources of fugitive dust emissions related to the coalhandling facilities have been identified as (1) conveyor, (2) crusher building, and (3) coal storage. The proposed control measures for each of these sources are discussed individually below.

Conveyors

Conveyors, housing the main belts from the mine portals to the run of mine coal intermediate stockpile, will be covered. Transfer points in the raw coal/crusher area will contain water sprays or other dust control methods as applicable. The conveyor discharge height will be minimized.

Crusher Building

The primary crushers will be enclosed and will contain water sprays or other control measures as applicable. Crushed coal would be transported to the storage area conveyor.

Coal Storage Pile

The coal storage pile would be periodically sprayed with water and/or nontoxic dust suppressants. The orientation of the coal pile is placed in such an area to protect from the prevailing wind direction to minimize the wind erosion.

11.4.3 Estimate of Controlled Emissions

Emissions have been estimated for the maximum projected coal production of 400,000 ton/yr. The major portion of this coal will be transported via conveyor.

Based on the control practice outlined in the EPA Region VIII Interim Policy paper on the Air Quality Review of Surface Mining Operation, the estimated total controlled emission is estimated at approxi-

mately 9.461 ton/yr. Table 11-5 shows the estimated emissions by applying BACT to the uncontrolled emission estimates of Table 11-4.

11.4.4 Estimated Cost of Emission Control

The estimated cost of emission control consists of equipment capital cost and operating cost. Equipment capital cost includes installed cost for water spray equipment, enclosures, telescoping chutes, and conveyor cover. The operating cost includes direct costs of utilities, maintenance, and operating labor for chemical dust suppressants.

The existing emission controls are covers for conveyor, silo and stacking tube, and treated coal haul road. The conveyor cover was installed at \$15,000 and the stacking tube cover cost about \$4,000. A water-spray truck cost about \$20,000.

The operating cost for soil stabilization depends on the kind of product used as dust suppressant. The manufacturer estimates that treatment cost varies from \$300 to \$1,000 per acre depending on the size of the project, rate of dilution, and distance from the source of supply. For the Co-op Mining lease

Table 11-5

Co-op Mining Company - Dust Control (Bear Canyon)

Storage File (Coal)

Average size of pile 5,000 T. (10,000 T. Cap. - Normally less than 1,000 T.)

Through Put 200,000 T. Per Year

D= 9.125

s= 20

d= 175 (Hiawatha weather station -151 days snow cover--39 Additional Days .01 In. or more of Rainfall)

$$e = .05 \frac{20}{1.5} \frac{175}{235} \frac{15}{15} \frac{9.125}{90} = .0525 \text{ 200,000 T.} = 5.25 \text{ T. Per Year}$$

Control- Coal is sprayed with water as it is being mined in order to meet underground Dust Control requirements. Additional Spray Equipment will be installed at the Storage Site to use if needed.

Crushing (Primary Only) 200,000 T. . . .02 = 4,000# =2 T. Per Year

Control - Enclosed and Vent to Bag house or water sprays

Screening 200,000 T. . . .1 = 20,00# - 10 T. Per Year

Control- Bag house or Water sprays

Conveyors and Transfer points 200,000 T. . . .2=40,000# =20 T. Per Year

Control - Enclosed and Vent to Bag house or water sprays

Roads (Haul) - s = 15
S = 20
W = 190

$$E = 5 \cdot .47945 = 2.39725 @ 19333.33 \text{ Miles per year} = 23.17 \text{ T. per year}$$

Control --Chemical Stabilization or Water Spray

Table 11-5 cont.

Roads (Access) s=15
S=10
W=190

$E = 2.5 \cdot .479452 = 1.9862$ 6000 Miles per year
3.59 T. Per year

Control -- Chemical Stabilization or Water Spray

Product removal 200,000 T. Per Year $\cdot .05 = 5$ T. Per Year

Control - Water Spray

area, the application of a product such as Coherex from May to October would cost about \$5,000.

Therefore, \$39,000 is estimated for capital cost, and \$5,000 is estimated for annual operating cost for emission control.

11.5 CLIMATOLOGICAL AND AIR QUALITY MONITORING*

The annual precipitation within the lease area ranges from 13 in near the mine office to 15 in at the center of the lease area. Since the precipitation varies significantly within the lease area, the Co-op Mining Company is planning to install a precipitation gauge and will monitor it routinely. The monitoring result will be reported to USGS and USFS.

Air quality is being monitored at the lease area by U.P. & L. through Utah State University. Particulates are the only pollutant that might impact air quality at the mine area. Increases in concentrations of other pollutants such as sulfur dioxide, nitrogen oxide, carbon monoxide, and photochemical oxidants would be negligible. The main source of TSP would be coal particles which would settle out within short distances (one mile or less) downwind.

The mining operation would not be a "major source" under the prevention of significant deterioration (PSD) regulations because total annual controlled emissions of particulate matter are expected to be less than 250 ton/yr. Therefore, the requirement for a PSD permit and for air quality monitoring is not anticipated, based on the July 7, 1980 PSD Regulation 40CFR, Parts 51, 52, 53, and 124.

*Subsections 11.5.1, 11.5.2, and 11.5.3 are addressed within the content of this section.

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Chapter 11

Appendix

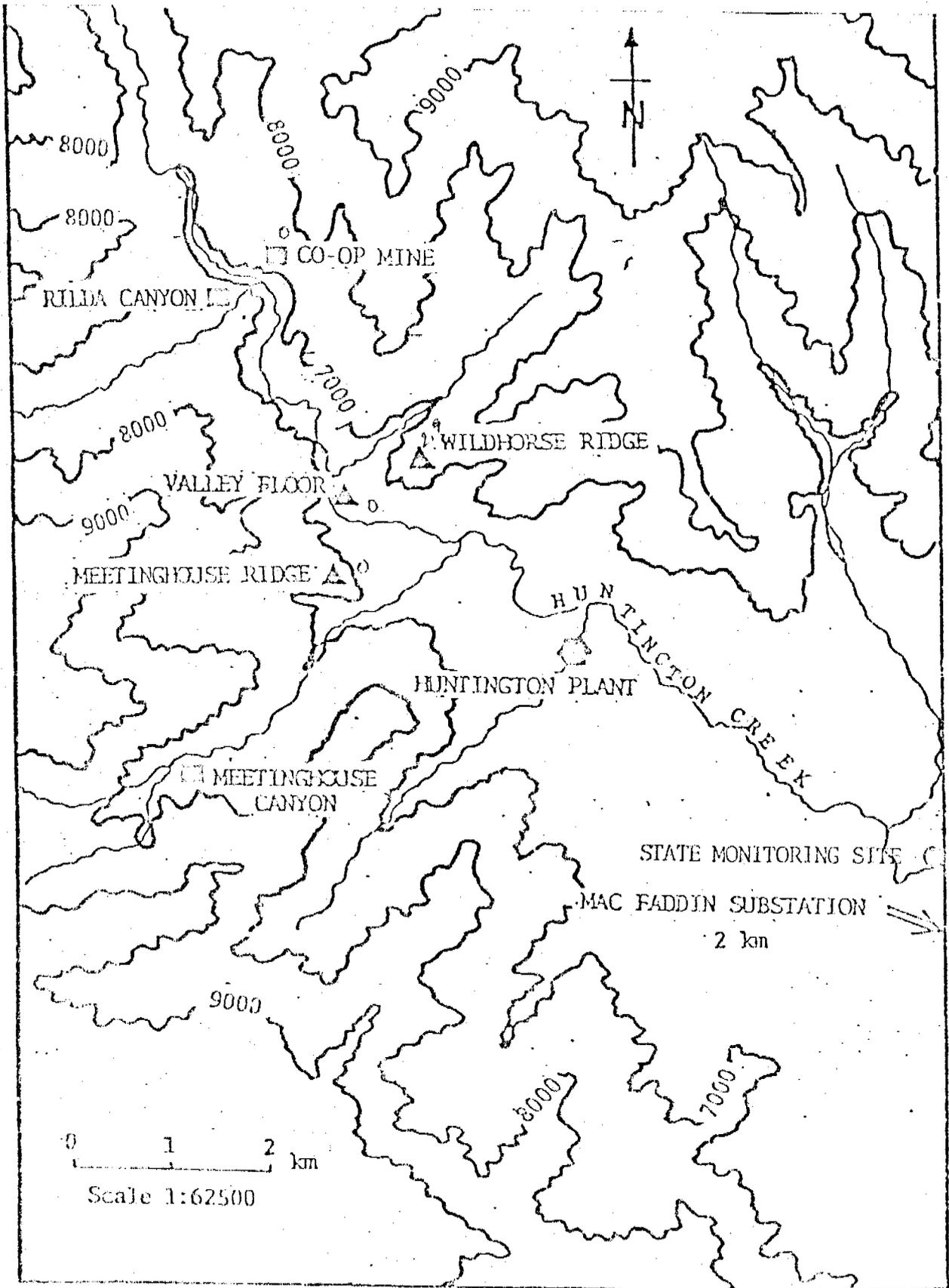
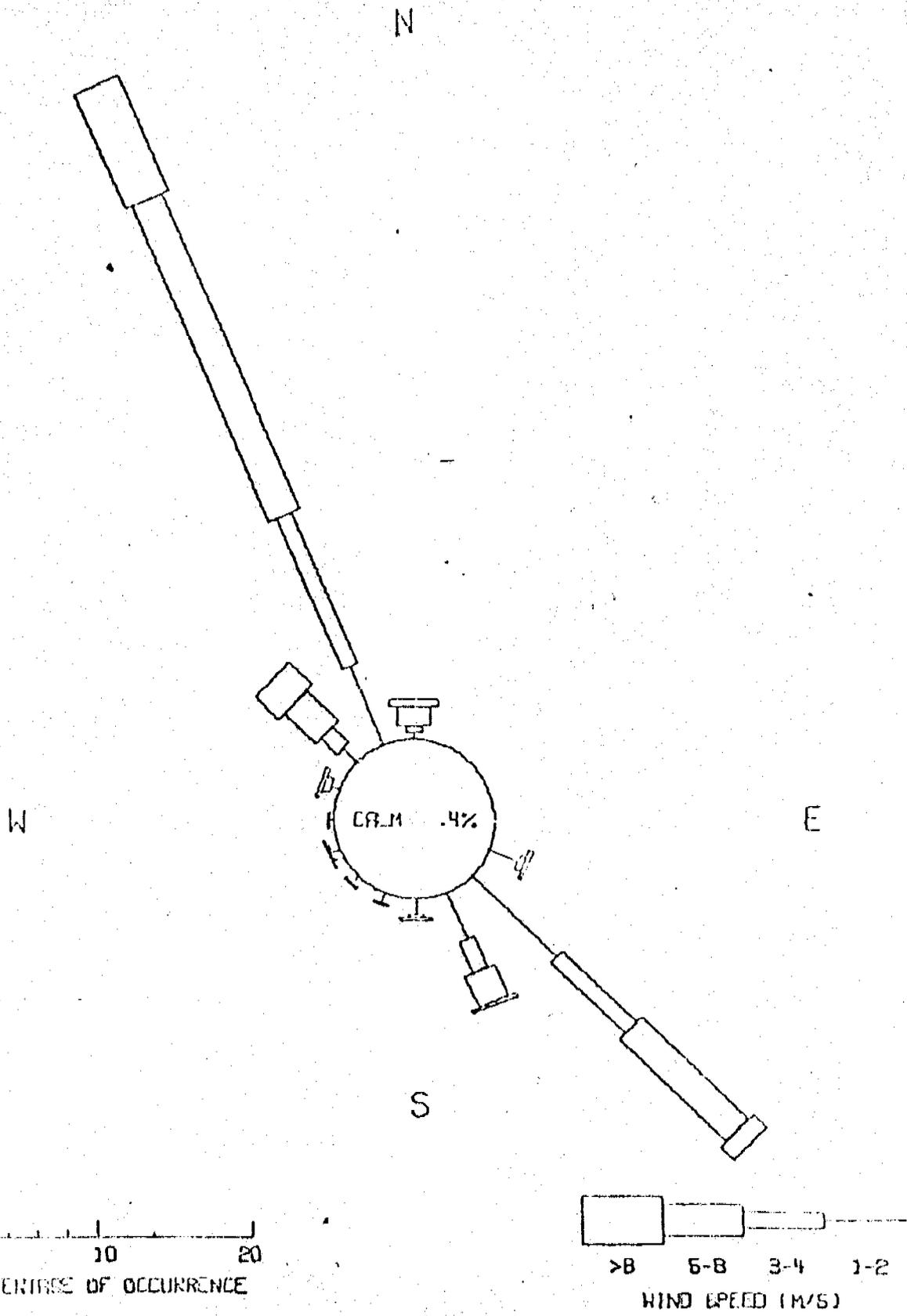


Figure 1.1 Map of Huntington Canyon, Utah, and the location of the plant site and air quality monitors.



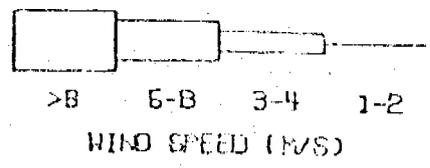
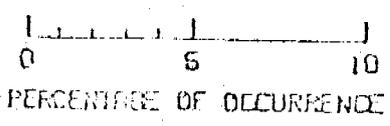
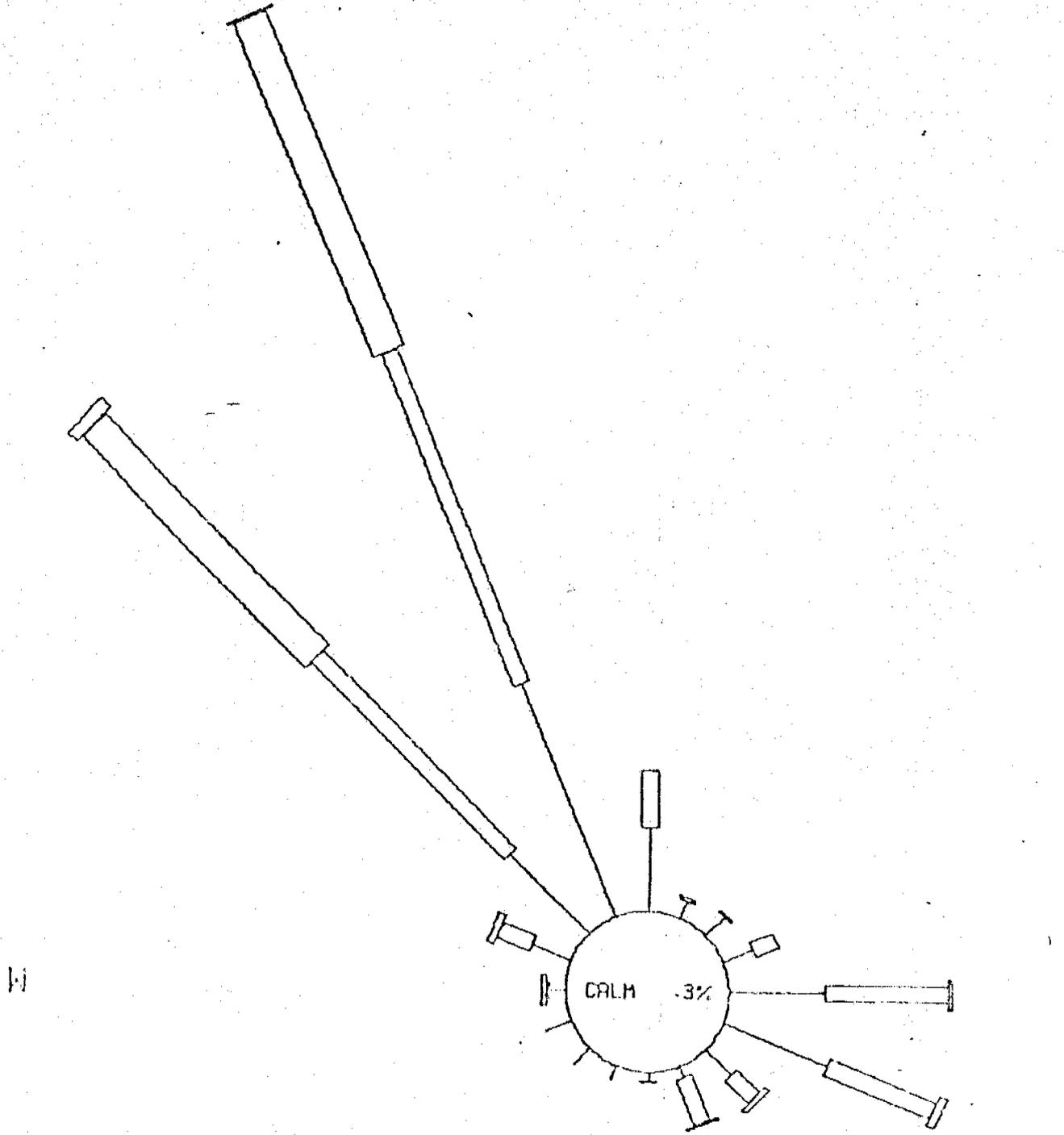
WILD HORSE RIDGE

OCT 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.3

N

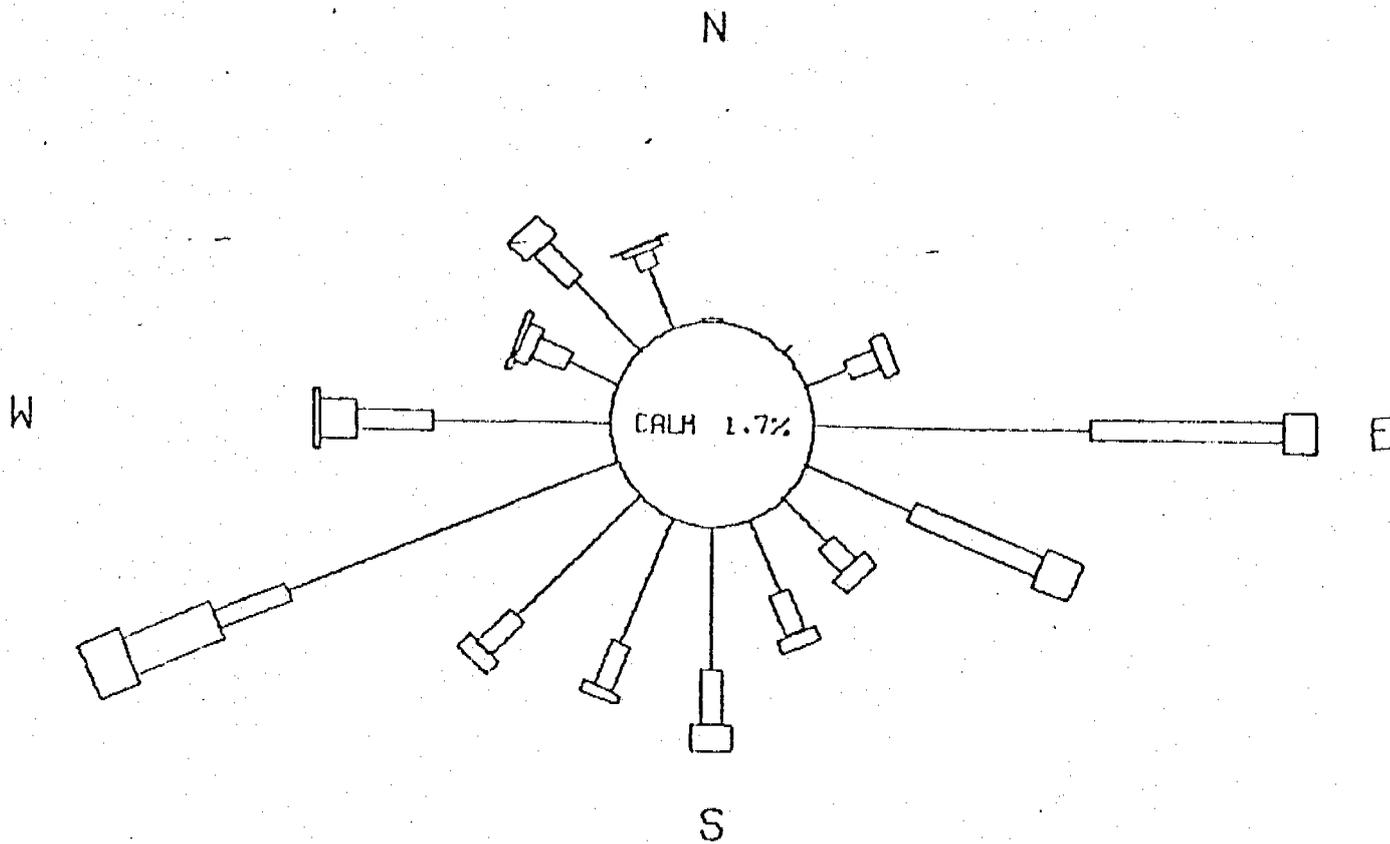


VALLEY FLOOR

OCT 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.4



0 5 10
PERCENTAGE OF OCCURRENCE

>8 6-8 3-4 1-2
WIND SPEED (M/S)

MEETING HOUSE

OCT 1977 THROUGH APRIL 1978

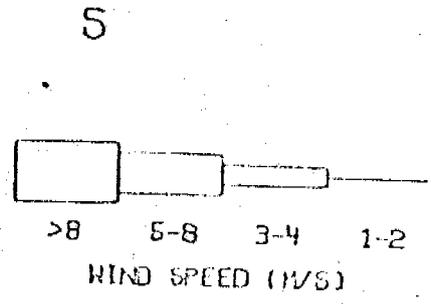
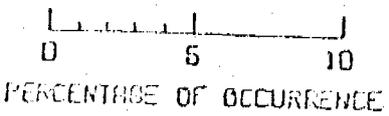
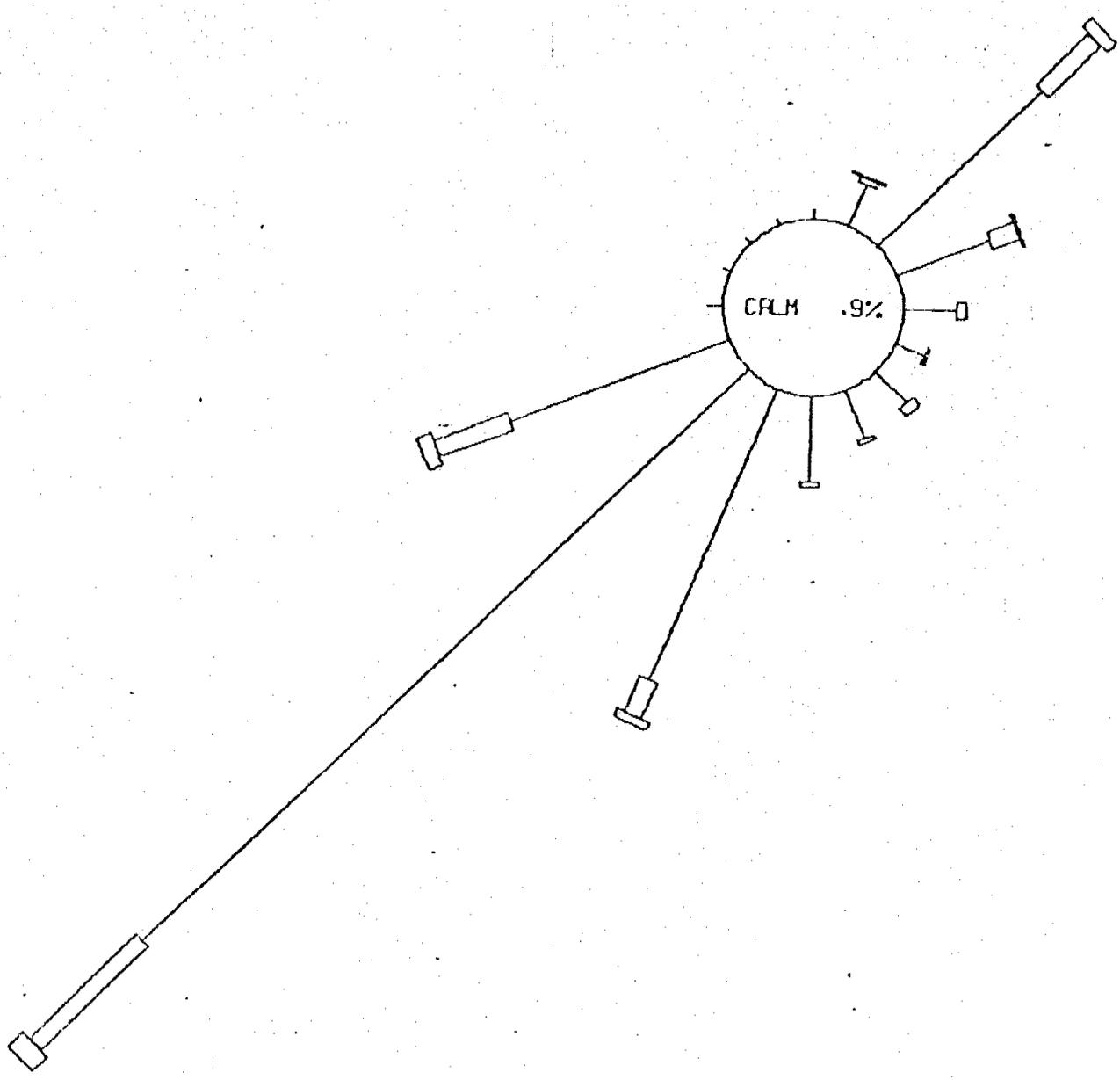
ALL TIMES

FIGURE 4.5

W

N

E

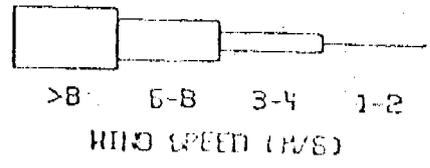
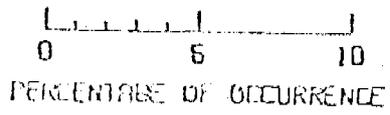
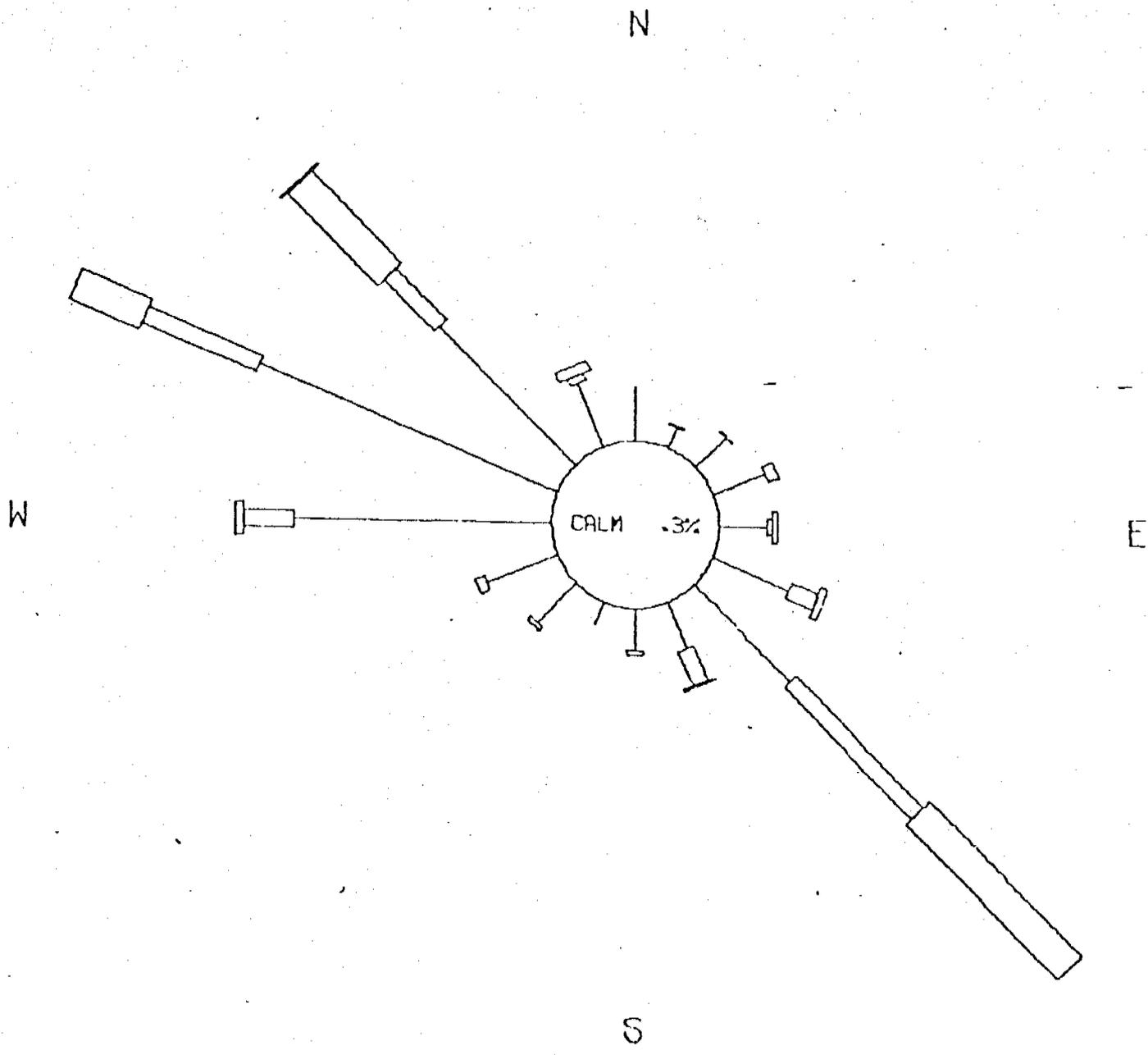


RILUA CANYON

DEC 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.8



CO-OP MINE

OCT 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.9