CHAPTER 3

BIOLOGY
(R645-301-300)

TABLE OF CONTENTS
CRANDALL CANYON MINE, MINE AND RECLAMATION PLAN
CHAPTER 3
BIOLOGY

TABLE OF CONTENTS (Continued)
CHAPTER 3

TABLE OF CONTENTS (Continued)
CHAPTER 3

CHAPTER 3

LIST OF PLATES

PLATE NUMBER	DESCRIPTION
PLATE 3-1(A)	Wildlife Map (Moose)
PLATE 3-1(B)	Wildlife Map (Elk)
PLATE 3-1(C)	Wildlife Map (Deer)
PLATE 3-2	Vegetation Map
PLATES 3-3, 3-4, 3-5 and 3-6 have been removed	
PLATE 3-7	Vegetative Community Study Map
PLATE 3-8	Vegetative Community Study Map
PLATE 3-9	Vegetative Community Study Map

Note: Bold number plates are included with this submittal.

CHAPTER 3

LIST OF APPENDICES

APPENDIX NUMBER	DESCRIPTION
APPENDIX 3-1	Vegetation Reference Area & Species List
APPENDIX 3-2	Aquatic Resources of Crandall Canyon
ADDENDUM TO APPENDIX 3-2	Synopsis of Riparian Baseline Inventory of Crandall Creek and Review of Baseline Riparian Inventory of Crandall Creek for Proposed Crandall Mine Expansion
APPENDIX 3-3	Vegetation and Terrestrial Wildlife Report
ADDENDUM TO APPENDIX 3-3	Listings of Special Interest, Threatened and Endangered Wildlife and Vegetation Species
APPENDIX 3-4	Letter from USDI Fish & Wildlife Services
APPENDIX 3-5	Irrigation Plan
APPENDIX 3-6	Proposed Seed Mixture
APPENDIX 3-7	Sample Adequacy
APPENDIX 3-8	UDWR Letters
APPENDIX 3-9	Deleted
APPENDIX 3-10	Population Survey Report
APPENDIX 3-11	Spruce/Fir/Aspen Communities At The Crandall Canyon Mine - 1996
APPENDIX 3-12	Crandall Creek/ Colorado Cutthroat Trout Mitigation Plans

CHAPTER 3

LIST OF APPENDICES (continued)

APPENDIX NUMBER	DESCRIPTION
APPENDIX 3-13	Wetland Delineation Crandall Creek Mine Expansion Area
APPENDIX 3-14	Woody Plant Species Density Measurements of the Proposed Disturbed Riparian Areas of Crandall Creek
APPENDIX 3-15	Productivity Estimate (NRCS) - Expansion Area
APPENDIX 3-16	DWR Raptor Survey (2003)
APPENDIX 3-16A	DWR Raptor Survey (2004)
APPENDIX 3-18	Water Depletion
APPENDIX 3-19	DWR Habitat Information, 2004
APPENDIX 3-20	Final Environmental Assessment, Modification of Federal Coal Lease UTU-68082, U.S. Forest Service
APPENDIX 3-21	Perennial Stream Considerations at "No-Name Creek" & Blind Canyon Creek, Tributaries to Huntington Canyon Creek (Mt. Nebo Scientific)

Note: Bold number plates and appendices are included with this submittal.

CHAPTER 3

BIOLOGY

3.10 Introduction

This chapter presents a description of the biological resources found within the life of mine permit area. The sections addressed in this chapter are:

- o the vegetative, fish and wildlife resources;
- o the potential impacts to vegetative, fish and wildlife resulting from the proposed operations,
- o the mitigation plans and measures to minimize the impacts;
- o and the reclamation plan to restore the vegetative, fish and wildlife resources to a condition suitable to the postmining land use.

3.11 Vegetation, Fish and Wildlife Resources

Vegetation, fish and wildlife resources of the permit area and adjacent area are described under 3.20.

The proposed Incidental Boundary Change will not create any surface disturbance or affect any vegetation resources. Regional vegetation information for the Incidental Boundary Change area can be found on Plate 3-2. Regional wildlife information for the IBC are is shown on Plate 3-1. Mining within the South Crandall lease will not create any surface disturbance or affect any vegetation or wildlife resources. Regional wildlife information for the South Crandall lease area is shown on Plate 3-1(A, B,C). Regional vegetation information for the South Crandall lease area is shown on Plate 3-2.

Mining within the U-68082 lease mod area will not create any surface disturbance or affect any vegetation or wildlife resources. Regional wildlife information for the U-68082 lease mod area is shown on Plate 3-1 and Appendix 3-19. Regional vegetation information for the U-68082 lease mod area is shown on Plate 3-2. Photographs of the regional vegetation of the lease mod area can be found in Appendix 7-64. A discussion of the vegetation in the drainages and perennial stream considerations in the lease mod area can be found in Appendix 3-21. Refer to Appendix 3-20 "Final Environmental Assessment, Modification of Federal Coal Lease UTU-68082, U.S. Forest Service" for additional information regarding wildlife and vegetation in the lease mod area.

3.12 Potential Impacts to Vegetation, Fish, and Wildlife Resources

Potential impacts and methods to minimize these impacts are described under 3.30.

3.20 Environmental Description

3.21 Vegetation Resource

3.21.1 Reference Areas

There are 10 vegetative communities in Crandall Canyon. They are:

(1) Cottonwood;
(2) Sagebrush;
(3) Mountain Shrub/Grassland;
(4) Mountain Grassland;
(5) Mixed Mountain Shrub/Conifer/Aspen;
(6) Aspen;
(7) Spruce/Fir/Aspen;
(8) Spruce/Fir;
(9) Alpine Grassland;
(10) Riparian.

Of the 10 communities, 6 lie within areas to be disturbed and/or impacted by the development and operation of the proposed GENWAL Mine Site (communities 1, 2, 4, 5, 7, and 10).

Mountain Grassland (3) and Aspen (5) are found on the north-facing south slope and higher up on the north slope, outside of areas to be disturbed. Spruce/Fir (9) is also found on the north slope, and Spruce/Fir (8) and Alpine Grassland (9) are found on the highest summits and ridges.

The previously disturbed areas around the existing mine portals exhibit a vegetation association distinctly different than the existing natural vegetative communities.

Vegetative Communities Within Areas to be Disturbed

Portions of 6 plant communities will be disturbed by mine site construction and road building. They are: Cottonwood; Sagebrush; Mountain Shrub/Grassland; Mixed Mountain Shrub/Conifer/Aspen; Spruce/Fir/Aspen; and Riparian. In addition, portions of the proposed disturbed area have been previously disturbed.

Representative areas of each community, other than Riparian, were sampled by means of three randomly placed 30 meter transects. Ten 1-square meter plots were randomly selected by lot in each of the 3 transects and sampled for cover and productivity. The Riparian community was sampled in two locations by means of 10 transects, 10 meters or more long placed at right angles to the thread of the stream and spaced from 1 to 10 meters apart (spacing randomly selected by lot). Each of the 20 transects was sampled by 2 dm x 1 meter plots spaced at 1 meter intervals for 5 meters or more (as needed to reach limits of Riparian community) on either side of the centerline of the stream. The Riparian transects were likewise sampled for cover and productivity.

The Seven communities sampled (including the previously disturbed area) are summarized in Tables 3-A through 3-H, of Appendix 3-1. A complete species list is provided in Table 1 and a

community/species list is provided in Table 2 (Appendix 3-1). A general description of visual dominants within each of the communities is provided below.

Cottonwood

Along the lower 200 meters of Crandall Creek; and along the bottomlands of Huntington Creek; and one short section of Crandall Creek near the portals; the vegetative community is dominated by Narrowleaf Cottonwood (Populus augustifolia) and Rocky Mountain Juniper (Juniperus Scopulerum) in the upper story and by Wood's Rose (Rosa Woodsii), Big Sage (Artemisia tridentata), Squaw Currant (Ribes cerium) and Rocky Mountain Juniper (Juniperus scopulorum) in the understory.

Sagebrush

The numerous small sagebrush flats occurring within Crandall Canyon are dominated by Big Sage (Artemisia tridentata).

Mountain Shrub/Grassland

This association, found on the south-facing slopes above Crandall Creek, is dominated by Curl-leaf Mahogany (Cercocarpus ledifolius), Rocky Mountain Juniper (juniperus Scopolorum), and Bluebunch Wheatgrass (Agropyron spicatum).

Mixed Mountain Shrub/Conifer/Aspen

This association is primarily found near the toe of the south-facing north slope of the canyon. It is essentially a blend of the Mountain Shrub/grassland and Spruce/Fir Aspen communities. This plant community is dominated in the upper story by the conifers Blue Spruce (Picea Pungens), Douglas Fir (Psuedotsuga menziesii), Ponderosa Pine (Pinus ponderosa), by Aspen (Populus tremuloides), Curl-leaf Mahogany (Cercocarpus ledifolius), and Rocky Mountain Juniper (Juniperus scopulorum). The understory is dominated by Mountain Snowberry (Symphoricarpos oreophilus), Rubber Rabbitbrush (chrysothamnus nauseosus), Needle and Thread Grass (Stipa Comata), and Bluebunch Wheatgrass (Agropyron spicatum).

Spruce/Fir/Aspen

This community is found in the bottomlands and north-facing south slope of Crandall Canyon. The upper story is dominated by Blue Spruce (Picea pungens), Douglas Fir (Psuedotsuga menziesii) and Aspen (Populus tremuloides). The understory is dominated by Mountain Snowberry (Symphoricarpos oreophilus). The Spruce/Fir/Aspen community generally gives way very quickly to the Mountain Shrub/Grassland or Mixed Mountain Shrub/Conifer/Aspen associations at the toe

of the north slope. This transition is dominated by Common Juniper (Juniperus communis) in the understory along with Mountain Snowberry (Symphoricarpos oreophilus).

A vegetation survey was conducted in July 1996 by Dr. Patrick Collins to assess the vegetation of the proposed disturbed area south of Crandall Creek. The report is included as Appendix 3-11. Productivity data for this area is provided in Appendix 3-15.

Riparian

The Riparian community was sampled in two locations because of differences in the substrata. Riparian #1 is located about 1.0 km below the existing mine portals. Here, Crandall Creek flows over bedrock (Star Point Sandstone). Riparian #2 is located just 200 meters upstream from the existing mine portals. There, the substrata is alluvium and bedrock (regolith). Also, the Riparian community around the Crandall Creek Mine Culvert Expansion was inventoried in 1994. The results are included in the Addendum to Appendix 3-2.

The Riparian communities exhibit more variety than the other communities sampled within the grass, herb, and shrub communities. However, the trees, which border the riparian zone seldom encroach within the zone.

The dominate shrubs of Riparian #1 are Red Osier Dogwood (Cornus stolonifera), Willow (Salix Myrtillifolia), and Common Juniper (Juniperus communis). The dominant herbs are Thistle (Cirsium pulchellum), Aster (Aster glaucodes), and Richardson's Geranium (Geranium richardsonii). The dominant grasses are Redtop (Agrostis stolonifera) and Fescue (Festuca Pratensis).

The dominant shrubs of Riparian #2 are Wood's Rose (Rosa Woodsil), Willow (Salix myrtillifolia), and Mountain Snowberry (Symphoricarpos oreophilus). The Dominant herbs (are the same three as in Riparian #1): Aster (Aster Glaucodes), Richardson's Geranium (Geranium richardsonii), Thistle (Cirsium pulchellum), and also includes Heartleaf Bittercress (Cardamine cordifolia). The dominant grasses are Smooth Brome (Bromus inermis), Redtop (Agostis stolonifera), and an unidentified grass. Also dominant in the grass and herb layer is horsetail (Equisetum arvense).

Woody plant density for the area to be disturbed by the yard expansion was collected in June 1997 and is provided in Appendix 3-14.

Previously Disturbed Areas

The previously disturbed areas around the existing mine portals are located in areas that were probably Spruce/Fir/Aspen and Mixed Mountain Shrub/Conifer/Aspen before 1939 when mining began in Crandall Canyon. After mining stopped around 1955 three shrubs have taken over;

Mountain Snowberry (Symphricarpos Oreophilus), Rubber Rabbitbrush (Chrysothamnus nauseosus), and Big Sagebrush (Artemisia tridentata).

Trees

Trees in the Cottonwood, Mixed Mountain Shrub/grassland, and Spruce/Fir/Aspen communities were sampled by the Point-centered Quarter Method with tree diameters taken at breast height. Twenty stations were randomly selected in each community. Data are reported in Tables 3-B, 3-D, 3-E, and 3-F (Appendix 3-1).

3.21.2 Productivity of Lands Prior to Mining Activities

The only historic commercial utilization of Crandall Canyon and the adjacent lease area over the last 50 to 100 years appears to be domestic grazing. The disturbed area associated with the past and current mining operations is approximately 14 acres, including mine yard expansion in 1998 and topsoil stockpiles.

Approximately two dozen elk cows and calves were in the canyon during the summer of 1980. Large game animals typically use the canyon for forage. However, the level of use is generally determined by the amount of forage available annually. The balance of productivity estimates are included in Appendix 3-1, along with the corresponding reference areas and tables of species.

3.22 Fish and Wildlife Information

Data associated with fish and wildlife habitat, both baseline conditions and changes to those conditions, have been collected by or obtained from the Utah Division of Wildlife Resources, Utah Division of Water Rights, U.S. Fish and Wildlife, U.S. Army Corps of Engineers, U.S. Forest Service, and outside consulting firms.

3.22.1 Protection and Enhancement of Fish and Wildlife

Numerous state and federal agencies provided current lists of species which are threatened, endangered, sensitive or of high-interest. The Utah Division of Wildlife Resources conducted baseline fisheries and raptor studies associated with the mine pad expansion. Independent consultants were utilized to assess the fish and wildlife resources associated with the original Crandall Canyon mine site. Winget Environmental Consultants were employed to investigate the initial aquatic resources (including the 1980 macroinvertebrate study and 1982 and 1983 stream surveys, see Appendix 3-2). Supplemental studies have been conducted by Environmental Industrial Services (EIS) and the Utah Division of Wildlife Resources (1994 and 1995) and included in Appendix 3-2.

The terrestrial wildlife resources were initially inventoried by Valley Engineering and subsequently studies were conducted by EIS as summarized within Appendix 3-3. A cursory tree nesting raptor inventory was also conducted by personnel from the Utah Division of Wildlife Resources and EIS (Appendix 3-3).

According to these studies, Crandall Creek is being used primarily as a spawning and nursery stream, but it also contains a few mature resident fish. Refer to Appendix 3-10 for a population survey report.

In 1997, the Utah Division of Wildlife Resources (DWR) determined that native Colorado Cutthroat Trout (CRCT) inhabited that segment of Crandall Creek where the stream was to be culverted to allow expansion of the mine yard. The Crandall Creek population is one of only a few populations of endemic Colorado River Cutthroat Trout populations identified on the Wasatch Plateau Manti-LaSal Forest and are therefore of high interest to the Forest Service, Division of Water Rights, Division of Oil, Gas and Mining and Division of Wildlife Resources. GENWAL agreed to comply with the conditions and stipulations of the letters included in Appendix 3-12 for the mitigation plan. Details of the mitigation plan are included in Appendix 3-12. GENWAL provided funding to remove the trout from a segment of Crandall Creek and construct habitat enhancement of the stream above the mine. After the mine yard expansion was completed and the DNA results were received, the Forest Service and DWR replaced only individual fish that demonstrated the highest genetic purity of Colorado River Cutthroat Trout back into Crandall Creek above the mine site.

3.22.2 Site Specific Resource Information Pertaining Wildlife

Mammals

Big game animals use the Crandall Canyon area as a part of their seasonal habitat. The migration of elk and deer on the Manti-La Sal National Forest occurs as a sheet migration with no specific corridors. Plate 3-1 shows elk and deer summer range on the high ridges and ledges of the canyon, and also depicts critical mule deer winter range habitat in the extreme lower portion of Crandall Canyon, contiguous to the confluence with Huntington Creek. Critical elk winter range occurs no closer than approximately 1.5 miles to the proposed surface facilities. Additional habitat information is available in Appendix 3-19.

Birds

Data pertaining to migratory and upland game birds within the permit area are included in Appendix 3-3 and in Table 5 of the November 1980 Valley Engineering Report (Appendix 3-3). Eleven of the twenty-two migratory birds are raptors (Appendix 3-3).

There are no known locations of drumming logs in Crandall Canyon or near the proposed disturbance areas, according to Larry Dalton of the Utah Division of Wildlife Resources. The mine permit and contiguous area inventoried to make this determination begins at the confluence of Horse Canyon with Huntington Canyon to the confluence of Mill Canyon with Huntington Canyon, and thence west to the west side of East Mountain.

No raptor nests where located in the riparian zone. The target species of the riparian inventory was the Goshawk. During the 1992 inventory no Goshawks were observed or located. (For further information, see the Environmental Assessment of Coal Lease UTU-68082, Crandall Canyon Tract by the USFS, Manti-La Sal National Forest.) Raptor nests have been located in Crandall Canyon (Plate 3-1A). One of the nests was occupied by a nesting pair of Golden Eagles in the Spring of 1995. During the raptor survey conducted in 1996 the nests were classified as "old, dilapidated" meaning that they were not active nests and had not been tended (based on communication with Ben Morris in March 1997).

No raptor nests were found within either the existing permit area or Incidental Boundary Change area during the 1998 raptor survey conducted on May 20, 1998 (personal communication with Ben Morris, May 1998). DWR conducted a raptor survey of the South Crandall lease area in May 2003. No nests were found. The results of this survey area shown in Appendix 3-16. DWR raptor surveys in 2003 and 2004 covered the U-68082 lease mod area, and no nest were found (see Appendix 3-16 and 3-16A).

Reptiles and Amphibians

The ranges and habitat preferences obtained from published data for the vertebrate species of southeastern Utah have been compared with the location and available habitats of Crandall and Huntington Canyons. Table 3 in Appendix 3-3 presents a list of the reptiles which may be found in the area and their relative abundance.

Reptiles are found throughout the mine permit area from the riparian areas to the mesic hillslopes and ridgetops. Amphibians are found near water in the habitats associated with Huntington and Crandall Creeks or near springs and seeps located on the hillsides above the creeks. (See Appendices 3-2 & 3-3 and refer to Table 5 included within Appendix 3-3). Baseline studies in the spring and summer of 1994 did not encounter the presence of any threatened or endangered reptile or amphibian.

3.22.21 Listed or Proposed Endangered or Threatened Species of Plants and Animals, and Critical Habitat

FEDERALLY LISTED AND PROPOSED ENDANGERED (E) AND THREATENED (T) SPECIES AND THEIR HABITAT IN EMERY COUNTY

In a 2004 listing the following T and E Species were identified for Emery County. They are:

Bonytail	*Gila elegans*	E
Colorado Pikeminnow	*Ptychocheilus lucius*	E
Humpback Chub	*Gila cypha*	E
Razorback Sucker	*Xyrauchen texanus*	E
Bald Eagle	*Haliaeetus leucocephalus*	T
Mexican Spotted Owl	*Strix occidentalis lucida*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footer Ferret	*Mustela nigripes*	E
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E

Listed threatened and endangered species potentially present in the permit area is the Bald Eagle (Haliaeetus leucocephalus) (E). (Source: U.S. Fish and Wildlife Service, July, 1994)

None of the species are likely to occur within the mine permit area, (including the South Crandall lease area and the U-68082 lease mod area) because habitats for these species in the permit area are marginal. Areas of potential occurrence include riparian forests along Huntington Canyon for the Bald Eagle.

A revised (2004) list of wildlife and vegetation T & E species within Emery County is provided in the second addendum to Appendix 3-3.

Migratory Birds of High Federal Interest

This group of especially significant species is comprised of 22 bird species identified by FWS as occurring in the Uintah-Southwestern Utah Coal Production Region. Of the 22 species 7 species have the potential of migrating within the region where the mine is permitted.

1. Bald Eagle
2. Golden Eagle
3. Ferruginous Hawk
4. Cooper's Hawk
5. Prairie Falcon
6. Western Bluebird
7. Flammulated Owl
8. Black Swifts
9. Williamson's Sapsuckers

Data from the U.S. Forest Service indicate that a list of mammals, birds, fish, amphibians and plant species which are sensitive species that are potentially present in the area of influence of the proposed mine permit. They are:

1. Townsend Big-Eared Bat (Mammal)
2. Northern goshawk (Bird)
3. Flammulated owl (Bird)
4. Colorado Cutthroat Trout (Fish)
5. Spotted Bat (Mammal)
6. Three-Toed Woodpecker (Bird)
7. Peregrin Falcon (Bird)

Goshawks and Colorado Cutthroat Trout are the only species on this list that have been observed in the permit area or contiguous to the permit area. According to the Forest Service the Colorado Cutthroats are hybrids, not pure. However, GENWAL has a firm commitment to report the presence of threatened or endangered species to the regulatory authority (irrespective of which list the plants or animals appear on). For example, a monitoring program to determine adaption of any nesting golden eagles was implemented.

Several raptor surveys have been conducted since the original survey in which a golden eagle was reported at a nest site the spring of 1980. The nest site was inactive upon inspection by the DWR in 1987 and no eagles were sited in the vicinity. A 1995 raptor survey conducted in June of 1995 found a nesting pair of Golden Eagles, with fledgling, in a nest on the ridge immediately north of the mine (Appendix 3-3). However, survey work later in 1996 showed the nest sites to be "old and dilapidated". The nests were not active and were in poor condition. No nests were found in the permit area or the Incidental Boundary Change area during the May 1998 raptor survey, (personal communication with Ben Morris, May 1998). DWR conducted a raptor survey of the South Crandall lease area in May 2003. No nests were found. The results of this survey area shown in Appendix 3-16. The U-68082 lease mod area was also surveyed and no nests were found (see Appendix 3-16 and 3-16A).

To further protect this potential valuable resource, an aerial survey for the purpose of identifying cliff-nesting raptors, will be conducted every three years or on request of the U.S. Fish and Wildlife Service (USF&W) or the Utah Division of Wildlife Resources (UDWR).

3.22.220 Habitats of Unusual High Value for Fish and Wildlife

Plates 3-1 and 3-1A identify wildlife usage areas of high or critical value. The haul road and surface facilities within the permit area will not disturb any winter range for deer or elk. Plate 3-1 shows elk and deer winter range in the valley bottoms.

Crandall Canyon represents only a portion of winter habitat for moose, the winter range encompasses all the Huntington Canyon drainage, with a very large amount of unoccupied adjacent habitat, (reference Larry Dalton). Thus, the projected impacts will be minimal. According to Larry Dalton of the State of Utah Division of Wildlife Resources, there is a sufficient volume of adjacent unoccupied habitat suitable to absorb displaced moose. The southeastern Utah moose herd is

proliferating at a normal pace. There is an abundance of suitable habitat that is not occupied. This is due, in part to a low initial transplant population of moose and some illegal killing.

3.22.230 Other Species or habitat that Require Special Protection Under State or Federal Regulations.

At present, there are no known additional species that require special protection. Although GENWAL will address any future concerns as they may arise.

No endangered or threatened plant species were encountered in the initial vegetation survey. (This conclusion is supported by a review of the field data in a meeting with Mr. Bob Thompson of USFS, Manti-La Sal National Forest). The subsequent vegetation survey conducted in the summer of 1994 did not encounter the presence of any threatened or endangered plant species.

3.22.300 Fish & Wildlife Service Review.

If, following the Fish and Wildlife review of the above section it is determined the information provided is not adequate, GENWAL will take whatever steps are deemed necessary and reasonable to provide additional requested information in a timely manner. Note letter from USF&W Service Appendix 3-4.

3.23 Maps and Aerial Photography.

GENWAL has a complete set of aerial photographs of the permit area and will make the material available upon request to any regulatory agency. All applicable maps are included in each chapter outlining critical areas that are addressed.

3.23.100 Maps Showing Location of Reference Areas.

Plates 2-4 and 3-7 show the location of the vegetation reference areas.

3.23.200 Monitoring Station(s)

For elevations and locations of monitoring stations used to gather data for fish and wildlife and any special habitat features see Appendix 3-2 and 3-3. This information was collected from the UDWR Publication 90-11.

3.23.300 Habitat Protection and Enhancement

GENWAL ensures that all electric power lines and other transmission facilities are constructed to minimize electrocution hazards. All fencing installed at the mine site will be

constructed to DWR standards, for the protection of wildlife. The landscape boulders/riprap stockpile at the topsoil storage site will provide shelter for the smaller animals.

Surface disturbance will be kept to a minimum. The road will be designed as narrow as practically possible. Encroachment on Crandall Creek will be kept to a minimum to protect the creek as a source of potential food for trout downstream in Huntington Creek.

During construction of the proposed expansion at the mine facility GENWAL commits to the following:

1. Crandall Creek will be temporarily diverted into a 18 inch perforated plastic pipe embedded in the drain rock in the creek bottom. Diversion of the flow through the pipe will allow construction activities to take place above the pipe and avoid impacting stream flow. The drain rock filter will also minimize sediment contribution to the stream. Silt fence and strawbale dikes will be used at the downstream portion of the project to aid in controlling erosion and sedimentation in the areas contiguous to the stream (Detailed construction plans are provided in Appendix 7-50).

2. The area not to be disturbed will be designated as a buffer zone and marked as specified in R645-301-521.200.

3. GENWAL commits to the development and implementation of appropriate mitigation plans with the regulatory authority (UDWR, USFS, Water Rights, UDOGM) should stream flow diminish significantly or water quality deteriorate.

4. During and after construction, the water quality and quantity in the perennial stream shall not be adversely affected.

5. Fill material used in the yard expansion will be taken from a borrow area that has been inspected and deemed to be free of noxious weeds by the UDAF.

GENWAL commits to working with the Forest Service, the Division of Wildlife Resources and the Division of Oil, Gas and Mining on suitable mitigation plans. Mitigation will be based on a 3:1 ratio. Enhancement will be performed at a location selected by the agencies to improve wildlife/fishery habitat on an area three times the length to be affected by the culvert placement. Refer to Appendix 3-12 for a discussion of mitigation measures associated with the yard expansion project.

The Utah Division of Wildlife Resources (DWR) has recently determined that native Colorado Cutthroat Trout (CRCT) inhabit the 1,500 feet of Crandall Creek in the immediate area of the proposed culvert installation. Because this fish has been heavily hybridized by past re-

stocking effort of other trout species, this fish is now considered sensitive by the U.S. Forest Service. The Forest Service and DWR have recently signed a CRCT recovery agreement designed to restore the fish to numerous streams throughout the State of Utah.

According to the Recovery Agreement, there are presently 21 pure and 59 potentially pure populations of CRCT which collectively inhabit more than 215 miles of stream in Utah. There are also another 41 populations of pure CRCT which have been identified in neighboring area of Colorado and Wyoming.

The Crandall Creek population is the only population yet identified on the Wasatch Plateau Manti-LaSal Forest and are therefore of high interest to the Forest Service, Division of Water Rights, Division of Oil, Gas and Mining and Division of Wildlife Resources. GENWAL recognizes the sensitive nature of this fish and has worked cooperatively with DWR and the Forest Service to develop an acceptable mitigation plan to provide suitable mitigation for the Crandall Creek population. Details of this mitigation plan are included in Appendix 3-12.

3.23.400 Vegetation Type, Plant Community, and Sample Locations

See Plates 3-2, 3-7, 3-8, and 3-9.

3.30 Operation Plan.

Each application will contain a plan for protection of vegetation, fish, and wildlife resources throughout the life of the mine.

GENWAL has prepared a plan to mitigate any adverse effects on vegetation, fish or wildlife. This plan is addressed in the following Sections 3.31, 3.32, 3.33, 3.41, and 3.40.

3.31 Disturbance and Interim Stabilization

As agreed to by the United States Forest Service and GENWAL, land above and within the 20 degree angle of draw of all second mined workings shall be monitored by infrared aerial photography techniques every five (5) years by the operator. This monitoring will begin in 1995 and continue once every five (5) years thereafter. Comparisons of vegetative cover will be made to determine if any adverse changes to the vegetative cover have occurred.

GENWAL further commits to not disturb any area within their permit boundary due to construction without approval from the Division. When disturbance does occur GENWAL will ensure that the smallest area practicable will be disturbed. GENWAL does reserve the right to change the location of fence posts, power poles, etc. without obtaining a permit modification. When

an area is disturbed, revegetation measures will be implemented to establish and maintain the area and to minimize surface erosion.

Mitigating Measures to Reduce Impacts on Vegetative Resources

The disturbed area within the permit area, including the four topsoil stockpiles, will be reclaimed upon permanent cessation of mining operations. Within the permit disturbed area during the operational phase, water will be applied to the coal, roads, and the adjacent forest development road when needed to reduce fugitive dust emissions. Additionally, magnesium chloride may be applied to the roads to reduce dust emissions.

All surface areas which are disturbed during construction and which will not be needed for mining operations (i.e., cut banks and outslopes of fill and areas near the sedimentation pond) will be revegetated in the fall of the year following completion of construction. This revegetation will be performed as described;

The seed mix listed below has been and will be used as temporary cover to stabilize topsoil stockpiles and disturbed areas:

Temporary Mix	lb/acre PLS
Agropyron smithii (western wheat grass)	4
Agropyron trachycaulum (slender wheat)	4
Bromus marginatus (mountain brome)	3
Elymus cinereus (great basin wild rye)	2
Melilotus officinalis (yellow sweet clover)	2
Total Seed Mix	15

A similar seed mix was used in the past for temporary cover, with the exception of Elymus janceus (Russian wild rye) which was used in place of Great Basin wild rye due to seed availability.

In the future the seed mix which will be used in the final reclamation will also be used for temporary cover to stabilize topsoil stockpiles. Lynn Kunzler of UDOGM conferred with the Forest Service regarding the change in seeding procedure and seed mix. An agreement was made, that if GENWAL would use the same mix for temporary reclamation, the changes in seed mix would be approved by the Forest Service. The temporary seeding may be observed by a representative from the UDOGM, Forest Service and GENWAL. If the seed mix should need changes due to over or under growth of a particular plant, an appropriate substitution will be made after consultation with the Division.

The interim reclamation plan for steep areas (areas having a slope greater than 30%) will be modified to provide a greater and faster growth rate as follows:

1) Alfalfa (Medicago sativa) was added at a rate of two lbs. PLS/acre to the above seed mix in the past and will be added in the future if necessary.

2) Hydromulch will be applied at a rate of 2000#/acre and fortified with up to 80#/acre tac depending on the slopes involved.

A reclamation map showing post construction interim reclamation areas and final reclamation accompanies this MRP as Plate 5-17. The correct number of acres to be revegetated in final reclamation is 14.33 acres, including the topsoil storage areas. The USFS access road and trailhead area will be left intact removing 1.47 acres from reclamation requirements.

The disturbed areas within the mine plan area over which the water reports to the sediment pond and which have interim reclamation will achieve an 80% cover on the slopes. The other interim reclamation area will be seeded with enough vegetation to prevent erosion. Refer to Appendix 3-5 for details of the irrigation plan to maintain 80% cover.

3.32 Subsidence Control Plan

GENWAL's survey, as stated in the mine plan, indicates that no structures exist within the permit area where a potential for subsidence may occur on the surface. (Renewable resource protection is addressed in Chapter 5, Section 5.25.)

Impacts of Subsidence

For a more complete discussion refer to Chapter 5, Section 5.25. Relative to potential impacts to wildlife (tree nesting raptors and cliff nests for raptors see Appendix 3-8 (letter from UDWR).

Control Measures to Mitigate Impacts

Any area that appears to have been impacted through subsidence will be inventoried to determine if any significant damage to vegetation or wildlife is apparent. In the event damage has occurred, the management agency responsible will be notified and a joint plan of mitigation will be formulated if deemed necessary and forwarded to Utah Division of Oil, Gas and Mining (UDOGM) for their approval prior to implementation.

3.33 Impacts to Fish and Wildlife

This section provides a description of how, to the extent possible, using the best technology currently available, GENWAL will minimize disturbance and adverse impacts to fish and wildlife and related environmental habitat during mining and reclamation operations, including compliance with the Endangered Species Act of 1973. This includes the location and operation of haul and access roads and support facilities so as to avoid or minimize impacts on important fish and wildlife species or other species protected by State or Federal law.

GENWAL has agreed to survey tree nesting raptors and their active nests if subsidence is detected. It is also agreed that during reclamation at the mine site, GENWAL will leave or construct certain structures which will benefit wildlife. For more specific information, see Appendix 3-8.

GENWAL also maintains a sedimentation pond and has two permitted UPDES discharge points which help to ensure that sedimentation and runoff do not reduce the viability of the downstream waters and habitat. GENWAL maintains stream buffer zones, has applied reclamation measures, and maintains control of the mine site runoff water to reduce the potential for offsite disturbances.

3.33.100 Compliance with R645-301-358

The GENWAL will comply with the requirements of R645-301-358 using BTCA to protect fish, wildlife and related environmental values.

3.33.200 Designated Species

GENWAL agrees to (at a minimum) protect and enhance species and habitats identified under R645-301-322.

3.33.300 Project Impact of Mining on Fish and Wildlife

Operation will unavoidably impact small vertebrate species, temporarily eliminate approximately 1,500 feet of fisheries habitat, and increase hunting pressure on big game species. Impact to the fishery in Crandall Creek which is adjacent to the permit area will be kept to a minimum. Approximately 1,500 feet of fisheries habitat will be temporarily lost when the stream is culverted. This area of the stream will be reclaimed and the habitat re-established during reclamation of the site.

GENWAL will protect wildlife habitat on the permit area by careful design and construction of mining facilities and transportation corridors, and by keeping surface disturbance to a minimum. GENWAL has committed to report to the regulatory authority the presence of any threatened or endangered species in the area.

The substation and transformer located within the permit area supplies all the power for the mine site. The power lines from the substation are in underground conduit, providing no threat to raptors.

Water depletion by mining consists of water evaporation caused by the ventilation current and water used in the mining process and removed within the coal shipments. Water evaporation by the ventilation current varies with the volume of air and is estimated to be less than 5 acre feet per year at the maximum air flow of the mines. The amount of water depleted by the mining process varies with the tonnage of coal produced per year. At the maximum annual production the amount of water depleted is estimated to be 40 acre feet. Refer to calculations in Appendix 3-18.

Mitigating Measures to be Employed to Protect Fish and Wildlife

Impacts on the lower 2 km of the canyon will remove approximately 0.5 acre of moose habitat, winter habitat in particular. This represents only a minute portion of the moose winter habitat which encompasses all of the Huntington drainage. Of the 0.5 acre winter range to be disturbed, the riparian habitat portion is of critical value, with only approximately 3000 square feet

of wooded area being disturbed. According to Larry Dalton of the State of Utah Division of Wildlife Resources, there is a tremendous volume of adjacent unoccupied habitat suitable to absorb displaced moose. The southeastern Utah moose herd is proliferating at a normal pace.

Moose are drawn to Crandall Canyon because of the water and vegetation which grows along the Crandall Creek. The Division of Wildlife Resources provided a map of moose wintering habitat

in the area, the information from that map is shown on Plate 3-1. Crandall Canyon is of critical grazing value to moose all year long.

As per Larry Dalton, State of Utah, Division of Wildlife Resources, there are no known locations of drumming logs in Crandall Canyon or near the proposed surface or haul road areas to be disturbed.

The loss of 1,500 feet of fisheries habitat will be mitigated with the recommendations from the UDWR and the U.S. Forest Service. GENWAL, the U.S. Forest Service and the Utah Division of Wildlife Resources have agreed to mitigate this loss. Refer to Appendix 3-12 for the specific mitigation measures that have been agreed upon by GENWAL and the agencies.

Also, the previously approved and also the recently updated air pollution control plan, as submitted in the permit, contains itemized mitigation for dust abatement during construction. In 1983 the practice of dumping rock and soil adjacent to the mine site near Crandall Creek was stopped, to reduce impact to fisheries and food production in Crandall Creek. Efforts will continue in the future to limit disturbance of fishery habitat.

GENWAL feels that the initial aquatic study and report provides sufficient baseline data (Appendix 3-2). Additional studies have been performed in 1994. GENWAL agrees to conduct an additional aquatic macroinvertebrate study in the spring and fall of 1997 (as agreed to by the Price Office of the Forest Service). Thereafter, GENWAL will conduct additional monitoring in the spring and fall of 2000 and every three years thereafter for the life of the mine (unless the study data indicate a different schedule).

UDWR has conducted cliff nesting raptor surveys of the entire permit area. These surveys have located one site where Golden Eagles either have historically built eries or areas that have a potential for eries.

Aerial surveys of the eagle nests will be conducted every three years or on request of the USF&W Service or the UDWR. Prior to the implementation of UDWR recommendations, GENWAL will advise UDOGM and request their approval and/or recommendations. An annual survey will only be conducted: (1) in the event that UDWR recommends it, (2) this course of action will not unduly harass or stress nesting eagles, and (3) if prudent to insure their safety and/or habitat.

Wildlife

In addition to cliff nesting raptors, there is a potential for five tree nesting raptors inhabiting the permit area. They are: the (1) Goshawk, (2) Sharp Shinned Hawk, (3) Red Tailed Hawk, (4) Swainson's Hawk and the (5) Ferrugenous Hawk (the Price office of the U.S. Forest Service is of the opinion that the Ferrugenous Hawk is unlikely to occur in the mine permit area). All of these species are condo-nesters and will normally have a number of nest locations and only utilize one

per any one season. Other than surface disturbances the only potential impact to these species would be the loss of an active nest during the egg incubation period or when flightless young were occupying the nest. This could possibly occur as a result of subsidence. A GENWAL representative will contact the UDWR and the U.S. Forest Service as per their recommendations. Appendix 3-8 outlines the course of action GENWAL has agreed to implement.

3.40 Reclamation Plan

3.41 Revegetation

The revised acreage is correct in itemizing 10.53 acres of disturbance within the permit area of 5195.30 acres (total lease acreage, including new leases), refer to Plates 1-1, 2-2 and 5-3. Each application will contain a reclamation plan for final revegetation of all lands disturbed by coal mining and reclamation operations, except water areas and the surface of roads approved as part of the postmining land use, as required in R645-301-353 through R645-301-357, showing how the GENWAL will comply with the biological protection performance standards of the State Program. The plan will include, at a minimum, as described in the following Sections 3.41.100 through 3.41.300.

3.41.100 Detailed Schedule and Timetable

All reclamation, other than areas handled in interim reclamation, will commence with final grading of disturbed surface areas, which should be completed in approximately one month. Within 30 days following completion of final grading (which should be in late September or early October), topsoil from the stockpile will be redistributed. Nutrients and soil amendments, if shown to be required by soil tests, shall be applied to the redistributed topsoil before the end of October. Seeding, transplanting and mulching will then proceed when moisture conditions are optimal for planting and seeding. Seeding will commence as soon as the seedbed is finished in the late fall. Tree planting will be done in conjunction with seeding or in the following spring, as soon the soil is workable.

As stipulated by the Price office of the U.S. Forest Service the sediment pond will be removed in final reclamation after the mine site has been revegetated and the potential for erosion and sedimentation has been significantly diminished. All associated control devices will be removed after the criteria of R645-301-763.100 has been achieved, according to the approved reclamation plan. The permanent runoff control system will then be completed (see Chapter 7 for further information).

3.41.200 Descriptions

3.41.210 Species and Amounts of Seeds and/or Seedlings

A planting (seed) mix has been developed for the non-riparian and riparian disturbed areas. It is made up of native and naturalized grass, forb, and shrub species (see Appendix 3-6). Trees species will be planted in the wooded areas and riparian zone.

Appendix 3-6 includes a list of grasses, forbs, shrubs and trees to be used after December 1988 for both interim stabilization of topsoil stockpiles and for reclamation. This list was complied by Lynn Kunzler in conjunction with the USFS. If changes in the seed mixture become necessary due to over or under growth, seed availability, etc., all parties involved will come to an agreement as to the right seed mixture for each area. This list has been amended for the culvert expansion project after consultation with DOGM and USFS.

Refer to Plate 5-16 and 5-17 for the areas to be planted with planting mixture (Appendix 3-6). Two tenths of a pound per acre of Louisiana Sagebrush (Artemisia ludoviciana) could be added if needed for erosion control.

The following procedures are designed to revegetate and control erosion. They should, to a large degree, satisfy the commitments made by GENWAL in their desire to restore the disturbed land to its pre-disturbance condition.

The actual ground involved comprises approximately 10.20 acres of disturbed land, primarily coal facilities and fill areas. The actual procedures involve a three phase program: (1) broadcast seeding, (2) hydromulch the entire area to supplement revegetation and control run-off until stabilization is complete, and (3) to plant seedlings to further stabilize the soil and to provide necessary wildlife, hydrological, and aesthetic commitments as required under R645 regulations.

3.41.220 Methods to be Used in Planting and Seeding

Phase 1 Seeding

The entire area of disturbance will be broadcast seeded during the first fall following the completion of the earth work (October through November). Spring seeding was considered too speculative to be implemented based on the variation in spring moisture regimes. All areas receiving top soil would be seeded. This includes the top soil stockpile area and associated disturbance.

Hydroseeding combines the advantages of applying seed uniformly over all areas, plus, with the addition of a tackifying agent, insures a greater degree of stability and seed-ground contact. "Tac" acts much in the same way as a "permeable matt" it sticks the seed to the ground and to a

degree, helps adhere the new soil to the side hill. It minimizes the potential for erosion and will be residual for up to 2 years, aiding the seedlings to become established.

3.41.230 Mulching Techniques, Type and Rate of Application

Phase 2 Mulching

The entire area of disturbance will be hydro-mulched during September-October. Hydromulching will be carried out in conjunction with the earth work. Recommendations for the hydromulching operation are as follows:

This methodology involves the use of hyroseeder to apply the seed and tac to all disturbed areas and then to overspray the seeding with a bonded fiber mulch in combination with additional tackifying agents.

The following rates of material should be utilized. Rates of tac were developed with respect to velocity and erosive power of water which is proportional to the square root of the slope. An empirical factor was determined from laboratory and field studies to arrive at the minimum tac fiber ratio. Thus, 60 pounds of tac per ton of fiber is determined to be required for a slope of 25% (a 25% slope will require the minimum amount of tac). For additional slopes the ratio of tac to fiber is calculated as:

SUGGESTED RATIOS OF TAC TO FIBER FOR HYDRO-SEEDING AND HYDRO-MULCHING TO SERVE AS MULCH OR SOIL BINDER

Slope Angle	Slope Ratio	Percent Slope	lbs. Tac Per ton Fiber	Ratio Tac To Fiber
14°	1 : 4	25%	60 (Minimum)*	1 : 30
26°	1 : 2	50%	80	1 : 25
33°	1 : 1 1/2	66%	100	1 : 20
45°	1 : 1	100%	120	1 : 16
45°	1 1/2: 1	150%	140	1 : 14
64°	2 : 1	200%	160 (Minimum)	1 : 12

Sixty pounds of tac is suggested as a minimum to insure excellent stabilization with the seed application. An additional 80 pounds of tac per acre with the mulch application has given excellent results on a 1 : 1 slope.

Following the seeding effort the entire area of disturbance will be hydro-mulched. The rate of application of the mulch is 2000 lbs./acre.

No attempts will be made to establish rabbitbrush as previous experience has shown that it is impossible to stop this shrub from invading the area. If Snowberry does not establish from seed by the end of the second year, seedlings from native plant nurseries will be planted randomly on approximately one rod intervals where they occurred in the original land cover of the disturbed areas.

Tree species and rates, to be planted on the slopes of 30% or less are listed in Appendix 3-6.

If the seeded shrubs do not grow, then replacement seedlings will be planted in clumps. While clumping will not give a uniform seed dispersal over the entire area it would enhance wildlife habitat.

Species diversity standards have been established for revegetated areas. These will insure that a good mix of grasses, forbs, shrubs and trees, where appropriate, will be re-established, and that the reclaimed area will not be dominated by one or two species. GENWAL has committed to protecting revegetated areas and to managing the reference area in a manner compatible with postmining land use.

Interim reclamation will be undertaken following construction. Plates 7-5 and 5-16 show areas of interim reclamation.

The USFS, USF&W Service and UDOGM have requested that the riparian habitat be restored along Crandall Creek. The proposed seed mix and planting mix should accomplish this goal.

3.41.240 Irrigation and Pest and Disease Control Measures

No irrigation is anticipated (see Section 3.31).

GENWAL hereby commits to avoid the use of persistent pesticides and/or chemicals and to prevent personnel caused fires.

Should lack of precipitation cause the vegetation to fail, all areas will be revegetated. No attempts will be made at irrigating the revegetated areas during final reclamation. The species recommended for revegetation are known to survive in this region without the artificial application of water.

3.41.250 Revegetation Success

Revegetation Monitoring

Success of revegetation shall be monitored by techniques approved by the Division after consultation with the appropriate State and Federal agencies. Comparison of ground cover and productivity will be made on the basis of reference area. Ground cover and productivity figures from the reference area will be used as a standard for all revegetated areas. The shrub density standard for south facing slope areas will be 1,336 shrubs/acres (as per baseline data).

GENWAL has used the reference area method to set criteria for determining success. One reference area was established, as shown on the Vegetation Community Study Map, Plate 3-7. The reference area for the north-facing slope spruce/fir/aspen community is shown on Plate 2-4.

The seed mix meets the postmining land use of light livestock grazing and wildlife habitat. Data on cover and tree density have been submitted. Should seeding not be successful, a plan for seedling shrub planting (to enhance the habitat for wildlife) will be developed prior to implementation and submitted to UDOGM for approval.

The original plots were done by ocular estimate of circular plots. The circular plots were done randomly by laying a steel circle of 11 feet circumference upon the ground and recording the vegetation density, the bare ground, surface fragments and litter values as a percent of the enclosed circular area. On the MSG area the following original species density, in percent of composition, were recorded: 92% grass, 2% forbs and 6% shrubs. Upon reseeding, there will be a minimum of 5% shrubs with a maximum of 20%, minimum of 2% forbs with a maximum of 20% and the remainder will be taken up by grass species to meet required standards. For the reference area, the following densities were found on the original survey: 94% grasses, 1% forbs and 5% shrubs. On the SFA area there will be a minimum of 6% grasses with a maximum of 20%, minimum of 14% forbs with a maximum of 30% and the remainder being taken up by shrubs.

On the MSG area including the reference area, there was no sign that any domestic livestock had ever used this area. The slope steepness of 70% and greater making domestic livestock use prohibitive. Elk and mule deer had and were using the area. The 30% and less slopes and the riparian area show that domestic livestock have used the areas.

GENWAL has chosen to follow the diversity standards recommended as a result of consultation between the Forest Service and the Division. In the spruce/fir/aspen areas, grasses are expected to dominate the vegetation for the first several years until the tree and shrub growth becomes more prominent. The diversity standard would be 3-15% relative cover from broadleaf forbs, at least 15% cover from trees and shrubs, and the balance from grasses. This will leave some latitude for variation over time since woody plants are expected to eventually become dominant in the area.

The riparian and north facing slope areas will also become dominated by woody species as the vegetation matures. A standard of 5-10% relative cover from broadleaf forbs, 40-85% relative cover from trees and shrubs, and 10-50% relative cover from grasses and grasslike plants will be applied to the riparian area.

For both riparian and spruce/fir/aspen areas, no one species will make up more than 60% of the cover in its respective vegetation class, except that individual species of trees and shrubs will make up no more than 80% of the density for this class. The diversity standards for south-facing slopes are based on Natural Resource Conservation Service range site potential plant community data. The diversity standard for the riparian and north facing slop areas was developed by a Forest Service botanist, a NRCS soil scientist and a DOGM biologist .

The Division and Wildlife Resources has established woody plant density success standards of 4,000 woody plants per acre for the spruce/fir/aspen areas and 6,000 woody plants per acre for riparian areas.

A detailed plan for monitoring revegetated areas is presented below. This includes specific methods for collecting data on cover, productivity, and shrub and tree density, as well as a time table for all monitoring activity.

The reference area will be reviewed by the SCS for range conditions every five years, during the field season before permit renewal. If the range condition is found to be in a deteriorating condition because of encroachment of wildlife or livestock the area will be fenced.

The areas that have been revegetated will be monitored during the 2nd, 4th, 7th, 8th, 9th and 10th years during the last half of the growing season, thus corresponding to the time of the original vegetation survey. Ocular estimates will be made in years 2 and 7 with quantitative estimates in years 4, 8, 9, and 10, or one year prior to Phase II Bond Release. Species diversity will be confirmed in years 9 and 10, or one year prior to Phase II Bond Release, and compared to the reference area data collected during the same sample period. If on any year the monitoring shows the vegetation to be below the requirements, steps will be taken to increase the vegetation by additional seeding with the required seed mixture.

Circular plots will be located randomly across the entire revegetated area. A steel hoop of 11 feet circumference, enclosing an area of 9.6 square feet will be used to determine the ocular plot for estimating percent cover by species and total vegetative cover, percent bare ground, percent of surface fragments and percent litter within the hoop boundaries.

The point-centered quarter plots will be used to check tree and shrub densities in years 4, 8, and 10, or prior to Phase II Bond Release, in order to demonstrate that 80% of trees and shrubs have

been in place for at least 60% of the liability period. No trees or shrubs will be counted that have not been established for two years.

For sample adequacy of vegetation data during the 9th and 10th years, the formula suggested in the latest UDOGM guidelines will be used.

Approximately 22 plots in the MSG area and 10 plots in the reference area will be needed to meet the standard of the UDOGM formulas. The double "t" test will be used, the 9th and 10th year, to test similarity of the reference area to its affected vegetational counterpart with respect to cover and shrub density and productivity.

Resulting figures and data from the reclaimed areas will be compared with the data collected the same year from the reference area to determine vegetative compliance. The reclaimed area must meet the success criteria during years 9 and 10 of the liability period. The double "t" test to check revegetation data and reference area data will be collected the same year.

Adequate sampling will be ensured, especially at the time of bond release, years 9 and 10. Reclamation will be considered successful when percent cover density and productivity are within 90% of the reference area or other approved standard (with a confidence interval of 90%).

As a final step during the last field check upon the vegetational productivity, an adequate sample, as determined by the above adequacy formula, within the reference area will be clipped and weighed and the weights recorded by individual species for each plot. The average weights of these plots will be compared to the average production of species of similar plots taken in the revegetated areas. The production of plots taken from the reseeded area must fall within the limits of 90% or better of the production of plots taken from the reference area. All weights for comparison will be dry weights.

Monitoring data will be submitted to the Division with the annual report. GENWAL also commits to fencing the revegetated area until plants are well established should grazing pressure on the revegetated area be excessive. Any fencing will be approved by the Division prior to erection.

Regarding erosion control monitoring, GENWAL proposes to utilize "Eriosion Condition Classification System" (Humphreys, 1990), the erosion classification system developed by the BLM and modified by Mark Humphreys of OSM. In utilizing this system, SSF values would be kept at less than or equal to the surrounding undisturbed areas.

3.41.300 Greenhouse Studies

Should the Division require greenhouse studies, field trials, or equivalent methods of testing, GENWAL will comply when feasible.

3.42 Fish and Wildlife

Each application will contain a fish and wildlife plan for the reclamation and postmining phase of operation consistent with R645-301-330 (Section 3.30) and the performance standards of R645-301-358 (Section 3.58). Following mining, revegetation will be primarily concerned with replacing the premining habitats. High value habitats will be restored; in many cases, they will be enhanced beyond their premining condition.

3.42.100 Enhancement Measures

Enhancement measures will be used during the reclamation and postmining phase of operation to develop aquatic and terrestrial habitat. Such measures may include restoration of streams and other wetlands, retention of ponds and impoundments, establishment of perches and nest boxes. Where the plan does not include enhancement measures, a statement will be given explaining why enhancement is not practicable.

No additional enhancements are proposed during the reclamation of the GENWAL mine facilities, other than those stated in the reclamation plan.

3.42.200 Criteria for Plant Species Selection

Where fish and wildlife habitat is to be a postmining land use, the plant species to be used on reclaimed areas will be selected on the following basis.

1. Their proven nutritional value for fish or wildlife;

2. Their use as cover for fish or wildlife; and

3. Their ability to support and enhance fish or wildlife habitat.

The selected plants will be grouped and distributed in a manner which optimizes edge effect, cover, and other benefits to fish and wildlife.

GENWAL's goals are to create an enhanced diversified cover and/or habitat that will support a wide range of species while restoring the area to a premining condition.

3.42.300 Croplands

There are no croplands within the permit area. See Appendix 2-1.

3.42.400 Residential, Public Service or Industrial

There are no residential, public service, or industrial postmining land uses planned within the permit area.

3.50 Performance Standards

3.51 General Requirements

All coal mining and reclamation operations will be carried out according to plans provided under R645-301-330 through R645-301-340.

3.52 Contemporaneous Reclamation

Revegetation on all land that is disturbed by coal mining and reclamation operations, will occur as contemporaneously as practicable with mining operations.

3.53 Revegetation

General Requirements

GENWAL will establish on regraded areas and on all other disturbed areas, except water areas and surface areas of roads that are approved as part of the postmining land use, a vegetative cover that is in accordance with the approved permit and reclamation plan. The seed mix and plant stock detailed in Section 3.41.200 meet all of the reference regulations in R645-301-353.

3.53.100 Vegetative Cover

The vegetative cover will be:

Diverse, effective, and permanent;

Comprised of species native to the area, or introduced species approved by the Division;

At least equal in extent of cover to the natural vegetation of the area; and

Capable of stabilizing the soil surface from erosion.

The erosion condition classification system will be employed on a yearly basis after final reclamation has been accomplished in order to monitor the effectiveness of revegetation in stabilizing the soil surface from erosion.

3.53.200 Plant Species

The established plant species will:

Have similar seasonal characteristics of growth as the original vegetation;

Be capable of self-regeneration and plant succession;

Be compatible with the plant and animal species of the area; and

Meet the requirements of applicable Utah and federal seed, poisonous and noxious plant; and introduced species laws or regulations.

3.53.300 Species Exceptions

The Division has granted exception to GENWAL to included yellow sweet clover in their seed mix to achieve a quick-growing, temporary, and stabilizing cover.

3.53.400 Prime Farm Lands

There are no prime farm lands within the permit area. See Appendix 2-1 (Prime Farm Land Determination).

3.54 Revegetation; Timing

See Section 5.42 of Chapter 5.

3.55 Revegetation; Mulching and Other Soil Stabilizing Practices

Suitable mulch and other soil stabilizing practices will be used on all areas that have been upgraded and covered by topsoil or topsoil substitutes. See Section 3.41.230.

3.56 Revegetation; Standards for Success

3.56.100

GENWAL's success of revegetation will be judged on the effectiveness of the vegetation for the approved postmining land use and the extent of cover compared to the extent of the reference area cover.

The Division's "Vegetation Information Guidelines, Appendix A" will be used for sampling techniques and methods to measure success.

Unmined lands in the area of GENWAL will be used to evaluate the appropriate vegetation parameters of ground cover, production, or stocking. Ground cover, production or stocking will be considered equal to the approved success standard when they are not less than 90 percent of the success standard. The sampling techniques for measuring success will use a 90-percent statistical confidence interval.

3.56.200 Postmining Land Use Success Standards

The area of disturbance will be reclaimed with the intent of limited domestic grazing as a side use to wildlife habitat and will adhere to the standards outlined in 356.200.

GENWAL agrees that the minimum stocking and planting arrangements will be specified by the Division. Trees and shrubs used in determining the success of stocking and the adequacy of plant arrangement will have utility for the approved postmining land use. At the time of bond release, such trees and shrubs will be healthy, and at least 80 percent will have been in place for at least 60 percent of the applicable minimum period of responsibility. No trees and shrubs in place for less than two growing seasons will be counted in determining stocking adequacy. Vegetative ground cover will not be less than that required to achieve the approved postmining land use.

Cropland

No prime farmland (cropland) exists within the permit area (see Appendix 2.1).

Residential, Public Service, or Industrial Postmining Land Use

Due to limitations imposed by topography, climate, soil conditions, inadequate water supply and other natural features, use of the land within the area has been limited primarily to livestock grazing, wildlife habitat and outdoor recreational activities.

No development for industrial, commercial or residential use is anticipated.

Previously Disturbed Areas

All previously disturbed land within the permitted area of disturbance will be addressed and reclaimed in the same manner as newly disturbed areas.

As the vegetative ground cover existing before redisturbance was 50.3%, this figure has been established as the vegetative cover standard for success for the areas previously disturbed by mining.

3.56.300 Siltation Structures

GENWAL will leave all siltation structures in place until adequate vegetation cover is achieved to minimize negative impacts and authorization has been given by the Division.

3.56.400 Removal of Siltation Structures

When the sediment pond is removed, the land on which the pond was located will be revegetated in accordance with the reclamation plan and R645-301-353 through R645-301-357.

3.57 Revegetation: Extended Responsibility Period

The period of extended responsibility for successful vegetation will begin after the last year of augmented seeding, fertilization, irrigation, or other work, excluding husbandry practices. Based on historic precipitation record GENWAL anticipates a 10-year liability and responsibility period.

GENWAL will take all steps necessary to insure revegetation success during reclamation.

3.58 Protection of Fish, Wildlife, and Related Environmental Values

GENWAL commits to using the best technology currently available to minimize disturbances and adverse impact to the fish, wildlife and related environmental values and the enhancement of these resources when practical.

Construction of the newly expanded surface facilities will allow salt and road traction to be stored in the area of the existing coal loading facility after these facilities have been removed and the area has been cleaned up. Runoff from this new salt/road traction storage area will report directly to the sediment pond thereby minimizing potential impacts to the aquatic environment in Crandall and Huntington Creeks. Installation of the 72" culvert will remove a section of aquatic habitat from Crandall Creek. However, the newly constructed surface facilitites will allow greater control of surface runoff from the mine area. This will reduce the potential for accidental contamination of Crandall Creek from sediment, coal fines and other contaminants.

Construction work that may have had an impact on the Crandall Creek fishery is the construction of the haul and access road. This haul and access road was constructed and is maintained under jurisdiction of the USFS. Impacts and required mitigation are addressed in the approved environmental assessment, authorizing the construction of the Crandall Canyon Road and Bridge as proposed by GENWAL, dated May 18, 1981. The approved air pollution control plan, as submitted in the permit, contains itemized mitigation for dust abatement during construction.

In 1983 the practice of dumping rock and soil adjacent to the mine site near Crandall Creek was stopped, to reduce impact to fish spawning and food production in Crandall Creek. Efforts will continue in the future to limit disturbance of fishery habitat.

GENWAL has committed to conducting additional macrobiotic studies in the spring and fall of 1997 and again in the year 2000 and every three years thereafter for the life of the mine (unless study data show a different schedule would be effective). Stream flow and water quality will also be monitored as proposed in previously submitted ground and surface water monitoring plans.

Threatened and Endangered Species

GENWAL will conduct no coal mining or reclamation operation which is likely to jeopardize the continued existence of endangered or threatened species. GENWAL will report to the Division any state-or federally-listed endangered or threatened species within the permit area.

No nests or eries are located within any area that could feasibly be in jeopardy through mining or mine related activities. At no time will GENWAL proceed in any manner which could theoretically jeopardize raptors or threatened and endangered species.

Wetlands and Riparian Vegetation

See Sections 3.23.300, 3.33.300, 3.41.200, and 5.25.16.

An inventory of soil and vegetation resources potentially affected by GENWAL's proposed yard expansion within the riparian zone of Crandall Creek was conducted in July and October of 1994 by employees of Environmental Industrial Services (EIS).

A soil survey, using U.S. Army Corp of Engineer standards, was conducted to determine the presence of hydric soils within the area of proposed disturbance. Six soil pits were located randomly throughout the riparian corridor immediately adjacent to Crandall Creek. Of the six samples sent to Intermountain Laboratories for analysis, two indicted possible hydric soil development. Two other pits were located up on a small bench above the riparian corridor. Of these samples, one indicated the presence of hydric soil, possibly the result of seepage from the hillside above.

The soil resources along the proposed expansion area had been previously mapped by the U.S. Forest Service. Portions of the field work were conducted by Mr. Dan Larson. Written descriptions were obtained from "Soil Survey of Parts of the Price River and Huntington River Watersheds" by John L. Swenson, Wesley Ketch and Laurel Stott, December, 1983. Refinement of the soil boundaries and descriptions were completed by GENWAL Resources, Inc. personnel, David Steed of EIS, and Chris Hansen of EarthFax, through additional field work conducted during the summers of 1995 and 1996.

The soils were mapped and correlated by the U.S. Forest Service as the Bundo-Lucky Star (Map Unit 100) and Lucky Star-Adel (Map Unit 711) complex and the Greyback Bachelor Family (Map Unit 301).

The Bundo-Lucky Star and Lucky Star-Adel are described as Typic Paleoboralfs, loamy-skeletal, fine sandy loam, 40 to 70 percent slopes. The Greyback Bachelor Family is described as a Typic Cryorthent, fine-loamy mixed, (calcareous), 30 to 50% slopes. These soils also contain small inclusions, less than 0.25 acres of alluvial/colluvial soils which have been deposited and formed on the south side of Crandall Creek. In the area of the mine, these soils are shallow to moderate in depth and are underlain by bedrock. Numerous rock outcrops are present.

Field methodology was based on procedures established by the U.S. Army Corp of Engineers (USACE), Corp of Engineers Wetland Delineation Manual, 1987 Edition for the identification of hydric soils. The procedures for the determination of wetland soils in both organic (nonsandy) and sandy soils incorporated into this study were:

- determining the presence of organic soils (histosols)
- determining the presence of organic material in surface horizon, or streaking of organic material in subsurface horizons (sandy soils)
- determination of a saturated A horizon (histic epipedon)
- the indication of a reducing environment (sulfidic material or presence of ferrous iron)
- a completely saturated soil structure (aquic or peraquic)
- use of a Munsell Color test (nonsandy soils only)
- determining the presence of an organic "pan"

The inventory of possible hydric soils was accomplished with the excavation of six (6) soil pits randomly located along the riparian corridor. Pits were located along the channel banks, so as not to sample recently deposited material or exposed channel substrate. As the material was excavated down to parent material, the composition of the native material was noted. Soil moisture was also noted for each sample as was depth of the organic layer. A composite sample was collected for each of the six samples because no significant soil horizon formation was apparent.

Two representative samples were collected from the adjacent bench area using the same methodology as for those collected along the riparian corridor. Only two samples were collected due to the small, uniform nature of the bench which comprised an area 200' x 50'. Composite samples were collected due to the lack of substantial horizon formation.

On-site field investigation of the riparian corridor and the adjacent bench indicated a potential for hydric soils at locations along the riparian zone at SS 5 and SS 6 and on the bench area at location SS 1. Riparian SS 5 and SS 6, Entisols located above the bankfull mark on the northern embankment of Crandall Creek, were saturated throughout their depth to parent material (preaquic).

The presence of thick organic layers within these two samples were also identified. The bench sample SS 1 was saturated and contained a one inch organic pan layer 11 inches below the surface. The pH levels were higher than expected along the riparian corridor (7.5 to 7.7). Munsell Color tests did not provide satisfactory identification of hydric soils since all of the samples analyzed were sandy.

A hydrologic influence to soil resources is inherent to a riparian area. All soil along the greenline; that area where a continuous cover of vegetation has resulted from the presence of a saturated environment, is to some degree hydric in nature. Though Samples 5 and 6 were identified as hydric soils, their presence along the channel within the narrow riparian corridor would assume this. Therefore, the presence of these two samples is not in itself a significant indicator of a wetland.

The presence of the hydric soil on the adjacent bench is questionable. Bench Sample 1 was taken uphill and more than 100 feet away from the true greenline corridor. At this location the influence of the wetted channel is doubtful. It is more likely that runoff from the steep slope above the bench may have resulted in sediment deposition and localized saturated environment. The presence of a seep or spring may also have produced this inclusion

The current vegetation inventory took into account the previous evaluation of the deciduous/coniferous community, past disturbances, and the divers nature of this stretch of Crandall Creek. Vegetation along this particular section is varied throughout the 1,000 feet, due to past disturbances from fire and grazing. A series of beaver ponds, rock outcrops and steep side slopes have also contributed to intermittent vegetation cover along the length of the corridor. The community cover, in general, is a mix of grassy slopes, deciduous and coniferous clusters, and shrubby stretches that border a relatively narrow wetted zone along the creek.

Vegetation cover was relatively high (>70%) over the area of proposed disturbance. Species richness and diversity within the corridor and the bench, however, do not reflect a highly even community. With the exception of forb species, diversity for the corridor and adjacent bench is low, considering the influence of the wetted hydrological regime associated with the creek in the narrow corridor. Species composition decreases as distance from the creek increases. The steep slopes (40-70%) that border the riparian corridor and bench are not as directly affected by the wetted channel, and tend to be covered with abundant xeric shrub species which do not have the water needs of the lush grasses, forbs and trees that border the creek. Diversity of species is thus limited by the availability of water and the resultant competition by hardier species on these slopes.

The influence upon the bench by the adjacent riparian corridor does not seem to be of a benefit to species diversity and richness. Moisture accumulations associated from winter snowpack and spring runoff have resulted in the high density of emergent quaking aspen (Populus tremuloides). Past disturbances to the bench be fire has resulted in the high density of transitional aspen "sucker" shoots. The high abundance of transitional shoots (<2 inch diameter) do not correctly reflect the amount of true trees upon the bench. Through competition and water

restrictions, the majority of shoots sampled could in effect die out or be replaced by another cover type.

High shrub abundance is expected. A drier environment (except for a small wetted inclusion at its western end) exist over much of the bench, establishing conditions that enable shrub species to compete more successfully for resources than other cover types. Due to interspecies competition, diversity of species is lower. Forb diversity, however, is high and may be the result of the wetted inclusion where soil moisture conditions allow for more mesic and lush vegetation cover to exist.

A wetland analysis has been done for the 1,500 foot segment of Crandall Creek where the yard expansion will occur and is included in Appendix 3-13. Using the information gathered for the baseline vegetation survey, an evaluation was done for this area based on the Army Corp of Engineers methodology described in "Corp of Engineers Wetland Delineation Manual (1987)". Using the evaluation format set forth in the USACE Wetlands Delineation Manual, this area does not meet the criteria of juridictional wetlands because it does not have dominant hydrophytic vegetation.

In conclusion, the stream inventory shows that no jurisdictional wetlands regulated by the Army Corps of Engineers exists in the proposed disturbance area along Crandall Creek. This determination was also confirmed by the Utah Division of Water Resources. GENWAL recognizes the significant value of the broadly defined wetlands that typically exist along steep mountain streams. The reclamation plan included in the Crandall Canyon Mining and Reclamation Plan specifically addresses the protection of the stream during the life of the yard expansion project as well as during final reclamation.

Electric Power Lines and Other Transmission Facilities

All electric transmission lines that could pose a threat to raptors have been safeguarded to minimize hazard.

Potential Barriers and Toxic Forming Materials

No structures at GENWAL create barriers to wildlife and no hazardous or toxic materials are stored which wildlife could gain access.

ADDENDUM TO APPENDIX 3-2

SYNOPSIS OF RIPARIAN BASELINE INVENTORY OF CRANDALL CREEK
AND
REVIEW OF BASELINE RIPARIAN INVENTORY OF CRANDALL CREEK
FOR PROPOSED CRANDALL MINE EXPANSION

8/15/95 REVISED 10/1/95

Addendum to
Appendix 3-2

Synopsis of Riparian Baseline Inventory of Crandall Creek and Review of Baseline Riparian Inventory of Crandall Creek for Proposed Crandall Mine Expansion

8/15/95 Revised 10/1/95

SYNOPSIS OF RIPARIAN BASELINE INVENTORY OF CRANDALL CREEK

PREPARED BY ENVIRONMENTAL INDUSTRIAL SERVICES

AUGUST, 1995

A complete inventory of all resources potentially affected by Genwal's proposed expansion within the riparian area was conducted between July and October of 1994 by employees of Environmental Industrial Services (EIS). Soil, hydrology, vegetation, and wildlife resources were inventoried by EIS, in cooperation with the USFS, Utah Division of Natural Resources (UDWR), and Soil Conservation Service (SCS). Cultural and archeological resources were inventoried by SENCO-PHENIX Archeological Consulting Services. All inventories were established on representative baseline(s) located along the length of the riparian corridor. Soil samples, hydrologic information, macrobenthic surveys, and inventories of wildlife resources were founded on twelve baseline transects, coinciding with established vegetation transects.

A soil survey, using U.S. Army Corp of Engineer standards, was conducted to determine the presence of hydric soils within the area of disturbance. Six soil pits were located randomly throughout the riparian corridor. Of the six samples sent to Intermountain Laboratories for analysis, two indicated possible hydric soil development. Two soil pits were located upon the small bench above the riparian corridor. Of these samples, one indicated the presence of hydric soil, the possible result of spring and seep activity.

A cultural resource inventory was conducted between August 18 and 22, 1994 by SENCO-PHENIX. No cultural resources were located and a archeological clearance for the proposed expansion was recommended.

An inventory of the vegetation present within the area of the proposed action consisted of thirty one transects within the riparian corridor and eleven on the adjacent bench. The community cover sampled consisted of a mix of grassy slopes, deciduous and coniferous clusters, and shrubby stretches bordering the narrow wetted zone along Crandall Creek. Vegetation cover was determined to be relatively high (> 70%), but not diverse. Species competition decreased as distance from the wetted zone increased. It was determined that diversity of species is limited by the availability of water and the resultant competition by hardier xeric species on the slopes above the riparian zone.

In meetings conducted with the USFS and UDWR during June and July of 1994, wildlife issues identified included the impact to fisheries, macrobenthic communities, neotropical bird use habitat, threatened and endangered species (T&E), raptor habitat, and big game use. No T&E plants were identified during the vegetation inventory. A review of T&E wildlife species that could occur within the area was conducted. Raptor species were identified as the most likely T&E species to be affected. A ground based inventory of raptor species was conducted but did not yield the presence of, or use by such species.

Bird species were identified during the course of the riparian inventory. Use by neotropical bird species, such as hummingbirds (**Selasphorus** spp.) was quite evident. Neotropical utilization of the area is most likely limited to energy use requirements rather than for nesting activity.

A macrobenthic community study indicated that structure of the community within Crandall Creek is based on a site-specific, autochthonous food base, with little reliance on the transport of food sources into the area. The majority of macrobenthic feeders found were gathering collectors. These feeders rely heavily on the abundant slow water areas where coarse particulate organic matter (CPOM) is abundant.

A fisheries inventory of Crandall Creek was performed by the UDWR on August 18, 1994. A UDWR review of that inventory is attached as ATTACHMENT 1.

A review of big-game impacts was also conducted. Impacts to mule deer (**Odocoileus hemionus**) and elk (**Cervus elaphus**) are expected to be limited, since no unique properties required by the local populations exist within the site. Use by moose (**Alces alces**), black bear (**Ursus americanus**), and mountain lion (**Felis concolor**) could occur, but is most likely limited to undisturbed areas above the area of the proposed action. Use by numerous small mammals was identified and an impact to them would occur. However, none were identified to be threatened, endangered or sensitive.

ATTACHMENT 1

UDWR FISHERIES INVENTORY REVIEW

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
Robert G. Valentine
Division Director

Southeastern Region
455 West Railroad Avenue
Price, Utah 84501-2829
801-637-3310
801-637-7361 (Fax)

August 11, 1995

Allan Childs
Generai Manager
Genwall Mining Co.
P.O. Box 1201
Huntington, Utah 84528

The sampling efforts on Crandall Creek from 1994 and 1995 indicate that the stream has a small resident population of cutthroat trout and is used as a spawning tributary by trout from Huntington Creek. The streams role as a spawning site for cutthroat trout in Huntington Creek is an important one and efforts should be made to protect it. Most of the usable spawning area is unfortunately within the area proposed to be altered by the arch culvert. I have enclosed graphs of our data.

Sincerely yours,

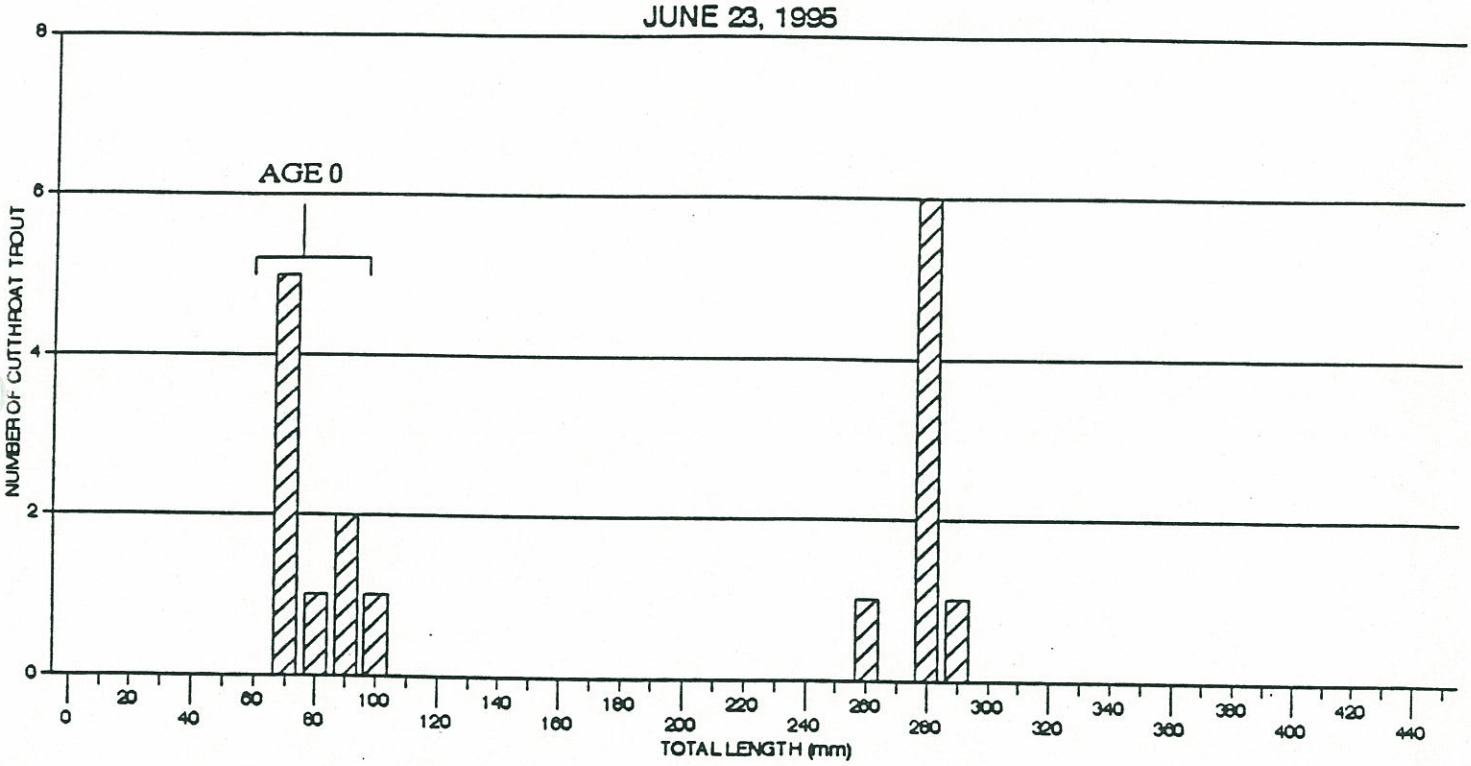
Miles Moretti
Regional Supervisor

cc: Mel Coonrod

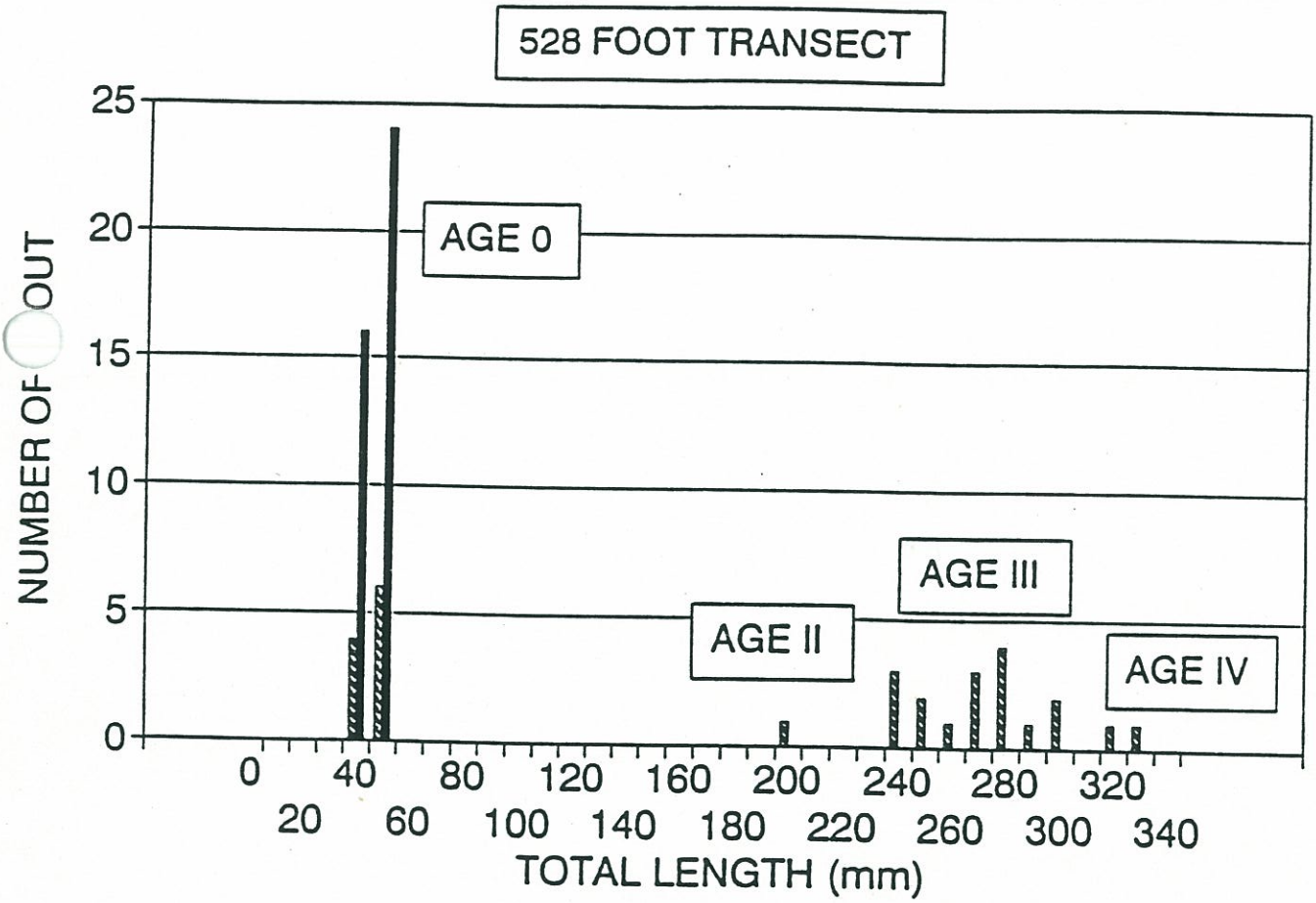
D:DATA\HUNTINGT\RFHUNT\95CRANDA

CRANDALL CANYON CREEK

JUNE 23, 1995



CRANDALL CANYON CREEK
AUGUST 18, 1994/NEXT TO MINE



REVIEW OF BASELINE RIPARIAN INVENTORY OF CRANDALL CREEK

PROPOSED CRANDALL MINE EXPANSION

GENWAL COAL COMPANY

PREPARED BY

DAVID STEED
OF
ENVIRONMENTAL INDUSTRIAL SERVICES
HELPER, UTAH

LIST OF CONTENTS

INTRODUCTION

It is the intent of the Genwal Coal Company to expand the operational capability of the Crandall Canyon Mine in Emery County, Utah. Current operations are located 1.5 miles from the junction where Crandall Canyon joins Huntington Canyon. Disturbance at the present is limited to the northern slope above the small, second-order Crandall Creek. The proposed expansion includes land acquired by Genwal Coal Company on the southern slope of the canyon, directly across from current operations. This acquired area is currently maintained as undisturbed, and/or is outside of the present permitted area. A primary consequence of expansion is the limited disturbance to the hydrological, vegetative and ecological nature of approximately 1000 feet of riparian community along Crandall Creek and the deciduous/coniferous community that dominates its southern slope. "Riparian community" refers to all resources that constitute the area of the proposed disturbance.

The deciduous/coniferous community predominant on the southern slope has been previously inventoried for past mining operational plans. The riparian corridor and nearby riparian bench have not been inventoried in the past. The planned area of disturbance includes 1000 feet of riparian community situated within a narrow V-shaped corridor along Crandall Creek. 40 to 70 percent slopes, covered with thick shrubs and trees such as Woods rose (**Rosa woodsii**), red-oiser dogwood (**Cornus stolonifera**), and willows (**Salix spp.**), border the confined greenline of forbs and grasses. Adjacent to the corridor is a quarter acre bench covered with emergent quaking aspen suckers (**Populus tremuloides**) and many small shrubs. This area is transitional in nature due the effects of past fires. Vegetation is a mixture of riparian species and plant life indicative of the deciduous/coniferous community on the slopes above.

Meetings with local state and federal agencies were conducted in July of 1994 to identify the potential impacts of disturbance. Foremost in importance was the potential elimination of 1000 feet of riparian community. Impact to species that utilize the area for energy and cover requirements was also discussed. Plans to culvert the creek throughout the length of disturbance was unfavorably reviewed by agency personnel, since it would create a significant "block" to the movement of fish species. It was recognized that the extent of biological resources was not sufficiently known in which to make a decision on the magnitude of impacts associated with mine expansion. Inventories of resources inherent to the area were thus planned before any decisions as to agency stance on the project would be made. Resource issues identified and discussed for further study include:

* Impacts to, and the extent of riparian vegetation
* The possibility of wetlands within the corridor
* Location of any cultural resource within the corridor

* The extent of the fish community within the area, and how it would be impacted

* The community structure of macrobenthic organisms

* Use of the area by migratory (Neotropical) birds

* Importance of the area to big-game species

* Impacts to downstream resources and the Huntington Canyon drainage

A review of meetings conducted is included in **ATTACHMENT 1.**

Due to the irregular and unique nature of the small area of disturbance, a full inventory; rather than a statistical comparison of the riparian community, was conducted. A major influencing factor for this decision was that a suitable reference area could not be found within the boundaries of the proposed disturbance. Due to the close proximity of U.S. Forest Service (USFS) land above and below the affected area, a reference area was restricted to the area of disturbance. Since vegetation cover varied significantly throughout the length of the affected community, the option of finding a representative section elsewhere was eliminated.

A complete inventory of all resources potentially affected by Genwal's expansion plans within the riparian area was conducted between July and October of 1994 by employees of Environmental Industrial Services (EIS). Soil, hydrology, vegetation, and wildlife resources were inventoried by EIS, with cooperation from the USFS, Utah Division of Natural Resources (UDWR), and Soil Conservation Service (SCS). Cultural and archeological resources were inventoried by SENCO-PHENIX Archeological Consulting Services. All inventories were established on representative baseline(s) located along the length of the riparian corridor. Soil samples, hydrologic information, macrobenthic surveys, and inventories of wildlife resources were founded on 12 baseline transects, coinciding with established vegetation transects.

HYDRIC SOIL INVENTORY

Previous inventories of soil resources, as required by the Utah Division of Oil, Gas and Mining (UDOGM) for current operational activities, are adequate for area soil description. However, soils along the riparian corridor and bench proposed for inclusion in expansion plans have been largely ignored, and require some method of identification. It was not the intent of this survey to identify the soil types present, but rather to determine the occurrence of hydric type soils.

A high probability of hydric soils; a indicator for the presence of wetland areas, exists within this area due to the saturated hydrological regime that exists there. Numerous beaver ponds throughout the length of the potential disturbance have resulted in

saturated soil conditions along areas below the bankfull level of the creek. Areas of concern within this study are those sections along the corridor above the bankfull mark and on the adjacent bench.

Methodology and Inventory Procedures

Methodologies based on procedures established by the U.S. Army Corp of Engineers (USACE), Corp of Engineers Wetland Delineation Manual, 1987 Edition for the identification of hydric soils were used. The procedures for the determination of wetland soils in both organic (nonsandy) and sandy soils incorporated into this study were:

* Determining the presence of organic soils (histosols)
* Determining the presence of organic material in surface horizon, or streaking of organic material in subsurface horizons (sandy soils)
* Determination of a saturated A horizon (histic epipedon)
* The indication of a reducing environment (sulfidic material or presence of ferrous iron)
* A completely saturated soil structure (aquic or peraquic)
* Use of a Munsell Color test (nonsandy soils only)
* Determining the presence of an organic "pan"

The inventory of possible hydric soils was accomplished with the excavation of six (6) soil pits randomly located along the riparian corridor. Pits were located along the channel banks, so as not to sample recently deposited material or exposed channel substrate. Care was taken to obtain the most representative sample for the area as a whole. As material was excavated down to parent material, composition was noted. Soil moisture was also noted for each sample, as was depth of the organic layer. A composite sample was collected for each of the 6 samples, since significant horizon formation was determined to be absent.

Two (2) representative samples were collected from the adjacent bench in the same manner as those along the riparian corridor. Only 2 samples were collected due to the uniformity of the bench and its small area (200' x 50'). A composite sample was collected due to a lack of substantial horizon formation. The presence of possible hydric soils was also inventoried in this location using the USACE guidelines.

Samples collected were sent to Intermountain Laboratories (IML) for analysis. Analysis performed on each sample was based on UDOGM methodology for baseline soil data.

Field and Laboratory Results

On-site field investigation of the riparian corridor and adjacent bench indicated the potential for hydric soils. Field inventory concluded that Riparian SS 5 and 6 were possibly hydric, as well as Bench SS 1. Riparian SS 5 and 6, Entisols located above the bankfull mark on the northern bank of Crandall Creek, were saturated throughout their depth to parent material (preaquic). The presence of thick organic layers within these two samples were also identified. Bench SS 1 was saturated and contained a 1 inch organic pan 11 inches below the surface.

Saturation levels were high for Riparian SS 5 and Bench SS 1 and 2. Levels for pH were not expected to be so high along the riparian corridor (7.5 to 7.7). Munsell Color tests performed on the composite samples were not satisfactory in determining hydric soil identification, since the samples analyzed were sandy. All results of the analyses performed by IML are shown in **ATTACHMENT 2**.

According to data reviewed on past soil surveys conducted within the ares, soils that make up the steep hill sides and upper portion of the channel may be loamy-skeletal Typic Cryoborolls with little soil moisture. The bench is potentially composed of skeletal Typic Cryoborolls (90 percent) with an inclusion of Histic Cryaquolls (10 percent). Field observations concurred with prior surveys. Actual soils surveyed within this study did resemble soils with distingushiable horizon development, though the samples taken were not developed soil types

A hydrological influence to soil resources is inherent to a riparian area. All soil along the greenline; that area where a continuous cover of vegetation has resulted from the presence of a saturated environment, is to some degree hydric in nature. Though Samples 5 and 6 were identified as hydric soils, their presence along the channel within the narrow riparian corridor would assume this. Therefore, the presence of these 2 samples are not a significant indicator of a wetland community

It is the presence of the hydric soil sample taken on the adjacent bench that is questionable. Bench Sample 1 was located uphill and over 100 feet away from the true greenline corridor. The influence of the wetted channel is doubtful. Runoff from the steep slope above the bench may have resulted in a deposition area, and a subsequent saturated environment. The presence of a seep or spring may too have resulted in the location of this inclusion.

CULTURAL RESOURCE INVENTORY

A cultural and archeological on-site inventory, in conjunction with a review of pertinent literature to the site, was conducted by SENCO-PHENIX on August 22, 1994. A copy of the report prepared is shown in **ATTACHMENT 3**.

VEGETATION INVENTORY

Introduction

The current vegetation inventory took into account the previous evaluation of the deciduous/coniferous community, past disturbances, and the diverse nature of this stretch of Crandall Creek. Vegetation along this particular section is varied throughout the 1000 feet, due to past disturbances from fire and grazing. Series of beaver ponds, rock outcroppings and steep side slopes have also contributed to an intermittent vegetation cover along the length of the corridor. The community cover in general, is a mix of grassy slopes, deciduous and coniferous clusters, and shrubby stretches that border a relatively narrow wetted zone along the creek.

Methodology

A total of forty-two (42) transects were randomly located within the affected riparian community. Thirty-one (31) transects were located across the length of the riparian corridor and eleven (11) were established upon the small bench. Ground cover sampled was based on the point intercept method, using a modified ten-point frame. At ten (10) foot intervals along each transect line, twenty (20) sample "points" were gathered with the use of the modified ten-point frame by placing it along each "side" of the point on that line.

Along the riparian corridor, the length of each transect depended upon the dimensions of the corridor at that location (length of slopes and channel width), and the distance to a differing community type. This distance ranged from sixty (60) feet to one hundred (100) feet. Transects on the riparian bench, however, were measured to one hundred (100) feet and located along its entire length. The location of the bench transects were situated as to maximize sampling of the bench and to prevent any double sampling of points assessed by sampling of the nearby corridor.

The type of ground cover at a given point was determined as being: a) bare: no litter or vegetation; b) rock: made up completely of rock or rock material; c) litter: dead or dying organic material; and d) vegetation: living organic material (i.e. plants). Vegetation was classified as being either a grass, forb, shrub or tree, the intercept point for a given plant being defined by the crown (as in forbs, shrubs, and trees) or by the basal portion (as in grasses). All vegetation species were identified in the field.

The points collected were used to determine the density (percent of cover) for a given cover type within the riparian community. Due to slight differences in vegetation composition, points from the bench area were not included with those from the corridor, and were separately analyzed for cover determination. Methodology for each area, however, remained the same. Calculation of percent cover was accomplished with the following equation:

$$\text{percent cover} = \frac{\text{no. of points for cover type}}{\text{total no. of points}}$$

Species richness (s), abundance (n), relative abundance (p) and diversity (H') were also determined. Diversity was determined by first obtaining relative abundance, which is defined as proportion of species that make-up N:

$$\text{relative abundance} = p = n/N$$

Where: n = total points for individual species
N = total points for all species

Diversity, defined as the amount of evenness among species, was then calculated using the equation:

$$\text{Diversity} = H' = \text{SUM OF } pLOG10p$$

The higher the diversity (H'=1.00) value, the higher the evenness, or diversity of species and trophic levels within that community. The lower the H' value (H'=0.00), the less even and diverse the community.

Productivity measurements were not made during this study. The SCS will be contacted at a later date in order to determine this value.

2940 points were collected along the riparian corridor. Of these points, 193 were bare, 189 were rock, and 439 were litter. Vegetation points totaled 2119 points and consisted of 239 grass points, 395 forb points, 867 shrub points and 618 tree points. Percent cover for the corridor was calculated as:

Bare	6.57%
Rock	6.43%
Litter	14.93%
*Vegetation	72.08%

* grasses	8.13%
forbs	13.44%
shrubs	29.49%
trees	21.02%

Cover was also calculated for vegetation points only (N = 2119 points):

Grasses	11.30%
Forbs	18.64%
Shrubs	40.92%
Trees	29.16%

41 species of vegetation made up the cover along the slopes and banks of the riparian corridor. Species richness was determined to be: grasses (s=11), forbs (s=14), shrubs (s=10) and trees (s=6).

Diversity was determined to be H'=0.59 for grasses, H'=0.96 for forbs, H'=0.54 for shrubs and H'=0.52 for trees. All information, including relative abundance, is shown in **ATTACHMENT 4**.

Bench points totaled 2200 points, of which 190 were bare, 27 rock, 351 litter and 1632 vegetation. Grass points totaled 106 points; forbs, 109 points; shrubs, 621 points; and trees, 796 points. Percent cover was calculated as:

Bare	8.64%
Rock	1.23%
Litter	15.96%
*Vegetation	74.18%

*	grasses	4.82%
	forbs	4.95%
	shrubs	28.23%
	trees	36.18%

Percent cover for vegetation points only was also calculated for the bench area:

Grasses	6.50%
Forbs	6.68%
Shrubs	38.05%
Trees	48.78%

30 species were inventoried on the bench. Species richness was determined for grasses (s=7), forbs (s=10), shrubs (s=6) and trees (s=7). Diversity was H'=0.46 for grasses, H'=0.80 for forbs, H'=0.61 for shrubs and H'=0.48 for trees. This information, along with relative abundance, is shown in **ATTACHMENT 4**.

Vegetation cover was relatively high (> 70%) over the area of proposed disturbance. Species richness and diversity within the corridor and the bench, however, do not reflect a highly even community. Evenness is a reflection of the stability of the community. The higher the diversity (H'), the more trophic layers present and thus the more even the community. With the exception of forb species, diversity for the corridor and adjacent bench is low, considering the influence of the wetted hydrological regime associated with the creek in the narrow corridor. Species composition decreases as distance from the creek increases. The steep slopes (40 to 70 percent) that border the riparian corridor and bench are not as directly effected by the wetted channel, and tend to be covered with abundant xeric shrub species which do not have the water needs of the lush grasses, forbs and trees that border the creek. Diversity of species is thus limited by the availability of water and the resultant competition by hardier species on these slopes.

The influence upon the bench by the adjacent riparian corridor does not seem to be of a benefit to species diversity and richness. Moisture accumulations associated from winter snowpack and spring

runoff, have resulted in the high density of emergent quaking aspen (**Populus tremuloides**). Past disturbance to the bench by fire has resulted in the high density of transitional aspen "sucker" shoots. The high abundance of transitional shoots (<2 Inch Diameter) do not correctly reflect the amount of true trees upon the bench. Through competition and water restrictions, the majority of shoots sampled could in effect die out or be replaced by another cover type.

High shrub abundance is as expected. A drier environment (except for a small wetted inclusion at its western end) exist over much of the bench, establishing conditions that inable shrub species to compete more successfully for resources than other cover types. Due to interspecies competition, diversity of species is lower. Forb diversity, however, is high and may be the result of the wetted inclusion where soil moisture conditions allow for more mesic and lush vegetation cover to exist.

WILDLIFE RESOURCES

On June and July of 1994, meetings with the Price, Utah offices of the USFS and UDWR were conducted to determine the potential threats as to the yet unidentified resources of the area. Using information gathered from past studies associated with the current operations of the Crandall Canyon Mine and knowledge inherent to the study of riparian areas, the issues identified included:

* Impact to fisheries resources
* Status of macrobenthic communities
* Neotropical bird habitat/use
* Threatened and endangered species
* Raptor habitat/use
* Big game habitat/use

In conjunction with the UDWR, inventories to determine the presence or extent of these resources were designed and conducted in August, 1994 by David Steed and Todd Welty of EIS. Assistance with Neotropical bird identification was provided by Ben Morris of the UDWR. Fisheries sampling and data analysis was conducted by the UDWR under the direction of Ken Phippen, Ben Morris and Derald Anderson. A synopsis of all surveys conducted is as follows:

Threatened and Endangered Species & Raptor Inventories

The vegetation inventory conducted did not reveal the presence of any threatened and endangered (T&E) plant species. Surveys conducted for fishery resources in Crandall Creek revealed only the presence of a small population of Yellowstone cutthroat trout (**Oncorhynchus clarki bouvieri**), a common species to the Huntington River Drainage (See Fisheries Resources).

No amphibians or reptiles were located during any of the surveys conducted. Occurrence of the Spotted frog (**Rana pretiosa**) was considered, but deemed unlikely. An inventory of the creek bottom

did not reveal the presence of any frog species.

Pre-survey literature research revealed the potential for the presence of T&E avian species. A review of a raptor survey conducted by the UDWR during October of 1993 indicated the presence of T&E raptor species within the area. The occurence of Bald eagles (**Haliaeetus leucocephalus**) and Peregrine falcons (**Peregrinus anatum**) was considered. A ground based inventory was designed to complement the 1993 survey and to evaluate the presence of T&E avian species in and around the riparian corridor.

A survey, conducted on August 19, 1994 by employees of EIS, was based on a 25 foot grid system situated on each of the baseline(s) established for inventory of the riparian area. A 360 degree optical search was carried out on each baseline and at all corners of the "grid". No nests for any avian species were located and no T&E raptor species were identified within the area of the riparian corridor and adjacent bench. A copy of the 1993 UDWR raptor survey is shown in **ATTACHMENT 5**.

Neotropical Birds

The identification of bird species sighted within the riparian area was conducted during each survey. The presence of neotropical species) was quite evident. Though hummingbirds (**Selasphorus spp.**) utilize the area of the riparian corridor for energy requirements while migrating, no unique properties that would significantly impact bird species were noticed to be inherent to the area. No nests or the sign of nesting activities were found along the riparian corridor. A complete list of bird species visually identified during the months of July, August and September is shown in **ATTACHMENT 6**.

Macrobenthic Community Structure

An inventory of macrobenthic resources within Crandall Creek was conducted on July 21, 1994. 12 sample sites were located on established baseline(s) relative to water speed and quality. Deep ponds, shallow pools, ripples and fast "rapid" areas were sampled using a 30.5 cm x 30.5 cm, 900 micron mesh Surber sampler. Samples were set apart based on water speed and related detritus deposition: 6 fast water (3 rapids/3 ripples); and 6 slow water (3 pools/3 ponds). Substrate at the site of rapid/ripple samples was thoroughly scrubbed to obtain all organisms present. Where samples were taken for ponds or pools, depositional sediment and detrital material prevented collection to substrate. Slow water samples were thus collected in shallow areas above and below the pond or pool.

Samples were sorted and all organisms present were identified to the family level. Benthic organisms were then placed into their respective functional feeding group, based on methodology by Cummins and Wilzbach, 1985; Minshall, 1992; and that used by the U.S. Forest Service (USFS) for evaluation of stream riparian area

conditions.

A total of 329 organisms were sampled along the length of the creek. ATTACHMENT 7 shows the breakdown based on water speed of the functional feeding group structure found in Crandall Creek.

How these feeding groups stand in relation to one another and the type of food that each functional group utilizes both indicate the health of a stream. Due to the higher abundance of Scrapers than Shredders, macrobenthic community structure seems to be based upon a autochthonous (site-specific) food base, rather than reliance of the transport of food sources into the area. The abundant ponds and slower water areas (ripples and pools) provide for ample concentrations of fine particulate organic matter (FPOM), coarse particulate organic matter (CPOM) and large woody debris upon which both Shredders and Scrapers utilize. Gathering Collectors are also higher due to the depositional character of the stream. Filtering Collectors require rapid water flow to aid food acquisition and are, thus limited to the short fast sections. Predator numbers are relatively high in the pool/pond areas due to the abundance of other feeding groups upon which they feed.

Fisheries Habitat

An inventory of fish species was conducted by the UDWR on August 18, 1994. Electro-shocking of the creek revealed only the presence of Yellowstone cutthroat trout. The results of analysis of age distribution of species sampled, relative to population and community structure, and rough data generated by the UDWR study is shown in ATTACHMENT 8.

Big-Game Habitat

No big-game species were observed while inventories of the affected area were being conducted. The presence of Mule deer (**Odocoileus hemionus**) within the riparian corridor was recognized by hoofprints along the banks of the creek and game trails descending from the deciduous/coniferous slopes above. The riparian area provides nutrient requirements for deer species, where vegetation cover, particularly forbs and grasses, provides an ample forage base. Impact to deer is expected to be limited to their use of the affected area. Since no unique properties within the area were noted, this impact should not excessively affect deer populations.

The presence of elk (**Cervus elaphus**) was not identified but they are known to occur within the area. Any impact to elk populations is expected to be minimal.

Utilization of the affected area by moose (**Alces alces**) is possible, but most use likely occurs in the areas of thick shrubs and abundant forbs above and below the area planned for disturbance.

Other Wildlife Resources

Use of the affected riparian community by other mammalian species was considered as well. Use by small mammals was observed, especially use by Red squirrels (**Tamiasciurus hudsonicus**) and Uintah chipmunks (**Tamais umbrinus**). Abundant downfall and rocky side slopes provide excellent cover for squirrel species.

Many old beaver dams are located along the length of the affected creek, but no beaver (**Castor canadensis**) were located. Long-tailed weasel (**Mustela frenta**) and possible Raccoon (**Procyon lotor**) tracks were located at the inlet of ponds created from past beaver activities.

Use by larger mammals, such as the Black bear (**Ursus americanus**) and Mountain lion (**Felis concolor**) is possible, but is most likely is limited to undisturbed sections of the creek above and below the mine The increase in disturbance resulting from expansion plans should not detrimentally affect these species.

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ATTACHMENT 1

REVIEW OF PRE-STUDY MEETINGS WITH USFS AND UDWR

ENVIRONMENTAL INDUSTRIAL SERVICES
4855 N. Spring Glen Rd., Helper, UT 84526 · Telephone (801) 472-3814 · FAX (801) 472-8780

July 7, 1994

Utah Division of Wildlife Resources
455 W. Railroad Avenue
Price, Utah 84501

Attn: Ben Morris

Re: Site Visit to Area of Proposed Genwal Mine Expansion, Crandall Creek

Dear Mr. Morris:

The following is a summary of our site visit on 7/1/94 to the potential area of disturbance along Crandall Creek, resulting from the proposed expansion of the Crandall Canyon Mine by Genwal Coal Company. A preliminary scoping meeting with the Division on 6/23/94, had led to the identification of concerns relating to wildlife use and habitat present at the site. Among these concerns were:

* Status of Crandall Creek as a fishery
* Composition of macrobenthic community in Crandall Creek
* Designation of Crandall Creek as a wetland or riparian area
* Big game use of the potentially disturbed area
* Use by, and presence of neotropical birds

These concerns arose from the possibility of up to 1300 feet of disturbance to Crandall Creek. Conceivably, the length of the creek within the existing Genwal mine lease could be culverted, and or bridged. In order to measure the impact of the mine's development on wildlife resources and their habitat, it was determined that baseline information be gathered by our firm and the Division. I believe it was the intent of our meeting on 7/1/94 to shed some light on the quality of Crandall Creek and to provide a more informative direction on which to base our cooperative studies.

<u>Location of Disturbance</u>

The section of Crandall Creek potentially impacted is within the Genwal Coal Company lease in upper Crandall Canyon. Though an actual stream length within the lease is not known, the distance from the downstream permit boundary to the upstream boundary is approximately 1320 feet. The creek is most likely a first order

Sent 7/7/94 a.s.

stream, judging from its size (< 6 ft wide, < 3 ft deep) and close origin (< 5 mi). Little meandering was noted along the streams length within the permit boundary. Channel bed composition ranges from hard rock, to cobble, to silt. Numerous ponds have been formed from past beaver activity. Vegetation along the stream is mostly bushes and small grasses. Conifers overhang the majority of the streams length, providing extensive areas of shade. A small riparian area, composed of shrubs, forbs and grasses, exists where a mild bank/slope gradient allows for a more complex community development.

Is Crandall Creek a Fishery?

During our site visit, trout (Salmo trutta?) up to 12 inches were seen. The presence of these fish indicate either an established population or a spawning ground, since the creek hasn't been planted for some time. It is in my opinion that since only one general size and age group was noted, that their presence is due to upstream spawning rather than an established year-round population. Regardless of the reason for their occurrence, a fishery evaluation and inventory will be conducted by the Division in August to determine the composition of the population now inhabiting Crandall Creek. During the course of all inventory work, the importance of this section and the upper reaches of Crandall Creek to cold water fish species will be evaluated.

What is the Composition of the Macrobenthic Community?

Though no macroinvertebrates were collected during this visit, I presume that benthic community composition is varied, judging from the fair velocity and cold temperature of the stream. Due to the high amount of coarse particulate matter available, shredder species are most likely dominant, with collector species being abundant as well. A complete benthic community and composition study will be initiated by our firm in order to determine the extent of this resource.

What is the Extent of Wetlands in the Potentially Disturbed Area?

Riparian development along the majority of the disturbed section of stream was extensive. Adequate bank cover was noted, as was the presence of stable, overhanging banks. Though the upper slopes above the stream showed the effects of past disruptions (grazing?), the channel and its surrounding riparian area (≤ 25 feet wide) seemed to be functioning. Excessive siltation was observed in most of the beaver ponds located. This is probably the result of upstream degradation to stream banks by grazing. Overhanging vegetation was abundant throughout the length of the permitted stream section, as was the amount of large woody debris within the stream channel.

A riparian inventory modelled after forest service methodology will be instigated by our firm this summer. The presence of actual wetlands were not located. A hydric soil inventory will be

implemented at the same time as the riparian inventory in order to determine the presence or potential for wetland areas.

What is the Importance of this Area to Wildlife?

The length of the stream within the permit area is bordered by adequate vegetation that could potentially be utilized by big game. During our visit, a female mule deer (Odocoileus hemionus) was observed to be feeding on vegetation within the riparian area directly below the permitted area. It is in my opinion that the permitted section holds considerable year-round value to wildlife. However, I don't believe that the withdrawal of this stream section from use and its resulting disturbance to the surrounding environment will significantly impact any wildlife species.

To accurately measure the use of this area by wildlife, we intend to implement a thorough threatened and endangered species inventory and habitat study. We realize that determining the value of an area to wildlife is difficult without the knowledge of past use, so it is also our intent to research past instances of wildlife utilization. Since no neotropical birds were identified during our visit, the status of this area as an aviary is still questionable. This to will be thoroughly studied and inventoried to accurately judge the areas value to bird species.

Summary

After seeing the site of the proposed expansion firsthand, and without knowing the actual location of the planned pad and portals, it was indicated that the presence of a culvert would be detrimental to any resource. A half-round, or possibly a series of bridges would seem to be an acceptable method to accessing the other side of the creek. Another concern was the effect of this expansion on downstream resources. It was agreed that during the course of all studies, that this impact would be considered. We also agreed that we would review past records for Crandall Canyon and Crandall Creek.

If you have questions concerning at all, please feel free to contact me. I will try to assist you in any way that I can.

Sincerely;

David Steed
Environmental Ecologist/Consultant

cc: File
Jay Marshall/Genwal

ENVIRONMENTAL INDUSTRIAL SERVICES
4855 N. Spring Glen Rd., Helper, UT 84526 - Telephone (801) 472-3814 - FAX (801) 472-8780

July 8, 1994

Paul Baker
Division of Oil, Gas & Mining
355 W. North Temple
#3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear Paul:

Concerning my inquiry on 7/8/94 relating to a proposed riparian inventory, we plan to follow your suggestion of a full baseline inventory of the riparian community present rather than the establishment of a set reference area. I believe your recommendation was based on the small size of the riparian zone (an average of 25 feet wide) and restrictions of the relevance of a reference section (1 acre) to the inventoried area (1300 feet). I appreciate the time and effort of your response to my questions. If you have any questions, or that I am wrong in my assumption of your recommendation, please feel free to contact me.

Sincerely,

David Steed
Environmental Ecologist/Consultant

CC: File
Steve Demczak/Price Office, DOGM
Jay Marshall/Genwal Coal Co.

ENVIRONMENTAL INDUSTRIAL SERVICES
4855 N. Spring Glen Rd., Helper, UT 84526 - Telephone (801) 472-3814 - FAX (801) 472-8780

July 22,1994

Jay Marshall
Genwal Coal Co.
195 N. 100 W.
P.O. Box 1201
Huntington, Utah 84528

Re: Baseline status on properties associated with Crandall Canyon mine expansion

Dear Jay:

The following is a short summary of activities conducted up-to-date in regards to the proposed mine expansion in Crandall Canyon:

6/22/94 Meeting with Utah Division of Water Rights to discuss intentions of Genwal, concerns of the Division, and the potential impact to downstream water resources.

6/23/94 Meeting with Utah Division of Wildlife Resources to discuss the potential impact of mine expansion to indigenous wildlife resources and their habitat.

6/27/94 Meeting with representatives of the Manti-LaSal National Forest to discuss the potential impact of mine expansion to USFS resources up and downstream from the project, and possible mitigation actions for these impacts.

7/1/94 On-site meeting with Ben Morris of the Utah Division of Wildlife Resources to view the proposed area of disturbance.

Specific concerns identified through these meetings have been included in reports sent to Genwal on 7/5/94 and 7/6/94. The potential impact to downstream water quality is a primary concern as is the impact of culverting Crandall Creek. It is our understanding that all agencies contacted were opposed to a full culverting of Crandall Creek, due to the impact that this project may have on fishery resources in Crandall Creek and the Huntington drainage.

Baseline activities were initiated on 7/11/94. A complete riparian vegetation inventory was conducted through 7/20/94. An inventory of the aspen community located within the proposed area of disturbance is currently being conducted. Identification and

community structure of the macrobenthic organisms present within Crandall Creek is planned for the week of 7/25, as is soil inventory of the proposed disturbed area.

In August, the Utah Division of Wildlife Resources will be conducting an electroshock inventory of fishery resources in order to determine the actual status of Crandall Creek as a fishery. Though fish have been located within the creek, its actual status as a true fishery is not known. The Huntington River drainage is of special concern, since the only disease-free strain of Yellowstone cutthroat trout in Utah is located within its reaches. The possibility of any impact to this species will be closely scrutinized by the Division.

During all inventory work, raptor and neotropical birds have been noted and identified. The use of Crandall Canyon especially by neotropical birds, was a concern of the Division of Wildlife Resources since many of these species are federally listed as threatened. A complete Threatened and Endangered inventory will be initiated in August to determine the extent of such sensitive species.

Actual on-site data retrieval is approximately half completed. The analysis of data presently acquired should be completed by the end of July and at that time will be summarized in a report to Genwal. If you have any questions concerning our activities to date and those planned at Crandall Canyon, please call me and I would be happy to explain our ongoing projects and methodology.

Sincerely,

David Steed
Environmental Ecologist/Consultant

ATTACHMENT 2

SOIL ANALYSIS RESULTS PREPARED BY INTERMOUNTAIN LABORATORIES

Inter-Mountain Laboratories, Inc.
2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

(E.I.S.) GENWAL COAL CO.
Helper, Utah
MINE: Mine
LOCATION: Riparian / Bench

DATE SAMPLED: August 19, 1994
DATE REPORTED: October 20, 1994

Lab No.	Location	Depths	pH	EC mmhos/cm @ 25°C	Saturation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Sand %	Silt %	Clay %	Texture	Organic Matter %
36374	SS 1 RIPARIAN		7.5	0.57	31.2	2.71	2.13	0.95	0.61	92.0	4.0	4.0	SAND	0.7
36375	SS 2 RIPARIAN		7.5	1.66	32.8	8.17	3.16	6.17	2.59	80.0	14.0	6.0	LOAMY SAND	0.8
36376	SS 3 RIPARIAN		7.7	0.81	34.7	4.73	2.82	1.05	0.54	76.0	16.0	8.0	SANDY LOAM	1.6
36377	SS 4 RIPARIAN		7.7	0.45	33.2	2.96	1.03	0.42	0.30	78.0	18.0	4.0	LOAMY SAND	0.9
36378	SS 5 RIPARIAN		7.7	0.66	46.1	3.71	2.10	1.17	0.69	70.0	22.0	8.0	SANDY LOAM	1.7
36379	SS 6 RIPARIAN		7.6	1.58	32.5	12.8	5.07	0.63	0.21	76.0	18.0	6.0	LOAMY SAND	1.0
36380	SS 1 BENCH		7.7	0.37	43.1	3.16	0.42	0.30	0.22	58.0	28.0	14.0	SANDY LOAM	3.1
36381	SS 2 BENCH		7.7	0.33	47.6	2.96	0.29	0.19	0.15	58.0	26.0	16.0	SANDY LOAM	3.6

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

Inter·Mountain Laboratories, Inc.
2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

(E.I.S.) GENWAL COAL CO.
Helper, Utah
MINE: Mine
LOCATION: Riparian / Bench

DATE SAMPLED: August 19, 1994
DATE REPORTED: October 20, 1994

Lab No.	Location	Depths	Carbonate %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t	P ppm	Avail Na meq/100g	Exch Na meq/100g
36374	SS 1 RIPARIAN		12.6	-0.01	0.06	109.	109.	<0.01	<0.01	<0.01	-0.01	109.	2.90	0.33	0.30
36375	SS 2 RIPARIAN		8.0	-0.01	0.26	65.8	65.6	<0.01	<0.01	<0.01	-0.01	65.8	4.06	0.66	0.46
36376	SS 3 RIPARIAN		16.3	-0.01	0.27	153.	153.	<0.01	0.01	<0.01	0.36	153.	5.87	0.36	0.32
36377	SS 4 RIPARIAN		10.5	-0.01	0.06	96.5	96.4	<0.01	<0.01	<0.01	-0.01	96.5	3.56	0.28	0.27
36378	SS 5 RIPARIAN		14.1	0.02	0.62	138.	137.	0.01	<0.01	<0.01	-0.01	138.	4.92	0.36	0.31
36379	SS 6 RIPARIAN		9.6	-0.01	0.13	84.7	84.6	<0.01	<0.01	<0.01	-0.01	84.7	4.12	0.28	0.26
36380	SS 1 BENCH		4.0	-0.01	0.29	29.8	29.5	<0.01	<0.01	<0.01	-0.01	29.8	15.1	0.26	0.25
36381	SS 2 BENCH		9.7	0.02	0.57	89.3	88.7	<0.01	<0.01	<0.01	-0.01	89.3	6.83	0.25	0.24

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

Inter-Mountain Laboratories, Inc.
2506 West Main Street
Farmington, New Mexico 87401
Tel. (505) 326-4737

(E.I.S.) GENWAL COAL CO.
Helper, Utah
MINE: Mine
LOCATION: Riparian / Bench

DATE SAMPLED: August 19, 1994
DATE REPORTED: October 20, 1994

Lab No.	Location	Depths	CEC meq/100g	ESP	K PE meq/l	Alkalinity PE meq/l	Total Selenium ppm	Bulk Density	Total Kjeldahl Nitrogen %	1/3 bar	15 bar	H2O Sol Selenium ppm
36374	SS 1 RIPARIAN		2.50	12.0	0.17	3.66	0.15		0.03	5.1	4.1	<0.02
36375	SS 2 RIPARIAN		9.00	5.08	0.20	2.80	0.15	1.24	0.03	7.2	5.1	<0.02
36376	SS 3 RIPARIAN		10.3	3.14	0.14	2.89	0.35	1.40	0.06	14.7	5.8	<0.02
36377	SS 4 RIPARIAN		8.50	3.13	0.33	2.17	0.20		0.05	6.4	5.1	<0.02
36378	SS 5 RIPARIAN		11.1	2.75	0.12	2.89	0.55	1.66	0.07	16.1	4.1	<0.02
36379	SS 6 RIPARIAN		9.62	2.70	0.22	2.12	0.55	1.46	0.04	10.3	4.1	<0.02
36380	SS 1 BENCH		28.4	0.87	0.18	2.55	0.20	1.19	0.15	17.9	11.0	<0.02
36381	SS 2 BENCH		32.4	0.74	0.14	2.46	0.80	1.09	0.16	20.6	12.8	<0.02

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble,ABPTA= Ammonium Bicarbonate-DPTA, AAO= Acid Ammonium Oxalate
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Environmental Industrial Services
Munsell Color

Lab No.	Location	Color
36374	SS1 Riparian	10 YR 5/3 Brown
36375	SS2	10YR 5/4 Yellowish brown
36376	SS3	2.5Y 6/3 Light yellowish brown
36377	SS4	2.5Y 5.5/3 Light olive brown
36378	SS5	2.5Y 5/3 Light olive brown
36379	SS6	2.5Y 5/3 Light olive brown
36380	SS1 Bench	10YR 3/2 Very dark grayish brown
36381	SS2	10YR 4/2 Dark grayish brown

ATTACHMENT 3

CULTURAL RESOURCE INVENTORY PREPARED BY SENCO-PHENIX

SENCO–PHENIX

AN INTENSIVE CULTURAL RESOURCE SURVEY AND INVENTORY OF THE PROPOSED GENWAL MINE EXPANSION

EMERY COUNTY, UTAH

PERFORMED FOR
Genwal Coal/Through
E.I.S.

In Accordance with State Guidelines
Antiquities Permit #U94-SC-424p

August 23, 1994

John A. Senulis

Direct Charge of Fieldwork

UTAH SHPO
COVER SHEET

Project Name: GENWAL MINE EXPANSION State Prj.#: U94SC424P
Report Date: August 23, 1994

Principal Investigator: John A. Senulis John A. Senulis

Field Supervisor(s): same

Acreage Surveyed
Intensive: 10 acres Recon/Intuitive: 10 acres

U.S.G.S. 7.5' Quad Map: Rilda Canyon, Utah (1979)

Sites Reported	Number	Smithsonian Site Number(s)
Archeological Sites: Revisit (No IMACS update)	0	
Revisit (IMACS update attached)	0	
New Sites (IMACS attached)	0	
Archeological Site total	0	
Historic Structues (USHS site form attached)		
Total NRHP Eligible Sites	0	

Checklist of Required Items:

1. X 1 Copy of the Final Report
2. X Copy of USGS 7.5' map showing Surveyed/Excavated area
3. Completed IMACS Site Inventory Forms Including
   - Parts A and B or C
   - NA IMACS Encoding Form
   - Site Sketch Map
   - Photographs
   - Copy of USGS 7.5' Quad showing site location with Smithsonian Site Number
4. X Completed Cover Sheet

ABSTRACT

An intensive cultural resource survey was performed by SENCO-PHENIX on the proposed Genwal Mine expansion project for Genwal Coal through E.I.S.. The proposed project is located on private land within the boundaries of the Manti-Lasal National Forest. The purpose of the archeological survey was to determine whether cultural resources are present which may be impacted by the proposed project.

No cultural resources were located and archeological clearance for the proposed project is recommended.

PROJECT LOCATION

The project area consists of a 1,000' long corridor centered on Crandall Creek and the extremely steep hillside to the south. The project area is in the north 1/2 of the NW/SW 1/4 of Section 5, T16S, R7E. Access to the project area is within the existing mine site. The project area is located on the enclosed copy of U.S.G.S. 7.5' Quad: Rilda Canyon, Utah (1979) . The project area was not staked but was easily located in reference to the existing Genwal Mine.

SPECIFIC ENVIRONMENT

The project area falls within the rugged dissected uplands of the Wasatch Plateau, which in turn is part of the larger basin and range Colorado Plateau transition area. The uplands are deeply dissected by intermittent streams and spring fed Crandall Creek which flows easterly 1 and 1/2 miles into the Huntington Creek drainage.

The project area is along the narrow valley bottom of Crandall Creek. Crandall Creek has been modified in the past by fire and reclamation activities and more recently by Beaver dams. The project area is located at an elevation of 7,740' to 7,800' in the area of stream bed and benches. The steep hillslope at the south edge of the project area reaches 8,000'. Soils are primarily rocky colluviums mixed with tan silty loams. Vegetation in the project area consists of dense fir and pine forest mixed with Aspen groves, Mountain Mahogany and a thick shrub understory. Fauna for the area includes elk, deer, antelope, rabbits and other burrowing animals with birds and reptiles completing the scenario. A school of an unknown species of Trout was observed in Crandall Creek on the day of the survey.

PREVIOUS RESEARCH

A files search was conducted on August 18, 1994 at the Antiquities Section of the Utah State Historic Preservation Office by John Senulis of SENCO-PHENIX. The following archeological

projects have been performed in the vicinity of the survey area:

1. 1975, David Gillio of the Manti-LaSal Forest surveyed the existing road through Crandall Canyon for the development of a mine. He located a large rockshelter (42EM-722) in the NW/SE/NE of Section 5, T16S, R7E. The rockshelter is far enough removed from the road that archeological clearance was recommended.

2. 1980, Wayne Howell of UTARC surveyed approximately 100 acres including a 200' road corridor and the SW/NW 1/4 of Section 5 and the SE/NE 1/4 of Section 6, both T16S, R7E. Howell found three prehistoric isolates in the general area around 42EM-722. Archeological clearance was recommended with the stipulation that 42EM-722 be fenced for protection prior to construction.

3. 1984, John and Jeanne Senulis of SENCO-PHENIX performed a 10% sample block survey for Genwal Coal through E.I.S of the NW/NW Section 5 and the NE/NE of Section 6, both T16S, R7E. No cultural resources were located.

No previously recorded archeological sites were located in the project area.

METHODOLOGY

The project area was archeologically surveyed by John Senulis of SENCO-PHENIX on August 22, 1994. The survey area was centered on the area of the banks of Crandall Creek and adjacent benches where meandering transects no greater than 15 meters were employed. The steep hillsides with no ground visibility to the south of Crandall Creek were not surveyed.

Special attention was paid during the survey to areas of subsurface soil exposure from animal burrowing and erosion.

Survey conditions were good with sunny skies and temperatures in the mid 80's. Winds were light out of the west at less than 5 m.p.h. Soils on the day of the survey ranged from wet and muddy on the creek banks to dry elsewhere.

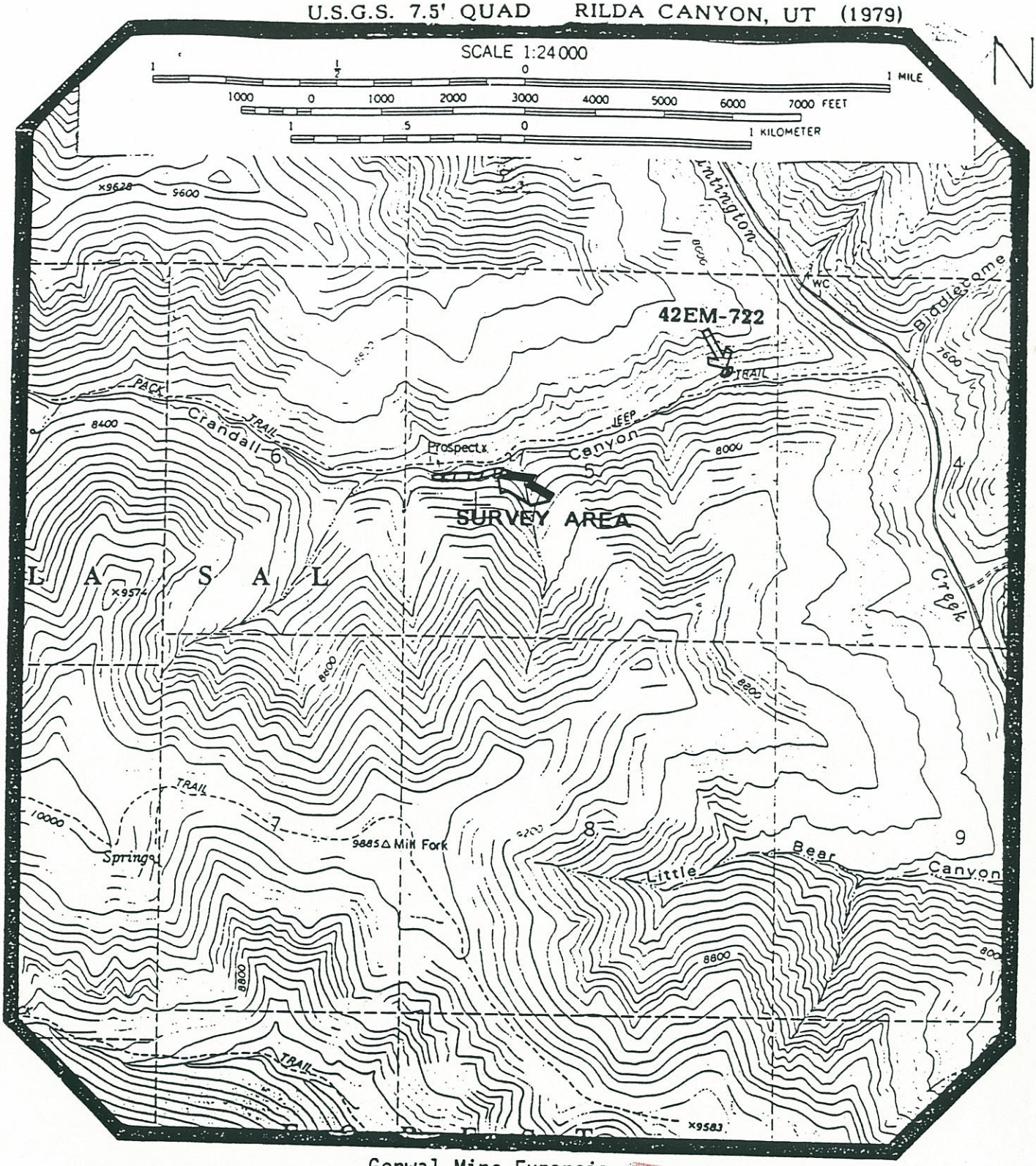
All field notes and photograph negatives are on file at the offices of SENCO-PHENIX in Salt Lake City, Utah.

FINDINGS AND RECOMMENDATIONS

No cultural resources were located and archeological clearance for the proposed mine expansion is recommended.

These recommendations are subject to approval or modification by the Utah State Historic Preservation Officer.

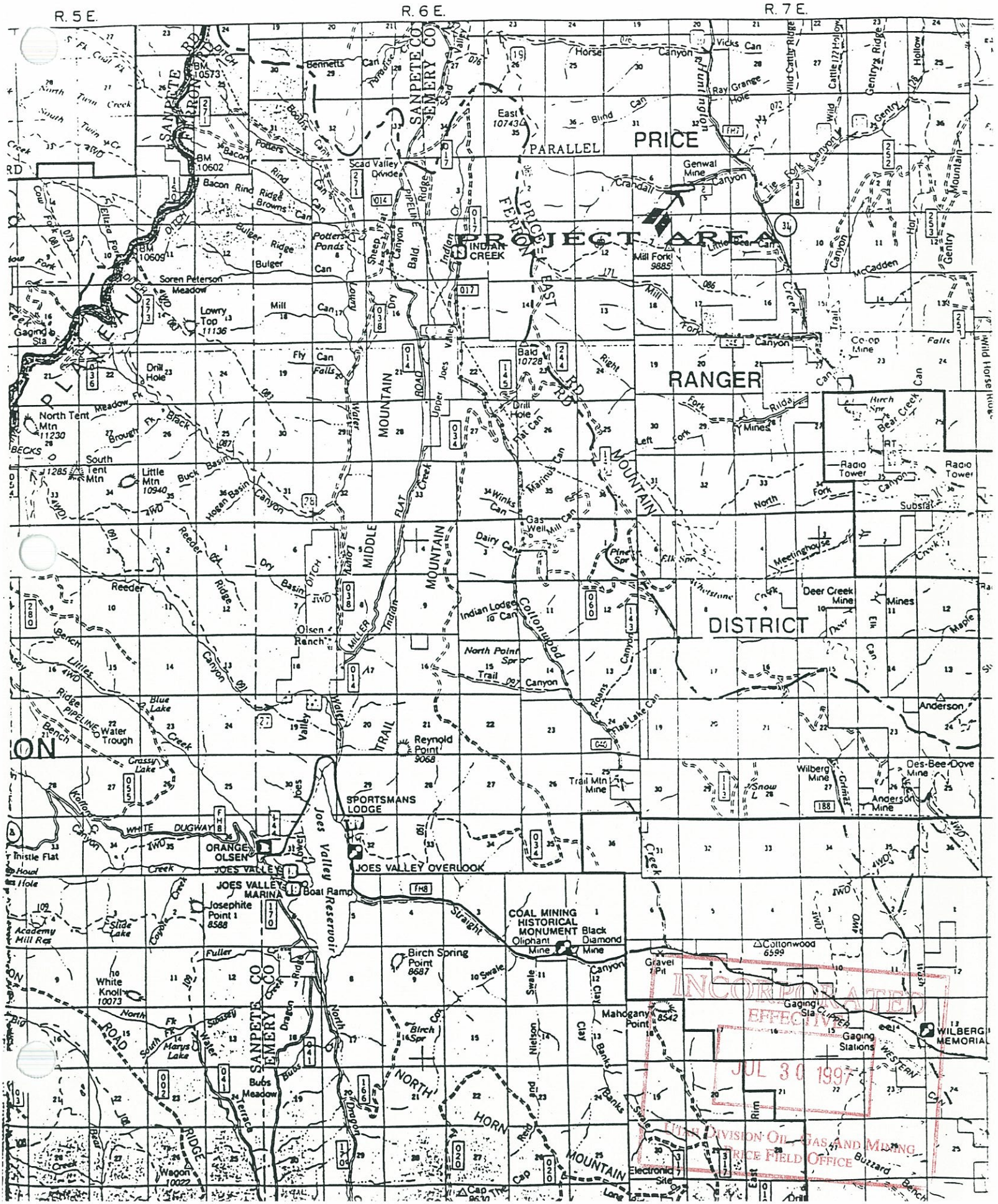
U.S.G.S. 7.5' QUAD RILDA CANYON, UT (1979)

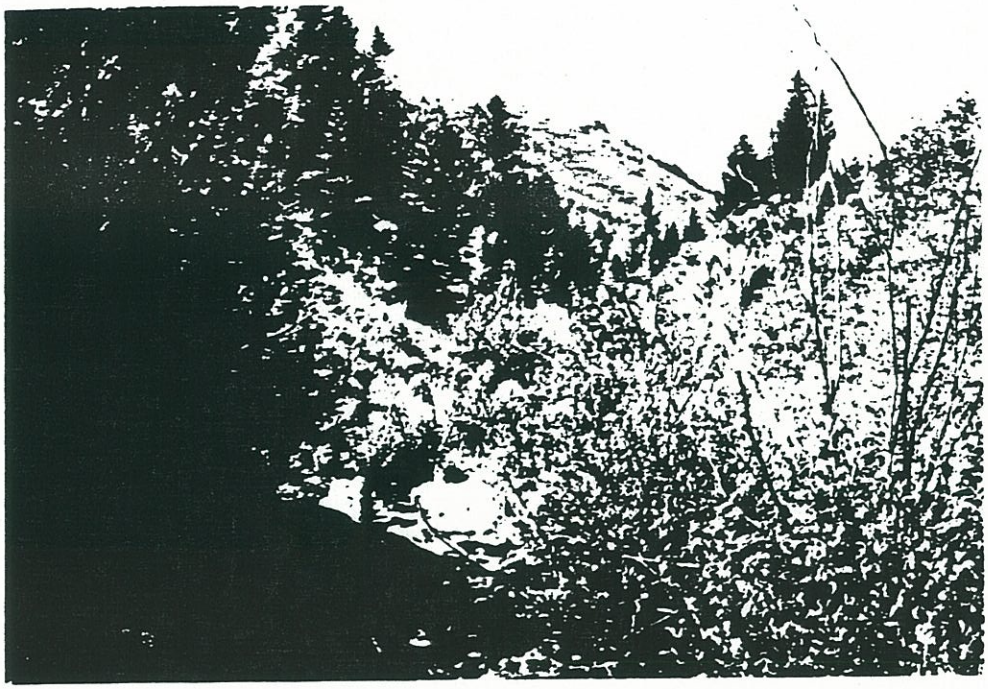


Genwal Mine Expansion
Genwal Coal through E.I.S.
Emery County, Utah
Price Ranger District
Sections 5, 6 T16S, R7E
SENCO-PHENIX (UT-159)
August, 1994

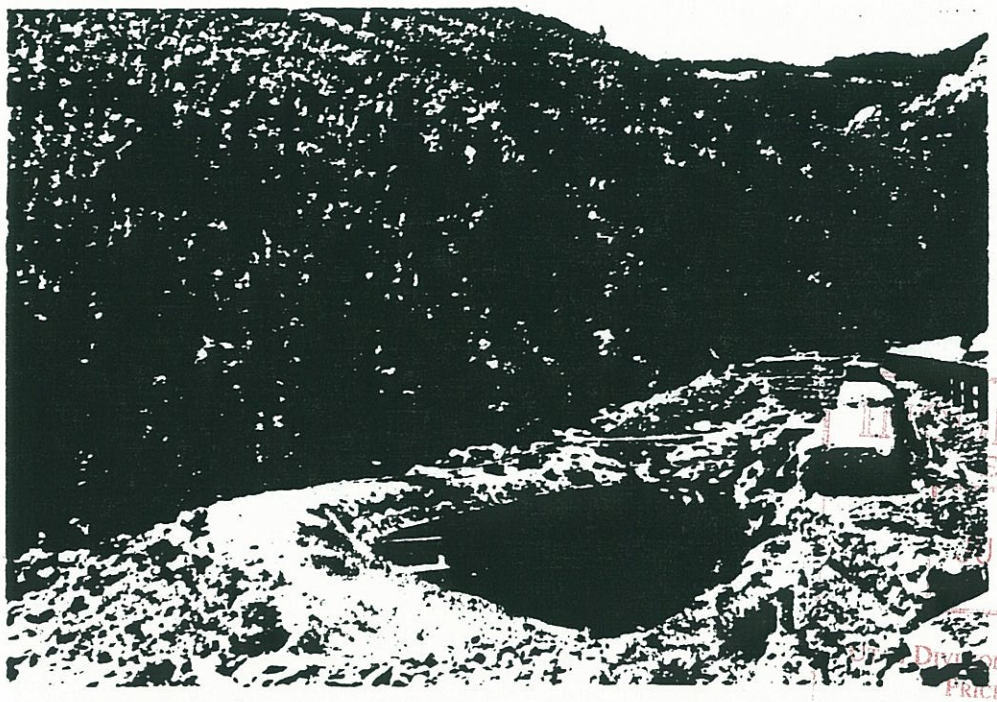
SENCO—PHENIX

(SANPETE AND FERRON RANGER DISTRICTS)





VIEW WEST OVER CRANDALL CREEK



VIEW WEST FROM EASTERN EDGE OF PROJECT AREA

VIEW SOUTHWEST OVER BEAVER PONDS

VIEW EAST OF PROJECT AREA FROM WEST END

ATTACHMENT 4

VEGETATION INVENTORY DATA

LIST OF PLANT SPECIES INVENTORIED WITHIN THE RIPARIAN CORRIDOR

Plant Type	Common Name	Species	Code	Points
Grasses				
	Smooth Brome	Bromus inermis	BRIN	3
	Red Top	Agrostis alba	AGAL	88
	Downy Brome	Bromus tectorum	BRTE	112
	Cheat	Bromus secalinus	BRSE	5
	Slender Wheatgrass	Agropyron trachycaulum	AGTR	7
	Crested Wheatgrass	Agropyron christatum	AGCH	9
	wheatgrass	Agropyron spp(1)	Agrop(1)	2
	wheatgrass	Agropyron spp(2)	Agrop(2)	3
	Indian Ricegrass	Oryzopsis hymenoides	ORHY	4
	Quackgrass	Elytrigia repens	ELRE	3
	Rush	Junous spp	Junou	3
Forbs				
	Sticky Aster	Machaeranthera bigelovii	MABI	76
	Richardson's Geranium	Geranium richardsonii	GERI	61
	Sticky Geranium	Geranium viscosissimum	GEVI	36
	Western Yarrow	Achillea lanulosa	ACLA	4
	Field Horsetail	Equisetum arvense	EQAR	79
	Fireweed	Epilobium angustifolium	EPAN	14
	goldenrod	Solidago spp	Solid	32
	Seep Spring Monkeyflower	Mimulus guttatus	MIGU	4
	mustard	Brassica spp	Brass	1
	sagewort	Artemisia spp	Artem	11
	thistle	Cirisium spp	Ciris	32
	Hound's Tongue	Cynoglossum officinale	CYOF	11
	Western Aster	Aster occidentalis	ASOC	1
	moss	Moss spp	Moss	33
Shrubs				
	Hackberry	Celtis reticulata	CERE	2
	willow	Salix spp	Salix	159
	Western Red Raspberry	Rubus strigosis	RUST	11
	Woods Rose	Rosa woodsii	ROWO	553
	Nootka Rose	Rosa nutkana	RONU	36
	Common Snowberry	Symphoricarpos albus	SYAL	31
	Russet Buffaloberry	Shepherdia canadensis	SHCA	9

LIST OF PLANT SPECIES INVENTORIED WITHIN THE RIPARIAN CORRIDOR (CONTINUED)

Plant Type	Common Name	Species	Code	Points
Shrubs				
	Gray Rabbitbrush	Chrysothamnus nauseosus	CHNA	12
	bitterbrush	Purshia spp.	Pursh	41
	Current	Sativum syme	SASY	13
Trees				
	Red Oiser Dogwood	Cornus stolonifera	COST	373
	Blue Spruce	Picea pungens	PIPU	83
	Narrowleaf Cottonwood	Populus angustifolia	POAN	17
	Quacking Aspen	Populus tremuloides	POTR	62
	Chokecherry	Prunus virginiana	PRVI	80
	Douglas Fir	Pseudotsuga taxifolia	PSTA	3

LIST OF PLANT SPECIES INVENTORIED ON RIPARIAN BENCH

Plant type	Common Name	Species	Code	Points
Grasses				
	Wheatgrass	Agropyron spp (1)	Agrop	5
	Red Top	Agrostis alba	AGAL	2
	Crested Wheatgrass	Agropyron christatum	AGCH	10
	Smooth Brome	Bromus inermis	BRIN	3
	Cheat	Bromus secalinus	BRSE	75
	Downey Brome	Bromus tectorum	BRTE	10
	Indian Ricegrass	Oryzopsis hymenoides	ORHY	1
Forbs				
	Strawberry	Americana britt	AMBR	3
	Western Yarrow	Achillea lanulosa	ACLA	15
	sagewort	Artemisia spp	Artem	2
	Indian Paintbrush	Castilleja Mutis	CAMU	3
	Thistle	Cirisium spp	Ciris	8
	Fireweed	Epilobium angustifolium	EPAN	8
	Richardson's Geranium	Geranium richardsonii	GERI	1
	Sticky Aster	Machaeranthera bigelovii	MABI	37
	Goldenrod	Solidago spp	Solid	25
	mullein	Verbascum spp	Verba	7

LIST OF PLANT SPECIES INVENTORIED ON RIPARIAN BENCH (CONTINUED)

Plant type	Common Name	Species	Code	Points
Shrubs				
	Gray Rabbitbrush	Chrysothamnus nauseosus	CHNA	157
	Woods Rose	Rosa woodsii	ROWO	55
	Western Red Raspberry	Rubus strigosis	RUST	8
	Current	Sativum syme	SASY	148
	Russet Buffaloberry	Shepherdia canadensis	SCHA	10
	Common Snowberry	Symphoricarpos albus	SYAL	243
Trees				
	Rocky Mountain Maple	Acer glabrum	ACGL	19
	Red Oiser Dogwood	Cornus stolonifera	COST	2
	Common Juniper	Juniperus commonis	JUCO	88
	Blue Spruce	Picea pungens	PIPU	156
	Narrowleaf Cottonwood	Populus angustifolia	POAN	9
	Quacking Aspen	Populus tremuloides	POTR	502
	Blue Elder	Sambucus cerulea	SACE	20

QUANTITATIVE ANALYSIS OF RIPARIAN CORRIDOR

COVER	SPECIES	ABUNDANCE (n)	RELATIVE ABUNDANCE (p)	DIVERSITY (H')
Grasses				
	BRIN	3	0.013	-0.024
	AGAL	88	0.368	-0.160
	BRTE	112	0.469	-0.154
	BRSE	5	0.021	-0.035
	AGTR	7	0.029	-0.045
	AGCH	9	0.038	-0.054
	AGROP 1	2	0.008	-0.017
	AGROP 2	3	0.013	-0.025
	ORHY	4	0.017	-0.030
	ELRE	3	0.013	-0.025
	JUNOU	3	0.013	-0.025
	S=11	**N=239**	**1.000**	**H'=0.594**
Forbs				
	MABI	76	0.192	-0.138
	GERI	61	0.154	-0.125
	GEVI	36	0.091	-0.095
	ACLA	4	0.010	-0.020
	EQAR	79	0.200	-0.140
	EPAN	14	0.035	-0.051
	SOLID	32	0.081	-0.088
	MIGU	4	0.010	-0.020
	BRASS	1	0.003	-0.008
	ARTEM	11	0.028	-0.043
	CIRIS	32	0.081	-0.088
	CYOF	11	0.028	-0.043
	ASOC	1	0.003	-0.008
	MOSS	33	0.084	-0.090
	S=14	**N=395**	**1.000**	**H'=0.957**

QUANTITATIVE ANALYSIS OF RIPARIAN CORRIDOR (CONTINUED)

COVER	SPECIES	ABUNDANCE (n)	RELATIVE ABUNDANCE (p)	DIVERSITY (H')
Shrubs				
	CERE	2	0.002	-0.005
	SALIX	159	0.183	-0.135
	RUST	11	0.013	-0.025
	ROWO	553	0.638	-0.125
	RONU	36	0.042	-0.058
	SYAL	31	0.036	-0.052
	SHCA	9	0.010	-0.020
	CHNA	12	0.014	-0.026
	SASY	13	0.015	-0.027
	PURSH	41	0.047	-0.062
	S=10	**N=867**	**1.000**	**H'=0.535**
Trees				
	COST	373	0.604	-0.132
	PIPU	83	0.134	-0.117
	POAN	17	0.028	-0.043
	POTR	62	0.100	-0.100
	PRVI	80	0.129	-0.115
	PSTA	3	0.005	-0.012
	S=6	**N=618**	**1.000**	**H'=0.519**

QUANTITATIVE ANALYSIS OF BENCH VEGETATION

COVER	SPECIES	ABUNDANCE (n)	RELATIVE ABUNDANCE (p)	DIVERSITY (H')
Grasses				
	AGROP 1	5	0.047	-0.062
	AGAL	2	0.019	-0.033
	AGCH	10	0.094	-0.097
	BRIN	3	0.028	-0.043
	BRSE	75	0.709	-0.106
	BRTE	10	0.094	-0.097
	ORHY	1	0.009	-0.018
	S=7	**N=106**	**1.000**	**H'=0.456**
Forbs				
	AMBR	3	0.028	-0.043
	ACLA	15	0.138	-0.119
	ARTEM	2	0.018	-0.031
	CAMU	3	0.028	-0.043
	CIRIS	8	0.073	-0.083
	EPAN	8	0.073	-0.083
	GERI	1	0.009	-0.018
	MABI	37	0.339	-0.159
	SOLID	25	0.229	-0.147
	VERBA	7	0.064	-0.076
	S=7	**N=109**	**1.000**	**H'=0.802**
Shrubs				
	CHNA	157	0.253	-0.151
	ROWO	55	0.089	-0.094
	RUST	8	0.013	-0.025
	SASY	148	0.238	-0.148
	SCHA	10	0.016	-0.029
	SYAL	243	0.391	-0.159
	S=6	**N=621**	**1.000**	**H'=0.606**

QUANTITATIVE ANALYSIS OF BENCH VEGETATION (CONTINUED)

COVER	SPECIES	ABUNDANCE (n)	RELATIVE ABUNDANCE (p)	DIVERSITY (H')
Trees				
	ACGL	19	0.024	-0.039
	COST	2	0.003	-0.008
	JUCO	88	0.111	-0.106
	PIPU	156	0.196	-0.139
	POAN	9	0.011	-0.026
	POTR	502	0.631	-0.126
	SACE	20	0.025	-0.040
	S=7	**N=796**	**1.000**	**H'=0.484**

ATTACHMENT 5

1993 UDWR RAPTOR SURVEY OF CRANDALL CANYON AREA

RESOURCES
Wildlife Resources

memorandum

June 29, 1993

TO: Bill Bates, Native Wildlife Manager

FROM: Scott Richardson, Habitat Biologist

SUBJECT: Genwal Mine Permit Area Raptor Survey

On June 29, 1993, I accompanied Mel Coonrod, consultant for Genwal Coal Co., on a raptor survey of Genwal's mine permit area. In addition, we surveyed the Left Fork of Huntington Canyon. Rocky Mountain Helicopter was hired by Genwal to conduct the survey. The following is a summary of the results of this survey. The numbers correspond to nest sites marked on the attached map. A similar summary was sent to Mel Coonrod and Genwal. Also attached is a map of the Left Fork of Huntington Canyon. Comments are written directly on the map as it was not included in the summary sent to Genwal.

Nest #1 - This site was indicated on our overlay. We were not able to locate the nest.

Nest #2 - This site was indicated on our overlay. We were not able to locate the nest.

Nest #3 - This is a new site that was not indicated on our overlays. It was old and in bad repair.

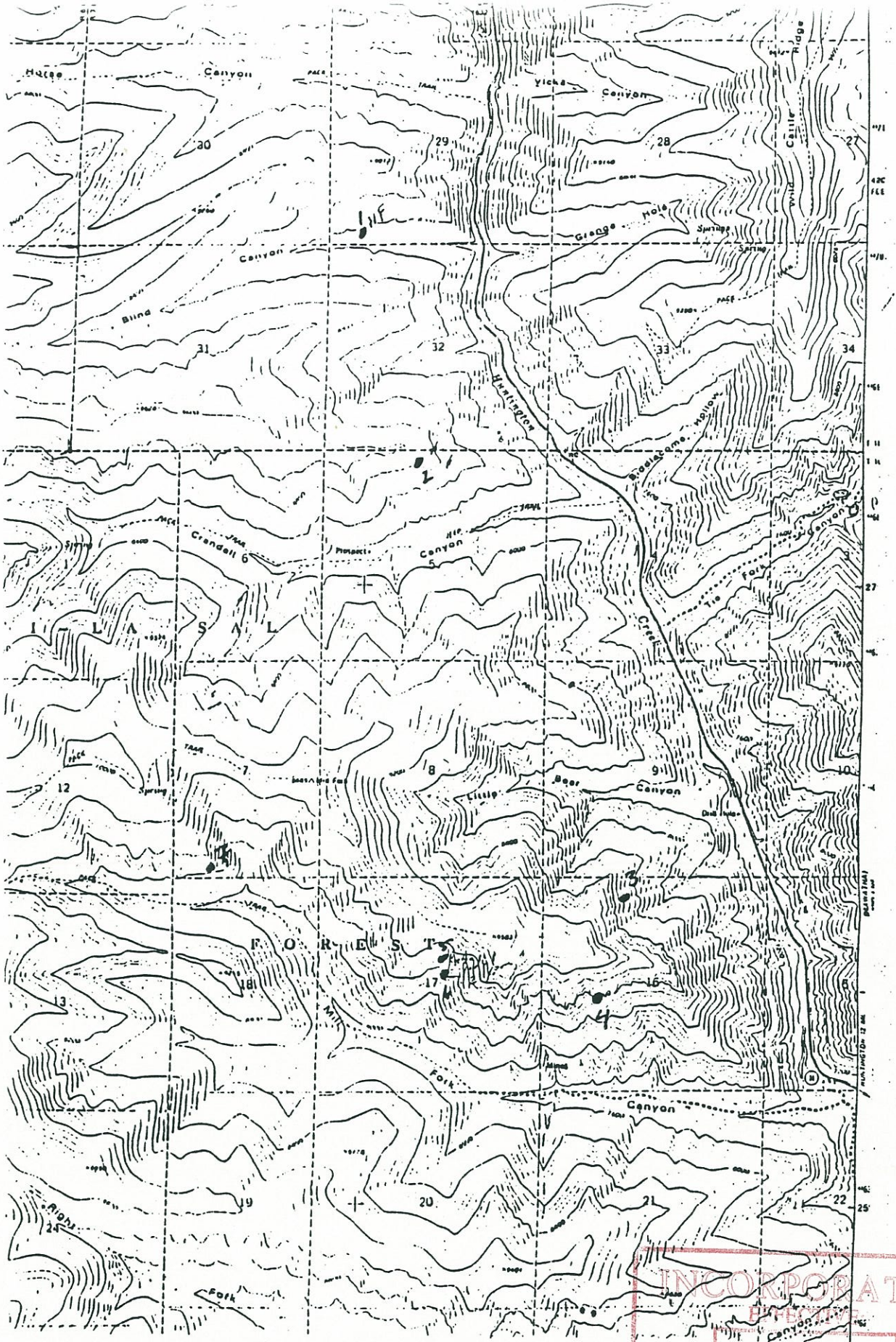
Nest #4 - This site was indicated on our overlay. We were not able to locate the nest.

Nest #5 - This was indicated as a golden eagle nest on our overlay. It was active, but was being used by red-tails. There were two young nearly ready to fledge. One adult was at the nest and hovered nearby the entire time we were in the area.

Nest #6 - This site was indicated on our overlay. We were not able to locate the nest.

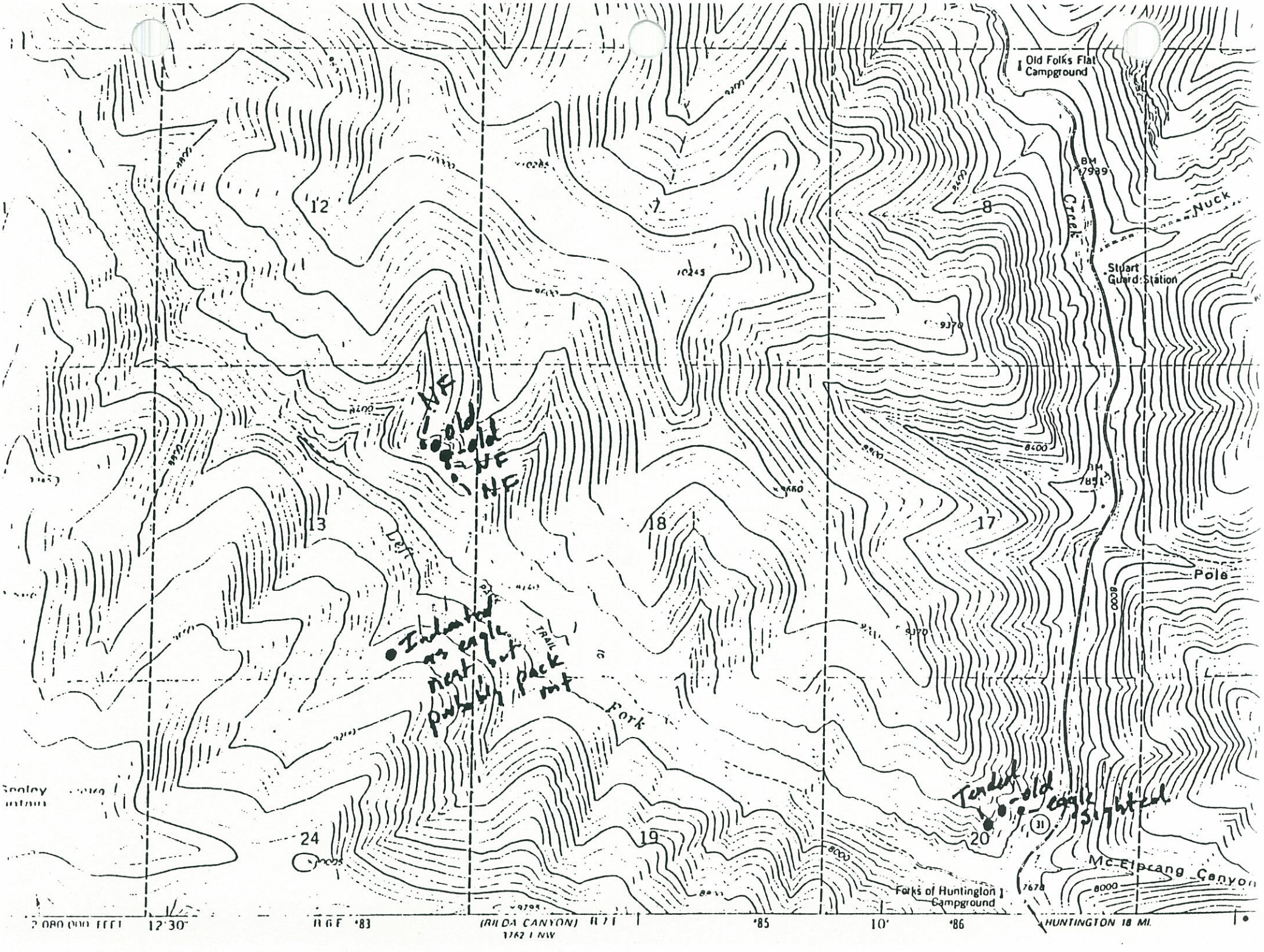
Nest #7 - This site was indicated on our overlay. We were not able to locate the nest.

We observed a golden eagle near the nest in the Left Fork, an immature red-tail in Crandall Canyon and an adult red-tail in Little Bear Canyon in addition to the red-tails at the nest site.



- Survey Boundary

● - Nest Sites


Old Folks Flat Campground
BM 7939
Nuck
Creek
Stuart Guard Station
12
7
8
NF
old
old
NF
NF
13
18
17
Pole
Indian
eagle
nest
Pack
Trail
Fork
24
19
20
Tenderfoot
old eagle sighted
Mc Elprang Canyon
Forks of Huntington I Campground
HUNTINGTON 18 MI.
12'30"
'83
'85
10'
'86
SCALE 1:24 000

ATTACHMENT 6

LIST OF BIRDS SIGHTED WITHIN PROPOSED AREA OF DISTURBANCE
JULY TO OCTOBER 1994

BIRDS IDENTIFIED WITHIN AREA OF POTENTIAL DISTURBANCE (RIPARIAN AREA AND ADJACENT BENCH)

DATE	COMMON NAME	SPECIES	SEX	NUMBER
July 11	Broad-tailed Hummingbird	Selasphorus platycercus	F	2
	Western Flycatcher	Empidonax Complex	M	1
	American Dipper	Cinclus mexicanus	U	2
July 12	Evening Grosbeak	Coccothraustes vespertinus	M	1
	Common Raven	Corvus corax	U	2
	Northern Flicker	Colaptes auratus	M	1
July 20	Broad-tailed Hummingbird	Selasphorus platycercus	F	1
	Red-Brested Nuthatch	Sitta canadensis	M	2
	Violet-green Swallow	Tachycineta thalassina	M&F	>25
	Western Tanager	Piranga ludoviciana	M	1
July 21	American Dipper	Cinclus mexicanus	M	3
	American Robin	Turdus migratorius	M&F	5
	Rufous Hummingbird	Selasphorus rufus	M	1
	Broad-tailed Hummingbird	Selsaphorus platycercus	M	2
August 18	Broad-tailed Hummingbird	Selsaphorus platycercus	M	2
	American Dipper	Cinclus mexicanus	U	2
	Western Flycatcher	Empidonax Complex	M	1
September 14	American Dipper	Cinclus mexicanus	U	1
	Red-Brested Nuthatch	Sitta canadensis	M	1
	Common Raven	Corvus corax	U	1
	Downy Woodpecker	Picoides pubescens	M	1
October 7	American Dipper	Cinclus mexicanus	U	1
	Northern Flicker	Colaptes auratus	M	2
	Common Raven	Corvus corax	M	1
	Black-capped Chickadee	Parus atricapillus	M&F	5

ATTACHMENT 7

MACROBENTHIC COMMUNITY DATA

TABLE 1. FAST WATER: RIPPLE (CPOM) SAMPLES

SAMPLE	FUNCTIONAL GROUP	ORDER	FAMILY	(n)
Sample 2	Predators			
		Diptera	Tipula	3
	Collectors			
	Filtering	Trichoptera	Hydropsychidae	1
	Gathering	Diptera	Chrionomidae	1
	Scrapers			
		Ephemeroptera	Heptageniidae	4
	Shredders			
		Trichoptera	Limnephilidae	4
				n=13
Sample 5	Predators			
		Diptera	Tipula	1
	Collectors			
	Gathering	Coleoptera	Elmidae	1
	Scrapers			0
	Shredders			
		Trichoptera	Limniphelidae	3
				n=5
Sample 11	Predators			
		Plecoptera	Setipalpia	2
	Collectors			
	Gathering	Diptera	Chironomidae	8
		Coleoptera	Elmidae	6
		Trichoptera	Leptoceridae	2
	Scrapers			
		Coleoptera	Psephenidae	5
	Shredders			0
				n=23

TOTAL n = 41

TABLE 2 FAST WATER: RAPID (PERIPHYTON) SAMPLES

SAMPLE	FUNCTIONAL GROUP	ORDER	FAMILY	(n)
Sample 3				
	Predators			0
	Collectors			
	Filtering	Trichoptera	Hydropsychidae	4
	Scrapers			
		Ephemeroptera	Heptageniidae	2
	Shredders			
		Diptera	Tipulidae	1
				n=7
Sample 7				
	Predators			
		Hymenoptera		3
	Collectors			
	Gathering	Coleptera	Elmidae	3
	Scrapers			
		Ephemeroptera	Heptageniidae	3
		Gastropoda		9
	Shredders			
		Diptera	Tipulidae	2
				n=20
Sample 9				
	Predators			
		Diptera	Tipula	3
		Plecoptera	Setipalpia	1
	Collectors			
	Filtering	Trichoptera	Hydropsychidae	4
	Gathering	Coleoptera	Elmidae	14
		Diptera	Chironomidae	5
	Scrapers			
		Coleoptera	Psephenidae	12
		Ephemeroptera	Heptageniidae	2
		Gastropoda		2
	Shredders			0
				n=43

TOTAL n = 70

TABLE 3 SLOW WATER: POOL (FPOM) SAMPLES

SAMPLE	FUNCTIONAL GROUP	ORDER	FAMILY	(n)
Sample 1				
	Predators			0
	Collectors			0
	Scrapers			0
	Shredders			
		Trichoptera	Limnephilidae	3
				n=3
Sample 8				
	Predators			0
	Collectors			
	Gathering	Coleoptera	Elmidae	4
		Trichoptera	Leptoceridae	9
	Scrapers			
		Ephemeroptera	Heptageniidae	3
		Gastropda		18
	Shredders			
		Diptera	Tipulidae	12
				n=46
Sample 10				
	Predators			
		Diptera	Tipula	4
		Plecoptera	Setipalpia	3
	Collectors			
	Gathering	Coleoptera	Elmidae	11
		Diptera	Chironomidae	10
	Scrapers			
		Ephemeroptera	Heptageniidae	5
		Gastropoda		24
	Shredders			0
				n=57

TOTAL n = 106

TABLE 4 SLOW WATER: POND (WOOD AND FPOM) SAMPLES

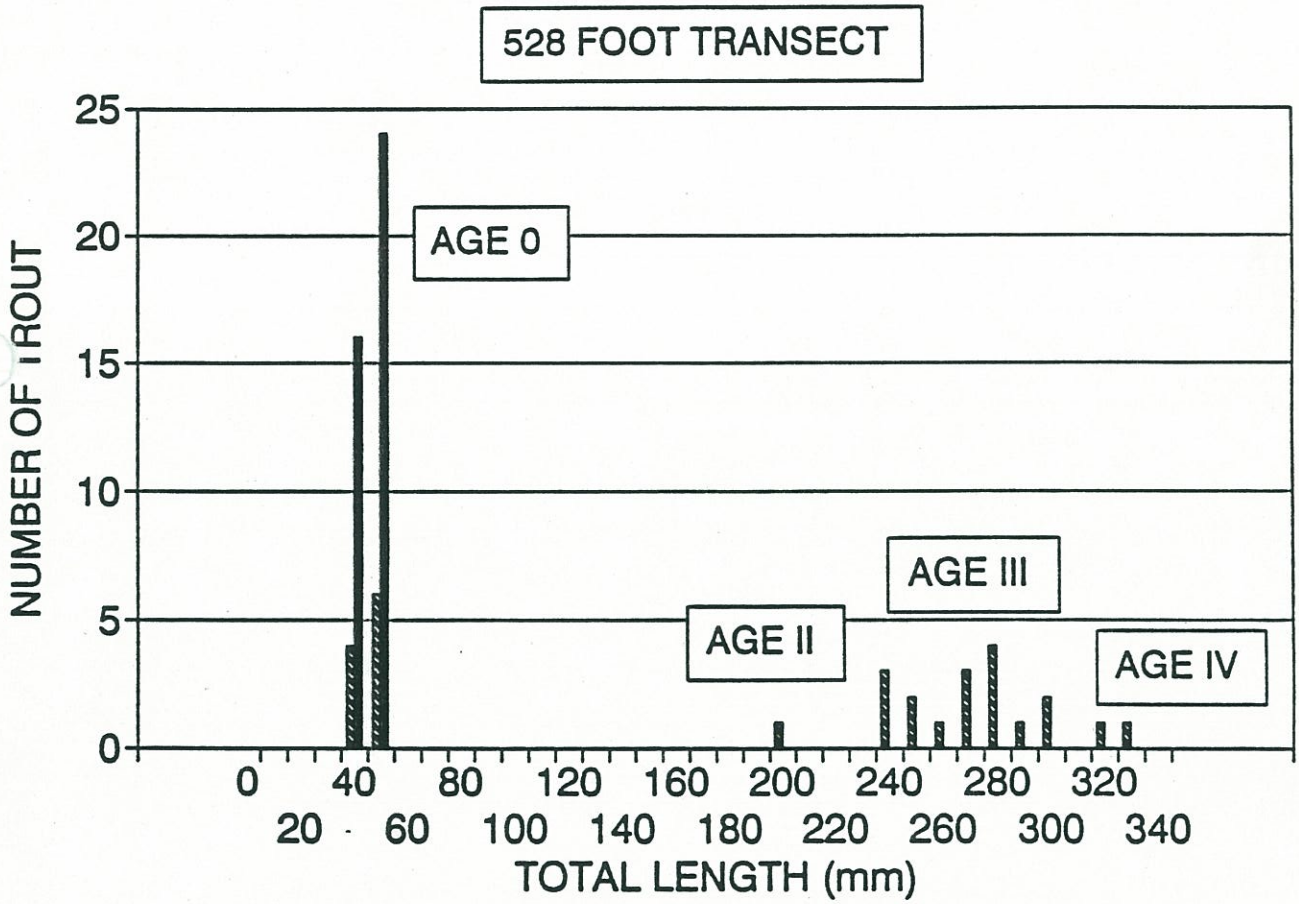
SAMPLE	FUNCTIONAL GROUP	ORDER	FAMILY	(n)
Sample 4				
	Predators			
		Diptera	Tipula	6
	Collectors			
	Gathering	Diptera	Chironomidae	5
		Coleoptera	Elmidae	3
	Scrapers			
		Gastropoda		4
	Shredders			
		Trichoptera	Limnephilidae	5
		Diptera	Tipulidae	10
				n=33
Sample 6				
	Predators			
		Diptera	Tipula	6
	Collectors			
	Gathering	Diptera	Chrionomidae	15
		Coleoptera	Elmidae	1
	Scrapers			
		Gastropoda		6
	Shredders			
		Trichoptera	Limnephilidae	4
				n=32
Sample 12				
	Predators			
		Diptera	Tipula	8
	Collectors			
	Gathering	Diptera	Chironomidae	4
		Trichoptera	Ephemeridae	1
		Tubifix		25+
	Scrapers			
		Gastropoda		9
	Shredders			0
				n=47+

TOTAL n = 112+

ATTACHMENT 8

UDWR FISHERIES DATA

CRANDALL CANYON CREEK
AUGUST 18, 1994/NEXT TO MINE



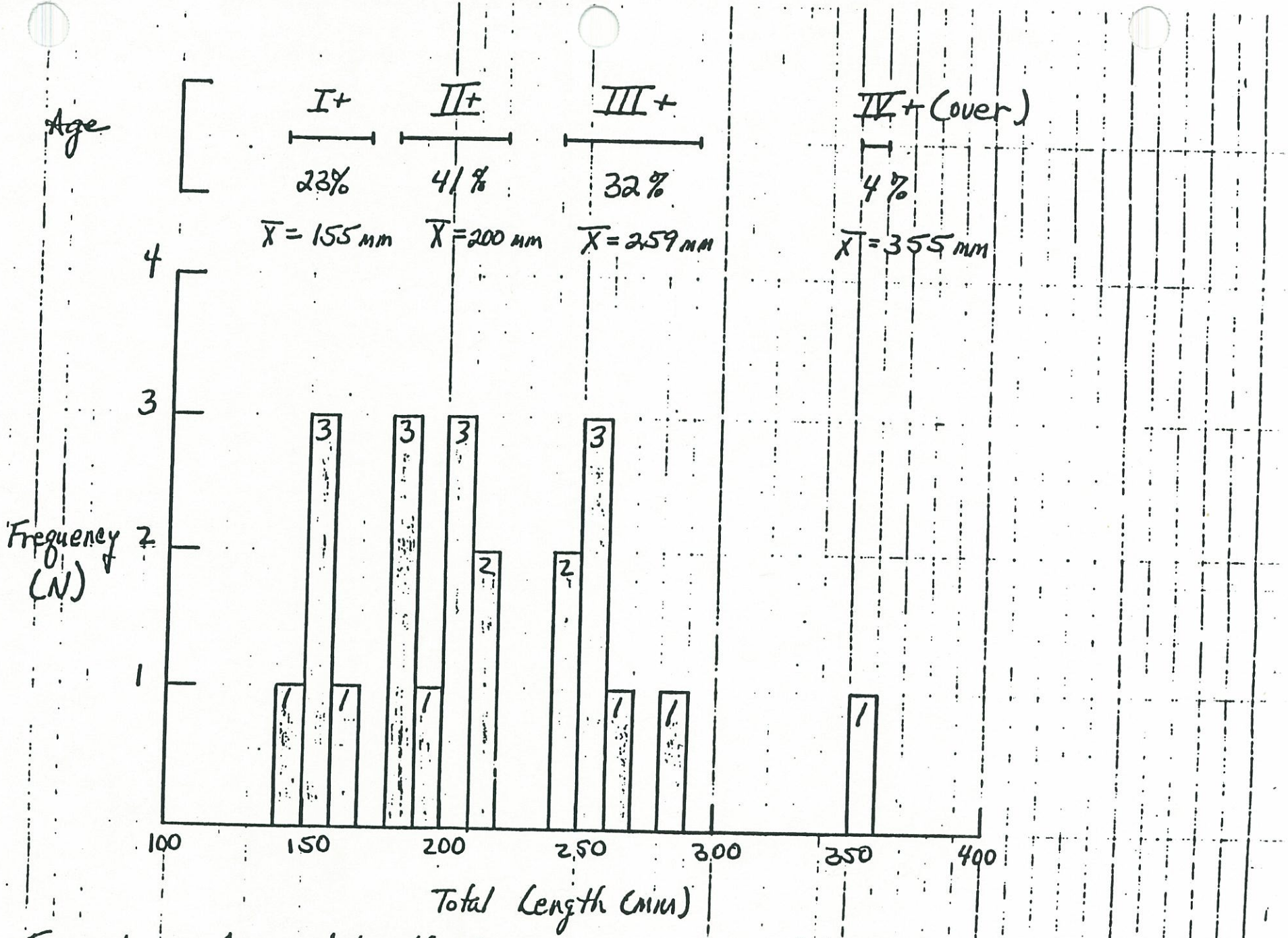


Figure 1. Age and length frequency of cutthroat trout sampled in Crandall Canyon Creek, Utah on July 21, 1983.

ATTACHMENT 9

VEGETATION COMPOSITION OF TRANSECTS WITHIN RIPARIAN CORRIDOR

05/23/97

VEGETATION COMPOSITION OF TRANSECTS WITHIN RIPARIAN CORRIDOR

Transect 1A 80 points

Bare	11
Litter	11
Rock	4
MABI	6
BRIN	1
GERI	2
COST	3
ACLA	1
PIPU	20
AGAL	1
Salix spp	20

Transect 1B 60 points

Bare	1
Litter	18
Rock	1
PIPU	15
MABI	3
COST	11
POAN	2
EQAR	2
GERI	2
CERE	2
Salix spp	3

Transect 1C 60 points

Bare	6
Litter	22
Rock	3
COST	20
EQAR	2
AGAL	5
GERI	2

Transect 1D 60 points

Bare	3
Litter	8
Rock	12
POTR	7
POAN	15
PRVI	11
GERI	2
EQAR	2

Transect 1E 60 points

Bare	0
Litter	6
Rock	1
BRTE	8
MABI	8
RUST	4
RONU	5
COST	20
EQAR	7
GERI	1

Transect 1F 80 points

Bare	0
Litter	1
Rock	0
ROWO	10
RONU	23
POTR	10
PRVI	28
GERI	4
PIPU	2
COST	2

Transect 1G 100 points

Bare	0
Litter	4
Rock	1
COST	70
POTR	10
AGAL	2
Salix spp	10
Moss spp	3

Transect 1H 120 points

Bare	0
Litter	0
Rock	0
PRVI	40
COST	60
PIPU	20

Transect 1I 120 points

Bare	0
Litter	9
Rock	2
ROWO	20
RONU	8
SYAL	6
PSTA	2
COST	44
AGAL	7
EPAN	1
GERI	1
Salix spp	20

Transect 1 140 points

Bare	7
Litter	40
Rock	7
BRSE	1
Agropyron spp(1)	2
ROWO	22
COST	15
PIPU	2
Artemisia spp(1)	1
Agropyron spp(2)	3
4	7
GEVI	16
Solidago spp	2
BRTE	6
Junous spp	1
AGAL	8

Transect 1J 60 points

Bare	4
Litter	7
Rock	3
ROWO	11
BRTE	4
POTR	8
COST	14
GERI	3
Artemisia spp(1)	4
Solidago spp	1
Junous spp	1

Transect 2 200 points

Bare	26
Litter	72
Rock	17
COST	12
PIPU	3
POTR	12
ROWO	20
Cirsium spp	1
GEVI	3
Solidago spp	16
SYAL	1
Purshia spp	17

Transect 1K 40 points

Bare	4
Litter	0
Rock	8
ROWO	16
BRTE	2
COST	4
MIGU	1
GEVI	1
Moss spp	4

Transect 3 140 points

Bare	15
Litter	31
Rocks	23
POTR	1
ROWO	3
COST	35
PIPU	2
GEVI	6
BRTE	2
RUST	2
Salix spp	20

Transect 4 120 points

Bare	5
Litter	14
Rocks	16
ROWO	56
COST	11
ACLA	2
BRSE	4
BRIN	2
MIGU	2
AGAL	3
Brassica spp	1
Salix spp	2
Artemisia spp	1
Moss spp	1

Transect 5 100 points

Bare	14
Litter	18
Rocks	4
ROWO	45
GEVI	10
Purshia spp	4
COST	1
PSTA	1
Moss spp	3

Transect 6 100 points

Bare	0
Litter	15
Rock	5
ROWO	24
BRTE	56

Transect 7 100 points

Bare	4
Litter	17
Rock	5
ROWO	21
POTR	1
BRTE	17
GERI	6
EPAU	1
Purshia spp	9
Salix spp	6
Artemisia spp(2)	5
Junous spp	1
Moss spp	7

Transect 8 100 points

Bare	17
Litter	12
Rock	3
ROWO	8
BRTE	17
PRVI	1
POTR	4
EQAR	13
GERI	7
PIPU	3
COST	1
Solidago spp	11
Cirisium spp	2
Moss spp	1

Transect 9 120 points

Bare	0
Litter	0
Rock	2
ROWO	45
AGAL	17
EQAR	11
COST	34
PIPU	3
Purshia spp	5
Cirisium spp	1
Salix spp	2

Transect 10 80 points

Bare	11
Litter	28
Rock	2
ROWO	18
AGAL	8
GERI	1
MIGU	1
COST	1
ACLA	1
SASY	5
Solidago spp	2
Cirisium spp	2

Transect 11 80 points

Bare	0
Litter	0
Rock	0
ROWO	40
AGAL	8
GERI	7
MABI	5
Salix spp	20

Transect 12 100 points

Bare	9
Litter	18
Rock	6
ROWO	17
POTR	7
GERI	7
MABI	12
AGAL	3
PIPU	13
Cirisium spp	3
Salix spp	5

Transect 13 80 points

Bare	1
Litter	5
Rock	8
ROWO	31
MABI	19
AGAL	5
EQAR	1
GERI	7
SHCA	2
Salix spp	1

Transect 14 80 points

Bare	10
Litter	17
Rock	13
ROWO	8
CYOF	11
MABI	11
AGAL	2
EQAR	7
Moss spp	1

Transect 15 100 points

Bare	1
Litter	18
Rock	5
ROWO	39
AGAL	9
GERI	6
MABI	3
COST	1
RUST	2
Purshia spp	2
Salix spp	7
Moss spp	7

Transect 16 100 points

Bare	1
Litter	0
Rock	5
ROWO	33
AGCH	9
AGAL	5
SASY	4
Salix spp	43

Transect 17 100 points

Bare	5
Litter	8
Rock	8
ROWO	21
CHNA	10
MABI	9
EQAR	18
AGAL	5
SASY	4
Cirisium spp	12

Transect 18 120 points

Bare	13
Litter	17
Rock	14
ROWO	20
RUST	3
EPAU	5
SYAL	21
EQAR	10
POTR	2
COST	8
SHCA	1
Purshia spp	4
Moss spp	2

Transect 19 80 points

Bare	10
Litter	18
Rock	6
ROWO	22
ORHY	4
SYAL	1
ELRE	2
EPAU	4
EQAR	3
GERI	3
CHNA	2
Cirisium spp	5

Transect 20 60 points

Bare	15
Litter	5
Rock	5
ROWO	3
EPAU	3
SYAL	2
ELRE	1
COST	6
EQAR	3
SHCA	6
Narrowleaf Aster	1
Cirisium spp	6
Moss spp	4

VEGETATION COMPOSITION WITHIN RIPARIAN CORRIDOR

Plant Type	Common Name	Species	Code	Points
Grasses				
	Smooth Brome	Bromus inermis	BRIN	3
	Red Top	Agrostis alba	AGAL	88
	Downy Brome	Bromus tectorum	BRTE	112
	Cheat	Bromus secalinus	BRSE	5
	Slender Wheatgrass	Agropyron trachycaulum	AGTR	7
	Crested Wheatgrass	Agropyron christatum	AGCH	9
	wheatgrass	Agropyron spp(1)	Agrop(1)	2
	wheatgrass	Agropyron spp(2)	Agrop(2)	3
	Indian Ricegrass	Oryzopsis hymenoides	ORHY	4
	Quackgrass	Elytrigia repens	ELRE	3
	Rush	Junous spp	Junou	3
Forbs				
	Sticky Aster	Machaeranthera bigelovii	MABI	76
	Richardson's Geranium	Geranium richardsonii	GERI	61
	Sticky Geranium	Geranium viscosissimum	GEVI	36
	Western Yarrow	Achillea lanulosa	ACLA	4
	Field Horsetail	Equisetum arvense	EQAR	79
	Fireweed	Epilobium angustifolium	EPAN	14
	goldenrod	Solidago spp	Solid	32
	Seep Spring Monkeyflower	Mimulus guttatus	MIGU	4
	mustard	Brassica spp	Brass	1
	sagewort	Artemisia spp	Artem	11
	thistle	Cirisium spp	Ciris	32
	Hound's Tongue	Cynoglossum officinale	CYOF	11

Plant Type	Common Name	Species	Code	Points
	Narrowleaf aster			1
	moss	Moss spp	Moss	33
Shrubs				
	Hackberry	Celtis reticulata	CERE	2
	willow	Salix spp	Salix	159
	Western Red Raspberry	Rubus strigosis	RUST	11
	Woods Rose	Rosa woodsii	ROWO	553
	Nootka Rose	Rosa nutkana	RONU	36
	Common Snowberry	Symphoricarpos albus	SYAL	31
Shrubs				
	Russet Buffaloberry	Shepherdia canadensis	SHCA	9
	Gray Rabbitbrush	Chrysothamnus nauseosus	CHNA	12
	bitterbrush	Purshia spp.	Purshia	41
	Current	Sativum syme	SASY	13
Trees				
	Red Oiser Dogwood	Cornus stolonifera	COST	373
	Blue Spruce	Picea pungens	PIPU	83
	Narrowleaf Cottonwood	Populus angustifolia	POAN	17
	Quacking Aspen	Populus tremuloides	POTR	62
	Chokecherry	Prunus virginiana	PRVI	80
	Douglas Fir	Pseudotsuga taxifolia	PSTA	3

APPENDIX 3-3

Vegetation & Terrestrial
Wildlife Report

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
Timothy H. Provan
Division Director

1596 West North Temple
Salt Lake City, Utah 84116-3195
801-538-4700
801-538-4709 (Fax)

September 2, 1993

Mr. George Morris
U.S. Forest Service
Manti-LaSal National Forest
599 West Price River Drive
Price, Utah 84501

Dear George:

The Division of Wildlife Resources (DWR) has reviewed the assessment of the Unsuitability Criteria for Genwal Coal Company's application to lease the Crandall Canyon Tract (Coal Lease Application UTU-68082). As requested, the following are comments on the application of these Unsuitability Criteria.

Criterion No. 10

The DWR concurs with your finding that there is no State designated critical or essential habitat for threatened or endangered plant or animal species found within the proposed lease area.

Criterion No. 15

In our April 5, 1993 comments to the Price Ranger District regarding this lease application, we indicated that the proposed lease area was utilized by such high interest species as elk, deer, black bear, blue grouse and cutthroat trout. The most significant impact to these species would occur if subsidence, resulting from underground mining, caused a decrease in the quality or quantity of water available in the various springs, seeps, and streams found within the proposed lease boundaries. Of particular concern is the potential impact to important fisheries located in Indian Creek and Crandall Creek. Crandall Creek occurs within the main lease area being considered and one of the alternatives which was presented would lease the area directly adjacent to Indian Creek. We would again like to make you aware of our preference for an alternative which would not lease the area adjacent to Indian Creek.

If an investigation has been completed with regard to potential impacts to surface and ground waters which shows there will be no significant impacts, then we concur with your finding that there will be no serious long-term impacts to high interest wildlife. If, however, an analysis of potential impacts to water sources has not been completed, we recommend that such an analysis occur prior to approval of this lease application.

Criterion No. 11

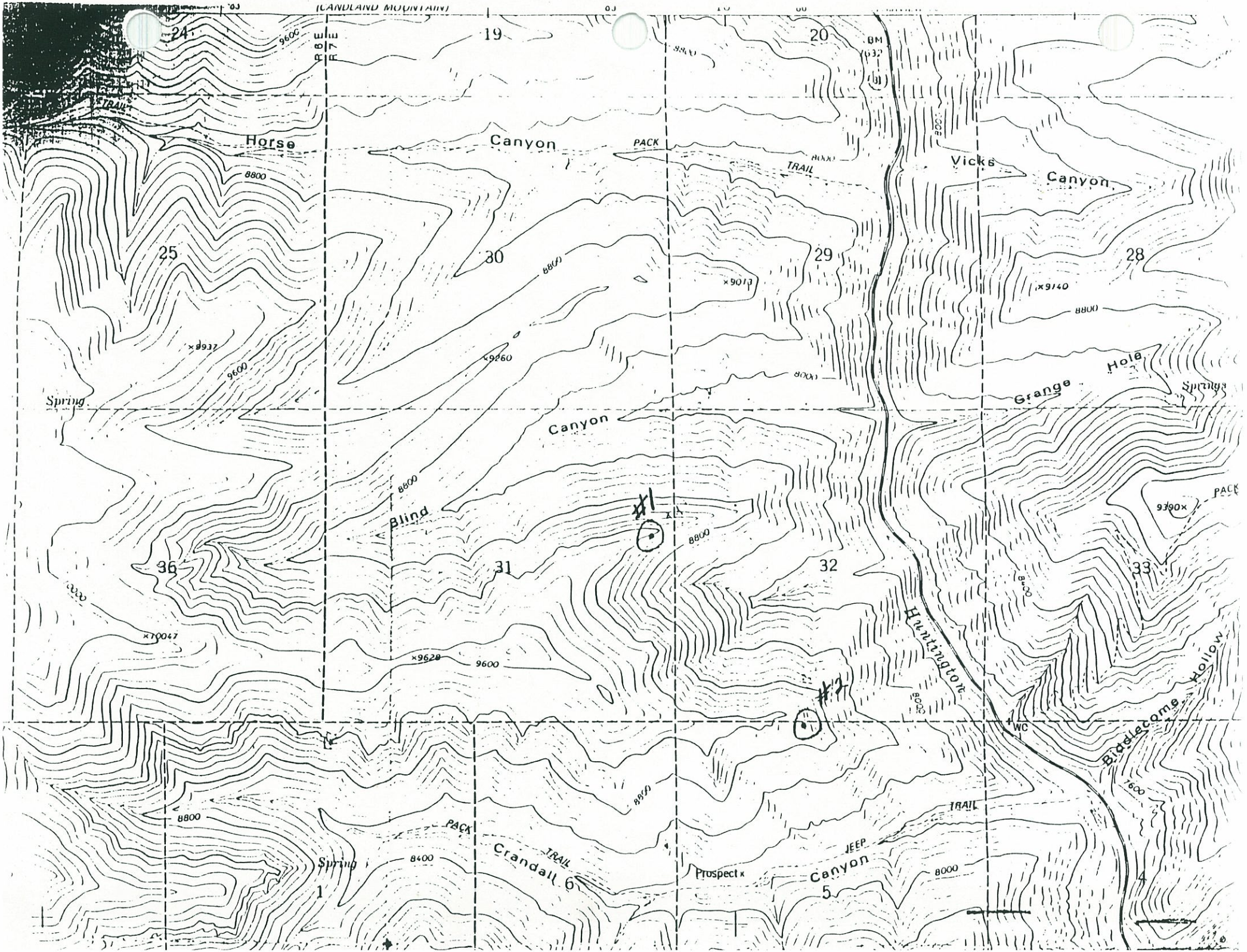
While input on this particular issue was not specifically requested, our information from raptor surveys conducted in this area indicates that an eagle nest is located within the proposed lease boundaries. This nest is located in the SE1/4NE1/4 Sec. 31, T. 15 S., R. 7 E., SLM. We have enclosed a map showing the location of this nest for your information and consideration.

We appreciate the opportunity to review this action and provide our input. If you have any questions or need additional information, please contact Ken Phippen, Regional Habitat Manager (637-3310).

Sincerely,

Timothy H. Provan
Director

Enclosure


Horse
Canyon
Vicks
Canyon
Grange
Hole
Springs
Spring
Canyon
Blind
Huntington
Biddlecome
Hollow
Crandall
Canyon
Prospect
TRAIL
PACK
JEEP
WC
#1
#2
24
19
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29
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36
31
32
33
1
6
5
4
8800
9600
8400
8000

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH STATE OFFICE
2060 ADMINISTRATION BUILDING
1745 WEST 1700 SOUTH
SALT LAKE CITY, UTAH 84104-5110

MANTI-LA SAL N.F.
FOREST SUPERVISOR
ENG./MINERALS
ECOSYSTEMS
REC/LANDS./WL
ADM. OFFICER
PLANNER
DISTRICT RANGER

cc: D-3
W. Nowak

In Reply Refer To

(ES)

August 26, 1993

George A. Morris, Forest Supervisor
Manti-LaSal National Forest
599 W. Price River Drive
Price. UT 84501

Dear Mr. Morris:

The Fish and Wildlife Service (Service) has received your letter of August 6, 1993 regarding an environmental analysis which is being conducted for Federal Coal Lease Application UTU-68082 (Crandall Canyon Tract). No surface facilities would be constructed in the lease area but there is a potential for mining-induced subsidence of surface features.

The Service has reviewed the attached Biological Assessment/Evaluation (BA) and the application of Unsuitability Criteria of interest to the Service to the leasing process. The Service concurs with the conclusion of the BA that leasing and subsequent project development will have no effects on the endangered bald eagle, the only listed species with potential to occur within the lease area. The Forest Service should note that the Northern goshawk is not proposed for listing by the Service, as is stated in the BA. The goshawk is a candidate species and as such has no protection under the Endangered Species Act at this time.

The Service can concur with the conclusions of the Unsuitability Criteria application as long as there are stipulations incorporated into the coal lease which preclude the subsidence of cliffs, which provide nesting habitat for the golden eagle, prairie falcon, and other migratory birds of high Federal interest within the vicinity of the proposed lease tract.

If you have any further questions, please contact Susan Linner of this office at (801) 975-3630.

Sincerely,

Susan C. Linner

for Robert D. Williams
State Supervisor

UTAH NATURAL RESOURCES
Wildlife Resources

memorandum

June 29, 1993

TO: Bill Bates, Native Wildlife Manager

FROM: Scott Richardson, Habitat Biologist

SUBJECT: Genwal Mine Permit Area Raptor Survey

On June 29, 1993, I accompanied Mel Coonrod, consultant for Genwal Coal Co., on a raptor survey of Genwal's mine permit area. In addition, we surveyed the Left Fork of Huntington Canyon. Rocky Mountain Helicopter was hired by Genwal to conduct the survey. The following is a summary of the results of this survey. The numbers correspond to nest sites marked on the attached map. A similar summary was sent to Mel Coonrod and Genwal. Also attached is a map of the Left Fork of Huntington Canyon. Comments are written directly on the map as it was not included in the summary sent to Genwal.

Nest #1 - This site was indicated on our overlay. We were not able to locate the nest.

Nest #2 - This site was indicated on our overlay. We were not able to locate the nest.

Nest #3 - This is a new site that was not indicated on our overlays. It was old and in bad repair.

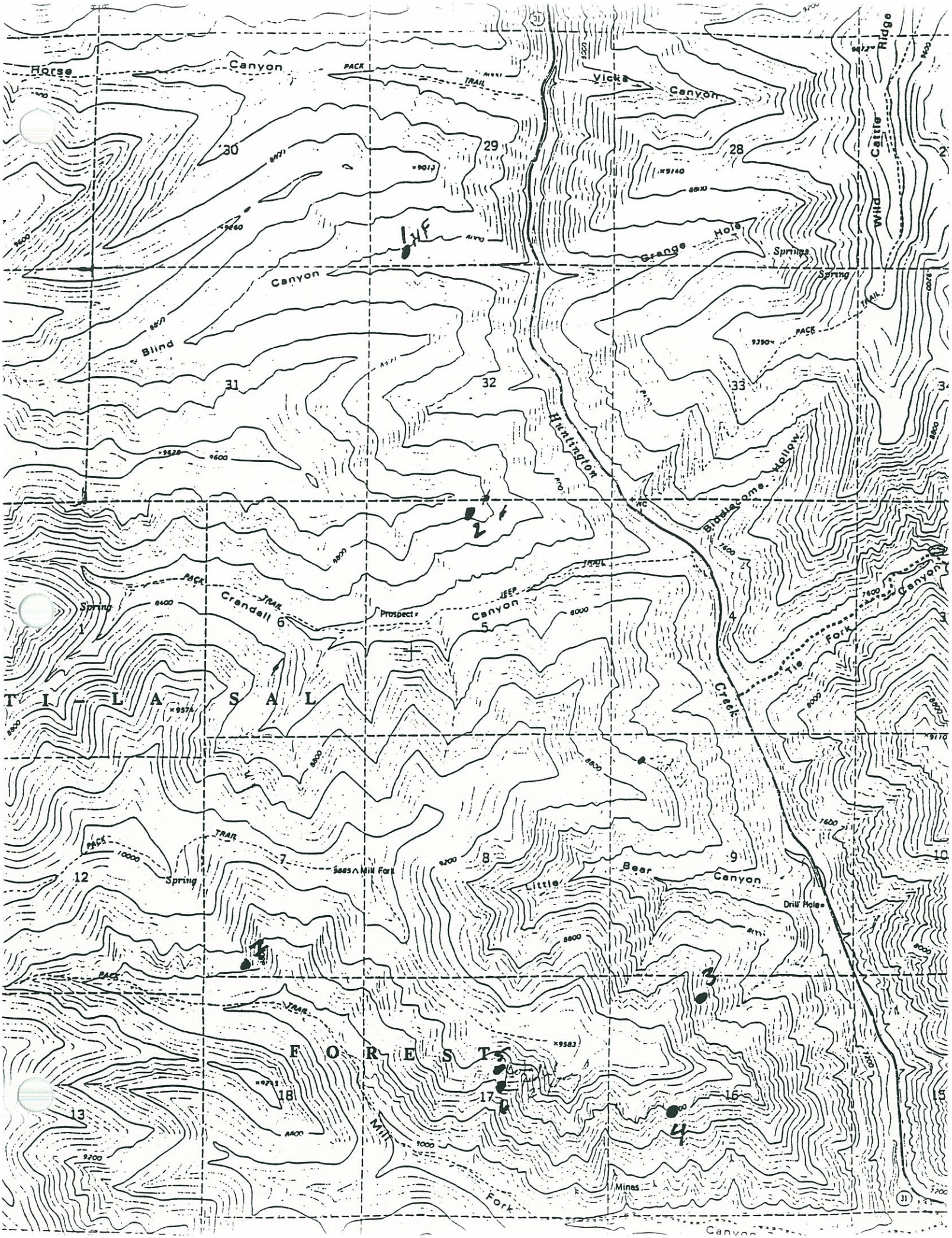
Nest #4 - This site was indicated on our overlay. We were not able to locate the nest.

Nest #5 - This was indicated as a golden eagle nest on our overlay. It was active, but was being used by red-tails. There were two young nearly ready to fledge. One adult was at the nest and hovered nearby the entire time we were in the area.

Nest #6 - This site was indicated on our overlay. We were not able to locate the nest.

Nest #7 - This site was indicated on our overlay. We were not able to locate the nest.

We observed a golden eagle near the nest in the Left Fork, an immature red-tail in Crandall Canyon and an adult red-tail in Little Bear Canyon in addition to the red-tails at the nest site.


Horse Canyon
Vicks Canyon
Cattle Ridge
Grange Hole Springs
Spring
Blind Canyon
Huntington
Blindcome Hollow
Crandall Canyon
Prospect
Spring
Tie Fork
Creek
T I L A S A L
F O R E S T
Spring
Mill Fork
Little Bear Canyon
Drill Hole
Mines
Fork
Canyon
TRAIL
JEEP
PACK
ARROYO
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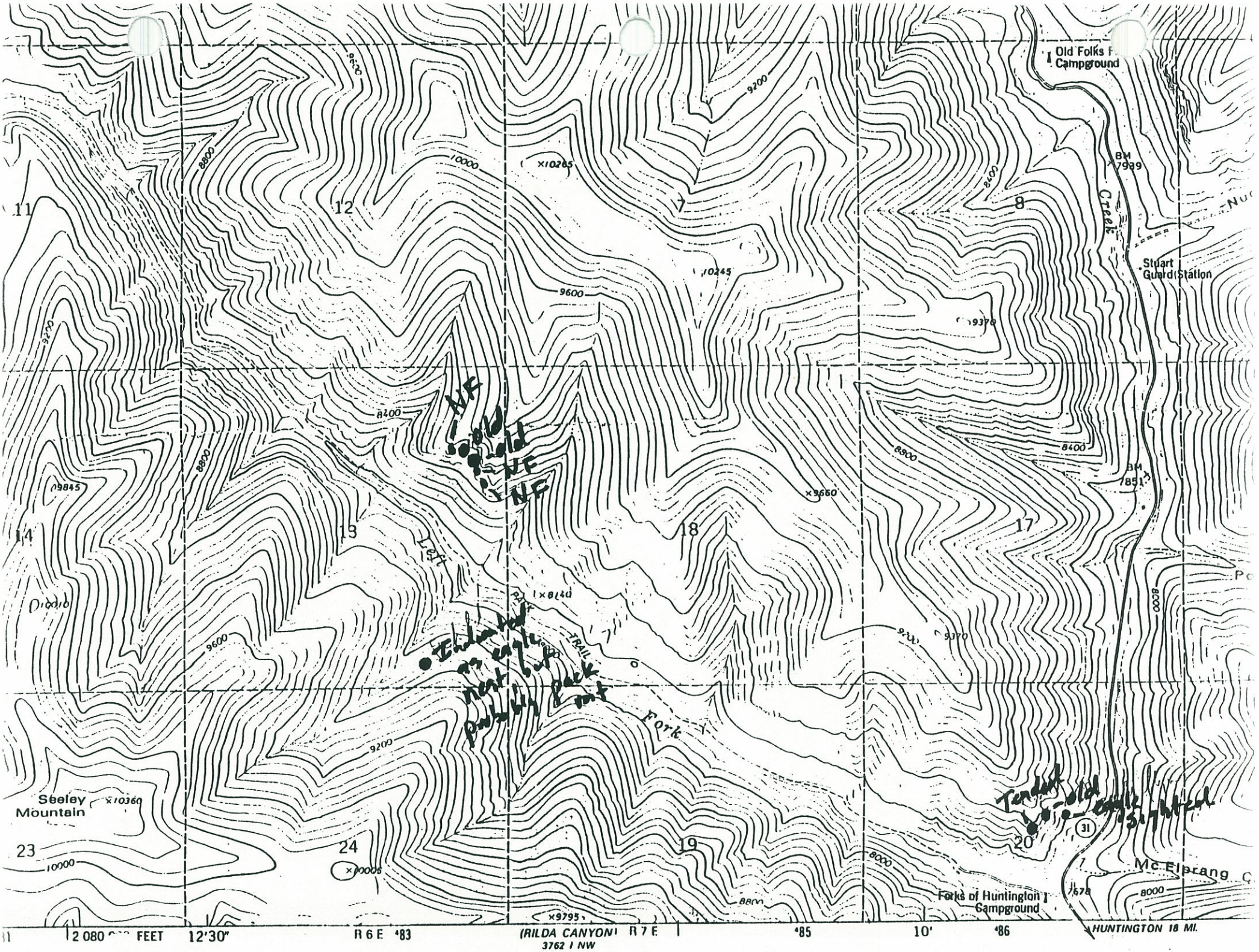
Old Folks F
Campground
BM 7939
Creek
Stuart
Guard Station
BM 7851
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12
7
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24
31
Seeley
Mountain
Forks of Huntington
Campground
Mc Elprang
HUNTINGTON 18 MI.
R6E
R7E
(RILDA CANYON)
3762 I NW
FEET
12'30"

VEGETATION

AND

TERRESTRIAL WILDLIFE

REPORT

GENWAL COAL CO. LEASE SITE

CRANDALL CANYON

EMERY CO., UTAH

NOVEMBER 1980

PREPARED BY

ENVIRONMENTAL DEPT.

VALLEY ENGINEERING, INC.

RICHFIELD, UTAH

TABLE OF CONENTS

TERRESTRIAL WILDLIFE AND HABITAT

This report will deal with the subject of terrestrial wildlife and habitat in Crandall Canyon by addressing itself to seven topics or subjects. These topics are (1) Raptors; (2) Migratory Birds of High Federal Interest (3) Upland Game Birds (4) State protected species; (5) Federally Listed Threatened or Endangered Species; (6) Big Game; (7) All other vertebrates - amphibians, reptiles, birds, and mammals.

RAPTOR SURVEY

Crandall Canyon was first searched for Raptor presence and use on June 16 and 17, 1980. Other searches were conducted during July. In addition, some raptor activities were observed and sign discovered during other phases of the wildlife and vegetational surveys being done. The purpose of the survey was to determine use of the area by raptorial species.

The only active nesting observed was that of a pair of Golden Eagles (Aquila chrysaetos). Their nest is located in a cliffy outcrop along the summit of the ridge north of Crandall Creek, and about 0.8 km northeast of the existing mine portals. On the 17th of June a single juvenile eagle was observed to still be in the nest. At that time, a single mature and a single immature Golden Eagle were seen soaring above the ridge in the vicinity of the nest. Judging from the small size of the white spots under its wings the immature eagle was probably fledged in 1979. Later in June and on numerous occassions

during July as many as four eagles were seen soaring in the vicinity of the nest. The group consisted of the three eagles previously mentioned plus another adult. Only on one occasion were they ever seen to cross to the south side of Crandall Canyon during their flights. On several occasions during July an adult male Goshawk (Accipiter gentilis) was observed hunting in the area of the existing portals. One evening he tried to take a red squirrel within twenty feet of where one of our biologists was sitting in camp.

The remains of several small birds preyed upon by raptors were found in the Spruce-Fir-Aspen areas upstream from the existing portals, as well as a single occurance (the remains of a Stellers Jay (Cyanocitta stelleri)) in the shallow side cayon entering Crandall Creek from the north 0.2 km west of the existing portals. Nearby this occurance were hawk droppings. Also in this shallow side canyon were found two inactive Cooper's Hawk (Accipiter cooperii) nests. One at the mouth 30 meters north of the road 40 feet up in a Blue Spruce and another 200 meters north 25 to 30 feet up a 70 foot White Fir. This latter nest is several years old, evidenced by the fact that the bottom is beginning to fall out. The remains of the Stellers Jay were found 75 meters above this last nest.

On the south side of Crandall Canyon there are three shallow side canyons, more or less equally spaced. The highest is 200 meters west of the above mentioned side canyon on the north. Near its mouth was found a very old nest with the remains of a casting beneath

it. It was 15 feet up a 40 foot Blue Spruce and judging from its height and appearance, is possibly that of a Sharp-shinned Hawk (Accipiter striatus). About 300 meters up this same canyon were found three Great Horned Owl (Bubo virginianus) castings. They appeared to be quite old.

1.8 km west of the existing mine portals Crandall Canyon forks. The cliffs in the notch of the fork were visually searched for raptor nests but none were spotted. Both forks of Crandall Canyon were thoroughly searched for raptor sign and nests for a distance of 500 meters or more, but none were found.

The only raptor sign found below the existing mine portals was the dried pelt of a rabbit 20 feet up in a Douglas Fir. This pelt was found approximately 1 km below the portals.

In conclusion, except for the eagle nest high on the ridge north and east of the existing mine portal area, there is no active raptor nesting in Crandall Canyon. However, some parts of the canyon are being used as a hunting range for raptors.

MIGRATORY BIRDS OF HIGH FEDERAL INTEREST

The U.S. Fish and Wildlife Service has compiled a list of twenty-two species of migratory birds, which occur in the Uintah-Southwestern Utah Coal Production Region, for which there is high federal interest.

Eleven of the twenty-two are raptors:

(1) Bald Eagle (Haliaeetus leucocephalus): An endangered winter resident of Utah, usually near lakes, rivers and marshes surrounded by open country with suitable perching sites. Crandall Canyon, because of its narrowness and small creek, and Huntington Canyon, because of its narrowness and swift water, are not good Bald Eagle habitat.

(2) Golden Eagle (Aquila chrysaetos): A common resident of the mountains and deserts of Utah. An active nest was found high on the ridge 0.8 km northeast of the proposed mine site. Mine development and operation should have little or no affect on this nest.

(3) Peregrine Falcon (Falco peregrinus): An endangered resident of canyons, high cliffs, rivers, marshlands and deserts. There are no known sightings of Peregrine Falcons in Huntington Canyon. The nearest known sightings come from Manti, roughly 30 kilometers southwest and the San Raphael River, roughly 60 kilometers southeast.

(4) Prairie Falcon (Falco mexicanus): A common resident of open habitat in canyons, mountains, plains, and deserts. Although none were seen, the Mountain Grassland found up on the north-facing south slope of Crandall Canyon could be suitable habitat of Prairie Falcons.

(5) Ferruginous Hawk (Buteo regalis): An uncommon summer resident and rare winter resident of open desert; infrequently seen in marshes and farmlands. Crandall and Huntington Canyon are not likely habitats for Ferruginous Hawk.

(6) Merlin (Falco columbarius) A common winter resident of open country and foothills which preys on flocks of perching birds. The Crandall Canyon area is not likely to attract Merlins.

(7) Cooper's Hawk (Accipiter cooperii): A common summer resident and transient and rare winter resident of broken woodlands, dry wooded canyons, riparian areas, pinion/juniper and conifer forests. An adult male Cooper's Hawk was seen in Huntington Canyon about 1 km north of Crandall Canyon on June 16, 1980. Also, two inactive nests were found in the shallow canyon west of the existing portals on the north slope of Crandall Canyon.

(8) Osprey (Pandion haliaetus): An uncommon transient which frequents rivers, lakes and large bodies of water. The several large lakes higher up Huntington Canyon may attract Osprey, but Crandall Canyon and Lower Huntington Canyon would not be Osprey territory.

(9) Spotted Owl (Strix occidentalis): A little known desert owl of wooded canyons with narrow side canyons. The Spotted Owl's published range does not overlap Huntington Canyon.

(10) Burrowing Owl (Speotyto cunicularia): A resident limited to open grasslands, usually prairies, deserts, and farmlands, but sometimes occuring at higher elevations. Although not seen in Crandall Canyon the Mountain Grassland community occuring up on the north-facing south slope could very well attract and support Burrowing Owls.

(11) Flammulated Owl (Otus flammeolus): A little known summer resident partial to open pine and fir forests in mountains. While not seen in Crandall Canyon, Flammulated Owl habitat abounds in Crandall Canyon.

The remaining eleven Migrating Bird species of High Federal Interest are discussed below:

(12) Pileated Woodpecker (Dryocopus pileatus): A rare resident of mature coniferous and mixed forests with many snags, but whose range does not include the Huntington Canyon area.

(13) Williamson's Sapsucker (Sphyrapicus thyroideus): An uncommon summer resident of high coniferous forests and burns, whose range does not include the Huntington Canyon area.**

(14) Lewis' Woodpecker (Asyndesmus lewis): A little known summer resident and transient preferring scattered or logged forests, burns, cottonwood groves and Ponderosa Pine, but whose range does not include the Huntington Canyon area.

(15) Great Blue Heron (Ardea herodias): A common resident of marshes, shallow reservoirs, rivers, streams, shores and irrigation ditches. The swift water and dense streamside growth along Crandall and Huntington Creek would not be suitable habitat for a Great Blue Heron. The beaver ponds in Crandall Canyon are very small and not likely to attract a heron.

(16) Long-billed Curlew (Numenius americanus): An uncommon summer resident and transient partial to meadows, pastures, and wetlands. None of these habitats are found in Crandall Canyon, nor nearby in Huntington Canyon.

(17) Band-tailed Pigeon (Columba fasciata): An uncommon summer resident and transient of forests, canyons, foothills near mountain brush (acorns) and agricultural lands. Although not seen during the spring, summer, and fall of 1980, this species could find suitable habitat in Crandall Canyon.

* The Williamson's Sapsucker (Sphyrapicus thyroideus) utilizes (nests) in the environs of the Huntington drainage typical to those found in Crandall Canyon. (Division of Wildlife Resources, DOGM Division Order # DO 91-B, April 18, 1991.)

(18) Sandhill Crane (Grus canadensis): A rare winter transient in prairies, grainfields and marshes, and a rare summer transient in mountain meadows and marshes. No suitable Sandhill Crane habitat is found in Crandall Canyon or nearby in Huntington Canyon.

(19) Black Swift (Cypseloides niger): An uncommon summer resident of open areas in mountain country. There is good Black Swift habitat in Crandall and Huntington Canyons. Numerous White-throated Swifts (Aeronautes saxatalis) were seen during 1980 but only a few Black Swifts.

(20) Western Bluebird (Sialia mexicana): An uncommon summer resident liking scattered trees, open coniferous forests and farms. Habitat in Crandall Canyon is suitable but none were seen during 1980.

(21) Scott's Oriole (Icterus parisorum): An uncommon summer resident keeping to Pinion/Juniper woodlands of desert mountains and to oak slopes and cottonwood trees in canyons, but whose range does not include the area of Huntington Canyon.

(22) Grace's Warbler (Dendroica graciae): An uncommon summer resident of Ponderosa Pine/Oakbrush communities of the mountains, but whose range does not include the Huntington Canyon area.

UPLAND GAME BIRDS SURVEY

Two species of Upland Game Birds inhabit Crandall Canyon in the areas of the mine site and road improvement. They are the Ruffed Grouse (Bonasa umbellus) and Blue Grouse (Dendragapus obscurus). Both species breed and nest in the area. Ruffed Grouse drumming logs are reported for the canyon by the Utah Division of Wildlife Resources. Several famal Ruffed Grouse were observed during 1980 in the Spruce/Fir/Aspen vegetative community west of the proposed mine site.

STATE PROTECTED SPECIES SURVEY

State laws and regulations protect a number of vertebrates whose range and habitat affinities include Crandall and Huntington Canyon.

* Amphibians: Tiger Salamander (Ambystoma tigrinum)

* Reptiles: None

Birds: All birds are protected. Besides the twenty-two already discussed under Migratory Birds of High Federal Interest two other potential residents of Crandall Canyon are listed as rare or limited. They are:

1. Gray Jay (R) (Perisoreus canadensis) which likes coniferous forests;
2. Yellowthroat (L)(Geothlypis trichas) which inhabits willow thickets along streambeds.

Mammals: Of the seventeen mammals listed as protected whose published ranges and habitat preferences include Crandall Canyon, nine have been observed to be present:

1. Snowshoe Hare (Lepus americanus)
2. Mountain Cottontail (Sylvilagus nuttallii)
3. Beaver (Castor canadensis)
4. Black Bear (Ursus americanus)
5. Long-tailed Weasel (Mustela frenata)
6. Badger (Taxidea taxus)
7. Cougar (Felis concolor)
8. Mule Deer (Odocoileus hemionus)
9. Wapiti or Elk (Cervus canadensis)

The remaining eight, although not observed, may inhabit or visit the area. They are:

* All amphibian and reptile species are protected in Utah. See Table 5 for a listing of amphibian and reptile species inhabiting the Crandall and Huntington Canyon areas.

10. Short tailed Weasel (or Ermine) (Mustela erminea)
11. Mink (Mustela vison)
12. Martin (Martes caurina)
13. Striped Skunk (Mephitis mephitis)
14. Spotted Skunk (Spilogale gracilis)
15. River Otter (Lutra candensis)
16. Bobcat (Lynx rufus)
17. Moose (Alces alces)

Development and operation of the mine will unavoidably impact these species through habitat destruction and increased human presence. Because of the narrowness of the canyon, extreme care will need to be exercised in the design and construction of the access road to minimize habitat destruction. The road should be kept as narrow as practical and cuts and fills should be severely limited, even to the point of regressing to some aspects of old style road design. Modern road design tends to glorify the smooth even grade and wide shoulder, but produces horrendous cuts and fills. Efficient use of space at the mine site would also be hoped for, with selective and needful, rather than wholesale clearing.

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN UTAH

None of the mammals or birds listed by the Federal Government as threatened or endangered, as of August 1980, reside in Crandall Canyon or nearby in Huntington Canyon. Those listed are:

Mammals:

Black-footed Ferret (Mustela nigripes)

Utah Prairie Dog (Cynomys parvidens)

Birds:

American Peregrine Falcon (Falco peregrinus anatum)

Arctic Peregrine Falcon (Falco peregrinus tundrius)

Bald Eagle (Haliaeetus leucocephalus)

Whooping Crane (Grus americana)

BIG GAME STUDY

The big game species known to inhabitat the Crandall Canyon area are the Black Bear (Ursus americanus), Cougar (Felis concolor), Wapiti or Elk (Cervus canadensis), Mule Deer (Odocileus heminus) and Moose (Alces alces).

The numerous game trails in the canyon attest to heavy use by Mule Deer and Elk. Deer were observed in the canyon on most days during 1980, both high on the ridges and at creek level. Elk signs were found high on the ridges. The canyon is used as a migration corridor for Mule Deer and Elk in the winter. Wintertime human activity in the canyon will pressure Elk to use other routes or higher trails to bypass the human presence.

In the cliffs above the mine some recent deer remains and Cougar tracks were found beneath a ledge. Black Bear tracks were seen in mud along Huntington Creek. Hunting pressure on these two species is likely to grow due to increased chance of sightings and better access.

Crandall Canyon is an important Moose habitat, especially in wintertime along the creek. Wintertime mining activities will impact Moose use of the lower 2 km of the canyon.

SURVEY OF ALL OTHER VERTEBRATES

AMPHIBIANS, REPTILES, BIRDS, AND MAMMALS

The published ranges and habitat preferences of the vertebrate species of southeastern Utah have been compared with the location and available habitats of Crandall and Huntington Canyons. The results have been prepared in tabular form and follow as Table 5.

EXPLANATION OF ABBREVIATIONS USED IN VERTEBRATE TABLES

COLUMN HEADINGS:

U	Ubiquitous
CW	Cottonwood
SG	Sagebrush
AG	Alpine Grassland
MG	Mountain Grassland
MSG	Mountain Shrub/Grassland
MSCA	Mixed Mountain Shrub/Conifer/Aspen
A	Aspen
SF	Spruce/Fir
SFA	Spruce/Fir/Aspen
R	Riparian
O	Observed on site
P	Protected by State or Federal Law

FIRST LETTER WITHIN BOXES:

C	Common (widespread and abundant)
U	Uncommon (widespread but not abundant)
O	Occasional (periodically identified over 10-15 years)
R	Rare (seldom identified in area)
L	Limited (restricted to a particular habitat)
K	Status unknown (believed present but little known)
X	Indicates "yes" in columns headed by 'O' and 'P'

SECOND, THIRD, AND FOURTH LETTERS WITHIN BOXES:

R	Resident
T	Transient
S	Summer
W	Winter

TABLE 5

AMPHIBIANS

Amphibians are always found near water. Amphibian habitat in the area is found along Huntington and Crandall Creeks and in springs and seeps found on the hillsides above the creeks.

The list below is of amphibians whose published ranges include Huntington Canyon.

Tiger Salamander (Ambystoma tigrinum)	CR-P
Great Basin Spadefoot Toad (Scaphiopus intermontanus)	CR
Western Toad (Bufo boreas)	R
Chorus Frog (Pseudacris triseriata)	CR
Leopard Frog (Rana pipiens)	CR

REPTILES

	CW	SG	AG	MG MSG	MSCA	A	SP STA	R	O	?
Collared Lizard (Crotaphytus collaris)				CR	CR					
Eastern Fence Lizard (Sceloporus undulatus)	CR	CR		CR	CR	CR	CR			
Tree Lizard (Urosaurus ornatus)	CR			CR	CR	CR	CR	CR		
Short-horned Lizard (Phrynosoma douglasii)		CR		CR	CR		CR			
Rubber Boa (Charina bottae)	CR					CR	CR		X	
Striped Whipsnake (Masticophis taeniatus)		CR		CR	CR					
Racer (Coluber constrictor)		CR	CR	CR	CR			CR		
Ringneck Snake (Diadophis punctatus)	R							R	X	
Gopher Snake (Pituophis melanoleucus)	CR	CR	CR	CR	CR		CR			
Milk Snake (Lampropeltis triangulum)	R	R		R	R	R	R			
Sonora Mountain Kingsnake (Lampropeltis pyromelana)	R			R	R	R	R			
Western Terrestrial Garter Snake (Thamnophis elegans)	CR	CR		CR	CR	CR	CR	CR		
Common Garter Snake (Thamnophis sirtalis)	CR				CR	CR	CR	CR	X	
Midget Faded Rattlesnake (Crotalus viridis concolor)		CR		CR	CR		CR			

BIRDS

	U	CW	SG	AG	MG MSG	MSCA	A	SF SFA	R	O
Green Heron (Butorides striatus)		RT								
Turkey Vulture (Cathartes aura)	CSR									
Goshawk (Accipiter gentilis)					UR	UR	UR	UR		X
Sharp-shinned Hawk (Accipiter striatus)		URT			URT	URT	URT	URT	URT	X
Cooper's Hawk (Accipiter cooperii)		CSRT RWR				CSRT RWR		CSRT RWR	CSRT RWR	X
Red-tailed Hawk (Buteo jamaicensis)		CR	CR	CR	CR					
Swainson's Hawk (Buteo swainsoni)			USR	USR	USR					
Golden Eagle (Aquila chrysaetos)				CR	CR					X
Blue Grouse (Dendragapus obscurus)					CR	CR	CR	CR		
Ruffed Grouse (Bonasa umbellus)							CR	CR	CR	
California Quail (Lophortyx californicus)					CR					
Mountain Plover (Charadrius montanus)					RT					
Band-tailed pigeon (Columba fasciata)						CSRT				
Yellow-billed Cuckoo (Coccyzus americanus)		KSR								
Screech Owl (Otus asio)		UR							UR	
Flammulated Owl (otus flammeolus)						KSR		KSR		
Great Horned Owl (Bubo virginianus)	CR									
Pygmy Owl (Glaucidium gnoma)		KR			KR	KR		KR		
Burrowing Owl (Speotyto cunicularia)					LR					
Long-eared Owl (Asio otus)		CR			CR					
Saw-whet Owl (Aegolius acadicus)						KR	KR	KR		
Common Nighthawk (Chordeiles minor)			CSR			CSR				

BIRDS - PAGE 2

	U	CW	SG	AG	MG MSG	MSCA	A	SF SFA	R	O
Black Swift (Cypseloides niger)					CSR					X
White-throated Swift (Aeronautes saxatalis)					CSR					X
Black-chinned Hummingbird (Archilochus alexandri)						CSR		CSR	CSR	X
Broad-tailed Hummingbird (Selasphorus platycercus)	CSR									
Rufus Hummingbird (Selasphorus rufus)	CSRT	CSRT		CSRT	CSRT	CSRT	CSRT	CSRT		
Calliope Hummingbird (Stellula calliope)				CSR		CSR	---	CSR		
Belted Kingfisher (Megaceryle alcyon)		UR								
Red Shafted Flicker (Colaptes cafer)		CR				CR		CR		X
Yellow-bellied Sapsucker (Sphyrapicus varius)		CR					CR			
Hairy Woodpecker (Dendrocopos villosus)		CR				CR	CR	CR	CR	
Downy Woodpecker (Dendrocopos pubescens)		CR				CR			CR	
Northern Three-toes Woodpecker (Picoides tridactylus)								UR		
Cassin's Kingbird (Tyrannus vociferans)					CSR	USR				
Ash-throated Flycatcher (Myiarchus cinerascens)					CSR	CSR				
Traill's Flycatcher (Empidonax traillii)		CSR							CSR	
Hammond's Flycatcher (Empidonax hammondii)								USR		
Dusky Flycatcher (Empidonax oberholseri)					CSR					
Gray Flycatcher (Empidonax wrightii)			RSR		RSR					
Western Flycatcher (Empidonax difficilis)		CSR				CSR		CSR		X
Western Wood Peewee (Contopus sordidulus)		CSR				CSR		CSR		

BIRDS - PAGE 3

	U	CW	SG	AG	MG MSG	MSCA	A	SF SFA	R	O
Olive-sided Flycatcher (Contopus borealis)						USR		USR		
Horned Lark (Eremophila alpestris)				CR	CR					
Violet-green Swallow (Tachycineta thalassina)					CSR	CSR				X
Tree Swallow (Iridoprocne bicolor)						CSR		CSR	CSR	
Rough-winged Swallow (Stelgidopteryx ruficollis)		CSR				CSR		CSR	CSR	
Cliff Swallow (Petrochelidon pyrrhonota)					CSR	CSR				
Purple Martin (Progne subis)							USR	CSR	-	
Steller's Jay (Cyanocitta stelleri)					CR	CR		CR		X
Gray Jay (Perisoreus canadensis)						RR		RR		
Scrub Jay (Aphelocoma coerulescens)		CR			CR	CR				
Black-billed Magpie (pica pica)		CR								X
Common Raven (Corvus corax)	CR									
Common Crow (Corvus brachyrhynchos)	OT									
Clark's Nutcracker (Nucifraga columbiana)								CR		X
Black-capped Chickadee (Parus atricapillus)						CSR		CSR		
Mountain Chickadee (Parus gambeli)						CSR	CSR	CSR		X
Bushtit (Psaltriparus minimus)		CR			CR	CR				
White-breasted Nuthatch (Sitta carolinensis)					CR	CR		CR	CR	
Red-breasted Nuthatch (Sitta canadensis)						CR		CR		
Pygmy Nuthatch (Sitta pusilla)						CR		CR		
Brown Creeper (Certhia familiaris)		CSR				CSR		CSR		

	U	CW	SG	AG	MG MSG	MG MSCA	A	SF SFA	R	O
Dipper (Cinclus mexicanus)		CR							CR	X
House Wren (Troglodytes aëdon		CSR								
Rock Wren (Salpinctes obsoletus)					CR	CR				
Canyon Wren (Catherpes mexicanus)					CR	CR				
American Robin (Turdus migratorius)	CR									
Hermit Thrush (Catharus guttatus)		CSR				CSR		CSR		
Swainson's Thrush (Catharus ustulatus)		CSR				CSR	CSR	CSR	CSR	
Veery (Catharus fuscescens)		USR								
Western Bluebird (Sialia mexicana)					USR	USR	USR	USR		
Mountain Bluebird (Sialia currucoides)						CSR		CSR		
Townsend's Solitaire (Myadestes townsendi)					CWR	CSR		CSR		
Blue-gray Gnatcatcher (Polioptila caerulea)		CSR			CSR				CSR	
Golden-crowned Kinglet (Regulus satrapa)						UR		UR		
Ruby-crowned Kinglet (Regulus calendula)		CWR			SWR			CSR		
Water Pipet (Anthus spinoletta)				CR				CR		
Bohemian Waxwing (Bombycilla garrulus)		UWR							CWR	
Solitary Vireo (Vireo solitarius)		USR			USR	USR			USR	
Warbling Vireo (Vireo gilvus)		CSR						CSR	CSR	X
Orange-crowned Warbler (Vermivora celata)		T			CSR	CSR	CSR		T	
Nashville Warbler (Vermivora ruficapilla)		UT				UT				
Audubon's Warbler (Dendroica auduboni)		CSR							CSR	T
Yellow Warbler (Dendroica petechia)		CSR					CSR		CSR	
Magnolia Warbler (Dendroica magnolia)						UT		UT		

BIRDS - PAGE 5

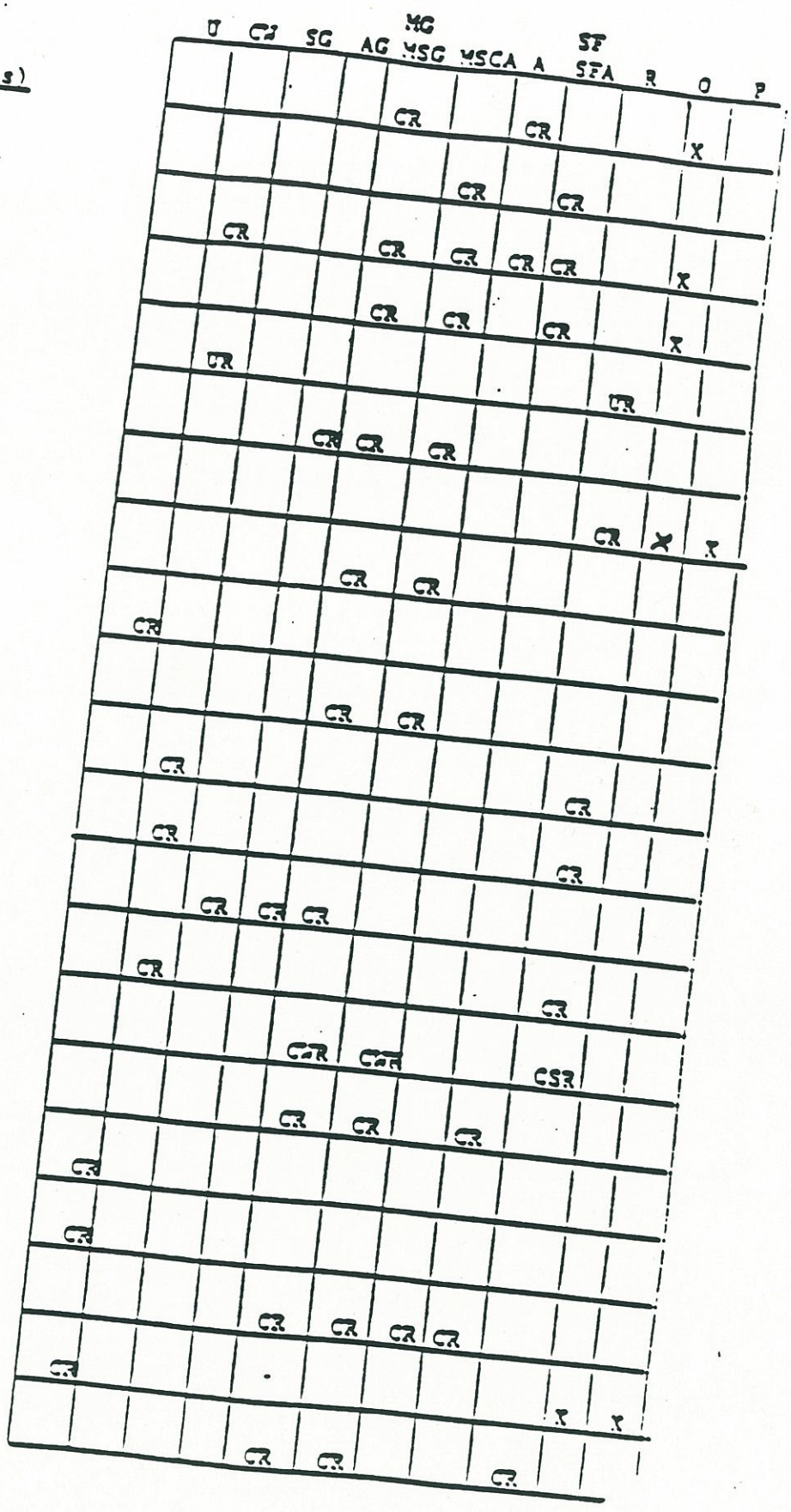
	U	CW	SG	AG	MG MS G	MSCA	A	SF SFA	R	O
Yellow-rumped Warbler (Dendroica coronata)		CSR				CSR	CSR	CSR		
Townsend's Warbler (Dendroica townsendi)						UT		UT		
Mac Gillivray's Warbler (Oporornis tolmiei)		CSR							CSR	X
Yellowthroat (Geothlypis trichas)		LSR							LSR	
Yellow-breasted Chat (Icteria virens)		CSR							CSR	
Wilson's Warbler (Wilsonia pusilla)								CSR	CSR	
American Redstart (Setophaga ruticilla)		UT							UT	
Rusty Blackbird (Euphagus carolinus)		OT								
Western Tanager (Piranga ludoviciana)		CSR				CSR	CSR	CSR	CSR	X
Black-headed Grosbeck (Pheucticus melanocephalus)		CSR			CSR				CSR	
Lazuli Bunting (Passerina amoena)		CSR			CSR				CSR	
Rufus-sided Towhee (Pipilo erythrophthalmus)					CR	CR				
Dark-eyed Junco (Junco hyemalis)		CSR				CSR		CSR		
Gray-headed Junco (Junco caniceps)					CSR	CSR		CSR		X
Tree Sparrow (Spizella arborea)		TWR								
Chipping Sparrow (Spizella passerina)						CSR	CSR	CSR		
White-crowned Sparrow Zonotrichia leucophrys)						CSR	CSR	CSR		X
Fox Sparrow (Zonotrichia iliaca)		KSR?								
Black-throated Sparrow (Amphispiza bilineata)			USR		USR	CSR				
Cassin's Finch (Carpodacus cassinii)						CSR		CSR		
Pine Grosbeak (Pinicola enucleator)						UR		UR		

BIRDS - PAGE 6

	U	CW	SG	AG	MG MSG	MSCA	A	SF SFA	R	O
Rosy Finch (Leucosticte arctoa)				CSR						
Pine Siskin (Carduelis pinus)						CR		CR		
American Goldfinch (Carduelis tristis)		CR								
Red Crossbill (Loxia curvirostra)						USR		USR		

MAMMALS

	U	CW	SG	AG	MG MSG	MSCA	A	SF SFA	R	O	P
North Water Shrew (Sorex palustris)		CR							CR		
Merriam Shrew (Sorex merriami)		UR			UR	UR	UR	UR			
Vagrant Shrew (Sorex vagrans)		CR							CR		
Masked Shrew (Sorex cinereus)		CR			CR	CR		CR	CR		
Dusky Shrew (Sorex obscurus)					CR	CR		CR			
Little Brown Myotis (Myotis lucifugus)		CR			CR	CR					
Long-eared Myotis (Myotis evotis)						CR		CR			
Long-legged Myotis (Myotis volans)					CR	CR					
Small-footed Myotis (Myotis leibii)					UR	UR					
Silver-haired Bat (Lasionycteris noctivagans)					CR	CR	CR	CR			
Big Brown Bat (Eptesicus fuscus)		CR			CR	CR	CR	CR			
Red Bat (Lasiurus borealis)		UR			UR	CR	UR	CR			
Hoary Bat (Lasiurus cinereus)		UR			CR	CR	UR	CR			
Western Big-eared Bat (Plecotus townsendii)					CR	CR		CR			
Snowshoe Hare (Lepus americanus)		CR			CR	CR	CR	CR	CR	X	X
Mountain Cottontail (Sylvilagus nuttallii)					CR	CR	CR	CR		X	X
Red Squirrel (Tamiasciurus hudsonicus)						CR		CR		X	
Rock Squirrel (Spermophilus variegatus)		CR			CR	CR					
Uintah Ground Squirrel (Spermophilus armatus)					CR	CR		CR			
Golden-mantled Ground Squirrel (Spermophilus lateralis)					CR	CR		CR			



Yellow-bellied Marmot
(Marmota flaviventris)

Northern Flying Squirrel
(Glaucomys sabrinus)

Least Chipmunk
(Eutamius minimus)

Uintah Chipmunk
(Eutamius umbrinus)

Cliff Chipmunk
(Eutamius dorsalis)

Northern Pocket Gopher
(Thomomys talpoides)

Beaver
(Castor canadensis)

Canyon Mouse
(Peromyscus crinitus)

Deer Mouse
(Peromyscus maniculatus)

Bushy-tailed Wood Rat
(Neotoma cinerea)

Rat
(Ondatra zibethicus)

Meadow Vole
(Microtus pennsylvanicus)

Mountain Vole
(Microtus montanus)

Richardson's Vole
(Microtus richardsonii)

Longtail Vole
(Microtus longicaudus)

orcupine
(Erethizon dorsatum)

oyote
(Canis latrans)

d Fox
(Vulpes fulva)

ay Fox
(Urocyan cinereoargenteus)

ck Bear
(Ursus americanus)

-ed Cat
arlacus astutus)

ADDENDUM TO APPENDIX 3-3

LISTING OF SPECIAL INTEREST, THREATENED AND ENDANGERED WILDLIFE AND VEGETATION SPECIES

8/15/95 REVISED 10/1/95

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1994)	Fish & Wildlife Status (1995)	DWR Status (1993)
PLANTS						
Arizona Willow			PE			
Autumn buttercup	S1		E			
Barneby reed-mustard	S1	YES	E			
Barneby ridge-cress			E			
Chatterley's Onion	S2	??		S (ML)		
Clay reed-mustard			T			
Clay phacelia	S1		E	E		
Dwarf bear poppy	S1		E			
Heliotrope milkvetch	CH/S1		T			
Jones cycladenia	S2	YES	T			
Kodachrome bladderpod	S1		E			
Kodachrome pepper-grass			PE			
Last chance townsendia	S1	YES	T			
Link Trail Columbine	S1	YES		S (ML)		
Maguire daisy			PT			

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1994)	Fish & Wildlife Status (1995)	DWR Status (1993)
PLANTS (Continued)						
Maguire daisy (var. maguirei)	S1	YES	E			
Giant four-wing saltbrush	S1		C2			
Maguire primrose	S1		T			
Navajo sedge	CH		T			
San Rafael cactus		YES	E			
Shrubby reed-mustard	S1		E			
Siler cactus			T			
Spineless hedgehog cactus				E		
Uinta Basin hookless cactus			T			
Ute Ladies'-tresses		??	T	S		
Welsh's milkweed	S1		T			
Winkler cactus	CH		PE			
Wright fishhook cactus		YES	E			

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1994)	Fish & Wildlife Status (1995)	DWR Status (1993)
PLANTS (continued)						
Meadow pussytoes		??		S		
Culter milkweed		??		S		
Desert milkvetch	S1	??		S		
Isely milkvetch		??		S		
Monument milkvetch		??		D		
Canyonlands sedge		??		S		
Creutzfeldt-flower	S2	??	C2	S (ML)		
Pinnate spring-parsley	S1	??	C2	S (ML)		
Kachina daisy	S2	??	C2	S (ML)		
La Sal daisy	S2	??	C2	S (ML)		
Sedge fescue		??		S		
Canyon sweetvetch	S2	??	C2	S (ML)		
Low hymenoxys		??		D		
Carolina Tassel-rue	S1	??		C (ML)		
Helenium hymenoxys		??		S		
Canyonlands lomatium		??		S		

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1994)	Fish & Wildlife Status (1995)	DWR Status (1993)
PLANTS (continued)						
Eastwood podistera		??		D		
Tidestrom beardtongue	S2	??	C2	S		
Nevada primrose		??		S		
La Sal Mountain groundsel		??		S		
Maguire campion		??		S		
Columbine (Flavescens rubicunda)		??		A		
Bicknell Milkvetch	S2	??	3C	S (ML?)		
Broad-leaved Desert Parsley	S1	??	C2	S (ML)		
Groundsel (Senecio dimorphophyllus var intermedius)	S2	??	3C	C (ML)		
Musinea groundsel	S1	??		S (ML)		
Peterson catchfly	S3	??	C2	S (ML)		
Carrington Daisy	S1	??	C2	S (ML)		
Abajo Daisy (abajoensis)	S1S2	??	3C	S (ML)		

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
MAMMALS						
Black-footed ferret	SH	YES	E			E
Utah prairie dog	S1		T			T
Spotted bat	S1	YES	C2	S	2	S1
Western big-eared bat		??		S		
Pygmy Rabbit	S3	YES	C2		2	
Virgin Merriam's kangaroo rat	S1		C2		2	S2
Gunnison Island kangaroo rat	S1		C2		2	
Dolphin Island chisel-toothed kangaroo rat	S1		C2		2	
Dolphin Island Ord's kangaroo rat					2	
North American lynx	S1	??	C2	S	2	S1S2
North American Wolverine	S1	??	C2	S	2	T
Allen's (Mexican) big-eared bat	S2S3		C2		2	S2

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
MAMMALS (continued)						
Southwestern otter	SX	??	C2		2	S1S2
California or Waterhouse leaf-nosed bat	S2		C2		2	
Navaho Mountain mexican vole	S2		C2		2	S1S2
Virgin River montane vole	S2		C2		2	S1S2
Small-footed myotis (bat)	S3?	??	C2		2	
Long-eared myotis (bat)	S3?	??	C2		2	
Fringed myotis (bat)	S3?	??	C2		2	
Long-legged myotis (bat)	S3?	??	C2		2	
Yuma myotis (bat)	S2	??	C2		2	
Big free-tailed bat	S2S3	??	C2		2	S1S2
Barnes' pika	S2		C2		2	S2
Cinnamon pika	S2		C2		2	S2
LaSal pika	S2		C2		2	S2

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
MAMMALS (continued)						
Heliotrope pika	S2		C2		2	S2
Wasatch pika	S2		C2		2	S2
Pale Townsend's (=western) big-eared bat	S4	??		S	2	S1S2
Stansbury Island harvest mouse	S1		C2		2	
Preble's shrew	S1		C2		2	
Mount Ellen Uinta chipmunk	S1		C2		2	
Bonneville southern pocket gopher	S2		C2		2	
Clear Lake pocket gopher	S2		C2		2	
Mount Ellen pocket gopher	S2		C2		2	
Stansbury Island pocket gopher	S1		C2		2	S1

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
MAMMALS (continued)						
Antelope Island pocket gopher	S1		C2		2	S1
Salt Gulch pocket gopher	S2		C2		2	
Skull Valley pocket gopher	S2		C2		2	
Swasey Spring pocket gopher	S2		C2		2	
Ringtail	S4					S2
Gray Wolf	SX		LELT			XTRP
Rock pocket mouse	S3?					S2
Desert kangaroo rat	S2					S1S2
Dolphin Island awl-toothed kangaroo rat	S1		C2			
Northern flying squirrel	S3					S2
Red bat	S2					S1S2
Northern river otter	S1					S1S2
American marten	S3					S2

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
MAMMALS (continued)						
Fisher	SX			S		XTRP
Stephen's Woodrat	S3					S1S2
Copenhagen Basin pika	SP		3C			S2
American pika	S3					S2
Cave myotis (bat)	SP		C2			
Northern pocket gopher	S2?					S1
Desert shrew	S3					S2

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
BIRDS						
American peregrine falcon	S2	YES	E (S/A)	E		E
Bald eagle	S1	YES	E, PDL	E		E
Southwestern willow flycatcher	S1/CH	??	E	S		S1S2
Whopping crane	M/SEN		E			E
Mexican spotted owl	S1		T	S		T
Flammulated owl	S2	??		S		
Northern goshawk	S3	??	C2	S	2	S1
Western burrowing owl	S2	??			2	S1
Ferruginous hawk	S2	??	C2		2	T
Mountain plover	S1	??	C2		1	S2
Black tern	S3	??	C2		2	S1
Caspian tern	S3					S1
Harlequin duck					2	
Western least bittern	S1	??	C2		2	

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
BIRDS (continued)						
White-faced ibis	S1		C2		2	
Common loon	S1			S		
Three-toes woodpecker	S2			S		S2
Short-eared owl	S2					S1
Swainson's hawk	S2		3C			S1S2
Yellow-billed cuckoo	S1					T
Western yellow-billed cuckoo	S1		3B			T
Common yellowthroat						S1
Yellow-breasted chat						S1
American white pelican						S2
Arizona Bell's vireo			3C			S1S2
Columbian sharp-tailed grouse	S1	??	C2	S	2	

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
FISH						
Bonytail chub	CH/S1	YES	E			E
Colorado squawfish	CH/S1	YES	E (Utah)			E
Humpback chub	CH/S1	YES	E			E
Lahotan cutthroat trout	S1		T			T
June sucker	CH/S1		E			E
Razorback sucker	CH/S1	YES	E			E
Virginia River chub	S1		E			E
Virgin spinedace	S1		PT			T
Woundfin	S1		E (Utah)			E
Desert sucker	S2		C2		2	S2
Flannelmouth sucker	S2	YES	C2		2	
Leatherside chub	S3		C2		2	
Roundtail chub	S2	YES	C2		2	T

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
FISH (continued)						
Least chub	S1		C1		1	E
Colorado River cutthroat trout	S2	YES	C2	S	2	S1
Bonneville cutthroat trout	S2		C2	S	2	S1
Bear Lake sculpin	S1					S2
Bear Lake whitefish	S1					S2
Bonneville cisco	S1					S2
Bonneville whitefish	S1					S2

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
REPTILES						
Desert tortoise	CH		T			
Banded gila monster	S2		C2 (Utah)		2	E
Speckled rattlesnake	S1					S2
Mojave rattlesnake	S1					S2
Desert iguana	S1					S2
Sonoran Mtn. Kingsnake	S3					S1
Desert tortoise	S1		LTC2 (T Utah)			E
Glen Canyon chuckwalla	S2		C2			T
Chuckwalla	S2		C2		2	T

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
SNAILS						
Knab ambersnail	CH/S1		E			
Cockerell's Striate disc	S1		C2 (Utah)			
California floater	S1		C2			
Eureka mountainsnail	S1		C2			
A land snail	S1		C2			
Utah bubble snail (physa)	S1		C2			
Fat-whorled pondsnail	S1		C1			
Utah valvata snail	CH		E			

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
AMPHIBIANS						
Arizona Southwestern Toad	S2		C2		2	S1
Lowland Leapard Frog					2	
Western toad	S2C					S1
Yavapai leopard frog	S1?		C2 (Utah)			S1
Spotted Frog	S1	??	C1C2 (Utah)	S	1	T

LISTED AND PROPOSED ENDANGERED, THREATENED AND SENSITIVE SPECIES
July 1995

Species	State Ranking	Emery County	Federal Status (1995)	Forest Service Status (1991)	Fish & Wildlife Status (1995)	DWR Status (1993)
INSECTS						
Utah chaetarthrian water scavenger beetle	S2?		C2		2	
Coral pink dune tiger beetle	S1		C1		1	
Macneil sooty wing skipper	S1		C2		2	
Spangler's hydroporus diving beetle	SH		C2		2	
Utah hydroporus diving beetle	SH		C2		2	
Spotted Warner Valley Dunes june beetle	S2?		C2		2	
Great Basin silverspot butterfly	S2?	??	C2		2	
Tanner's black camel cricket	S2		C2		2	
Utah minute moss beetle	SH		C2		2	

LEGEND

State Ranking (Utah Natural Heritage Program, Division of Wildlife Resources)

M	Migrates through Utah
CH	Critical Habitat - Proposed or designated
S1	Critically imperiled in the state
S2	Imperiled in the state
S3	Rare or uncommon
S4	Widespread, abundant, and apparently secure, but with cause for long-term concern
S2C	Imperiled in the state, species in captivity or cultivation
SH	Historical habitat in Utah
SP	Potential for listing
SX	Extirpated - species that has disappeared, as a resident of Utah since 1800
SEN	Extirpated and nonbreeding in the State of Utah

County

YES	Species or habitat found within the county
??	Species or habitat possible within the county

Federal

E	Endangered
T	Threatened
PE	Proposed Endangered
PT	Proposed Threatened
C1	Candidate (category 1) Potential listing as threatened or endangered
C2	Candidate (category 2) Working list for category 1
3B	Former candidate, rejected because of synonym or hybrid
3C	Former candidate, rejected because more common or adequately protected
LT	Listed as threatened in Utah
LELT	Proposed endangered in part of range, proposed threatened in a different part, listed as endangered in Utah
PDL	Proposed downlisting in Utah, 1994

Forest Service

A	Added to sensitive listing in 1994
D	Dropped from sensitive listing in 1994
E	Endangered
T	Threatened
S	Sensitive
ML	Manti-La Sal National Forest
C	Species of concern in the forest designated

Fish & Wildlife

1	Substantial information to support species listing as endangered or threatened
2	Evidence of vulnerability, but not sufficient to support listing as endangered or threatened

Utah Division of Wildlife Resources (DWR)

E	Endangered
T	Threatened
S1	Species whose population has been depleted or is declining in numbers, distribution and/or habitat
S2	Occurs in limited areas and/or numbers due to a restricted or specialized habitat
S1S2	Both of the above
XTRP	Extirpated - species that has disappeared, as a resident of Utah since 1800

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES
AND THEIR HABITAT IN CARBON AND EMERY COUNTY
February 1995

CARBON COUNTY			
SPECIES	SCIENTIFIC NAME	STATUS	HABITAT DESCRIPTION
Bald Eagle	Haliaeetus leucocephalus	E	3,7
Black-footed Ferret	Mustela nigripes	E	6
Bonytail Chub	Gila elegans	E	4
Colorado Squawfish	Ptychocheilus lusius	E	4
Humpback Chub	Gila cypha	E	4
Peregrine Falcon	Falco peregrinus	E	1
Razorback Sucker	Xyrauchen texanus	E	4
EMERY COUNTY			
Bald Eagle	Haliaeetus leucocephalus	E	1,7
Barneby Reed-mustard	Schoenocrambe barnebyi	E	
Black-footed Ferret	Mustela nigripes	E	6
Bonytail Chub	Gila elegans	E	4
Colorado Squawfish	Ptychocheilus lusius	E	4
Humpback Chub	Gila cypha	E	4
Jones Cycladenia	Cycladenia humilis var. jonessi	T	
Last Chance Townsendia	Townsendia aprica	T	
Maguire Daisy	Erigeron maguirei var. maguirei	E	7
Peregrine Falcon	Falco peregrinus	E	1
Razorback Sucker	Xyrauchen texanus	E	4
San Rafael Cactus	Pediocactus despainii	E	
Wright Fishhook Cactus	Sclerocactus wrightiae	E	

1 Nests in this county of Utah.
2 Migrates through Utah, no resident populations.
3 Wintering populations.
4 Critical habitat designated in this county.
5 Critical habitat proposed in this county.
6 Historical range.
7 Proposed downlisting to threatened

E Endangered
T Threatened

Compiled by U.S. Fish and Wildlife Service

UTAH CANDIDATE SPECIES
Fish and Wildlife Service
January 4, 1995

Species	Scientific Name	Category	Utah Range
AMPHIBIANS			
Arizona Southwestern Toad	Bufo microscaphus microscaphus	2	SW Utah
Lowland (yavapai & San Felipe) Leapard Frog	Rana yavapaniensis	2	Virgin River
Spotted Frog	Ranan pretiosa	1	Wasatch Front, West Desert
BIRDS			
Northern Goshawk	Accipiter gentilis	2	Conifer forests
Western Burrowing Owl	Athene cunicularia hypugaea	2	Semiarid grasslands
Ferruginous Hawk	Buteo regalis	2	Open desert areas
Mountain Plover	Charadrius montanus	1	Semiarid grasslands, plains, plateaus
Black Tern	Childonias niger	2	Water systems
Harlequin Duck	Histrionicus histrionicus	2	Rare
Western Least Bittern	Ixocrychus exilis hesperis	2	Water systems
White-faced Ibis	Plegadis chihi	2	Marshes, meadows
Columbian Sharp-tailed Grouse	Tympanuchus phasianellus columbianus	2	Grassland/sagebrush

UTAH CANDIDATE SPECIES
Fish and Wildlife Service
January 4, 1995

Species	Scientific Name	Category	Utah Range
FISH			
Desert Sucker	Catostomus clarki	2	Virgin River
Flannelmouth Sucker	Catostomus laipinnis	2	Colorado, Green River drainages
Leatherside Chub	Gilas copei	2	W. Slope Wasatch Range
Roundtail Chub	Gila robuta	2	Colorado, Green River drainages
Least Chub	Iotichthys phlegethontis	1	Tooele, Millard, Juab Counties
Colorado River Cutthroat Trout	Oncorhynchus (=Salmo) Clarki pleuriticus	2	W. Slope Rocky Mtns., North Slope Uinta Mtns.
Bonneville Cutthroat Trout	Oncorhynchus (+Salmo) clarki utah	2	Bear R., Deep Creek Mtns, Pine Valley
INSECTS			
Utah Chaetarthrian Water Scavenger Beetle	Chaetarthria utahensis	2	Santa Clara Creek
Coral Pink Dune Tiger Beetle	Cicindela limbata albissima	1	Coral Pink Sand Dunes
Macneil Sooty Wing Skipper	Hesperopsis gracielae	2	Atriplex thickets, Colo. R, Wash. Co.
Spangler's Hydroporus Diving Beetle	Hydroporus spangleri	2	Lamb's Canyon, SLC Utah
Utah Hydroporus Diving Beetle	Hydroporus utahensis	2	East side Utah Lake
Utah Minute Moss Beetle	Limnebius utahensis	2	Rich, Morgan, Weber Counties

UTAH CANDIDATE SPECIES
Fish and Wildlife Service
January 4, 1995

	Scientific Name	Category	Utah Range
INSECTS (continued)			
Spotted Warner Valley Dunes June Beetle	Polyphylla avittata	2	Hurricane Dunes
Great Basin Silverspot Butterfly	Speyeria nokomis nokomis	2	Wet meadows, seeps with violets
Tanner's Black Camel Cricket	Utabaenetes tanneri	2	Willow Springs, Kane County
MAMMALS			
Pygmy Rabbit	Brachylagus idahoesis	2	Sagebrush and loose soil
Virgin Merriam's Kangaroo Rat	Dipodomys merriami frenatus	2	Washington, Co.
Gunnison Island Kangaroo Rat	Dipodomys microps alfredi	2	Gunnison Island, Great Salt Lake
Dolphin Island Chisel-toothed Kangaroo Rat	Dipodomys ordii cineracues	2	Dolphin Island, Great Salt Lake
Dolphin Island Ord's Kangaroo Rat	Dipodomys ordii cineraceus	2	Dolphin Island, Great Salt Lake
Spotted Bat	Euderma maculatum	2	Crevices, Buildings
North American Lynx	Felis lynx canadensis	2	Conifer forests
North American Wolverine	Gulo gulo luscus	2	Remote mountains
Allen's (Mexican) Bigeared Bat	Idionycteris (=Plecotus) phyllotis	2	San Juan, Wash. County, caves in pine forests

UTAH CANDIDATE SPECIES
Fish and Wildlife Service
January 4, 1995

Species	Scientific Name	Category	Utah Range
MAMMALS (continued)			
Southwestern Otter	Lutra canadensis sonorae	2	Streams, lakes
California or Waterhouse Leaf-nosed Bat	Macrotus californicus	2	Washington, County
Navaho Mountain Mexican Vole	Microtus mexianus navaho	2	Navaho Mtns., Utah
Virgin River Montane Vole	Microtus monanus rivularis	2	Washington, County
Small-footed Myotis (Bat)	Myotis ciliolabrus	2	Widespread
Long-eared Myotis (Bat)	Myotis evotis	2	High Mtn. Forests
Fringed Myotis (Bat)	Myotis thysanodes	2	Widespread, caves, crevices, buildings
Long-legged Myotis (Bat)	Myoptis volans	2	Widespread, high elev., buildings, crevices
Yuma Myotis (Bat)	Myotis yumanensis	2	Eastern, Southern, Utah, caves, tunnels
Big Free-tailed Bat	Nycinomops macrotis (=Tadarida m., T. nolossa)	2	So. Utah, caves, crevices, buildings
Barnes' Pika	Ochotona princeps barnesi	2	Johnson's reservoir, Sevier County
Cinnamon Pika	Ochotona princeps cinnamomea	2	Puffer Lake, Tuchar Mtns.

UTAH CANDIDATE SPECIES
Fish and Wildlife Service
January 4, 1995

Species	Scientific Name	Category	Utah Range
MAMMALS (continued)			
La Sal Pika	Ochotona princeps lasalensis	2	Warner Ranger Station, La Sal Mountains
Heliotrope Pika	Ochotona princeps moorei	2	Baldy Ranger Station, Manti Natl. Forest
Wasatch Pika	Ochotona princeps wasatchensis	2	Big Cottonwood Canyon, SLC, Utah
Pale Townsend's (=western) Big-eared Bat	Plecotus townsendii pallescens	2	Widespread
Stansbury Island Harvest Mouse	Reithrodontomys megalotis ravus	2	Stansbury Island, Great Salt Lake
Preble's Shrew	Sorex preblei	2	Timpie Springs, WMA
Mount Ellen Uinta Chipmunk	Tamias umbrinus sedulus	2	Mt. Ellen, Henry Mtns., Garfield Co.
Bonneville Southern Pocket Gopher	Thomomys unbrinus bonnevillei	2	Fish Springs
Clear Lake Pocket Gopher	Thomomys umbrinus convexus	2	E. Clear Lake, Millard County
Mount Ellen Pocket Gopher	Thomomys umbrinus dissimilis	2	Mt. Ellen, Henry Mtns., Garfield Co.
Stansbury Island Pocket Gopher	Thomomys umbrinus minimus	2	Stansbury Island, Great Salt Lake
Antelope Island Pocket Gopher	Thomomys umbrinus nesophilus	2	Antelope Island, Great Salt Lake
Salt Gulch Pocket Gopher	Thomomys umbrinus powelli	2	Salt Gulch, Garfield County

UTAH CANDIDATE SPECIES
Fish and Wildlife Service
January 4, 1995

Species	Scientific Name	Category	Utah Range
MAMMALS (continued)			
Skull Valley Pocket Gopher	Thomomys umbrinus robustus	2	Orr's Range, Skull Valley, Tooele County
Swasey Spring Pocket Gopher	Thomomys umbrinus sevieri	2	Swasey Spring, House Mtns., Millard County
REPTILES			
Banded Gila Monster	Heloderma suspectum cinctum	2	Southwestern Utah, Brush & Riparian
Chuckwalla	Sauromalus obesus	2	Rocky hillsides, SW Utah from Glen Canyon

1 Substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.

2 Some evidence of vulnerability, but not enough data to support listing.

Compiled by U.S. Fish and Wildlife Service

INTERMOUNTAIN REGION ENDANGERED, THREATENED AND SENSITIVE SPECIES MANTI-LA SAL FOREST
(Known and Suspected)
U.S.F.S 1991

ENDANGERED	
BIRDS	
Peregrine falcon	Falco peregrinus
Bald eagle	Haliaeetus leucocephalus
PLANTS	
Spineless hedgehog cactus	Echinocereus triglochidiatus var. inermis
Clay phacelia	Phacelia argillacea
SENSITIVE	
MAMMALS	
Spotted bat	Euderma maculatum
Western big-eared bat	Plecotus townsendii
BIRDS	
Southwestern willow flycatcher	Empidonax trailii extimus
Flammulated owl	Otus flammeolus
Northern goshawk	Accipiter gentilis
PLANTS	
Isely milkvetch	Astragalus iselyi
Monument milkvetch	Astragalus monumentalis
Creutzfeldt-flower	Crypthantha creutzfeldtii
Pinnate spring-parsley	Cymopterus beckii
Kachina daisy	Erigeron kanchinensis
LaSal daisy	Erigeron mancus
Canyon sweetvetch	Hedysarum occidentale var. canone
Low hymenoxys	Hymenoxys helenioides

INTERMOUNTAIN REGION ENDANGERED, THREATENED AND SENSITIVE
SPECIES MANTI-LA SAL FOREST
(Known and Suspected)
U.S.F.S 1991

SENSITIVE	
PLANTS	
Helenium hymenoxys	Hymenoxys helenioides
Canyonlands lomatium	Lomatium latilobum
Tidestrom beardtongue	Penstemon tidestromii
Maquire campion	Silene petersonii
Ute ladies' tresses	Spiranthes diluvialis

FOREST SERVICE
INTERMOUNTAIN REGION SENSITIVE SPECIES
MANTI-LA SAL FOREST
February 1994

Species	Scientific Name	Status
PLANTS		
Meadow pussytoes	Antennaria arcuata	Y
Culter milkweed	Asclepias culteri	?
Desert milkvetch	Astragalus desereticus	?
Isely milkvetch	Astragalus iselyi	Y
Monument milkvetch	Astragalus monumentalis	Dropped 1994
Canyonlands sedge	Carex scirpoidea var. curatorum	Y
Creutzfeldt-flower	Crypthantha creutzfeldtii	Y
Pinnate spring-parsley	Cymopterus beckii	Y
Kachina daisy	Erigeron kachinensis	Y
LaSal daisy	Erigeron mancus	Y
Sedge fescue	Festuca dasyclada	Y
Canyon sweetvetch	Hedysarum occidentale var. canone	Y
Low hymenoxys	Hymenoxys depressa	Dropped 1994
Helenium hymenoxys	Hymenoxys helenioides	Y
Canyonlands lomatium	Lomatium latilobum	Y
Tidestrom beardtongue	Penstemon uintahensis	Y
Eastwood podistera	Podistera eastwoodiae	Dropped 1994
Nevada primrose	Primula nevadensis	Y
LaSal Mountain groundsel	Senecio dimorphophyllus var. intermedius	Y
Maquire campion	Silene petersonii	Y
Columbine	Aquilegia flavescens rubicunda	Added 1994
Daisy	Erigeron abajoensis	Added 1994

? Suspected but not verified in forest
Y Varified in forest

Compiled U.S. Department of Agriculture, Forest Service, Feb. 7, 1994 revision

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
Robert G. Valentine
Division Director

Southeastern Region
455 West Railroad Avenue
Price, Utah 84501-2829
801-637-3310
801-637-7361 (Fax)

June 16, 1996

Genwall
P.O. Box 1201
Huntington, UT 84528

Attention: Randy Gainer

Randy:

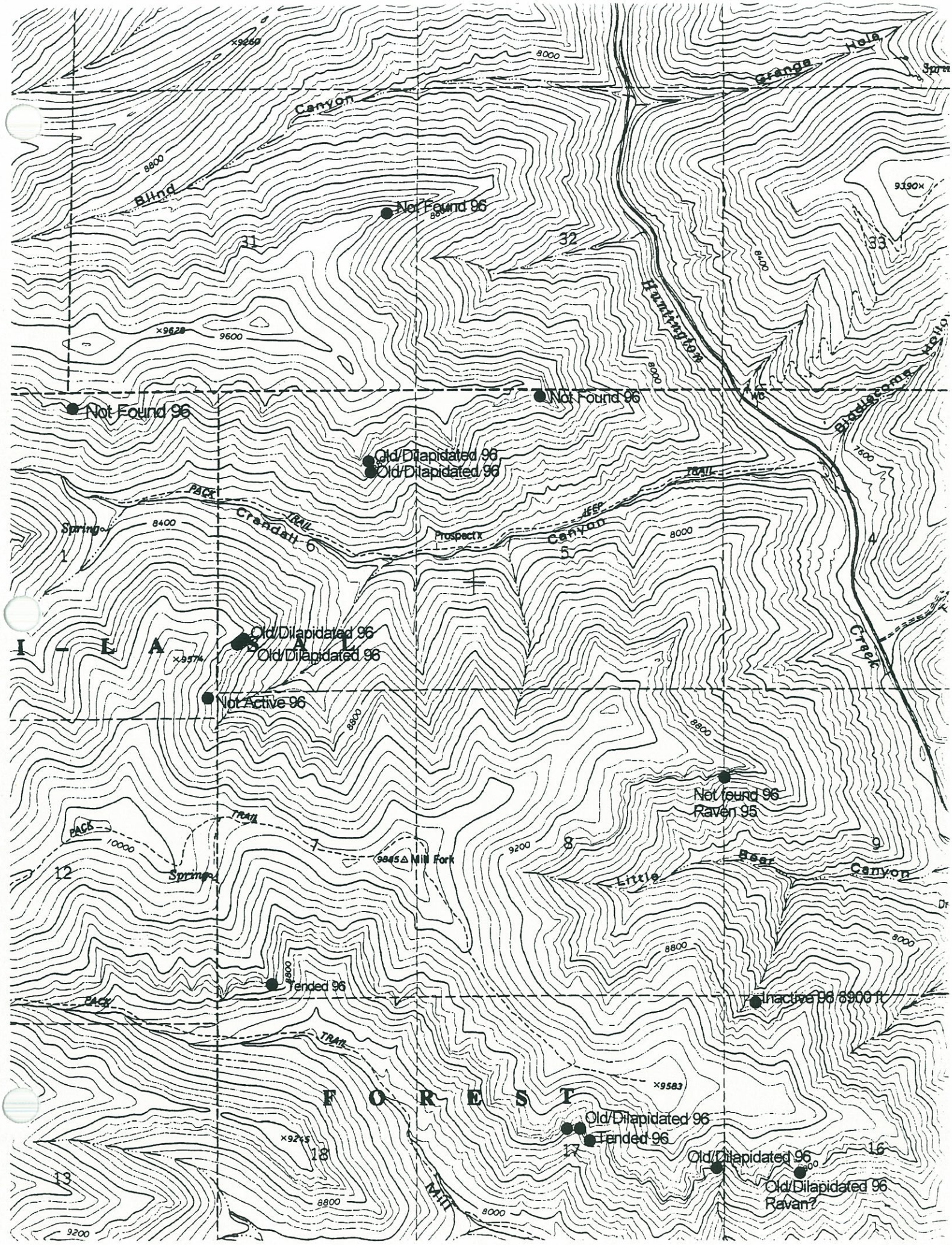
Attached is the completed 1996 raptor survey map from the May 21 survey. The survey was completed by Scott Walker from our Great Basin Experiment Station, you and me. No active or tended nests were found.

If you have any questions please call me at 801-637-3310.

Sincerely,

Ben Morris
Habitat Biologist

BM/gd
Attachment
Copy: Genwall File
Raptor File


Not Found 96
Not Found 96
Not Found 96
Old/Dilapidated 96
Old/Dilapidated 96
Old/Dilapidated 96
Old/Dilapidated 96
Not Active 96
Not found 96
Raven 95
Tended 96
Inactive 96 8900 ft
Old/Dilapidated 96
Tended 96
Old/Dilapidated 96
Old/Dilapidated 96
Ravan?
Blind Canyon
Grange Hole
Huntington
Bladgeame
Crandall
Trail
Pack
Trail
Spring
Prospect
Deep Canyon
Creek
Little Bear Canyon
Mill Fork
Trail
Pack
Spring
Trail
Pack
Trail
Mill
F O R E S T
I - L A S A L
8000
8400
8800
9200
9600
9845 Mill Fork
1
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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Michael O. Leavitt
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Division Director

Southeastern Region
455 West Railroad Avenue
Price, Utah 84501-2829
801-637-3310
801-637-7361 (Fax)

7 June 1995

David Steed
EIS
4855 North Spring Glen Road
Helper, UT 84526

Dave:

Here's the data you ask for on the raptor surveys around Genwall. Sorry they're late, but we've had a major surge in requests for information, and assessment of projects this week.. I didn't include the map for the north side of Horse Canyon because neither raptors, nests, nor good nesting habitat was found. The canyons surveyed were Horse, Blind, Crandall, Little Bear, and Mill Fork. Mill Fork and Crandall canyons were surveyed on 22 May. The other canyons were surveyed on 1 June.

NEST	CONDITION/YEAR
1	NF 95
	IN 91
2	OD 91
	NF 95
3	YOUNG 95
4	IN 95
5	NF 95
	OD 90
6	OD 90
	NF 95
7	YOUNG RAVEN 95

NEST	CONDITION /YEAR
8	TENDED 92, 93, 94, 95
9	TENDED 92
	IN 93
	IN 94
	OD 95
10	ACTIVE 90
	OD 92
	IN 93
	OD 95
11	TENDED 92
	YOUNG 93
	OD 95
12	OD 92, 93, 94, 95
	Possible raven 92
13	IN 95

IN Inactive, no visible activity that year
OD Old and/or dilapidated
ACTIVE Birds visited and worked on the nest that year
NF Nest not found
YOUNG Young raptors present in nest

Hope this helps,

Ben Morris
Habitat Biologist

SECOND ADDENDUM TO APPENDIX 3-3

LISTING OF CURRENT (2004) THREATENED & ENDANGERED

WILDLIFE AND VEGETATION SPECIES

FEDERALLY LISTED AND PROPOSED ENDANGERED (E) AND THREATENED (T) SPECIES AND THEIR HABITAT IN EMERY COUNTY

Barneby Reed-mustard	*Schoenocrambe barnebyi*	E
Jones Cycladenia	*Cycladenia humilis* var. *jonesii*	T
Last Chance Townsendia	*Townsendia aprica*	T
Maguire Daisy	*Erigeron maguirei*	T
San Rafael Cactus	*Pediocactus despainii*	E
Winkler Cactus	*Pediocactus winkleri*	T
Wright Fishhook Cactus	*Sclerocactus wrightiae*	E
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[1]	*Haliaeetus leucocephalus*	T
Mexican Spotted Owl[1,4]	*Strix occidentalis lucida*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footer Ferret[6]	*Mustela nigripes*	E
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E

1 Nests in this county of Utah.

4 Critical habitat designated in this county.

6 Historical range.

9 Candidate species have no legal protection under the Endangered Species Act. However, these species are under active consideration by the Service for addition to the Federal List of Endangered and Threatened Species and may be proposed or listed during the development of the proposed project.

10 Water depletions from any portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery programs.

For additional information contact: U.S. Fish and Wildlife Service, Utah Field Office, 2369 West Orton Circle, Suite 50, West Valley City, Utah 84119 Telephone: (801) 975-3337.

SENSITIVE SPECIES LISTED FOR THE MANTI-LA SAL NATIONAL FOREST

- Chatterlay Onion *Allium geyeri chatterleyi*
- Sweet -flowered rock jasmine *Andorsace chanaejasme carinata*
- Link Trail columbine *Aguilegia flavescens rubicunda*
- Bicknell Milkvetch *Astagalus consobrinus*
- Creutzfeldt-flower cryptanth *Cryptantha creutzfeldtii*
- Pinnate spring-parsley *Cymopterus beckii*
- Abajo daisy *Erigeron abajoensis*
- Carrington daisy *Erigeron carringtonae*
- Kachina daisy *Erigeron kachinensis*
- LaSal daisy *Erigeron mancus*
- Canyonlands lomatium *Kinatuyn katukibyn*
- Canyon sweetvetch *Hedysarum occidentale var. canone*
- Arizona willow *Salix arizonica*
- Musinea groundsel *senecio musiniensis*
- Maguire campion *Silene petersonii*

Appendix 3-6

Seed Mixes

4/97 Revised 5/97

Seed Mix
(Non-Riparian Area)

Species		**Broadcast Rate Lbs/acre**
GRASSES AND FORBS:		
Achillea millefolium		
Yarrow		0.5
Artemisia tridentata vaseyana		
Mountain Big Sage		1.0
Agropyron smithii		
Western Wheatgrass		3.0
Agropyron spicatum		
Bluebunch Wheatgrass		2.0
Aster glaucoides		
Blueleaf Aster		1.0
Bromus carantus (marginatus)		
Mountain Brome		3.0
Dactylis glomerata (piaute)		
Orchart Grass		0.5
Linum lewisii		
Lewis Flax		1.0
Medicago sativa		
"Ranger" Alfalfa		0.5
Melilotus officinalis		
Yellow Sweetclover		0.5
Penstemon strictus		
Rocky Mountain Penstemon		1.0
Sanguisorba minor		
Small Barnet		1.0
Viguiera multiflora		
Showy Goldeneye		0.5
	Total	15.5
SHRUBS:		
Symphorica oreophilus		
Snowberry		1.0
Rosa woodsii		
Woods Rose		1.0
Rhus trilobata		
Squawbush		1.0
	Total	3.0

Seed Mix (continued)

(Non-Riparian Area)

Species	**Plants/acre**
TREES:	
Populus tremuloides	
Quaking Aspen	150

In addition, on north facing slopes, the following plants will be added:

TREES:	
Populus tremuloides	
Quaking Aspen	600
SHRUBS:	
Shepherdia canadensis	
Buffaloberry	1,000
Rosa woodsii	
Woods Rose	700

Seed Mix (Riparian Area)

Species	Broadcast Rate Lbs/acre
GRASSES AND FORBS:	
Achillea millefolium	
Yarrow	0.5
Artemisia tridentata vaseyana	
Mountain Big Sage	1.0
Agropyron smithii	
Western Wheatgrass	3.0
Agropyron spicatum	
Bluebunch Wheatgrass	2.0
Aster glaucoides	
Blueleaf Aster	1.0
Bromus carantus (marginatus)	
Mountain Brome	3.0
Dactylis glomerata (piaute)	
Orchart Grass	0.5
Linum lewisii	
Lewis Flax	1.0
Medicago sativa	
"Ranger" Alfalfa	0.5
Melilotus officinalis	
Yellow Sweetclover	0.5
Penstemon strictus	
Rocky Mountain Penstemon	1.0
Sanguisorba minor	
Small Barnet	1.0
Viguiera multiflora	
Showy Goldeneye	0.5
Agrostis stolonifera	
Redtop	1.5
Poa pratensis	
Kentucky Bluegrass	1.5
Total	18.5

Seed Mix (continued)

(Riparian Area)

	Plants/acre
SHRUBS:	
Rosa woodsii	
Woods Rose	500
TREES:	
Cornus stolonifera	
Red Osler Dogwood	20
Populus angustifolia	
Narrowleaf Cottonwood	10
Salix (native)	
Native Willow (cuttings from adjacent areas)	100

NOTE: One of the following will be planted at one foot (maximum) intervals along the stream: Woods Rose, Red Osler Dogwood, or Willow. The remainer will be planted adjacent to the stream and uphill from the first row. Willows may be clumped at vulnerable locations along the stream banks to stabilize the embankment.

Plugs of Equisetum arvense will be planted at approximately two foot intervals along the stream, depending on actual density in the field.

The riparian seed mix would be applied in the area 20 feet on either side of Crandall Creek.

APPENDIX 3-10

POPULATION SURVEY REPORT

3/26/97

POPULATION SURVEY REPORT

Water: Crandall Creek

Path/file: C:\DATA\MARV\96REPORT\96CRANDL.WPD

Location: Emery County

Date: February 4, 1997

Authors: Marvin Boyer, Regional Fisheries Biologist
Kevin Christopherson, Regional Fisheries Manager

Subject: Fish population survey

INTRODUCTION

Crandall Creek was surveyed in 1996 to collect tissue samples for cutthroat trout genetic identification and to describe the trout species, densities, and distribution. Due to an increase in activities at the Genwall Mine operation and projected expansions, Crandall Creek has been surveyed annually since 1994. In 1995 and 1996, reconnaissance surveys (one each year) were performed upstream of the known trout populations to evaluate available habitat and to search for additional cutthroat trout populations.

Crandall Creek can be functionally divided into three reaches. The downstream reach near the confluence of Huntington Creek is below a natural fish barrier and contains brown trout, rainbow trout, and cutthroat trout (phenotypes of likely hybrids).

The middle reach, adjacent to the mine, is composed of beaver ponds, pools, low gradient riffles, and high gradient riffles. This reach has been sampled in the early 1980's and annually since 1994. The unique feature of the middle reach is that it is totally isolated from upstream migration of the non-native fish that inhabit Huntington Creek and the lower reach of Crandall Creek. This isolation, due to the natural barrier in lower Crandall Creek, suggests that all the trout above the barrier are of wild stock. There are no DWR records of fish being stocked in Crandall Creek. This supports the supposition that the cutthroat trout above the barrier are likely the native sub-species *Oncorhynchus clarki pleuriticus*.

The upstream reach is a high gradient environment possessing many cascades and high gradient riffles as well as low gradient riffles and runs. This reach is deficient in nursery habitat and adult fish habitat. Due to the lack of habitat and the extreme variation in discharge, trout would not likely inhabit this poor habitat during high flow periods and/or low flow periods.

METHODS

In 1994 and 1995, fish populations were surveyed with backpack electrofishing gear. In 1996, a three pass depletion estimate for a 300 ft section of the middle reach was conducted. After completing the survey, the total length and weight of each fish were measured before they were released back into the reach.

In the upstream reach, all likely habitats were electrofished in search of cutthroat trout. Extremely high gradient areas were by-passed in order to survey the most likely spots where cutthroat trout may exist. In 1994 and 1995, slightly less than one mile of stream was surveyed (Figure 1). In 1996, more than one mile of stream was surveyed during two hours of electrofishing effort(Figure 1).

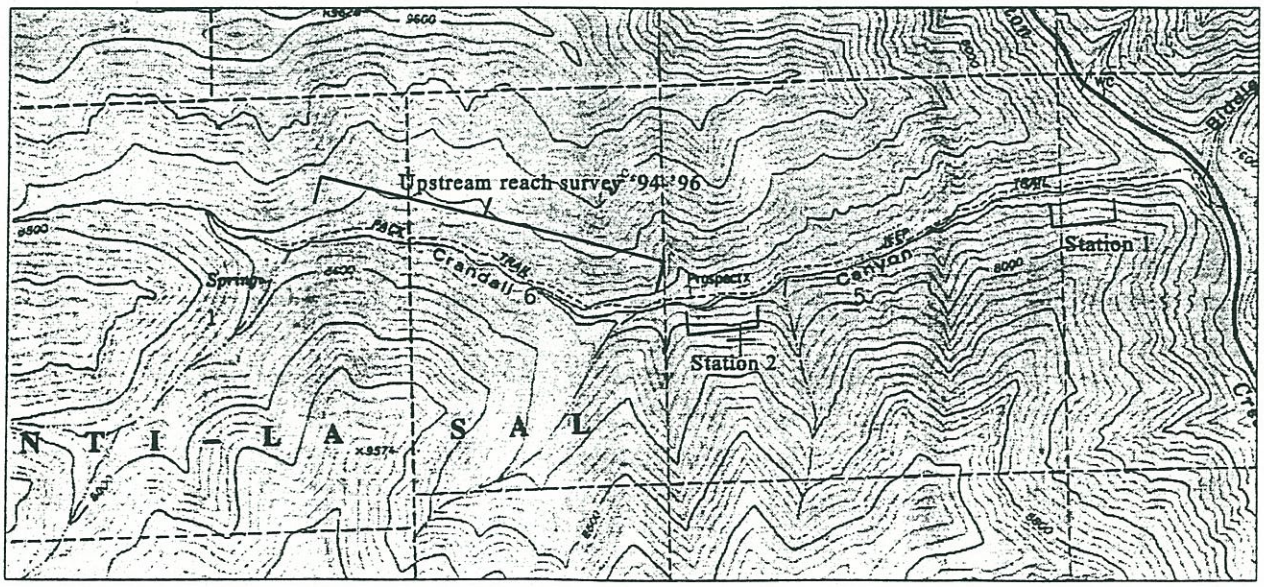

Figure 1. Map of Crandall Creek and survey stations.

Data was entered and manipulated using Quatro Pro (v5.0). Graphics were created using Word Perfect Presentations (v3.0). Reports were written using Word Perfect (v6.1).

RESULTS

The reach of stream located adjacent to the mine has consistently produced wild cutthroat trout in various size classes (Figure 2). No other species were captured at station 2. The data strongly suggest that the middle reach of Crandall Creek is an important spawning and nursery area. Since the surveys were conducted in spring, summer, and fall, it is apparent that it is used throughout the growing season by all size classes represented in Figure 2.

The 1994 survey at station 2 (Figure 1) consisted of 528 feet of habitat including a large beaver pond. It was noted on the 1994 data sheets that many trout were sighted but not captured due to the depth of the beaver pond. The 1995 and 1996 results were from 300 ft sections (station 2)(Figure 1) that did not include the beaver pond (hence fewer total fish were captured). The 1996 population estimate for station 2 was 37 (±1). Thirteen fish were collected for genetic testing and preliminary results indicate these fish are a pure strain of Colorado River cutthroat trout.

The upstream reach surveys in 1994-1996 resulted in the capture and/or sighting of zero fish. Several areas had marginal habitat for late summer conditions, but contained no fish. These marginal habitats were a small percentage of the total area.

DISCUSSION

The mining operation at Crandall Creek has been noted as a cause of concern in reports as early 1983. The concern then, was on impacting recruitment of wild cutthroat trout into Right Fork of Huntington Creek. Now an additional concern is that the small population of cutthroat trout is a remnant of the native Colorado River cutthroat subspecies. If the final results of the genetic analysis indicate a pure strain of Colorado River cutthroat trout, these fish will be instrumental in implementation of the Colorado River Cutthroat Recovery Plan. The main concern with

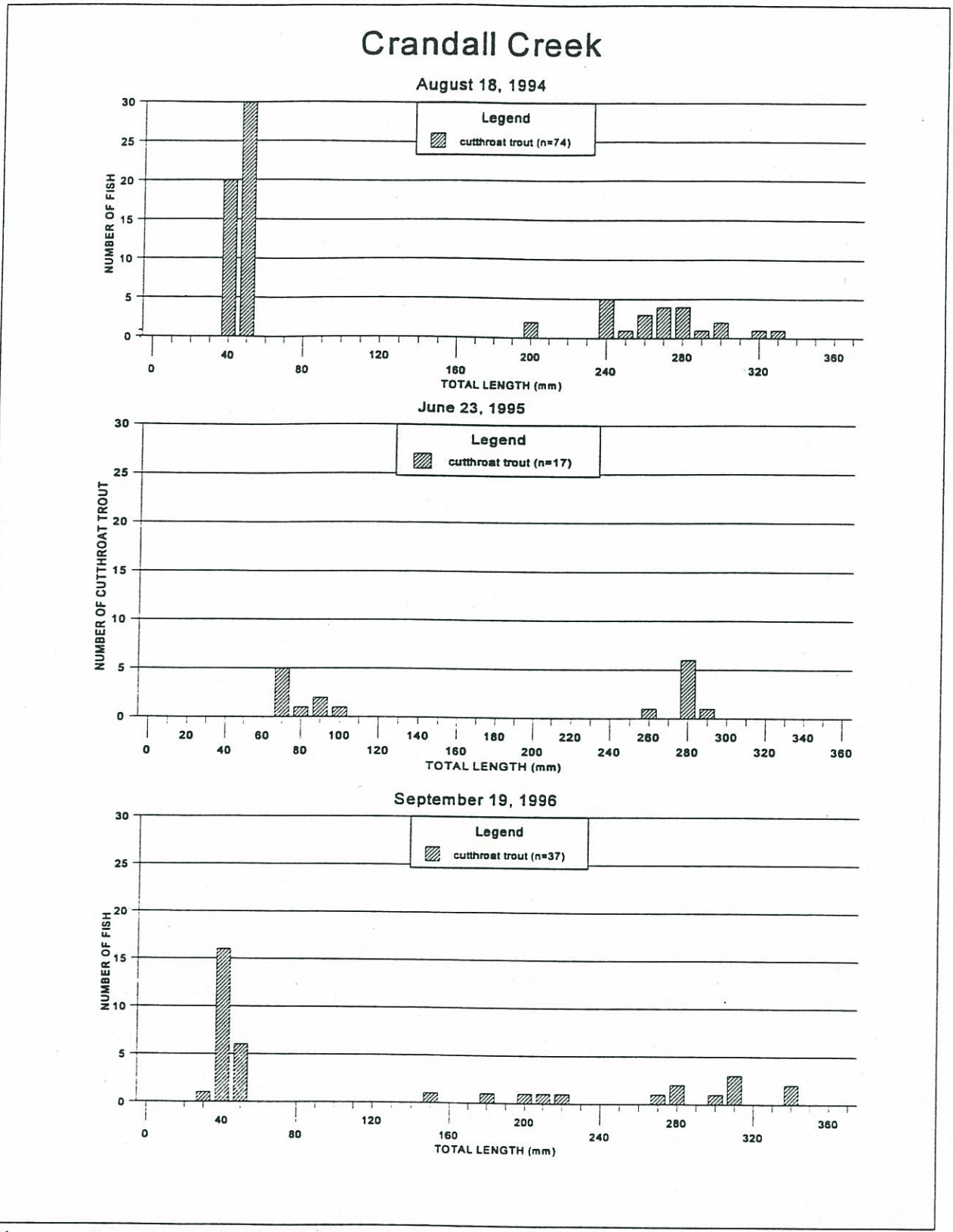

Figure 2. Length frequency of cutthroat trout from station 2 of Crandall Creek from 1994 (528' survey), 1995 (300' survey), and 1996 (300' survey).

operations at the mine is, if the wild cutthroats are displaced, they will move downstream of the barrier where they will be lost to hybridization with non-native Yellowstone cutthroat trout *(Oncorhynchus clarki bouvieri)* and rainbow trout which are common below the barrier located in the lower reach of Crandall Creek. Any movement of trout from the middle reach to the lower reach is a functional emigration without a chance of possible return due to the barrier. The fact that the small ephemeral upstream reach does not provide adequate habitat to support the trout residing in Crandall Creek year-round is the most likely conclusion to be drawn since there has never been a trout collected in this reach.

APPENDIX 3-11

SPRUCE/FIR/ASPEN COMMUNITIES AT THE CRANDALL CANYON MINE - 1996

FEBRUARY 1997

SPRUCE/FIR/ASPEN COMMUNITIES AT THE CRANDALL CANYON MINE

1996

Prepared by

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for

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February 1997

TABLE OF CONTENTS

SPRUCE/FIR/ASPEN COMMUNITIES AT THE CRANDALL CANYON MINE

SCOPE

The following report has been written in an attempt to assess the current condition of a plant community that has been proposed for future disturbance by a coal mining company. A reference area chosen in a similar plant community has also been studied that will be used as a standard for future revegetation success. Finally, an area that has been previously disturbed by natural conditions has also been reported in this document.

INTRODUCTION

General Site Description

Genwal Coal Company's Crandall Canyon Mine is situated within Crandall Canyon, a tributary of Huntington Canyon. These canyons are located within a portion of the Wasatch Plateau in Emery County, Utah.

An area has been proposed for disturbance to accommodate expansion of the coal mine's surface facilities. The proposed area would primarily affect riparian and spruce/fir/aspen plant communities. Also affected could be another plant community that, because of natural erosion and subsequent small earth slides, the species composition has been somewhat changed and represents more disturbed or transitional plant species. A reference area was also chosen to be used as a standard for future revegetation success. This area is located in the same general area, but at a slightly higher elevation and will not be disturbed by future mining activities. Mitigation of the riparian area has already been planned and approved, so this plant community was not sampled for this report.

The reference and proposed disturbance areas had very similar environmental characteristics i.e. soils, geology, aspect, slope, elevation, climate and vegetation. Elevation of the study areas ranged between 7,500 ft and 8,000 ft above sea level. Exposure was primarily north-facing with a slope of 38 degrees on both the proposed disturbed and reference areas.

METHODS

Methodologies used herein were performed in accordance with the guidelines supplied by the State of Utah, Division of Oil, Gas and Mining (DOGM).

Quantitative and qualitative data were recorded within the plant communities of the proposed disturbed and reference areas in Crandall Canyon in July 1996.

Transect and Quadrat Placement

Transect lines for sampling were placed randomly throughout the sample areas. Stratified random placement of sampling quadrats were designed to decrease bias, yet encompass as much of the area as practical. Once the transect lines were placed, regular points were then marked on them. From these marks, a random number dictated the direction and distance to place the quadrats at right angles to the transect lines.

Cover, Composition and Frequency

Cover estimates were made using ocular methods with meter square quadrats. Two methods were employed for cover estimates. First, the cover was estimated so that, with the structural layering (or foliage height diversity) of the plant species including rock

litter and bareground, there was a possibility of reaching total cover that exceeded 100 percent. In this method the actual *ground* cover was first estimated, disregarding cover created by forest canopy. Overstory was then estimated, adding it the ground cover. The second method ignored structural layering so that total cover including overstory, understory, litter, rock and bareground summed to be exactly 100 percent. Although both methods are acceptable in concept, each focuses on slightly different composition and/or wildlife habitat. Data from the later methods (where total cover summed to 100 percent) were reported within the context of this document.

Species composition, or the relative percent of each life form, were calculated from the cover data. Additionally, relative frequencies, or the relative number each plant species was present in the quadrats, were also assessed.

Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature followed "A Utah Flora" (Welsh et al., 1993).

Woody Plant Species Density

Density of woody plant species in all areas were recorded using the point-quarter distance method developed by Cottom and Curtis

in 1956. In this method, random points were placed on the sample sites and measured into four quarters. The distances to the nearest woody plant species were then recorded in each quarter. The average point-to-individual distance was equal to the square root of the mean area per individual.

Sample Adequacy & Statistical Comparisons

Sampling adequacy was attempted using formulas from Cochran (1977), with the goal that at least 80% of the samples would fall within 10% of the true mean for the plant communities in the area. The formula used is given below.

$$N_{min} = \frac{t^2 s^2}{(dx)^2}$$

where,

N_{min}	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

Student's t-tests were also employed to compare the proposed disturbed and reference areas of the sites for cover and density. All sample means, standard deviations, and sample sizes were included in this report to enable the reviewers to check or apply further statistical tests if desired.

Photographs

Color photographs of the sample areas were taken at the time of sampling and have been submitted with this report.

RESULTS

Proposed Disturbed (Spruce/Fir/Aspen)

The total living cover of the area proposed for disturbance was estimated at 78.75% (shown in Table 7), of which 42.25% consisted of overstory cover and 36.50% was understory [see Table 1(A)]. The remainder of the ground cover was litter (13.39%), bareground (4.09%) and rock (3.76%). Composition of the understory cover consisted of 89.33% woody species, 8.64% forbs and 2.03% grasses [Table 1(B)].

Most common overstory species were Douglas fir (*Pseudotsuga menziesii*) and Colorado blue spruce (*Picea pungens*), including limited aspen (*Populus tremuloides*) trees. The color photographs in this report show this community well. Most prevalent understory woody species were: soapberry (*Sheperdia canadensis*), mountain lover (*Pachistima myrsinites*), Red-osier dogwood (*Cornus sericea*), and Douglas fir [see Table 1(C)].

Although much less abundant than the woody species, several forbs were present in the quadrats. Some of the more common species were baneberry (*Actaea rubra*), blueleaf aster (*Aster glacodes*) and blunt-fruit sweet-cicely (*Osmorhiza depauperata*). Only two grass species were present in the plots -- Kentucky bluegrass (*Poa pratensis*) and mountain brome (*Bromus carinatus*).

Woody species density was quite high, estimated at 11,990 individuals per acre. Most of the common species in the density measurements were nearly the same as reported above in the cover information. Refer to Table 2 for the density of all woody species.

Reference Area (Spruce/Fir/Aspen)

The area chosen as a reference area to be used for future revegetation success standards had nearly identical total living cover (75.25%) as the proposed disturbed area, but the proportion of overstory (30.50%) and understory (44.75%) was somewhat different [Table 3(A)]. Litter, bareground and rock cover were also similar to the proposed disturbed area.

Understory composition was also similar in the understory species but the reference area had slightly more grasses and forbs proportionately [Table 3 (B)]. Moreover, the dominant species of the reference area were very similar to the proposed disturbed

area [Table 3 (C)]. Woody species density was even higher in this area, estimated at over 15,000 individuals per acre (Table 4).

Previously Disturbed

Other areas that are proposed for disturbance were probably once very similar to the communities reported above, but due to soil conditions, steep slopes, and excess moisture these areas have been subject to small earth slides or "sloughing". Consequently, the plant cover and composition in these areas of natural disturbance were rather different than the previously described communities. For this reason these areas were sampled, documented, photographed, and reported separately.

No overstory was present in these area. Total living cover (understory) was estimated as 29.58. Litter only comprised 8.75%, whereas rock and bareground were both nearly 31.0% [Table 5 (A)]. Composition was also somewhat different when compared to the areas reported above. For example, relatively few woody species were encountered within the quadrats (9.41%). Forbs were the most prevalent life form (75.40%), followed distantly by grasses (15.19%). Refer to Table 5(B) for composition figures.

As one would expect by the comments above, the most common species were also quite different than the reference and proposed

disturbed areas. The most common species was blueleaf aster, followed by thistle (*Circium* sp.) and mountain brome [Table 5(C)].

Woody species density was also markedly different. Total number of individuals per acre was only 1,718, the most common being snowberry (*Symphoricarpos oreophilus*), Woods rose (*Rosa woodsii*) and current (*Ribes wolfii*). Refer to Table 6 for woody species densities of each species.

DISCUSSION

Statistical Comparisons

Each parameter of the proposed disturbed area was compared to those of the reference area. With the exception of the previously disturbed or slide areas, most of the parameters were very similar. For example, when the total living cover (overstory and understory) were compared, there was no statistical difference between the two areas. Furthermore, there was no difference in the understory comparison, however, the overstory cover was statistically greater in the proposed disturbed area (this was unusual due to the close similarities between understory and total living cover). Density did show a difference statistically with more woody plants per acre in the

reference area.

Standards for Revegetation Success

For the most part, most of the area proposed for disturbance compared quite favorably with the reference area selected to be the standard at the time of final reclamation.

One could use the total living cover for the cover standard, but at values approaching 80%, this may be difficult to achieve at the time of final reclamation. This, because approximately half of this cover value was contributed by overstory, and it is unlikely that the revegetated communities will be mature enough to provide this much overstory in the 10-year responsibility period required for the mined land reclamation. On the other hand, understory values alone may not be an aggressive enough standard of success for cover. An intermediate value could be considered.

Consideration should also be given to using standards of success for density as high as the estimated values suggest. Obviously, the dense stands of woody species comes at the expense of forbs and grasses that may provide valuable wildlife habitat diversity. In other words, more native forb and grass species cover may be more desirable to provide habitat diversity.

Finally, the standards for the previously disturbed areas should be set no higher than what currently exists. However, consideration could also be entertained to making the standards the same in these areas as those of the proposed disturbed areas if the aforementioned *intermediate* values are agreed upon by the mining company and DOGM.

TABLE 1: Summary of total cover, composition and cover by species for the **Proposed Disturbed** Spruce/Fir/Aspen Community in Crandall Canyon, Utah.

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Overstory Cover	42.25	15.53	20
Understory Cover	36.50	12.36	20
Litter	13.39	8.46	20
Bareground	4.09	5.50	20
Rock	3.76	3.24	20

B.

UNDERSTORY COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Trees & Shrubs	89.33	21.56	20
Forbs	8.64	16.67	20
Grasses	2.03	6.55	20

C.

UNDERSTORY COVER & FREQ. BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Acer glabra	0.50	2.18	20	5.00
Cornus sericea	5.00	9.75	20	35.00
Jumiperus communis	0.50	2.18	20	5.00
Lonicera utahensis	0.25	1.09	20	5.00
Pachistima myrsinites	5.50	6.87	20	50.00
Picea pungens	1.00	3.00	20	10.00
Populus tremuloides	1.25	2.68	20	15.00
Pseudotsuga menziesii	4.00	7.00	20	35.00
Rosa woodsii	0.50	2.18	20	5.00
Salix lutea	0.50	2.18	20	5.00
Shepherdia canadensis	12.75	15.81	20	75.00
Symphoricarpos oreophilus	1.50	4.50	20	15.00
Forbs				
Actaea rubra	0.50	1.50	20	10.00
Aster glaucodes	0.50	1.50	20	10.00
Fragaria vesca	0.15	0.65	20	5.00
Gentianella heterosepala	0.15	0.65	20	5.00
Geranium richardsonii	0.25	1.09	20	5.00
Lathrus lanszwertii				
Osmorhiza depauperata	0.50	2.18	20	5.00
Smilacina stellata	0.25	1.09	20	5.00
Swertia radiata	0.35	1.15	20	10.00
Grasses				
Bromus carinatus	0.10	0.44	20	5.10
Poa pratensis	0.50	1.50	20	10.00

TABLE 2: Summary for woody species density for the **Proposed Disturbed** Spruce/Fir/Aspen Community in Crandall Canyon, Utah.

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Acer glabra	149.87
Acer grandidentatum	149.87
Cornus sericea	1948.36
Juniperus communis	149.87
Lonicera utahensis	149.87
Pachistima myrsinites	2997.48
Picea pungens	299.75
Populus tremuloides	599.50
Pseudotsuga menziesii	1798.48
Ribes wolfii	1798.49
Rosa woodsii	749.37
Salix lutea	149.87
Rubus parviflorus	149.87
Shepherdia canadensis	599.50
Symphoricarpos oreophilus	299.75
TOTAL	11989.92

TABLE 3: Summary of total cover, composition and cover by species for the **Reference Area** Spruce/Fir/Aspen Community in Crandall Canyon, Utah.

A. **TOTAL COVER**	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Overstory Cover	30.50	19.93	20.00
Understory Cover	44.75	20.09	20.00
Litter	14.12	7.45	20.00
Bareground	6.02	4.53	20.00
Rock	4.61	3.07	20.00

B. **UNDERSTORY COMPOSITION**	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Trees & Shrubs	84.16	17.04	20.00
Forbs	11.23	14.02	20.00
Grasses	4.60	7.37	20.00

C. **UNDERSTORY COVER & FREQ. BY SPECIES**	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Abies concolor	2.75	7.82	20	20.00
Lonicera utahensis	2.50	8.87	20	10.00
Mahonia repens	0.25	1.09	20	5.00
Pachistima myrsinites	10.00	13.69	20	40.00
Picea pungens	0.50	2.18	20	5.00
Populus tremuloides	2.50	4.87	20	30.00
Pseudotsuga menziesii	4.25	6.53	20	45.00
Ribes wolfii	7.75	7.33	20	80.00
Rosa woodsii	0.90	1.84	20	20.00
Salix lutea	0.25	1.09	20	5.00
Sambucus caerulea	0.50	2.18	20	5.00
Shepherdia canadensis	4.25	7.79	20	35.00
Symphoricarpos oreophilus	2.00	3.67	20	25.00
Forbs				
Achillea millefolium	0.10	0.44	20	5.00
Aster glaucodes	2.25	2.95	20	40.00
Castilleja sp.	0.15	0.65	20	5.00
Lathrus lanszwertii	0.25	1.09	20	5.00
Smilacina stellata	0.50	1.50	20	10.00
Swertia radiata	0.85	1.80	20	20.00
Thalictrum fendleri	0.25	1.09	20	5.00
Grasses				
Bromus carinatus	1.00	2.00	20	20.00
Poa pratensis	1.00	2.00	20	20.00

TABLE 4: Summary for woody species density for the **Reference Area** Spruce/Fir/Aspen Community in Crandall Canyon, Utah.

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Abies concolor	1125.73
Lonicera utahensis	562.86
Mahonia repens	187.62
Pachistima myrsinites	1500.97
Populus tremuloides	3001.94
Pseudotsuga menziesii	938.10
Ribes wolfii	3377.18
Rosa woodsii	750.48
Salix lutea	187.62
Shepherdia canadensis	2439.07
Symphoricarpos oreophilus	938.11
TOTAL	15009.68

TABLE 5: Summary of total cover, composition and cover by species for the **Previously Disturbed** Spruce/Fir/Aspen Community in Crandall Canyon, Utah.

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Overstory Cover	--	--	12
Understory Cover	29.58	9.46	12
Litter	8.75	9.60	12
Bareground	30.83	18.47	12
Rock	30.83	11.70	12

B.

UNDERSTORY COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Trees & Shrubs	9.41	14.57	12
Forbs	75.40	25.14	12
Grasses	15.19	16.78	12

C.

UNDERSTORY COVER & FREQ. BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Pachistima myrsinites	0.42	1.38	12	8.33
Populus tremuloides	0.42	1.38	12	8.33
Ribes wolfii	0.83	1.86	12	16.67
Rosa woodsii	1.25	2.98	12	16.67
Forbs				
Achillea millefolium	1.25	2.17	12	25.00
Aster glaucodes	6.67	4.71	12	83.33
Castilleja sp.	0.83	1.86	12	16.67
Circium sp.	3.75	3.61	12	35.00
Epilobium angustifolium	0.83	1.86	12	16.67
Gentianella heterosepala	2.50	2.50	12	50.00
Geranium richardsonii	2.92	4.77	12	33.33
Lathrus lanszwertii	0.83	1.86	12	16.67
Senecio eremophilus	0.83	1.86	12	16.67
Swertia radiata	1.25	2.17	12	25.00
Grasses				
Bromus carinatus	3.33	5.14	12	33.33
Poa pratensis	1.67	3.12	12	25.00

TABLE 6: Summary for woody species density for the **Previously Disturbed** Spruce/Fir/Aspen Community in Crandall Canyon, Utah.

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Acer glabra	143.18
Pachistima myrsinites	35.80
Picea pungens	71.59
Ribes wolfii	357.95
Rosa woodsii	429.54
Shepherdia canadensis	143.18
Symphoricarpos oreophilus	536.93
TOTAL	1718.17

TABLE 7: Statistical summary sheet for the proposed disturbed and reference areas in Crandall Canyon, Utah

PROPOSED DISTURBED			
Overstory Cover	x=42.25	s=15.53	n=20
Understory Cover	x=36.50	s=12.36	n=20
Total Living Cover*	x=78.75	s=9.47	n=20
Density**	x=523.16	s=220.35	n=20
REFERENCE AREA			
Overstory Cover	x=30.50	s=19.93	n=20
Understory Cover	x=44.75	s=20.09	n=20
Total Living Cover*	x=75.25	s=7.15	n=20
Density**	x=417.91	s=159.80	n=20
PREVIOUSLY DISTURBED			
Overstory Cover	x= --	s= --	n=12
Understory Cover	x=29.58	s=9.46	n=12
Total Living Cover*	x=29.58	s=9.46	n=12
Density**	x=3650.78	s=1808.33	n=12

STATISTICAL ANALYSES

Proposed Disturbed vs. Reference Area			
Overstory Cover	t=2.080	df=38	SL=p<.05
Understory Cover	t=1.564	df=38	SL=NS
Total Living Cover	t=1.319	df=38	SL=NS
Density	t=1.729	df=38	SL=p<.05
Previously Disturbed vs. Reference Area			
Overstory Cover	t= --	df= --	SL= --
Understory Cover	t=2.446	df=30	SL=p<.05
Total Living Cover	t=15.491	df=30	SL=p<.05
Density	t=8.031	df=30	SL=p<.05

x = sample mean, s = sample standard deviation,
n = sample size, NS = nonsignificant,
p = probability level of significance
* represents understory and overstory cover combined.
** represents average space (sq. in.) occupied by each individual (see Tables for actual density measurements).

COLOR PHOTOGRAPHS

Reference Area (Spruce/Fir/Aspen)

Previously Disturbed Area

Proposed Disturbed (Spruce/Fir/Aspen)

APPENDIX 3-12

CRANDALL CREEK/COLORADO CUTTHROAT TROUT MITIGATION PLANS

United States Department of Agriculture | Forest Service | Manti-La Sal National Forest
599 West Price River Dr.
Price, Utah 84501
Phone # (801) 637-2817
Fax # (801) 637-4940

File Code: 2820-4

Date: May 21, 1997

Utah Division of Oil, Gas and Mining
ATTN: Daron Haddock
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City UT 84114-5801

Subject: Installation of Culvert in Crandall Creek to Expand Surface Facilities, Crandall Canyon Mine, Genwal Resources, Inc., ACT/014/032, Folder #2, Emery County, Utah.

Dear Daron:

On April 8, 1997 representatives of the U.S. Forest Service, Manti-La Sal National Forest (Forest Service); Utah Division of Wildlife Resources (DWR); Bureau of Land Management (BLM); Utah Division of Oil, Gas and Mining (DOGM); and Genwal Resources, Inc. (Genwal) met to discuss the impacts of a proposed culvert on aquatic resources in Crandall Creek. Recent genetics testing has shown that trout found in the stream reach to be culverted are possibly a remnant population of Colorado River cutthroat trout (CCT), a Forest Service and State sensitive species. Currently, the DWR and the Forest Service, along with other agencies, are in the process of finalizing a Conservation Plan aimed at recovering this subspecies, once found throughout the Colorado River drainage, to avoid any future need for Federal listing.

Genwal has proposed to culvert approximately 1,450 feet of Crandall Creek, within a privately held parcel of land, to allow adequate operating room for expanded facilities at the mine. Two factors complicate this proposal. First, the fish in this portion of Crandall Creek are the only known, potentially pure, strain of CCT on the Wasatch Plateau of the Manti-La Sal National Forest and the DWR and the Forest Service are obligated to ensure that no actions are taken that will increase the potential need for listing. Second, these fish have only been found within a relatively small segment of the stream, about 1,500 feet long, that is exactly in the same location as the proposed culvert installation. Unfortunately, Crandall Canyon is steep and narrow, and Genwal has few, if any, options of reducing the length of the culvert and size of the impacted area while also meeting their expanded facilities needs.

All parties involved in this project have worked together to find an appropriate solution to this situation. Agreement was reached at the April 8th meeting to a number of mitigation measures that would enhance recovery of CCT on the Manti-La Sal National Forest and enhance stream habitat elsewhere for habitat lost under

the culvert while allowing Genwal to proceed with their expansion plans. These proposed mitigation measures are as follows:

Mitigation for impacts to the suspected CCT population:

1. Require Genwal to delay construction until after cutthroat can be moved to a secure and suitable, temporary location. All fish will be removed from the reach of Crandall Creek with the suspected CCT population. Adult fish moved will be individually marked and tested so that only pure CCT can be used as brood stock for reintroductions. Genwal will fund the DWR to do this work at a cost of $5,000.

2. Necessary NEPA and work to enhance stream habitat above the Forest boundary on Crandall Creek will be completed to increase pools and resting habitat. This work is expected to allow continued existence of a small population of cutthroat in this area. Genwal will fund the Forest Service to do this work at a cost of $25,000. After enhancement work and genetics testing are completed, it is anticipated that adults or their offspring, or CCT from another source, will be released in the creek above the culvert.

3. The DWR will complete genetic analysis, surveying other populations, and implement other items in the CCT Conservation Agreement with $15,000 in funds provided to them by Genwal.

4. The Forest Service and the DWR will work to identify and agree on another site appropriate for permanent CCT establishment on the Forest. Once a site is agreed upon, site preparation work and eventual release will follow. This work may include fish population surveys and habitat suitability analyses, construction of a barrier to prevent other fish species from entry into the drainage, multiple rotenone treatments to remove resident fish populations, habitat enhancement and protection measures (e.g., fencing, riparian planting, bank stabilization, etc.), and any necessary NEPA work. Genwal will fund the DWR and the Forest Service to complete this work at a cost of $105,000. Payment will be made to the DWR for deposit into an account requiring approval by both the DWR and the Forest Service for any payment.

5. The Forest Service will conduct analysis of high sediment loads apparently originating from headwater portions of Crandall Canyon and develop remedial measures as appropriate. Genwal will fund the Forest Service to do this work as a cost of $5,000.

6. The DWR will contact the State Institutional Trust Lands Administration to discuss analysis of their lands in headwater portions of Crandall Canyon to determine sources of apparent sedimentation to the creek, conduct analysis as requested, and discuss appropriate remedial measures. Genwal will fund DWR to do this at a cost of $5,000.

Mitigation for the loss of stream and spawning habitat and potential effects of the mine on water quality:

7. Stream and rangeland improvements will be made in Upper Scad Valley to improve stream habitat conditions and reduce impacts on Scad Valley Creek.

These include: eliminating a sheep corral located in a wet meadow along the stream and replacing it with two or three new corrals built on upland locations to improve livestock distribution, relocation of the sheepherder's camp and obliteration of the road and ford, develop and gravel roads to access new facilities, and institution of additional livestock management techniques to protect the riparian area. A toilet will be constructed in Huntington Canyon to enhance water quality in Huntington Creek. Genwall will fund the Forest Service to do this work at a cost of $55,000. Monitoring for effectiveness of this work will be conducted by the DWR and the Forest Service.

We appreciate the opportunity to comment on this project. If these proposed mitigation measures are imposed, we feel that both coal production and fisheries protection goals can be reasonably expected to be achieved.

Our comments on the revised Mining and Reclamation Plan for the Crandall Canyon Mine are attached. We are unable to consent to the revision until our comments have been addressed and we have reviewed Genwal's revised proposal.

Sincerely,

for
JANETTE S. KAISER
Forest Supervisor

Attachment

cc:
Genwal Resources, Inc.
USDI-BLM, Price River Resource Area (George Tetrault)
USDI-BLM, Utah State Office (Alan Rabinoff)

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
Robert G. Valentine
Division Director

1596 West North Temple
Salt Lake City, Utah 84116-3195
801-538-4700
801-538-4709 (Fax)

May 16, 1997

James W. Carter, Director
Division of Oil, Gas and Mining
1594 West North Temple, Ste. 1210
Salt Lake City, Utah 84114-5801

Dear Jim:

On April 8, 1997, representatives of the Manti-La Sal National Forest Service (Forest Service), Division of Wildlife Resources (DWR), Bureau of Land Management (BLM), Division of Oil, Gas and Mining (DOGM), and Genwall Coal Company (Genwall) met to discuss the impacts of a proposed culvert on aquatic resources in Crandall Creek. Recent genetics testing has shown that trout, found in the stream reach to be culverted, are possibly a remnant population of Colorado River cutthroat trout (CCT), a Forest Service and State sensitive species. Currently, the DWR and the Forest Service, along with other agencies, are in the process of finalizing a Conservation Plan aimed at recovering this subspecies, once found throughout the Colorado River drainage, to avoid any future need for Federal listing.

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All parties involved in this project have worked together to find an appropriate solution to this situation. Agreement was reached at the April 8th meeting to a number of mitigation measures that would enhance recovery of CCT on the Manti-La Sal National Forest and enhance stream habitat elsewhere for habitat lost under the culvert while allowing Genwall to proceed with their expansion plans. These proposed mitigation measures are as follows:

Mitigation for impacts to the suspected CCT population:

1. Require Genwall to delay construction until after cutthroat can be moved to a secure and suitable, temporary location. All fish will be removed from the reach of Crandall Creek with the suspected CCT population. Adult fish moved will be individually marked and tested so that only pure CCT can be used as brood stock for reintroduction. Genwall will fund DWR to do this work at a cost of $5,000.

2. Necessary NEPA and work to enhance stream habitat above the Forest boundary on Crandall Creek will be completed to increase pools and resting habitat. This work is expected to allow continued existence of a small population of cutthroat in this area. Genwall will fund the Forest Service to do this work at a cost of $25,000. After enhancement work and genetics testing are completed, it is anticipated that adults or their offspring, or CCT from another source, will be released in the creek above the culvert.

3. The DWR will complete genetic analysis, surveying other populations, and implement other items in the CCT Conservation Agreement with $15,000 in funds provided to them by Genwall.

4. The Forest Service and the DWR will work to identify and agree on another site appropriate for permanent CCT establishment on the Forest. Once a site is agreed upon, site preparation work and eventual release will follow. This work may include fish population surveys and habitat suitability analyses, construction of a barrier to prevent other fish species from entry into the drainage, multiple rotenone treatments to remove resident fish populations, habitat enhancement and protection measures (e.g., fencing, riparian planting, bank stabilization, etc.), and any necessary NEPA work. Genwall will fund the DWR and the Forest Service to complete this work at a cost of $105,000. Payment will be made to the DWR for deposit into an account requiring approval by both the DWR and the Forest Service for any payment.

5. The Forest Service will conduct analysis of high sediment loads apparently originating from headwater portions of Crandall Canyon and develop remedial measures as appropriate. Genwall will fund the Forest Service to do this work as a cost of $5,000.

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Mitigation for the loss of stream and spawning habitat and potential effects of the mine on water quality:

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We appreciate the opportunity to comment on this project. If these proposed mitigation measures are imposed, we feel that both coal production and fisheries protection goals can be reasonably expected to be achieved.

Sincerely,

John Kimball
Director

cc: Genwall
Manti-LaSal National Forest
Greg Mladenka, Division of Water Rights
DWR Habitat, SLO
USFWS, Salt Lake Office

crandfin.wpd

GENWAL
RESOURCES, INC.

P.O. Box 1420 • 195 North 100 West • Huntington, Utah 84528
Telephone (801) 687-9813 • Fax (801) 687-9784

May 30, 1997

Jim Carter
Director
Utah Division of Oil, Gas & Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

Dear Mr. Carter,

Genwal Resources has recently received copies of letters from the US Forest Service (5/21/97) and the Utah Division of Wildlife Resources (5/16/97) addressed to your office. These letters discuss the mitigation requirements associated with Genwal's proposed surface expansion project in Crandall Canyon, and specifically, the mitigation measures which have been agreed upon regarding the possible remnant population of Colorado River cutthroat trout in nearby Crandall Creek. Copies of these letters are attached and are part of this correspondence thru reference.

The purpose of this letter is to acknowledge that Genwal fully concurs with the mitigation plan as outlined in these letters. Genwal commits to work cooperatively with the Forest Service and DWR in the spirit and letter of these mitigation agreements. We will participate with Forest Service and DWR in signing a memorandum of agreement to accomplish this agreed-upon mitigation in a manner acceptable to both agencies as outlined in the above referenced letters.

As part of our Crandall Canyon mine Mining and Reclamation Plan (Act 015/032) we hereby agree to comply with the conditions and funding stipulations as stated in these letters and agree that these conditions/stipulations constitute the mitigation plan that Genwal has agreed upon with the agencies.

We, at Genwal, very much appreciate the cooperation shown by both the Forest Service and DWR in working with us to reach an agreement that provides the necessary mitigation for this sensitive population of fish and still allows us to pursue the necessary expansion of our mining operation in Crandall Canyon.

If you have any questions or comments regarding this matter please feel free to call me.

Sincerely,

Dave Shaver
Manager of Technical Services

cc Ted Stewart, DNR
Jeanette Kaiser, FS
Bill Bates, DWR

APPENDIX 3-13

WETLAND DELINEATION - CRANDALL CREEK MINE EXPANSION AREA

Revised 4/25/97

WETLAND DELINEATION

GENWAL RESOURCES, INC.
CRANDALL CANYON MINE EXPANSION AREA
CRANDALL CREEK

EMERY COUNTY, UTAH

CONDUCTED BY

EIS ENVIRONMENTAL CONSULTING
4855 NORTH SPRING GLEN ROAD
HELPER, UTAH 84526

APRIL 16, 1997

Introduction

Genwal Resources, Inc. is currently in the planning stages of the expansion of their Crandall Canyon Mine operation. Located in Crandall Canyon, a side canyon of Huntington Canyon in Emery County, the existing facility would expand into the channel of Crandall Creek. This expansion area was described in a detailed report prepared in 1994 by EIS Environmental Consulting. The purpose of the report at the time was to fully evaluate the vegetation that would be impacted by the expansion for reclamation purposes, as well as to identify the potential presence of hydric soils, cultural resources, fisheries, macrobenthic community structure, threatened and endangered species and Neotropical birds. The inventory of the area concentrated on the 2.98 acre (approximately 1,300 feet long by 100 feet wide) riparian corridor and the small 0.23 acre (200 feet long and 50 feet wide) bench adjacent to the corridor on the south, undisturbed side of the canyon.

Vegetation baseline data analyzed in the report was gathered from 31 transects in the riparian corridor and 11 transects on the bench. Species diversity, abundance and community structure is described in great detail within the report. Soil test pits were excavated along the channel bank at six locations in the corridor and two locations on the adjacent bench. It was determined that three sample sites, two along the creek and one on the bench were possibly hydric; and either associated with proximity to the creek or associated with runoff from the steep side hill above the bench.

Using the Army Corp of Engineers (USACE) methodology described in Corp of Engineers Wetland Delineation Manual (1987), it is the intent of this report to review data relevant to the riparian corridor and delineate the existence or non-existence of wetland(s) within the area of the planned expansion. The bench area, due its location away from the creek, will not be reviewed within this report.

Methodology

A variety of procedures are described within the manual to fit a multitude of situations. The 2.98 acre area has been surveyed and inventoried a number of times by the mine, associated consultants, and federal agencies. Based on the existing data, an on-site Level 2 routine determination (See Section D, Subsection 2) will not be conducted. A Level 1 and 2 comprehensive field determination, (See Section D, Subsection 3) will not be conducted due to the size of the described area (less than five acres) and abundance of data. Due to the degree of inventory conducted in the 1994 inventory, a cumulative determination (Section E) will not be required. Atypical situations (Section F) and problem areas (Section G) are not applicable to the site.

Methodology described for a off-site Level 1 routine determination (Section D, Subsection 1) is applicable to the expansion area described. Procedures outlined in the flowchart shown on page 54 (Figure 1) of the manual were utilized during the course of this evaluation. A breakdown of the flowchart is described in the next section.

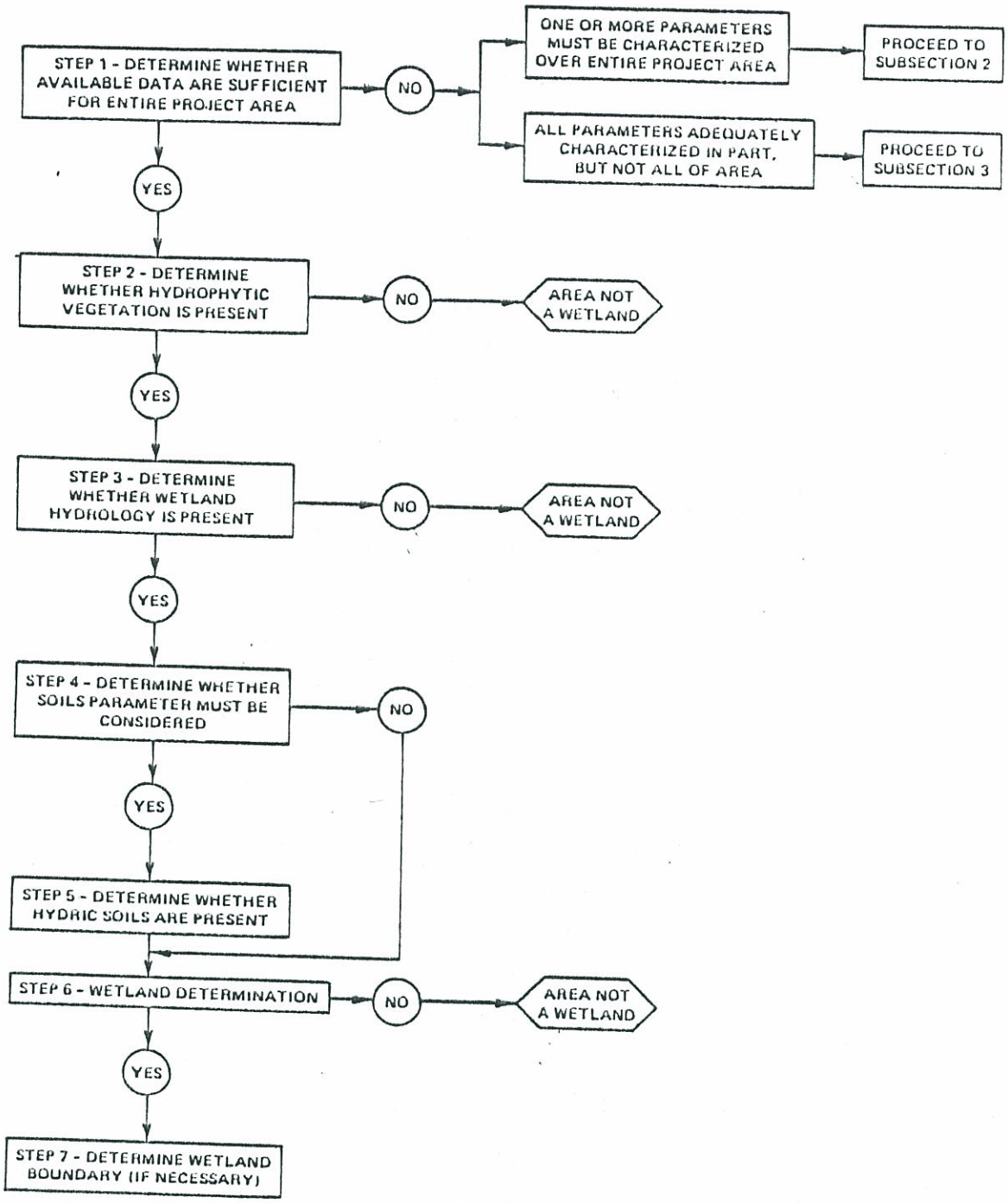


Figure 13. Flowchart of steps involved in making a wetland determination when an onsite inspection is unnecessary

FIGURE 1

Level 1 Wetland Determination

Determine Whether Available Data Are Sufficient for Entire Project Area

Based on the requirements referenced in Section B of the manual for the description of vegetation, soils, and hydrology (Step 5, 7, & 9), the following data has been previously prepared and has been utilized for this report:

* Map of study area - Proposed Culvert Disturbed Area (Exhibit 1)
* Baseline Riparian Inventory of Crandall Creek - EIS Environmental Consulting (1994)
* EarthFax Soils Inventory Data (1995, 1996)
* Genwal Resources, Inc. Appendix 2-3B Supplemental Soil Inventory (1997)
* Genwal Resources, Inc. Lease Buy Application 11 (In Review)
* 10 years of Utah Division of Oil, Gas and Mining hydrolocial data of Upper and Lower Flumes (Above and below study area)
* In-progress U.S. Forest Service soils data (Referenced and described in Appendix 2-3B)
* U.S. Fish and Wildlife Service National List of Plant Species that Occur in Wetlands: Utah
* Natural Resource Conservation Service Hydric Soils of the United States

This information is sufficient for the entire project area.

Determine Whether Hydrophytic Vegetation is Present The presence or lack of hydrophytic vegetation was determined by using the vegetation data described in the 1994 Baseline Riparian Inventory. Hydrophytic vegetation classifications (obligate, facultative wetland, facultative and facultative plus (+)) were obtained from the USFWS manual for wetland plants in Utah. Facultative minus (-) plants were dropped from review, since they lack typical adaptations as described on page 17, paragraph two of the USACE manual. Figure 2 shows the USACE data form for wetland determination that incorporates data analyzed from the 1994 report. Dominant vegetation for each class shown is made up mostly of facultative upland or facultative minus species, and, therefore, are not considered hydrophytic.

Conclusion Based on lack of dominant (> 50 percent) hydrophytic vegetation, no USACE jurisdictional wetlands exist within the expansion area. Based on the wetland delineation manual, no need to further evaluate hydric soils potential or hydrologic conditions is required.

Support for Conclusion

As stated previously, 31 transect were inventoried along a 1,300 foot baseline adjacent to the creek. Each transect proceeded from the edge of the existing disturbance area (edge of riparian area), across the creek, and to the next community type (spruce-aspen community). A breakdown of the points for each layer type, with percentage of each based on the 2119 vegetation sample points gathered along the corridor is shown in Table 1. Species described in the table are either obligate, facultative wetland, or facultative, and do not reflect the dominant species as shown on the USACE data form (Figure 2).

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: Genwal Resources Application Number: - Project Name: Crandall Canyon Mine Expansic

State: UT County: Emery Legal Description: Township: 16 S Range: 7 E

Date: 4/16/97 Plot No.: - Section: 5

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		Herbs	
1. Cornus stolonifera	FACW	7. Agrostis alba	FACW
2. Picea pungens	FAC (-)	8. Equisetum arvense	+
3. Prunus virginiana	FACU	9. Machaeranthera bigelovii	NI
Saplings/shrubs		Woody vines	
4. Rosa woodsii	FAC (-)	10. Not Applicable	
5. Willow spp	FACW	11.	
6. Purshia spp.	NI	12.	

% of species that are OBL, FACW, and/or FAC: 37.2 Other indicators: -.

Hydrophytic vegetation: Yes ___ No X. Basis: 50% (44.4%) of dominants are hydrophyl

Soil (See App. 2-3B)

Series and phase: Inclusion B On hydric soils list? Yes___; No X.

Mottled: Yes___; No X. Mottle color: -; Matrix color: -.

Cleyed: Yes X No___ Other indicators: -.

Hydric soils: Yes___ No___; Basis: Questionable - some characteristics

Hydrology

Inundated: Yes___; No X. Depth of standing water: -.

Saturated soils: Yes X; No___. Depth to saturated soil: + 12".

Other indicators: -.

Wetland hydrology: Yes X; No___. Basis: Draft lines, Sediment deposits associated with creek

Atypical situation: Yes___; No X.

Normal Circumstances? Yes X No___.

Wetland Determination: Wetland___; Nonwetland No.

Comments: Based on lack of hydrophylic vegetation and questionable hydric soils.

Determined by: [signature]

B2

FIGURE 2

TABLE 1 Percent Cover of Wetland Plants in Riparian Corridor (2119 Total Points)

Cover Type	Points		% of Cover Type	% of Vegetation
Trees			-	-
Obligate	None			
Facultative Wetland				
Cornus stolonifera	373		60.4	17.6
Facultative				
Populus tremulodies	62		10.0	2.9
Populus angustifloia	17		2.6	0.8
		Total	73.0	
Shrubs				
Obligate	None			
Facultative Wetland				
Salix species	159		18.3	7.5
Facultative				
Celtis reticulata	2		0.2	0.09
		Total	18.5	
Forbs				
Obligate				
Rush spp.	3		0.8	0.01
Mimulus guttatus	4		1.0	0.02
Facultative Wetland				
Agrostis alba	88		13.9	4.2
Facultative				
Aster occidentalis	1		0.3	0.05
Facultative (+)				
Equisetum arvense	79		19.8	3.7
		Total	21.9	
TOTAL POINTS	788		TOTAL COVER	37.2

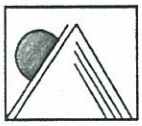
Of the dominant species shown on the USACE data form, 44.4 percent were hydrophytic. This is less than the 50 percent required for classification of a wetland based on vegetation (Based on the USACE requirement that all three indicators be in place - vegetation, soils, & hydrological conditions). It should also be indicated that methodology described in Section D and Section E of the manual for a more detailed hydrophytic vegetation inventory would only require four to five transects. The 1994 inventory consisted of 31 transects (14.4 percent of the total area), a much more intensive survey than required by the USACE.

APPENDIX 3-14

WOODY PLANT SPECIES DENSITY MEASUREMENTS OF THE PROPOSED DISTURBED RIPARIAN AREAS OF CRANDALL CREEK JUNE 1997

WOODY PLANT SPECIES DENSITY MEASUREMENTS OF THE PROPOSED DISTURBED RIPARIAN AREAS OF CRANDALL CREEK

1997



Prepared by

MT. NEBO SCIENTIFIC, INC.
330 East 400 South, Suite 6
P.O. Box 337
Springville, Utah 84663
(801) 489-6937

Patrick D. Collins, Ph.D.

for
ANDALEX RESOURCES, INC.
P.O. Box 902
Price, Utah 84501

June 1997

INTRODUCTION

The Crandall Canyon Mine is situated within Crandall Canyon, a tributary of Huntington Canyon. These canyons are located within a portion of the Wasatch Plateau in Emery County, Utah. Elevation of the study area ranged from 7,770 ft to 7,850 ft above sea level.

An area has been proposed for disturbance to accommodate expansion of the coal mine's surface facilities. The proposed disturbed area would primarily affect riparian and spruce/fir/aspen plant communities. The spruce/fir/aspen communities have been sampled previously (July 1996) and reported by *MT. NEBO SCIENTIFIC, INC.* (February 1997). Although vegetation sampling has also been conducted earlier in the riparian area by EIS (August 1995), biologists from the State of Utah, Division of Oil, Gas & Mining (DOGM) determined that woody species density measurements were also necessary as required by state regulations. This report documents results from woody species sampling within the riparian area at the Crandall Canyon mine site.

METHODS

Woody Plant Species Density

Density of woody plant species of the proposed disturbed areas were made using belt transects. These 5 ft by 25 ft belts were placed randomly adjacent to the creek in the areas where the stream flow influences the vegetation. Most of the entire length of the area that was proposed for disturbance were represented by the transects.

Total number of individuals by species were counted in each of the belt transects. The average number was then calculated followed by the number of individuals per acre.

Sample Adequacy

Sampling adequacy was calculated using formulas from Cochran (1977), with the goal of at least 80% confidence level with a 10% change in mean. The formula used is given below.

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

nMIN	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

Photographs

Color photographs were taken of the study area at the time of sampling. The photographs were not included in this report but are available upon request.

RESULTS

Total woody species density was estimated to be 11,224 individuals per acre in the riparian area. The most important woody plant species by density were Wood's rose (*Rosa woodsii*), whiplash willow (*Salix lucida*), and red-osier dogwood (*Cornus sericea*). Results of all species densities are shown on Table 1.

TABLE 1: Woody species densities of the proposed disturbed riparian areas of Crandall Creek.

	NUMBER/ACRE
Chrysothamnus nauseosus	217.80
Cornus sericea	1756.92
Juniperus scopulorum	29.04
Populus tremuloides	479.16
Picea pungens	14.52
Pseudotsuga menziesii	29.04
Ribes viscosissimum	14.52
Rosa woodsii	6112.92
Salix lucida	1960.20
Sherperdia canadensis	43.56
Symphoricarpos oreophilus	566.28
TOTAL MEAN DENSITY	11223.96
(STANDARD DEVIATION)	(3483.32)

APPENDIX 3-15

PRODUCTIVITY ESTIMATES (NCRS) - EXPANSION AREA

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
PRICE FIELD OFFICE
350 NORTH 400 EAST
PRICE, UTAH 84501

Patrick D. Collins,Ph.D.
Mt. Neb Scientific
330 E.400 S. Suite 6
Springville, Ut. 84563

Dear Patrick:

Listed in the table are the area, condition, and production of the areas around the Genwal Mine.

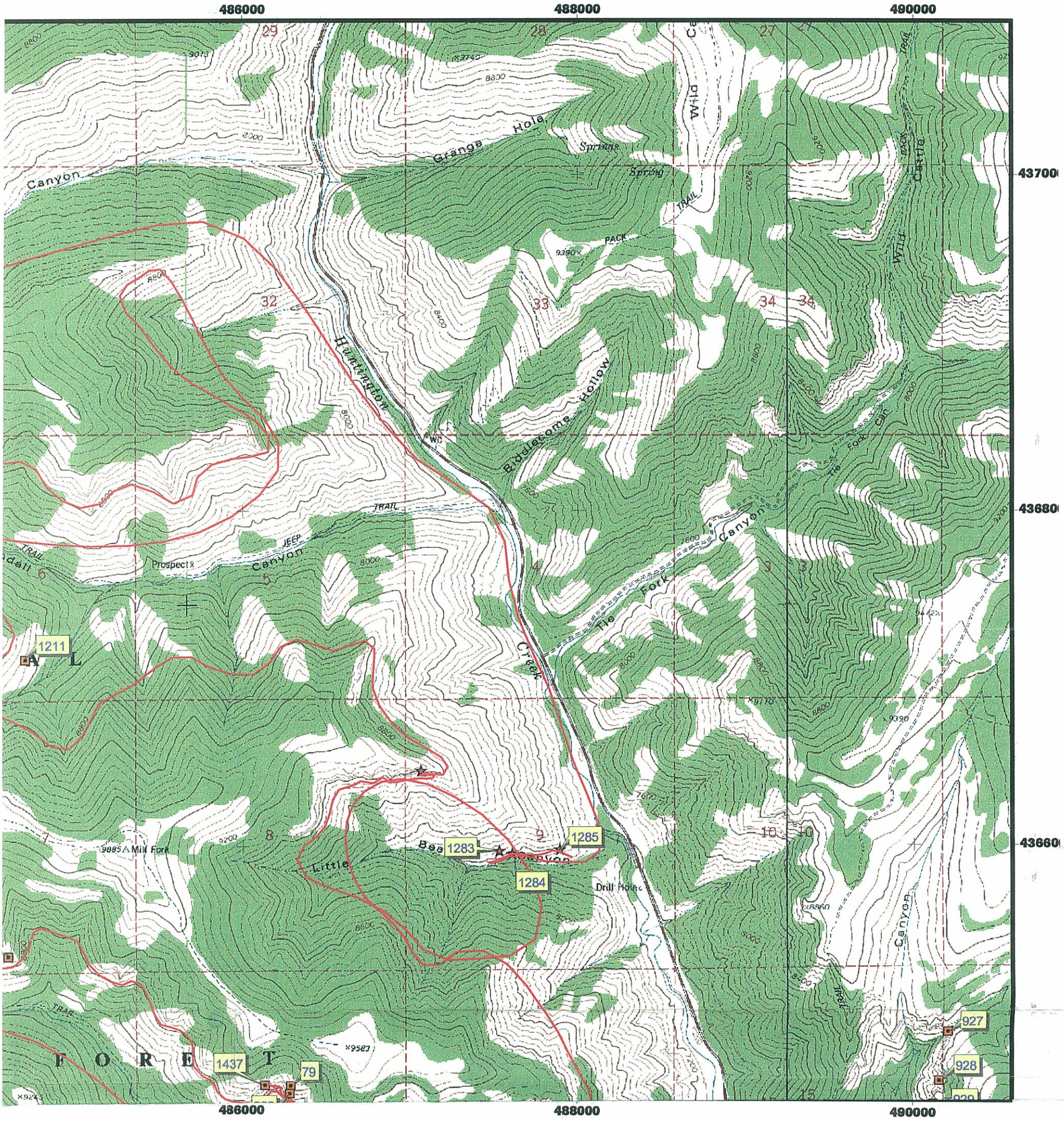
SITE	AREA	CONDITION	PRODUCTION
Spruce Fir Aspen	Reference area	Good	2500 lbs.
Spruce Fir Aspen	Proposed disturbed	Good	2500 lbs.
Spruce Fir Aspen	Previously Disturbed	Fair	1000 lbs.
Riparian area	Reference area	Good	1500 lbs.

The method used to determine herbage production and site condition was ocular estimate. The production figures are based on air dry herbage per acre.

George S. Cook
George S. Cook
Range Conservationist

APPENDIX 3-16

DWR RAPTOR SURVEY (2003)

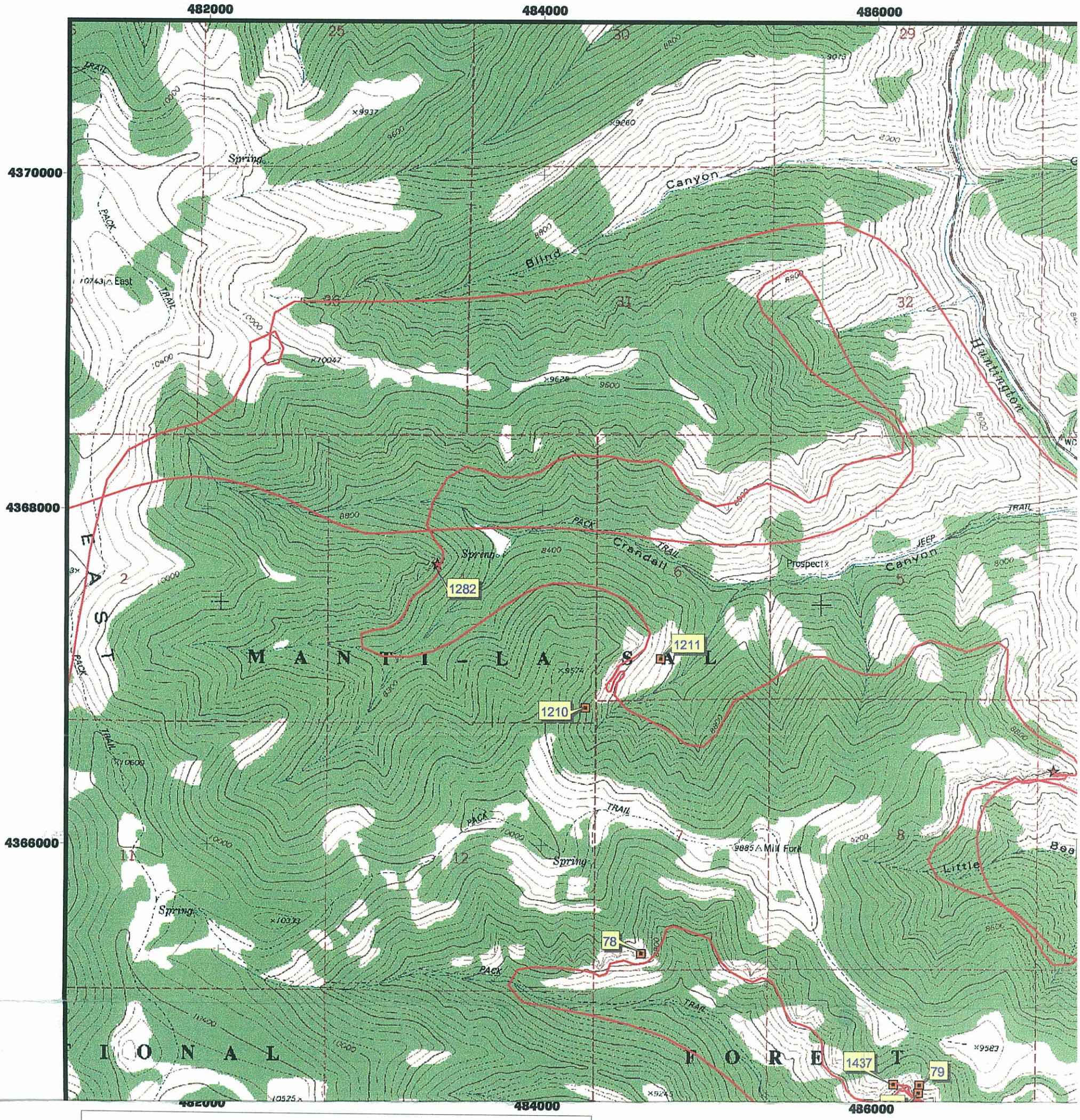


2003 Raptor Survey
Genwall

N
W E
S

STATE OF UTAH
NATURAL RESOURCES
Division of Wildlife Resources

Anthony Wright
Utah Division of Wildlife Resources
475 W. Price River Drive, Suite C
Price, UT 84501



Key to Features

- 2003 Flightlines

Raptor Nests

- American Kestrel
- Bald Eagle
- Cooper's Hawk
- Falcon
- Ferruginous Hawk
- Golden Eagle
- Great Horned Owl
- Peregrine Falcon
- Prairie Falcon
- Raven
- Red-tailed Hawk
- Unknown
- Buteo
- 7.5' Quad Boundaries

2003 Raptor Survey
Genwall

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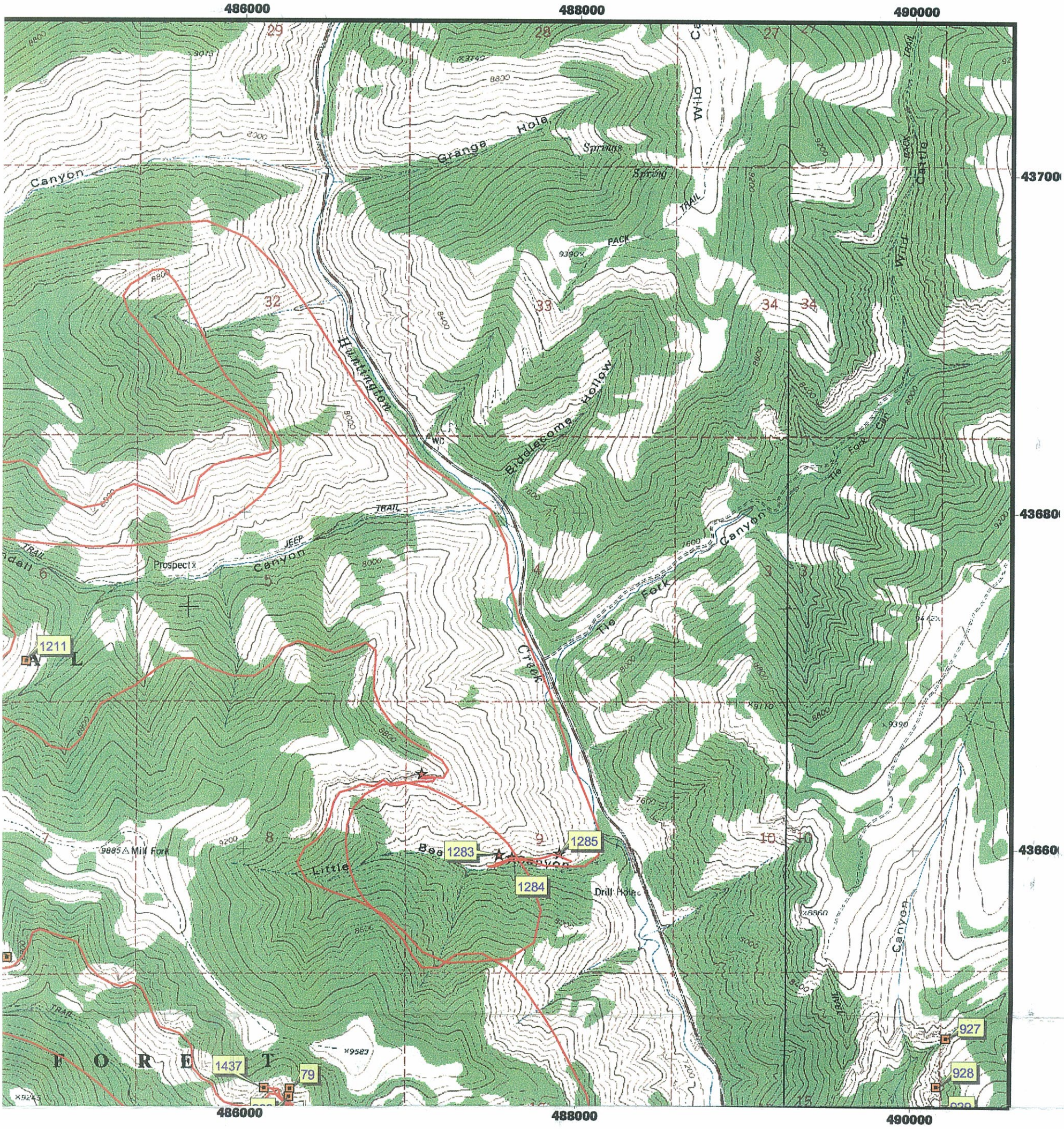

2003 Raptor Survey
Genwall

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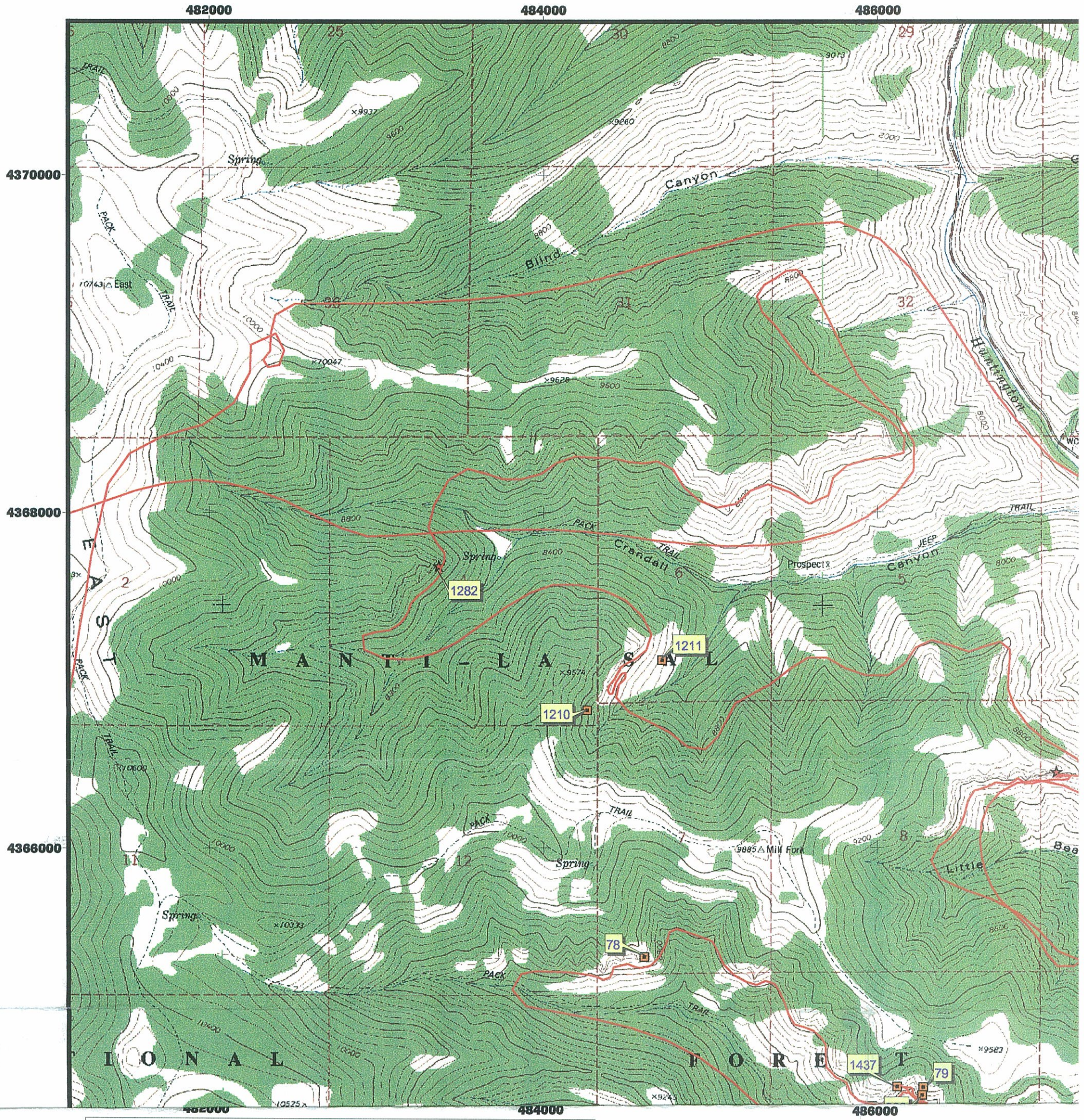
STATE OF UTAH
NATURAL RESOURCES
Division of Wildlife Resources

Anthony Wright
Utah Division of Wildlife Resources
475 W. Price River Drive, Suite C
Price, UT 84501



Key to Features

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- Prairie Falcon
- Raven
- Red-tailed Hawk
- Unknown
- Buteo
- 7.5' Quad Boundaries

2003 Raptor Survey Genwall

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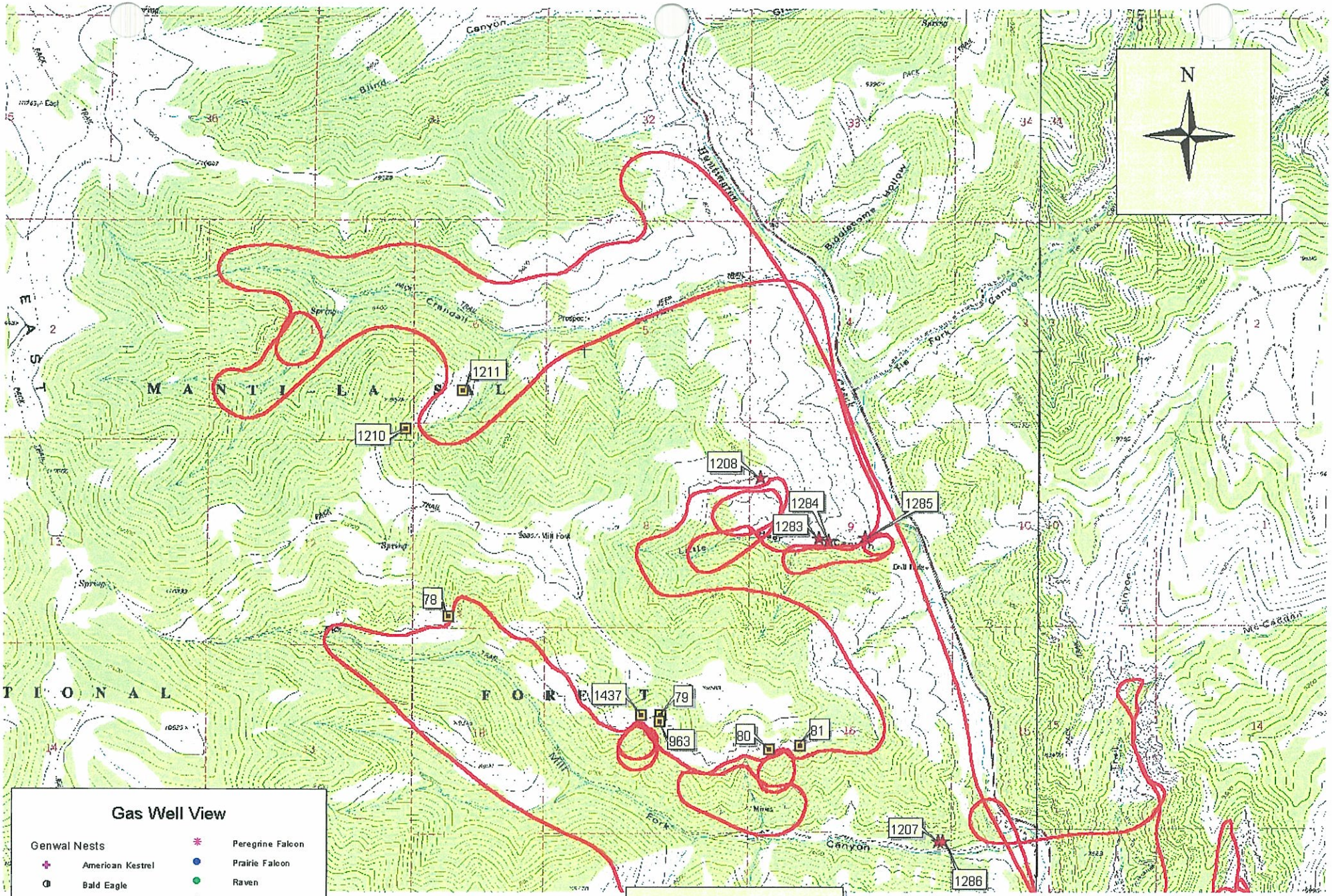
APPENDIX 3-16A

DWR RAPTOR SURVEY (2004)



STATE OF UTAH
NATURAL RESOURCES
Division of Wildlife Resources

17 June 2004

Anthony Wright
475 W. Price River Drive
Price, UT 84501

Raptor Survey
Genwal 2004

Attributes of Genwal_out.shp												
Nest_no	X_utm27	Y_utm27	Date	Species	Type	Status_04	Eggs	Yng	Age	Comments	Status_03	Status02
78	484600	4365349	20040519	Golden Ea	Cliff	inactive					inactive	Tended
79	486275	4364567	20040519	Golden Ea	Cliff	inactive					tended	Tended
80	487129	4364303	20040519	Golden Ea	Cliff	inactive					tended	Active
81	487376	4364333	20040519	Golden Ea	Cliff	inactive					tended	Inactive
963	486269	4364520	20040519	Golden Ea	Cliff	tended				greenry	Tended	Tended
1207	488466	4363584		Red-tailed	Cliff	not survey(					not survey(	Active
1208	487059	4366448	20040519	Red-tailed	Cliff	inactive				North side	inactive	Inactive
1210	484259	4366818	20040519	Golden Ea	Cliff	inactive					inactive	Active
1211	484707	4367115	20040519	Golden Ea	Cliff	tended				greenry	tended	Inactive
1282	483368	4367679	20040519	raven	Cliff	active		5		red-tail las	inactive	Inactive
1283	487524	4365966	20040519	Red-tailed	Cliff	inactive				.	inactive	Inactive
1284	487601	4365948	20040519	Red-tailed	Cliff	inactive				.	inactive	Inactive
1285	487886	4365975	20040519	Red-tailed	Cliff	inactive				.	inactive	Inactive
1286	488502	4363583		Red-tailed	Cliff	not survey(				.	not survey(	Inactive
1437	486119	4364571	20040519	Golden Ea	Cliff	not found					inactive	NA

Status01	Status00	Status99	Status98	Elevation	Company	Quad	
Inactive	Tended	Inactive	Active	8900	Genwal	Rilda Canyon	
Inactive	Tended	Tended	Dilapidatec	8800	Genwal	Rilda Canyon	
Active	Active	Inactive	Inactive	8700	Genwal	Rilda Canyon	
Inactive	Inactive	Dilapidatec	Inactive	8800	Genwal	Rilda Canyon	
Inactive	Tended	NA	NA	8800	Genwal	Rilda Canyon	
Active	NA	NA	NA	7200	Genwal	Rilda Canyon	
Inactive	NA	NA	NA	8800	Genwal	Rilda Canyon	
Tended	NA	NA	NA	9000	Genwal	Rilda Canyon	
Dilapidatec	NA	NA	NA	8900	Genwal	Rilda Canyon	
NA	NA	NA	NA	9000	Energy We	Rilda Canyon	
NA	NA	NA	NA	7600	Energy We	Rilda Canyon	
NA	NA	NA	NA	7600	Energy We	Rilda Canyon	
NA	NA	NA	NA	7600	Energy We	Rilda Canyon	
NA	NA	NA	NA	7300	Energy We	Rilda Canyon	
NA	NA	NA	NA		Energy We	RILDA CANYON	

APPENDIX 3-18

WATER DEPLETION

WATER DEPLETION

1. Mining Process Water

   Water lost due to use in mining process - measured as percentage moisture of coal hauled to customer. 2,000,000 tons/yr x 2% = 29.4 acre feet

2. Ventilation Evaporation

   Water lost due to ventilation currents drying out mine water.

   Estimated at 2.5 gallons per million cfm annually.

   Estimated maximum 1,000,000 million cfm at 2.5 gallons = 40 acre feet.

3. Sediment Pond Evaporation

   Water lost to evaporation in sediment pond.

   Estimated to be one acre foot per year.

4. Subsidence Effect on Springs

   Estimated at zero because of no known effects of spring disruption.

5. Direct Use

   Pumped from creek for crusher building use - goes into sediment pond.

   Estimated at 2 acre feet per year in use but is not actually lost. Assume no loss.

6. Alluvial Loss

   None

7. Deep Aquifer Pumpage

   None

8. Mine Discharge

   Genwal has discharged at 500 gpm (approximately 800 acre feet per year) for the past 6 years. This is all old water according to the Mayo age dating studies. This is water that enters the watershed, therefore there is presently a net gain to the watershed of more than 700 acre feet:
   800 - (29.4 + 40 + 1) = 800 ac.ft. added, less 70.4 ac.ft. depleted = 729.6 ac.ft.

APPENDIX 3-19

DWR HABITAT INFORMATION, 2004

MOOSE

Legend

- Utah Counties
- Moose
  - winter
  - summer
  - year-long
  - Other
- City Labels
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

ELK

Legend

- Utah Counties
- Elk Habitat
  - winter
  - summer
  - year-long
  - Other
- City Labels
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

MULE DEER

Legend

- Utah Counties
- Mule Deer Habitat
  - winter
  - summer
  - year-long
  - Other
- City Labels
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

APPENDIX 3-20

FINAL ENVIRONMENTAL ASSESSMENT

MODIFICATION OF FEDERAL COAL LEASE UTU-68082,

U.S. FOREST SERVICE

FINAL
ENVIRONMENTAL ASSESSMENT
MODIFICATION OF FEDERAL COAL LEASE UTU-68082

MANTI-LA SAL NATIONAL FOREST
FERRON-PRICE RANGER DISTRICT
EMERY COUNTY, UTAH

Joint Lead Agencies:

USDA Forest Service
Manti-La Sal National Forest
599 West Price River Drive
Price, Utah 84501
(435) 637-2817

USDI Bureau of Land Management
Utah State Office
324 South State Street, Suite 301
Salt Lake City, Utah 84111
(801) 539-4031

Responsible Officials:

Alice Carlton
Forest Supervisor
Manti-La Sal National Forest
599 West Price River Drive
Price, Utah 84501

Sally Wisely
Utah State Director
Bureau of Land Management
324 South State Street, Suite 301
Salt Lake City, Utah 84111

Cooperating Agency:

USDI Office of Surface Mining Reclamation and Enforcement
Western Regional Coordinating Center
1999 Broadway, Suite 3320
Denver, Colorado 80202-5733

For Further Information Contact:

Karl Boyer
Geologist
Manti-La Sal National Forest

Gregg Hudson,
Geologist
Bureau of Land Management

Abstract: This Environmental Assessment (EA) considers, the environmental, social, and economic effects of coal mining within a 120 acre modification to Federal Coal Lease Tract UTU-68082, if it is leased by GENWAL Mining Company. Leasing of the modification would make the coal available for energy production. The proposed action is to provide a list of special coal lease stipulations for incorporation into the coal lease agreement, and to later consent to the mine plan for the tract. The EA evaluates the potential effects of underground mining within the tract and adjacent lands. The Forest Supervisor must decide what coal lease stipulations to provide to the Bureau of Land Management to incorporate into the coal lease. After leasing, the Forest Supervisor must decide whether to consent to the lease.

TABLE OF CONTENTS

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

FINAL
ENVIRONMENTAL ASSESSMENT
CRANDALL CANYON MINE
MODIFICATION OF FEDERAL COAL LEASE
UTU-68082

CHAPTER 1
PURPOSE AND NEED

1.1 PROPOSED ACTION

The proposed action is for the Bureau of Land Management (BLM) to modify Federal Coal Lease UTU-68082 by adding 120 acres. The Forest Service proposes to consent to the modification, subject to all lease terms, conditions, and stipulations contained in the original lease, and any additional stipulations needed to address surface effects in the modification area consistent with Forest Plan direction. This action would enable Genwal Resources Inc. (Genwal) to economically recover the available coal reserves within the proposed lease modification area and is in keeping with the BLM and Forest Service missions of providing the opportunity to recover leasable minerals on National Forest System Lands consistent with requirements for managing other resources.

1.2 PROJECT DESCRIPTION

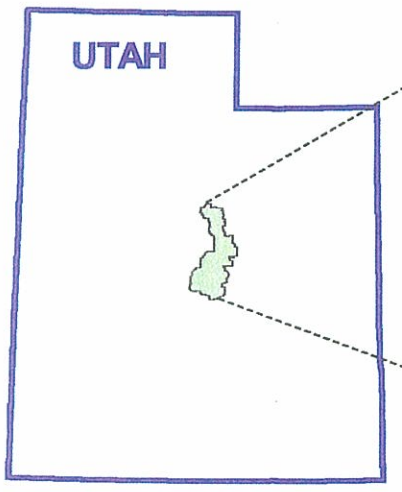
Genwal submitted an application for modification of Federal Coal Lease UTU-68082 to the BLM on February 27, 2004. The lease modification lies entirely within the boundaries of the Manti-La Sal National Forest. The proposed modification area, located immediately adjacent to the east side of UTU-68082, was originally excluded from the delineated tract due to low coal seam thickness. The proposed lease modification involves adding 120 acres of National Forest System lands administered by the Manti-La Sal National Forest in Emery County, Utah described as follows (Figure 1, Page 2):

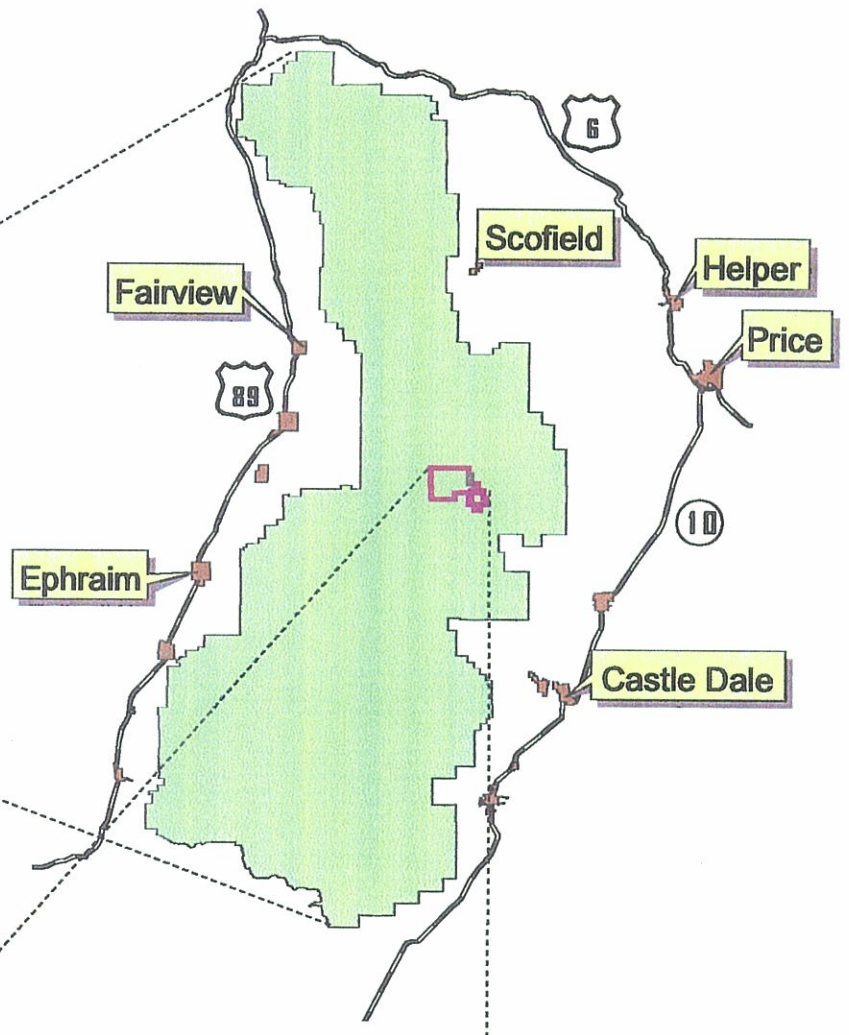
T. 15 S., R. 7 E., SLM, UT
Section 32, W1/2 NW1/4; NW1/4 SW1/4

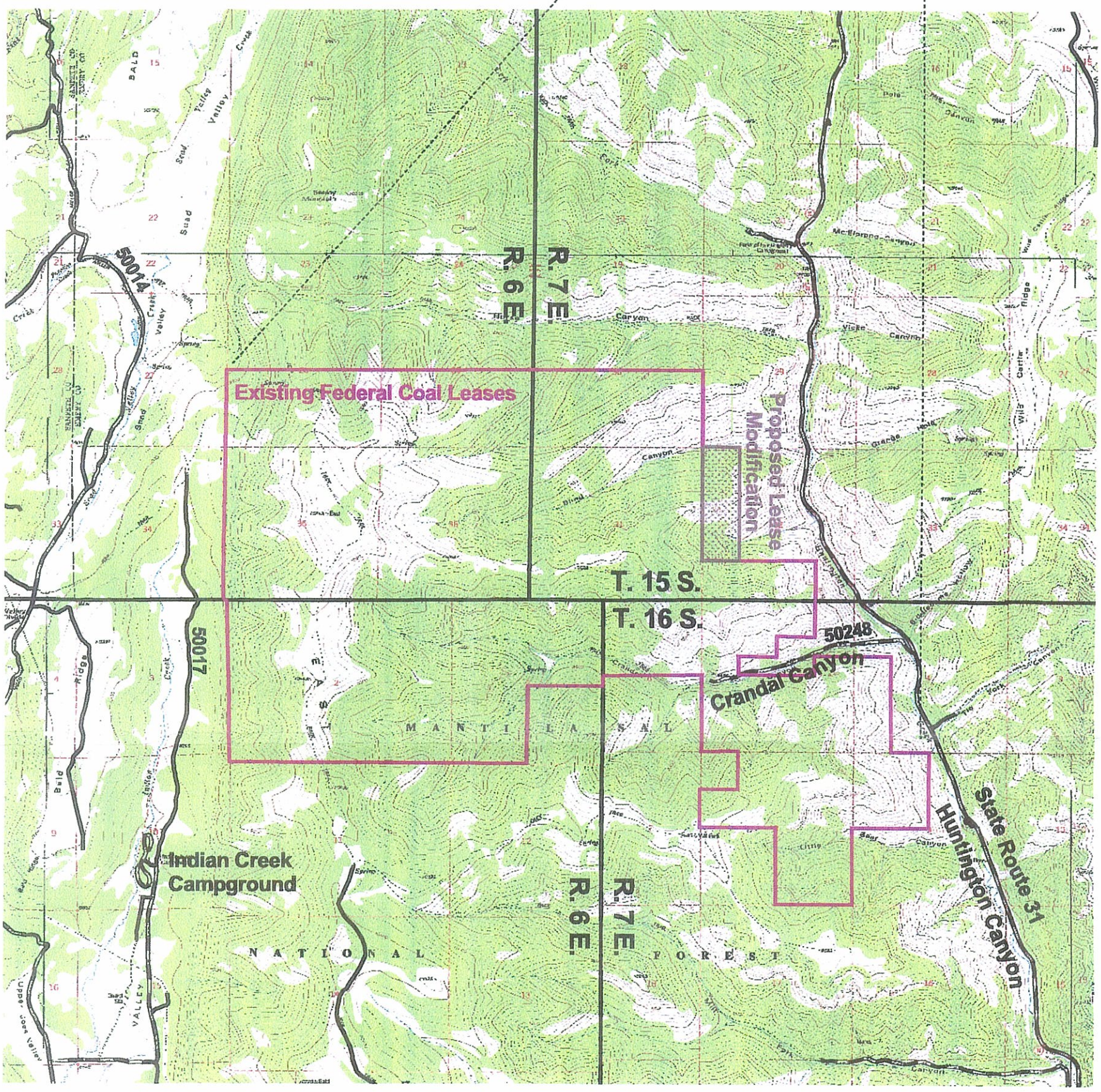
The coal reserves in the proposed 120 acre lease modification would be approached from the south or west through existing underground mine workings in the Crandall Canyon Mine. No roads or portal facilities would be constructed for this project. The proposed lease modification area is an isolated area adjacent to the current lease. The proposed action would not lead to other future mining actions.

Figure 1

General Location Map
Modification of
Federal Coal Lease UTU-68082







1:50000

1 0 1 2 3 4 5 Miles

N

1.3 PURPOSE AND NEED

The Bureau of Land Management (BLM) has made a determination as per 43 CFR 3432.2 (a) that: (1) the modification serves the interests of the United States; (2) there is no competitive interest in the lands or deposits; and (3) the additional lands or deposits cannot be developed as part of another potential or existing independent operation. Therefore there is a need to modify the existing coal lease versus processing a lease by application under 43 CFR 3425.

The purpose of the lease modification is to recover the potentially available coal reserves in the proposed lease modification area, with mitigations needed to protect non-coal resources. If the coal reserves are not mined concurrently with UTU-68082, the coal would probably be bypassed and never mined. The proposed and reasonably foreseeable underground mining would consist of entries with support pillars and long wall extraction methods.

1.4 SCOPE OF THIS ENVIRONMENTAL ANALYSIS

1.4.1 Scoping Process

Project scoping was conducted from May 4 to July 8, 2004. Comments were requested from Interdisciplinary Team (IDT) members, other Federal agencies, State, county and local agencies within Utah, Indian tribes, environmental groups, and interested individuals. Requests for comments were published in the *Sun Advocate* and *Emery County Progress* newspapers on May 4 and June 8, 2004. The project has been listed in the Forest Service Quarterly Schedule of Proposed Actions. Letters requesting comments were sent to 77 interested parties. Four outside responses were received. From these outside responses and the internal scoping, the IDT identified potential issues that are identified in Section 1.4.3.

The following is a summary of the outside responses that were received:

1) Utah Environmental Congress (UEC) requested that a cumulative effects analysis be completed for Management Indicator Species (MIS), wolverines, and Threatened, Endangered, and Protected Species (TEPS) on the Forest, and for the watersheds originating on the Wasatch Plateau. They also requested that the analysis address potential disruption to suitable habitat for migratory birds.

2) The Hopi Tribe requested a copy of the Cultural Resource Survey Report of the project to assist them in determining whether the area of potential effect contained any cultural resources significant to the Hopi Tribe.

3) The U.S. Fish and Wildlife Service was primarily concerned with the loss of perennial surface water and the disruption of springs and seeps due to mining subsidence, and the effects that the loss of water would have on wildlife habitat.

4) The Navajo Nation stated that they did not have any immediate concerns with the project and that the project area would not impact any Navajo Traditional Cultural Properties.

1.4.2 Relevant Planning Documents and Analyses

1) The Land and Resource Management Plan (LRMP) for the Manti-La Sal National Forest on page III-4 states that the Forest Management Goals for Minerals and Geology are to:

   a. Provide for the interpretation of surface and subsurface geologic conditions and processes such as landsliding.

   b. Manage geologic resources, common variety minerals, ground water, and underground spaces (surficial deposits, bedrocks, structures, and processes) to meet resource needs and minimize adverse effects.

   c. Provide appropriate opportunities for and manage activities related to locating, leasing, exploration, development, and production of mineral and energy resources

   d. Ensure that adequate reclamation of disturbed areas is accomplished.

2) Chapter III of the LRMP prescribes Management Requirements for the lease modification area:

   a. Management Activity: Leasable Minerals (LRMP, Page III-35).
   General Direction 01- Negative recommendations, denials, or consent for leasing, permitting, or licensing will be based on site-specific environmental assessments using appropriate standards and guidelines. Stipulations for these actions should minimize and/or mitigate effects or conflicts with other resource uses and should return disturbed lands to conditions compatible with emphasis on the management unit or adjacent management unit.

   b. Management Activity: Range (LRMP, Page III-66).
   General Direction 01- Provide appropriate mitigation measures to assure continued livestock access and use.

   General Direction 02- Those authorized to conduct developments will be required to replace losses through appropriate mitigations, where a site-specific development adversely affects long term production or management.

3) Crandall Canyon Mine EA, September 1997

4) Mill Fork Tract EA, June 1997

1.4.3 Issues Evaluated in Detail

1.4.3.1 Surface Water

In areas of low overburden, subsidence fractures could be continuous to the surface. Surface water in either perennial drainages or seasonal and ephemeral runoff could be disrupted and/or intercepted by the underground mine workings. This could affect ecosystems, stream morphology, and stream flows.

Evaluation Criteria:

- Evaluate effects to drainages by classification (perennial, intermittent, or ephemeral), in feet.
- Acres and duration of impacted wetland and riparian areas.

1.4.3.2 Ground Water

In areas of shallow overburden, interception of ground water by the mine workings could disrupt the sources and flow paths supplying springs and seeps.

Evaluation Criteria:

- Number of springs and volumes affected.

1.4.3.3 Escarpment Failure

The Castlegate Sandstone is located along the western edge of the proposed lease modification. Subsidence could result in the failure of the Castlegate escarpment; causing effects to visual resources and raptor nesting habitat, and resulting in increased erosion and sediment production.

Evaluation Criteria:

- Visuals (consistency with Visual Quality Objectives).
- Raptor Nests (number of nests and acres of lost habitat).
- Erosion and Sedimentation (effects to water quality).

1.4.3.4 Wildlife

Subsidence and possible loss of surface and ground water could affect Management Indicator Species (MIS), Macroinvertebrates, Migratory Bird Species, Threatened, Endangered and Sensitive Plant and Animal Species and their habitat.

Evaluation Criteria:

- Effects to suitable habitat.
- Presence of species.

1.4.4 Issues Considered but Not Further Evaluated

1.4.4.1 Range

No conflicts are anticipated with the lease proposal as far as impacts to available livestock forage. No surface facilities or roads would be constructed for this project; therefore, noxious weed introduction is not an issue.

1.4.4.2 Cultural and Paleontological Resources

a. Paleontological Resources.

The Forest Service conducted paleontological inventories in the East Mountain area from 1998 to 2001. No potential sites were located in the proposed lease modification area.

b. Archaeological Resources.

The area was surveyed for potential historic or archaeological resources in June 2004. None were found and the potential effects have been determined to be negligible. No known objects on or adjacent to the lease tract are listed in or are eligible for the National Register of Historic Places. No significant heritage resources will be affected by the action. A letter received from the Utah State Historic Preservation Office states that no historic properties would be affected in the area.

Initial scoping documents were sent to the tribal governments of the Hopi, Paiute, Ute Mountain Ute, White Mesa Ute, Ute Tribe (Fort Duchesne), and Navajo beginning in May of 2004. Two tribes, The Navajo and the Hopi, responded to the scoping documents, indicating a general concern for avoiding potential impacts to cultural resource sites. All of the tribes listed above were sent copies of the cultural resources inventory report associated with the project. This communication also included a request for information regarding any potential sacred sites, TCP's (Traditional Cultural Properties), and plants or other natural resources the tribes might have concerns with. No Traditional Cultural Properties or sacred sites were identified in the analysis area through these consultation efforts. A list of culturally significant plants provided by the Paiute was submitted to the Forest botanical expert for review. There are no sensitive or threatened species on that list and those species on the list that occur in the project area will not be negatively affected by the proposed action.

Should any unanticipated paleontological or cultural resources be encountered during the implementation of this project, all work would stop until assessment of the finding could be made.

1.4.4.3 Roadless Area

The proposed coal lease modification lies within the East Mountain Roadless Area. The undeveloped character of the roadless area would not be affected. No roads or portal facilities would be constructed for this project. The proposed lease modification is an isolated area adjacent to the current lease; it contains a small amount of mineable coal accessible only through the existing mine in the current lease. The proposed action would not lead to other future mining actions. The coal lease modification would be mined entirely by underground mining methods and adjacent existing underground mine workings would access the tract. The amount of subsidence would be minimal, approximately 3 feet.

1.5 DECISIONS THAT MUST BE MADE

The Utah State Director of BLM must decide whether or not to modify the lease and under what terms, conditions, and stipulations. The Bureau of Land Management (a joint lead agency) is responsible for issuance and administration of coal leases under the Mineral Leasing Act of 1920, as amended and Federal Regulations 43 CFR 3400.

The Forest Supervisor of the Manti-La Sal National Forest must decide whether or not to consent to the lease modification by BLM, and prescribe lease stipulations needed to protect non-mineral resources. The Federal Coal Leasing Amendments Act of 1975 that amended the Mineral Leasing Act of 1920 provides Forest Service consent authority.

The Forest Supervisor would also consent to any approval of the associated permit revision by Utah Division of Oil, Gas, and Mining, which would involve including this lease modification in the permit area.

The Office of Surface Mining Reclamation and Enforcement is a cooperating agency in this action.

1.6 APPLICABLE LEGAL AND REGULATORY REQUIREMENTS AND COORDINATION

The decisions must conform to the overall guidance of the Manti-La Sal National Forest Plan (1986), as amended, and its Final Environmental Impact Statement (FEIS), 1986. This environmental analysis tiers to the Forest Plan FEIS.

This coal lease modification will be processed under the authority of the Mineral Leasing Act of 1920. Approving the lease modification would give the lessee an exclusive right to mine the coal, but does not authorize mining or surface disturbing activities.

Before any lease development can occur, the operator must obtain approval of a comprehensive Mining and Reclamation Plan and a mine permit in accordance with the state and Federal Regulations. Surface management agency (in this case the Forest Service) consent and incorporation of provisions for protection of non-mineral resources are required prior to issuing a permit. Approval of a Resource Recovery and Protection Plan under 43 CFR 3482 and consent from the BLM are also required.

The Surface Mining Reclamation and Control Act of 1977 (SMCRA) gives the Department of the Interior, Office of Surface Mining (OSM) primary responsibility to administer programs that regulate surface coal mining operations and the surface effects of underground coal mining operations. In January 1981, pursuant to Section 503 of SMCRA, the Utah Division of Oil, Gas and Mining (DOGM) developed, and the Secretary of the Interior approved, a permanent program authorizing Utah DOGM to regulate surface coal mining operations and surface effects of underground mining on non-Federal lands within the state of Utah. In March 1987, under Section 523(c) of SMCRA, Utah DOGM entered into a cooperative agreement with the Secretary of the Interior authorizing Utah DOGM to regulate surface coal mining operations and surface effects of underground mining on Federal lands within the State.

Under the cooperative agreement, Federal coal lease holders in Utah must submit permit application packages (PAP's) to OSM and Utah DOGM for proposed mining and reclamation operations on Federal lands in the State. Utah DOGM reviews the PAP to ensure that the permit application complies with the permitting requirements and that the coal mining operation will meet the performance standards of the approved permanent program. If it does comply, Utah DOGM issues the applicant a permit to conduct coal mining operations. OSM, the BLM, the Forest Service, and other Federal agencies, review the PAP to ensure that it complies with the terms of the coal lease, the Mineral Leasing Act of 1920 (MLA), NEPA, and other Federal laws and their attendant regulations. OSM recommends approval, approval with conditions, or disapproval of the PAP MLA mining plan to the Assistant Secretary, Land and Minerals Management.

Utah DOGM enforces the performance standards and permit requirements during the mine's operation and has primary authority in environmental emergencies. OSM retains oversight responsibility for this enforcement. BLM and the Forest Service have authority in those emergency situations where Utah DOGM or OSM inspectors can not act before environmental harm or damage occurs.

CHAPTER 2
DESCRIPTION OF ALTERNATIVES

2.1 INTRODUCTION

This chapter presents the alternatives considered for implementation, features common to action alternatives, alternatives considered but not further analyzed, and a comparative summary table of the alternatives considered for implementation responding to the identified issues. A no action alternative and two action alternatives are considered in detail.

Table 2-1, List of Alternatives

Alternative 1 – No Action
Alternative 2 – Consent/Approval of Project as Proposed
Alternative 3 – Consent/Approval of Project with Supplemental FS Mitigations

2.2 HISTORY AND PROCESS USED TO FORMULATE THE ALTERNATIVES

Alternative development is driven by public comments and input from Forest Service personnel. Comments were sought by various means including newspapers, the Forest Service's *Schedule of Proposed Actions*, and by letters to State and County governments and other interested parties.

Letters requesting comments were sent to 77 interested parties. Four letters were received in response to the Forest's public involvement efforts. The contents of each letter were reviewed and issues identified that could help refine the analysis, project design, and development of alternative actions.

2.3 ALTERNATIVE DESIGN, EVALUATION, AND SELECTION CRITERIA

Action alternatives must be consistent with the rights granted to the lessee under Federal Coal Lease UTU-68082, as conditioned by the lease terms and stipulations contained therein. In addition, any occupancy and development of the lease must be consistent with all applicable, non-discretionary laws and regulations.

All alternatives must include implementation of Soil and Water Conservation Practices as detailed in the project file. This calls for all reasonable measures to be taken by the operator to prevent sediment caused by operations from entering adjacent drainages.

2.4 DESCRIPTION OF PROPOSED ALTERNAIVES

Alternative 1 – No Action

Alternative 1 addresses the need to provide a "No Action" alternative (40 CFR 1502.14). The Forest Service would not consent to, and the BLM would not approve the coal lease modification. Subsequently, Alternative 1 would not allow for mining within the modification area, and therefore not provide coal reserves for the mine. No mitigation measures or monitoring would be required as part of this alternative other than meeting Forest Plan direction, standards, and guidelines.

Alternative 2 – Consent/Approval of the Lease Modification as Proposed

This alternative represents Genwal's proposal to modify Federal Coal Lease UTU-68082 to provide coal reserves for the Crandall Canyon Mine so that current production levels are maintained, and to recover Federally owned coal deposits that may otherwise be bypassed. The Utah State Director of BLM must decide whether or not to modify the lease to include the additional 120 acres. The Bureau of Land Management is responsible for issuance and administration of coal leases under the Mineral Leasing Act of 1920, as amended and Federal Regulations 43 CFR 3400. The Forest Supervisor of the Manti-La Sal National Forest must decide whether or not to consent to the lease modification by BLM, with terms and conditions as contained in Federal Coal Lease UTU-68082. The Federal Coal Leasing Amendments Act of 1975 that amended the Mineral Leasing Act of 1920 provides Forest Service consent authority.
The Forest Supervisor would also consent to any approval of the associated permit revision by Utah Division of Oil, Gas, and Mining, which would involve including this lease modification in the permit area.

The 120 acre area would be added to Federal Coal Lease UTU-68082 for mining through their Crandall Canyon Mine. Because it is not a competitive bid process, another company would not be able to bid on the lease. The lease would be subject to those lease terms and conditions (stipulations) contained in Federal Coal Lease UTU-68082 (Appendix B).

Alternative 3 – Consent/Approval of the Proposed Lease Modification with BLM Stipulations and Supplemental Forest Service Stipulations

This alternative is similar to Alternative 2 with application of an additional mitigation measure (Appendix C) designed to lessen anticipated environmental effects.

2.5 PAST, PRESENT, AND REASONANLY FORSEEABLE FUTURE ACTIONS

CEQ regulations (40 CFR 1508.7) define cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency

(Federal of non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Past, present, and reasonably foreseeable future actions in the project area have been developed in support of this EA. The cumulative effects for each resource category are addressed under each alternative in Chapter 4. Estimates of residual, current, or anticipated effects are discussed. The sum of the effects, in addition to the anticipated direct and indirect effects of the proposed action, will form the basis for the cumulative effects analysis.

If the lease modification is approved, no other future actions are planned for the 120-acre tract beyond removal of the coal reserves.

2.6 COMPARISON SUMMARY OF ALTERNATIVES

Table 2-2, Comparison of Alternatives, displays the components of each alternative and the physical changes to the environment likely to occur from the project for each alternative. These changes are not in themselves identified as issues, but would cause changes to resources and the socioeconomic setting and, therefore, form the basis for the identified issues.

Table 2-2 Comparison of Alternatives

Issue: Surface Water	Alternative 1	Alternative 2	Alternative 3
a. Impacts to drainages, by classification (in feet):			
1. Perennial	0	0	0
2. Intermittent	0	2200	1050
3. Ephemeral	0	2200	1050
b. Impacted wetland and riparian areas			
1. Acres	0	5.8	3.6
2. Duration (years)	0	permanent	0

Issue: Ground Water	Alternative 1	Alternative 2	Alternative 3
a. Impacts to springs/seeps			
1. Number of springs/seeps	0	8	5
2. Volumes (gpm)	0	0-10	0-5

Issue: Escarpment Failure	Alternative 1	Alternative 2	Alternative 3
a. Visuals			
1. Meets Forest VQO	Yes	Yes	Yes
b. Impacts to raptor nests			
1. Number of nests	0	0	0
2. Acres of lost habitat	0	0	0

c. Erosion & Sedimentation 1. Effects to water quality	No	Yes	No

Issue: Wildlife	Alternative 1	Alternative 2	Alternative 3
a. Impacts to wildlife 1. Effects to habitat 2. Presence of species	 No Yes	 Yes Yes	 No Yes

CHAPTER 3
AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the affected environment, with emphasis on the identified issues.

This analysis tiers to the Manti-La Sal National Forest Land and Resource Management Plan (Forest Plan) and incorporates by reference the analysis disclosed in its Final Environmental Impact Statement and Record of Decision, 1986, as amended. Relevant Forest-wide and management area goals, direction, and standards from the Forest Plan are incorporated in this analysis and are further discussed in this chapter.

The proposed coal lease modification area is located between Crandall Canyon and Blind Canyon and overlooks Huntington Canyon. The Forest Plan identifies the Management Prescription (key map and pages III-64 to III-66) for the proposed site as Range Management (RNG), where the emphasis is on production of forage and cover for domestic livestock and wildlife. The proposed coal lease modification satisfies the requirements for management unit direction through the incorporation of the standard stipulations, best management practices, and additional measures as discussed in the alternatives.

3.2 DESCRIPTION OF AFFECTED RESOURCES

3.2.1 Surface Water

The 120 acre lease modification area is located entirely within the Huntington Creek watershed (a tributary to the San Rafael River). Two tributaries to Huntington Creek drain the modification area; the northern part is drained by Blind Canyon and the central and southern portions are drained by Shingle Canyon Creek (Figure 2, page 16). Huntington Creek flows through the town of Huntington, Utah, and into Castle Valley, where the water is primarily used for agriculture and electrical power generation. A minor component of the water is used as the municipal water source for the town of Huntington.

The study area for surface water hydrology includes both streams (Blind Canyon and Shingle Canyon creeks) in the proposed 120 acre lease modification area plus an additional area that may be impacted by subsidence. The discussion regarding springs and seeps is found in Ground Water, Section 3.2.2.

A perennial stream has flowing water year-round during a typical year. The water table is located above the streambed for most of the year. Ground water is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for

streamflow (USACE, definitions for 2002 Nationwide Permits). The importance of springs in maintaining perennial streamflow is variable and ranges from a major to a supplemental source. A perennial stream is made up primarily of gaining or effluent segments. However, in arid environments, a stream may have losing or influent segments and still be considered perennial if the influent segment has perennial segments up and downstream of it. Note that the alluvial ground water that supports perennial stream segments originates in a variable source area upstream/up-gradient of the perennial segment. Intermittent streams typically occur in these portions of the source area. Intermittent streams flow during snowmelt runoff and are usually dry by late summer and early fall. Ephemeral streams only flow as a direct response to storm events.

The Mining and Reclamation Plan for the Crandall Canyon Mine (Vol. 6, Appdx. 7-48) discussed perennial flow in Blind Canyon. The perennial stream section extends from the confluence with Huntington Creek, upstream to as high as 9640 feet in elevation. Perennial flow is found along the entire length of (and beyond) the northern boundary of the proposed lease modification area. Recent investigations (Petersen, 2004, and Collins, 2004) also indicate that Blind Canyon is a perennial stream. Stream flow measurements and macroinvertebrate samples taken in Shingle Canyon Creek during these recent investigations indicate that it is not perennial. However, certain plant species found in the drainage leave open the possibility that the stream could be given a perennial designation. It is possible that Shingle Canyon could be intermittent in the upper reaches and perennial in the lower main stem. Additional surveys later in the growing season would be necessary in order to make a conclusive determination regarding the perennial status of this drainage. Base flow of the streams is probably supplied from springs and seeps, with additional flow contributed by snowmelt and rain.

The Forest Service has a water right on Blind Canyon Creek (93-182) from the intersection of the creek with the western boundary of Sec. 32 to its intersection with Huntington Creek for stock watering. The Forest Service also has a water right on Shingle Canyon Creek (93-1180) from the NE1/4SE1/4 Sec. 31, through Sec. 32, to its intersection with Huntington Creek for stock watering. No other water rights were found within the proposed lease modification area.

Information for the surface and ground water evaluations was derived from:

- Mining and Reclamation Plan, Genwal Mining Company
- Information and maps generated by the Forest Service, USGS, and Genwal
- Water rights data from the Utah Department of Natural Resources, Division of Water Rights
- Perennial Stream Considerations At "No-Name Creek" & Blind Canyon Creek, Tributaries To Huntington Canyon Creek, Mt. Nebo Scientific, Inc., June 2004
- A hydrologic investigation of the permit area conducted by Petersen Hydrologic

The State of Utah has assigned beneficial use designations and water quality standards to these waters. The beneficial uses include:

- 1C – protected for use as a raw water source for domestic water systems with prior treatment by treatment processes as required by the Utah Division of Drinking Water.
- 2B – protected for secondary-contact recreation, such as boating, wading, or similar uses.
- 3A – protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain.
- 4 – protected for agricultural uses, including irrigation of crops and stock watering.

3.2.2 Ground Water

Eight springs and seeps (Figure 2, page 16) have been identified within the 120-acre lease modification area, with recorded discharge rates from 0 to 10 gpm. Flows were highest during the spring due to snowmelt and seasonal recharge. Seven of the springs have been completely dry at times. Five springs/seeps are located in areas of the proposed lease modification with less than 300 feet of overburden and 3 other springs/seeps are located in areas with 300 feet or more of overburden. Small riparian areas could be associated with these springs.

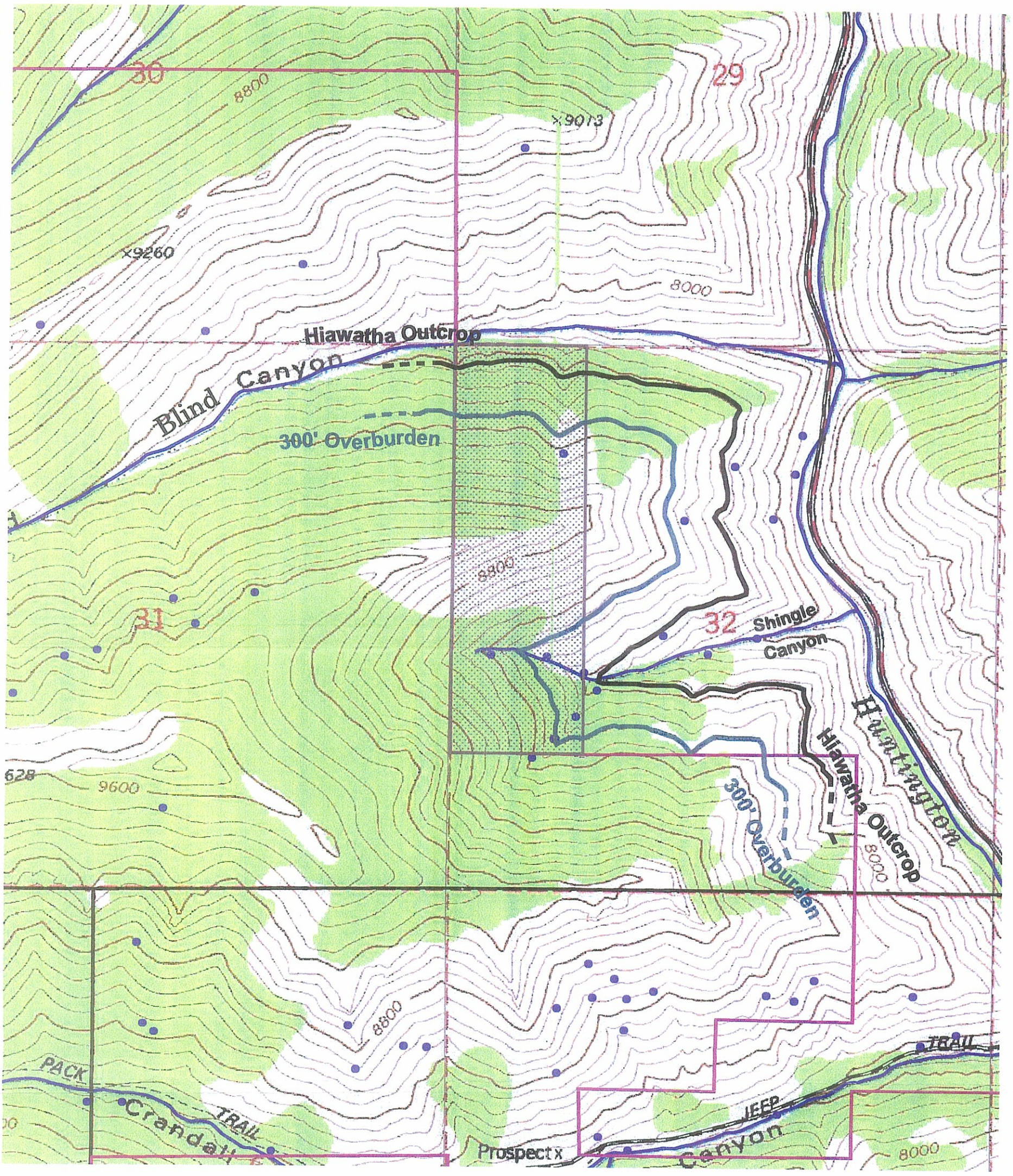
None of the springs and seeps have been developed. Some of them are used for livestock watering during the summer months. These springs are located in the Blackhawk Formation. Springs within the Blackhawk Formation generally occur under perched conditions. The Blackhawk is composed of layers of sandstone and shale. Water from snowmelt and precipitation events moves downward through porous layers of the formation until it comes in contact with an aquitard. The water then moves laterally along the top of the non-porous lens until it exits at an outcrop. Many such small seeps/springs occur within the Blackhawk Formation and overlying Price River Formation. Surface subsidence effects, which could affect flow patterns to springs and seeps, are associated with projects of this type on the Wasatch Plateau.

No faults are known to transect the proposed lease modification. As long as an appropriate overburden thickness was observed and the mine did not intercept surface water, water encountered within the mine would be from paleo-sandstone channels within the Blackhawk Formation and possible upwelling from the Star Point Sandstone. This water has been age dated to approximately 12,000 – 18,000 years old. It would not reach the surface in any appreciable amounts under natural conditions.

Available hydrologic monitoring data indicate that the springs and seeps in the southern portion of the project area are supported by snowmelt during the spring and early summer rather than by a reservoir system that would provide sustainable flows throughout the year.

Figure 2

Modification of Federal Coal Lease UTU-68082
Surface & Groundwater Resources



Proposed Lease Modification
Existing Federal Coal Leases
Stream
Spring / Seep

Roads
Suitable for High Clearance Vehicles Only
Suitable for Passenger Cars

N

1:12000

1 0 1 2 3 4 5 Miles

3.2.3 Escarpment Failure

The coal lease modification area is located on the western edge of Section 32, T15S, R7E, in Huntington Canyon. The proposal is to access the coal reserves from adjacent underground mine workings. No surface occupancy is considered for the area and surface disturbance from roads or other developments would not occur.

A small outcrop of the Castlegate Sandstone, approximately 1400 feet in length (Figure 3, page 18), is located along the western edge of the proposed lease modification. Overburden thickness is approximately 800-1000 feet in this area. The escarpment is approximately 3000 feet from the only road in the area (State Highway 31). Subsidence could result in tension cracking and possible separation of blocks from the Castlegate escarpment.

a. Visuals

Characteristic Landscape

East Mountain is a long, high elevation ridge, extending North and South. Elevations range from approximately 7,000' in Huntington Canyon to over 10,700' along the ridge top. The ridge top is mostly covered with large patches of Aspen, Spruce and Fir, except for small meadows near the head of steep draws. Sagebrush extends along lower slopes and interface with the patches of conifers and aspen. Vertical ledges are common in the steep Huntington Canyon.

Visual Quality Objective

The Visual Quality Objective (VQO), (Manti-La Sal NF Forest Plan, *Visual Quality Objective Map, 1986,*) is Modification of landscape character in approximately the western half of the lease modification area. Under the Modification VQO, management activities may visually dominate the original landscape character, however the alterations should appear as natural occurrences within the surrounding area. In approximately the eastern half of the lease modification area the VQO is Partial Retention. Under the Partial Retention VQO, alterations may be evident, but must remain subordinate to the characteristic landscape.

b. Raptor Nests

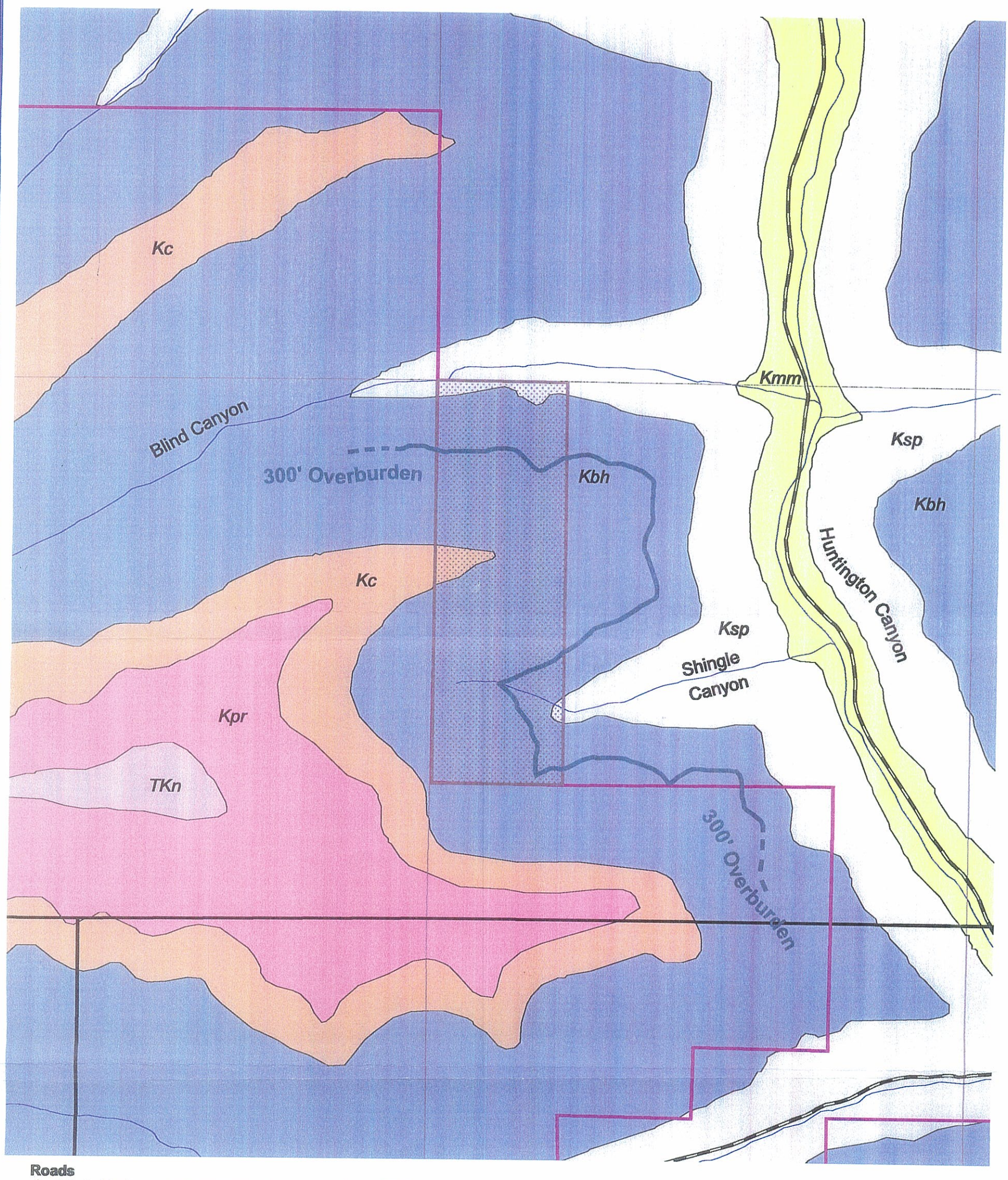
There are no known raptor nests within one mile of the proposed lease modification area boundaries.

c. Erosion and Sedimentation

An increase of erosion and sedimentation are sometimes associated with escarpment failure.

Figure 3

Modification of Federal Coal Lease UTU-68082
Geology



Roads
- Suitable for High Clearance Vehicles Only
- Suitable for Passenger Cars

- Proposed Lease Modification
- Existing Federal Coal Leases

Geology

Cretaceous
- Kpr - Price River Formation
- Kc - Castelgate Sandstone
- Kbh - Blackhawk Formation
- Ksp - Start Point Formation
- Kmm - Mancos Shale, Masuk Member

Tertiary
- TKn - North Horn Formation

N

1:12000

0.5 0 0.5 1 Miles

3.2.4 Wildlife

3.2.4.1 Threatened and Endangered Species

Endangered species are species that have been identified, and listed in the Federal Register, by the U.S. Fish and Wildlife Service (Service) as being in danger of extinction throughout all or a significant portion of its range. Threatened species are species that have been identified, and listed in the Federal Register, by the Service as likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (Figure 4, page 26).

Table 3-1 lists wildlife species designated as Threatened or Endangered (T&E) by the Service that could occur in Emery County, Utah. T&E species that could occur in Emery County but do not have suitable habitat and are not likely to occur in or near the proposed project area are also identified in Table 3-1, and will not be considered further in this Wildlife Resources Report. There are no proposed wildlife species identified for Emery County.

Table 3-1
Threatened and Endangered Species

A list of threatened (T) and endangered (E) species that may occur within the area of influence of the proposed Genwal lease modification project in Emery County, Utah.

SPECIES	SPECIES STATUS	SPECIES OCCURRENCE IN THE PROJECT AREA AND CONSIDERATION IN THIS WILDLIFE RESOURCES REPORT
Bald Eagle *Haliaeetus leucocephalus*	**Threatened**	**Not Considered.** There are no habitat features in or near the proposed project area that would attract bald eagles to the vicinity of the proposed project; however they may occur incidentally in or near the proposed project area. Proposed activities within the lease modification area would not impact bald eagle habitat or incidentally occurring eagles in the project area.
Mexican Spotted Owl *Strix occidentalis lucida*	**Threatened**	**Not Considered.** In Utah, the Mexican spotted owl nests in steep-walled, complex rock canyons at relatively low elevations (USDI 2001a). Canyons are generally at least 2 kilometers long and less than 2 kilometers wide. There is no suitable Mexican spotted owl habitat in or near the proposed project area.
Western Yellow-billed Cuckoo *Coccyus americanus occidentalis*	**Candidate**	**Not Considered.** The western yellow-billed cuckoo breeds in Utah, but migrates to South America during winter. Cuckoos are riparian obligates. Nesting habitat is classified as dense lowland cottonwood/willow riparian forest characterized by a dense sub-canopy or shrub layer. In Utah, nesting habitats are found at elevations between 2,500 to 6,000 feet. They appear to require large tracts (100 to 200 acres) of contiguous riparian nesting habitat (Parrish et al. 2002). There are not large contiguous tracts of riparian habitat in the vicinity of the proposed project, and the project area is located above 8,500 feet elevation. Therefore, the proposed project is not likely to affect the Yellow-billed cuckoo.
Southwestern Willow Flycatcher *Empidonax trailii extimus*	**Endangered**	**Not Considered.** The southwestern willow flycatcher is a riparian obligate, nesting in areas with high shrub densities interspersed with openings or meadows; they nest in cottonwood/willow habitats and structurally similar riparian vegetation such as alder and aspen. The proposed project is located in fairly dry pinyon/juniper, sagebrush, mohagany habitats with aspen and ponderosa pine near by; there is no suitable habitat for this species in or near the project area.
Black-footed Ferret *Mustela negripes*	**Endangered**	**Not Considered.** The black-footed ferret depends on prairie dog colonies for food and shelter. There are no prairie dog colonies (potential ferret habitat) in or near the proposed project area. The historic range of the ferret likely included parts of Emery County, but the soils in and near the proposed project would not likely support prairie dogs or ferrets.
Utah Prairie-dog *Cynomys parvidens*	**Threatened**	**Not Considered.** Basic habitat requirements considered for the Utah prairie dog are deep, well-drained soil, vegetation low enough so that prairie dogs can see over or through, and suitable forage (Spahr et al. 1991). There is not suitable habitat in or near the proposed project area.

Bonytail *Gila elegans*	**Endangered**	**Not Considered.** Historically, the bonytail existed in warm water reaches of larger rivers in the Colorado River Basin; it is considered to be adapted to pools and eddies of mainstream rivers. It has been extirpated from most of its historic range. Currently, a small number of wild adults exist in Lake Mohave in the Lower Colorado River Basin, and there are small numbers of wild individuals in the Green River and in subbasins of the Upper Colorado River Basin (USDI 2002a). The bonytail has not been located on the Forest, and the proposed project would not adversely impact drainages where it is found.
Humpback Chub *Gila cypha*	**Endangered**	**Not Considered.** The humpback chub is restricted to deep, swift mainstem and large tributaries in relatively inaccessible canyons of the Colorado River Basin. Adults require eddies and sheltered shorelines in streams that maintain high spring flows that flush sediments from spawning areas and form gravel deposits used for spawning. Young require low-velocity shoreline habitats. Currently, there are six known extant populations, which are located in the Upper Colorado River, Yampa River and Little Colorado River (USDI 2002b). The humpback chub has not been located on the Forest, and the proposed project would not adversely impact drainages where it is found.
Razorback sucker *Xyrauchen texanus*	**Endangered**	**Not Considered.** Historically the razorback sucker was widely distributed in warm-water reaches of the Colorado River and its tributaries from Wyoming to Mexico. Adults require deep pools, eddies and backwaters in spring; shallow water associated with sandbars in summer; and low velocity pools and eddies in winter. Young require quiet, warm, shallow water found at tributary mouths, and in coves or shorelines in reservoirs. Currently, within the Upper Colorado River Basin this species is only found in small numbers in the middle Green River, between the confluence of the Duchesne and Yampa rivers, and in the lower reaches of those two tributaries (USDI 2002d). There are no suitable razorback sucker stream habitats on the Forest, and the proposed project would not adversely impact drainages where it is found.
Colorado pikeminnow *Ptychocheilus lucius*	**Endangered**	**Not Considered.** The Colorado pikeminnow is endemic to the Colorado River Basin, and it historically extended from the Green River in Wyoming, to the Gulf of California; it was widespread and abundant in warm-water rivers and tributaries. It is a long-distance □igratory (hundreds of kilometers to and from spawning areas). Adults require deep pool and eddie habitats in streams that have high spring flows. Currently, in Utah this species occurs in the Green River from Lodore Canyon to the confluence of the Colorado River (USDI 2002c). The Colorado pikeminnow has not been found on the Forest, and the proposed project would not adversely impact drainages where it is found.

3.2.4.2 Sensitive Species

Sensitive species are species that are recognized by the Regional Forester as needing special management attention in order to prevent them from becoming threatened or endangered.

Table 3-2 lists the Intermountain Regional Forester's list of sensitive wildlife species that could occur on the Manti Division of the Manti-La Sal National Forest (MLNF). Sensitive wildlife species that do not occur or have suitable habitat in or near the proposed project area are identified in Table 3-2 and will not be considered further in this Wildlife Resources Report.

Table 3-2
Sensitive Species

Sensitive wildlife species that could occur on the Manti Division of the MLNF, and their potential occurrence in the proposed lease modification area.

SPECIES	SPECIES OCCURRENCE IN THE PROJECT AREA AND CONSIDERATION IN THIS WILDLIFE RESOURCES REPORT
Spotted Bat *Euderma maculatum*	**Considered.** In Utah, the spotted bat is likely found throughout the state. It is known to use a variety of vegetation types from approximately 2,700 to 9,200 feet (Oliver 2000) , including riparian, desert shrub, spruce/fir, ponderosa pine, montane forests and meadows. Spotted bats roost alone in rock crevices high up on steep cliff faces. There are rock outcrops in the proposed lease modification area that could provide suitable roost habitat for the spotted bat.

Townsend's Big-eared Bat *Plecotus townsendii pallescens*	**Not Considered.** In Utah, Townsend's Big-eared Bats roost and hibernate in caves and mines; they also roost (but not hibernate) in buildings (Oliver 2000). There are no caves, mine openings or buildings in the lease modification area, therefore the proposed project is not likely to impact this species.
Greater Sage Grouse *Centrocercus urophasianus*	**Not Considered.** Sage grouse are generally found where there are large tracts of sage brush habitat with a diverse and substantial understory of native grasses and forbs or in areas where there is a mosaic of sagbrush, grasslands, aspen. Wet meadows, springs, seeps, or other green areas within sagebrush shrublands are generally needed for the early brood-rearing period. The proposed lease modification area is located in steep mountanous terrain with limited sagebrush habitat, which does not provide suitable habitat for sage grouse.
Northern Goshawk *Accipiter gentilis*	**Not Considered.** The proposed lease modification area is located in steep mountainous terrain that is partially covered with large tracts of young to medium aged aspen interspersed with spruce/fir and some Douglas fir, which does not provide suitable habitat for the northern goshawk.
Peregrine Falcon *Falco peregrinus*	**Not Considered**. Peregrine falcon's average foraging distance from the eyrie extents out to 10 miles, with 80 percent of peregrine falcon foraging occurring within a mile of the nest, and they have been known to forage up to 18 miles from their nest site (Spahr et al. 1991). There is a peregrine falcon eyrie located approximately 12 miles from the proposed lease modification area. Proposed activities in the lease modification area would not impact foraging peregrine falcons, their nesting habitat or their foraging habitat.
Flammulated Owl *Otis flammeollus*	**Not Considered.** Flammulated owls appear to be associated with mature pine or mixed conifer forests with a ponderosa pine and/or Douglas fir component. There are no mature mixed conifer forest stands in or near the proposed lease modification area that would provide suitable habitat for the flammulated owl.
Three-toed woodpecker *Picoides tridactylus*	**Not Considered.** Three-toed woodpeckers use forests containing spruce, grand fir, ponderosa pine, tamarack, and lodgepole pine. Nests may be found in spruce, tamarack, pine, cedar, and aspen trees. There is no suitable three-toed woodpecker habitat in the proposed lease modification area.
Spotted Frog *Rana pretiosa*	**Not Considered.** Spotted frogs are most commonly found in cold, still, permanent water in such habitats as marshy edges of ponds or lakes, in algae-grown overflow pools of streams, and near flat water springs with emergent vegetation. This frog has a broad distribution throughout the previously glaciated regions of British Columbia. They also occur in the Rocky Mountains of Alberta, and have patchy distribution in the United States, from Washington to Montana and south to Nevada and Utah. In Utah, the spotted frog occurs in isolated populations, and is considered to be a relict from the last ice age. The spotted frog has not been found on the Manti – La Sal National Forest or in the proposed project area.
Colorado Cutthroat Trout *Oncorhynchus clarki pleuriticus*	**Not Considered.** Colorado cutthroat trout require cool, clear water in streams with well vegetated banks, which provides cover and bank stability. Deep pools and structures such as boulders and logs provide instream cover. This species is believed to have formerly been widespread in lakes, rivers, and streams in Utah, however now it is limited to isolated headwater streams and other rigorous environments where other species such as rainbow trout and Yellowstone cutthroat throat have not been introduced. Colorado cutthroat trout are not found in the proposed project area, and the project would not adversely impact drainages where it is found.
Bonneville Cutthroat Trout *Oncorhynchus clarki utah*	**Not Considered.** Bonneville cutthroat trout require cool, clear, well-oxygenated water and the presence of clean, well-sorted gravels with minimal fine sediments for successful spawning. They are found at high, moderate and low elevations in small head water streams in the Bonneville basin (USDI 2001b). Bonneville cutthroat trout are not found in the proposed project area, and the project would not adversely impact drainages where it is found.

The Genwal Resources, Inc. Lease Modification Project has the potential to impact one sensitive wildlife species: the Spotted bat.

Spotted Bat

The spotted bat ranges from Mexico through the western states to the southern border of British Columbia; it is probably widely distributed in low numbers throughout western North America (Toone 1994). And it probably occurs throughout Utah, but its distribution appears to be patchy. Hasenyager (1980) thought that "the range of the spotted bat in Utah could incorporate the southern third of the state and central portions of the west desert where suitable roosts exist, excluding the higher portions of the central mountain range." Habitat occupied by this bat in Utah ranges from low desert (2700 ft) to montane coniferous forests below 9,200 feet in elevation (Oliver 2000). They have been found in a variety of habitat types including open ponderosa pine, desert shrub, pinyon/juniper, and open pasture and hay fields. In Utah, the spotted bat has been captured in several habitats: lowland riparian habitat (open meadows), desert shrub

communities (sagebrush/rabbitbrush), ponderosa pine forest, montane grassland (grass/aspen), and montane forest and woodland (grass/spruce/aspen). This species has also been occasionally found in or on buildings in Utah towns and cities (Oliver 2000). They typically roost singly in crevices in steep cliff faces. Cracks and crevices in limestone or sandstone cliffs provide important roosting sites (Spahr et al. 1991), especially where rocky cliffs occur in proximity to riparian areas. Day roosts and maternal roosts are typically within small (up to 6 cm) cracks and crevices in cliff faces (Toone 1994). The relative inaccessibility of cliff roosts may insulate spotted bats from human disturbance, but the species has been observed roosting (and foraging) near campgrounds (Toone 1994). Spotted bats are thought to feed mainly on moths high above the vegetation canopy. They forage alone after dark using echolocation, which is effective for fast flight feeding on tympanate moths (moths that can detect ultra-sonic sounds). As is common with many bats, spotted bats may forage a considerable distance (up to 6 miles) from roost sites (Toone 1994).

Roosting habitat in the Wasatch Plateau region is likely to occur in numerous cliffs along the edges of the plateau and on canyon walls that cut through the plateau. It is likely that spotted bats forage in a variety of habitats on the Plateau that are located within 6 miles of suitable roost cliffs and at elevations lower than 9,200 ft. Various surveys on the MLNF have detected spotted bats in several major canyons (and their tributaries) on the east side of the plateau, including Muddy, Ferron, Straight, Cottonwood, and Huntington Canyons (Perkins and Peterson 1997, and Sherwin et al. 1997).

Observations made during the 1997 surveys on the MLNF indicated that spotted bats tolerate at least moderate human disturbance while foraging. Surveys were conducted at several sites near roads with light to moderate vehicular traffic (Crandall Canyon, Huntington Canyon, Straight Canyon), including tandem coal trucks. Spotted bats were observed foraging at low elevation sites, within 30 meters of the right-of-way. The fact that spotted bats were relatively common in active and previously mined areas may imply that subsidence caused cliff failures have not dramatically affected resident populations (Sherwin, et al. 1997).

3.2.4.3 Management Indicator Species

Management Indicator Species (MIS) are species identified at the Forest planning level that could indicate changes in Forest habitats resulting from management actions. The potential impacts to these species resulting from management actions are analyzed at the project level.

Table 3-3 lists wildlife species identified as Management Indicator Species (MIS) by the Manti-La Sal National Forest (MLNF) that could occur on the Manti Division of the MLNF. MIS species that do not occur and do not have suitable habitat in or near the proposed project area are identified in Table 3-3 and will not be considered further.

Table 3-3
Management Indicator Species

Table 3-3. Management Indicator Species that could occur on the Manti Division of the Manti-La Sal National Forest.

Species Common name (*Scientific name*)	Species/Habitat Associations	Consideration of this Species
Rocky Mountain Elk *Cervus canadensis*	Elk tend to occupy the higher elevation aspen and mixed conifer habitats from spring through early fall, and move to lower elevation mixed shrub, pinyon/juniper, and sagebrush habitats for winter.	**Not Considered.** Elk are known to use the proposed lease modification area; however proposed activities in the area are not likely to appreciably impact this species or features of its suitable habitat.
Mule Deer *Odocoilus hemionus*	Mule deer use most of the habitat types surrounding the proposed project area. Lower elevation pinyon/juniper and sagebrush habitats provide suitable winter range. Most mule deer winter range is located at the edge of National Forest system lands on BLM managed land. Deer populations in this area exhibit seasonal movement (elevational migration) in response to snow cover.	**Not Considered.** Mule deer are found in and around the proposed lease modification area; however proposed activities in the area are not likely to appreciably impact this species or features of its suitable habitat.
Northern Goshawk *Accipiter gentilis*	Goshawks have been found in a variety of forest ecosystems including lodgepole pine, aspen, ponderosa pine, Douglas fir, and mixed forests throughout much of the northern hemisphere. Goshawk nest sites are usually located in dense mature forests with relatively large trees, near water, and on benches of relatively little slope (Graham et al. 1999). Closed canopies are important for protection and thermal cover, and relatively open understories are important to allow maneuverability during foraging.	**Not Considered.** The proposed lease modification area is located in steep mountainous terrain that is partially covered with large tracts of young to medium aged aspen interspersed with spruce/fir and some Douglas fir, which does not provide suitable habitat for the northern goshawk.
Golden Eagle *Aquila chrysaetos*	Golden eagles generally inhabit mountainous or hilly terrain, but can also be found in valleys and western plains, especially during migration and winter. They generally nest on cliffs, but they also have been known to nest in trees. They hunt over open country for small mammals, snakes, birds and carrion.	**Not Considered.** There is potentially suitable golden eagle nesting habitat near the proposed lease modification area, and there is suitable golden eagle foraging habitat in and near the proposed project area; however proposed activities in the area are not likely to appreciably impact this species or its preferred habitat.
Macroinvertebrates (aquatic Insects)	Aquatic macroinvertebrates play important roles in ecosystems where they occur. Their best known role is serving as food for other organisms, especially fish, amphibians, and water birds. They are also important in other ecological processes such as the breakdown and cycling of organic matter and nutrients.	**Considered.** Aquatic macroinvertebrates occur in streams near the proposed lease modification area. Macroinvertebrates were found in streams near the proposed lease modification area.

Macroinvertebrates (Aquatic)

A variety of aquatic macroinvertebrate species (Collins, Patrick D., Perennial Stream considerations at "No-Name Creek" & Blind Canyon Creek, Tributaries to Huntington Canyon Creek, June, 2004) that require a continuous water source inhabit Blind Canyon Creek, which flows near the northern end of the proposed lease modification area. A number of macroinvertebrates that do not require year-round flows were found in the lower reach of Shingle Canyon Creek, which is east of the lease modification area.

Changes in aquatic macroinvertebrate populations have been linked to changes in aquatic habitat condition due to land management actions. Aquatic macroinvertebrate population changes have been attributed to high spring runoff, to high summer water flows, to low stream flows, increased sedimentation and changes in water chemistry.

3.2.4.4 Migratory Birds

Migratory bird conventions impose obligations on federal agencies for the conservation of migratory birds and their habitats. The Migratory Bird Treaty Act has implemented these conventions with respect to the United States, and Executive Order 13186 ensures that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions on migratory birds, with emphasis on species of concern.

The Utah Partners in Flight Avian Conservation Strategy identifies 20 non-game migratory land birds as priority species. Eleven of these species could be expected to occur on the Ferron/Price Ranger District of the Manti-La Sal National Forest. Table 3-4 lists these species, their habitat associations, and their consideration in the document.

Table 3-4
Neotropical Migratory Birds

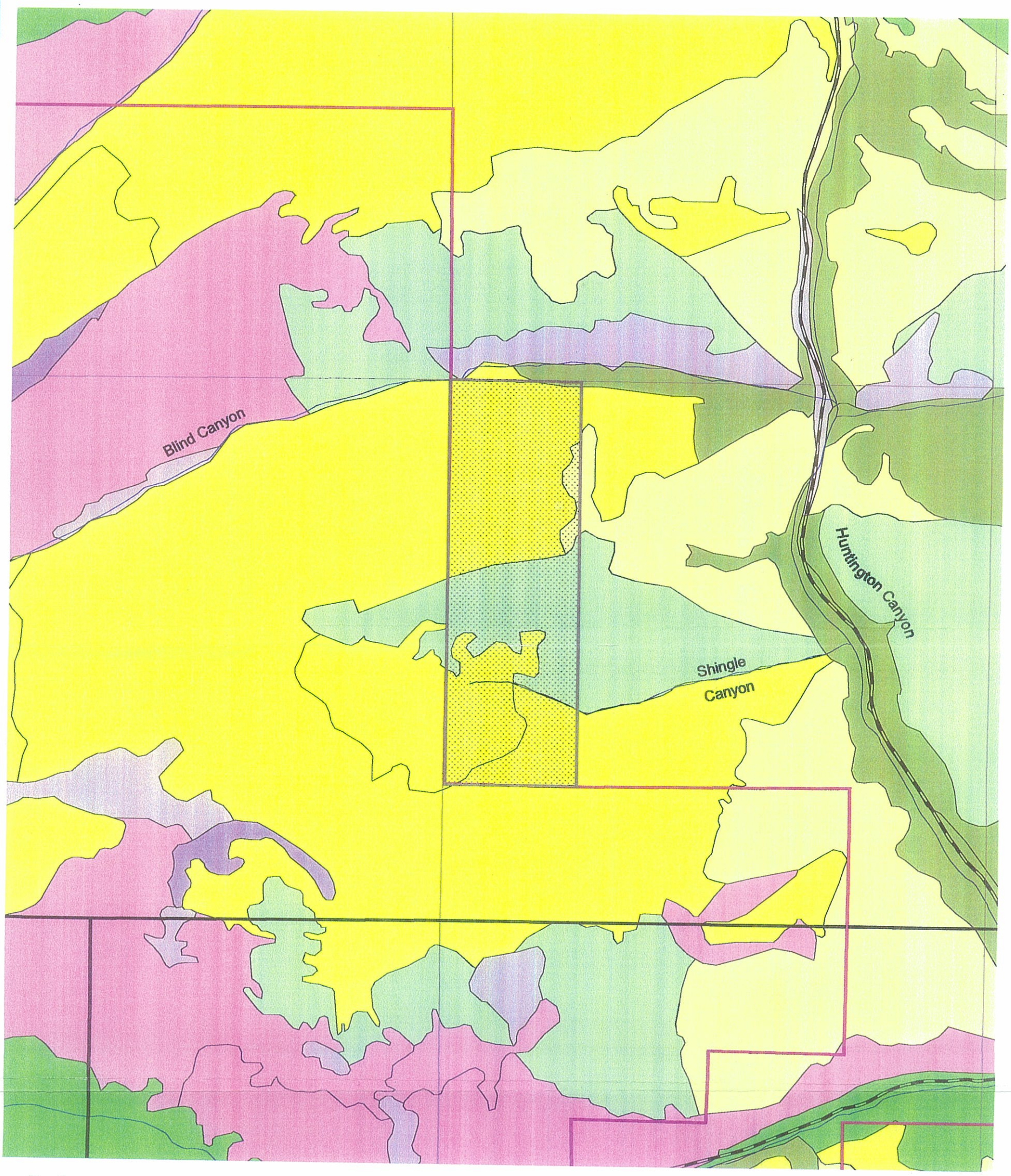
Table 3-4. Neotropical migratory birds (NTMBs) listed as priority species by the Utah Partners in Flight Avian Conservation Strategy that could occur on the Manti Division of the Manti-La Sal National Forest.

Common name (*Scientific name*)	Species/Habitat Associations	Consideration of this species
Virginia's Warbler (***Vermivora virginae***)	Preferred breeding habitat includes chaparral and open stands of pinyon/ juniper, ponderosa pine and scrub oak, mountain mahogany thickets or other low brushy habitats on dry mountainsides. In Utah, the primary breeding habitat is oak, and secondary breeding habitat is pinyon/juniper at elevations ranging from 4,000 to 10,000 ft. (Parrish et al. 2002).	**Not Considered.** Virginia's warblers are known to occur on the Ferron/Price Ranger District of the Manti-La Sal NF, but they are not known to nest here, and there is no suitable breeding habitat in the proposed lease modification area.
Gray Vireo (***Vireo vicinior***)	Preferred breeding habitat is on arid slopes dominated by mature pinyon/ juniper woodlands. This species commonly occurs in suitable habitats in Colorado, Nevada and Arizona at elevations ranging from 3200 ft. to 6800 ft., and they are known to nest in southwest Utah north to Sevier County. Gray vireos are not believed to nest on the Manti Division of the Manti-La Sal NF, but occur at lower elevations in Emery County, Utah (Parrish et al. 2002).	**Not Considered.** The proposed lease modification area does not provide suitable habitat for this species, and the project area is located above 8,000 ft. elevation, which is above the elevation range of this species.
Bell's Vireo (***Vireo bellii arizonae***)	Preferred nesting habitat in Utah is cottonwood-willow dominated riparian areas. This species breeds in southwestern Utah in the Virgin River drainage, Zion NP, and Beaver Dam Wash (Parrish et al. 2002). Bell's vireos are not known to nest on the Manti Division of the Manti-La Sal NF.	**Not Considered.** The proposed project area does not contain suitable riparian habitat for this species.
Black Rosy-Finch (***Leucosticte atrata***)	Breeds above timberline in Alpine tundra using barren, rocky or grassy areas and cliffs among glaciers or at bases of snow fields. In Utah, the largest breeding populations occur in alpine habitats in the Wasatch and Uinta Mountains.	**Not Considered.** The proposed project is located in sub-alpine habitats below the elevation breeding range of the black-rosy finch.

Brewer's Sparrow (*Spizella breweri breweri*)	Breeding habitat is primarily shrubsteppe, but may also breed in high desert scrub (greasewood) habitats. Breeding habitats are usually dominated by big sagebrush (Parrish et al. 2002).	**Not Considered.** There is some potentially suitable breeding habitat within the proposed lease modification area; however proposed activities in this area are not likely to appreciably impact the Brewer's sparrow.
Black Swift (*Cypseloides niger*)	Black swifts nest in small colonies near and often behind waterfalls at elevations ranging from 6,000 ft. to 11,500 ft (Parrish et al. 2002). There are only 2 confirmed breeding locations Utah: the Bridal Veil Falls area and Aspen Grove area (Parrish et al. 2002)	**Not Considered.** The proposed project area does not contain suitable nesting habitat for this species.
Broad-tailed Hummingbird (*Selasphorus platycercus*)	In Utah, the primary breeding habitat is lowland riparian; They have also been recorded as breeding in mountain riparian, aspen, ponderosa pine, Engelmann spruce, subalpine fir, and Douglas fir (Parrish et al. 2002). Nesting typically occurs at elevations ranging from 6,000 to 8,000 ft. near streamside habitat.	**Not Considered.** The broad-tailed hummingbird may occur in the proposed lease modification area; however proposed activities in the area are not likely to appreciably impact this species.
Ferruginous Hawk (*Buteo regalis*)	Usually breeds in areas of flat and rolling terrain in grassland or shrub steppe habitat. Avoids high elevations, forest and narrow canyons. Occurs in grasslands, agricultural lands, sagebrush/saltbrush/greasewood shrub lands and the periphery of pinyon/juniper habitats.	**Not Considered.** The proposed lease modification area is located at high elevations and in steep terrain, which does not provide suitable habitat for the ferruginous hawk.
Yellow-billed Cuckoo (*Coccyzus americanus*)	In Utah, the yellow-billed cuckoo is a rare breeder in large tracts (100-200 acres) of contiguous dense lowland riparian habitats. Over the last 10 years, there are only 3 breeding records in the state; none on the Manti Division of the Manti-La Sal NF (Parrish et al. 2002).	**Not Considered.** There are no large tracts of riparian habitat in or near the proposed lease modification area; the project does not provide suitable habitat for the yellow-billed cuckoo.
Black-throated Gray Warbler (*Dendroica nigrescens*)	Preferred breeding habitat includes dry oak slopes, pinyon, juniper, pinyon/juniper woodlands, open mixed woods, and dry coniferous and mixed conifer habitats with brushy understories, and in chapparal. It occurs from sea level up to 5400 ft. elevation.	**Not Considered.** The proposed project is located above 8,000 feet elevation, which is above the elevation range of the black-throated gray warbler.
Sage Sparrow (*Amphispiza belli nevadensis*)	Uncommon permanent resident in Utah; occurs up to 8,000 ft. elevation. Nests have been found in rabbitbrush, hopsage, saltbush, and big sage.	**Not Considered.** There is some potentially suitable breeding habitat within the proposed lease modification area; however proposed activities in this area are not likely to appreciably impact the sage sparrow.

Figure 4

Modification of Federal Coal Lease UTU-68082
Habitat



3.3 DESCRIPTION OF OTHER RESOURCES

3.3.1 Range and Noxious Weeds

The lease modification area lies on the allotment boundary between the Gentry Mountain cattle allotment and the Crandall Ridge sheep allotment. This is a very steep area with rock outcrops and is not considered suitable for grazing by either sheep or cattle. The area is mostly mapped as unsuitable aspen. No conflicts are anticipated with the lease proposal as far as impacts to available livestock forage.

The closest livestock watering troughs are approximately 2500 feet to the southwest of the project area. This area has been previously undermined without reported damage to the troughs. In the project area itself, there are four springs that provide water for sheep while they graze the upper ridges. Cattle water in the bottom of the canyon along Huntington Creek and no impacts to available water are anticipated in this area.

Crandall Ridge Sheep Allotment

Presently, this allotment is being combined with the Crandall Canyon Sheep Allotment but the combination of these two allotments has not been finalized at this time. The permitted number of sheep is expected to be 900 head with a July 1 to September 30 grazing season. There are 3 sheep permittees dependent on this allotment for summer forage.

Gentry Mountain Cattle Allotment

The allotment provides forage for 1440 head of cattle with a June 27 to September 30 grazing season. Fifteen livestock permittees, mostly from Huntington, Utah, graze their cattle within the permitted area. Approximately 400 head enter the allotment through Huntington Canyon (west side of allotment), others enter through Mohrland (east side of Gentry Mountain). Those that use Huntington Canyon graze up side canyons and along Huntington Creek to Pole Canyon where the cows are moved to the top of Gentry Mountain. Steep side slopes in the canyon keep cattle in the bottoms and rarely do they get to the top of East Mountain.

Noxious Weeds

Musk thistle is well established in side canyons in Huntington Canyon. Any surface disturbance of the lease area would most likely be invaded by musk thistle unless aggressive control action is initiated. The status of weeds within the lease area is not known but canyons on either side of the new lease (Blind and Crandall Canyons) have established stands of musk thistle. Biological control agents have been placed throughout Huntington Canyon but establishment of viable populations of those insects has been spotty.

No roads or portal facilities would be constructed for this project and, therefore, noxious weed introduction should not occur.

3.3.2 Paleontological and Cultural Resources

Paleontology

The area between Crandall Canyon and Blind Canyon was reviewed on Forest Service Paleontological Inventory Maps. There are no known paleontological resources in the area and very few rock outcrops within the area that lend it to meaningful fossil surveys. Therefore, there is presently no concern that the coal lease modification project would impact any resources in paleontology.

Archaeological Resources

The area was surveyed for potential historic or archaeological resources in June 2004. None were found and the potential effects have been determined to be negligible. A letter received from the Utah State Historic Preservation Office states that no historic properties would be affected in the area.

Should any unanticipated paleontological or cultural resources be encountered during the implementation of this project, all work would stop until assessment of the finding could be made.

3.3.3 Roadless Area

The proposed coal lease modification lies within the East Mountain Roadless Area. The undeveloped character of the roadless area would not be affected. No roads or portal facilities would be constructed for this project. The proposed lease modification is an isolated area adjacent to the current lease; it contains a small amount of mineable coal accessible only through the current lease. The proposed action would not lead to other future mining actions. The coal lease modification would be mined entirely by underground mining methods and adjacent existing underground mine workings would access the tract. The amount of subsidence would be minimal, approximately 3 feet.

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter identifies the projected impacts of implementing each of the alternatives considered in detail in Chapter 2. This chapter discloses the potential direct/indirect effects, cumulative impacts, and irreversible and irretrievable commitments for the Issues Evaluated in Detail. The criteria for significant impacts refer to adverse impacts to the quality or quantity of perennial streams, intermittent stream segments tributary to perennial streams, reservoirs, wetlands, and surface water rights. Insignificant impacts are those related to ephemeral drainages, intermittent streams, and ponds. Direct and indirect effects are those effects that would likely occur during or shortly after implementation of a specific alternative. Direct/indirect effects are presented by resource topic corresponding to the issues identified in Chapter 1. Cumulative impacts are those effects that may occur with implementation of an alternative combined with other past, present, or reasonably foreseeable actions. Activities on East Mountain that could add incrementally to the impacts of the proposed lease modification are included in Appendix A. An irreversible commitment of resources generally applies to non-renewable resources; however, it could also apply to actions that can only be renewed after a very long period of time. Irretrievable commitments apply to losses of production or commitment of renewable natural resources; the loss is only irretrievable for the period of time during which the disruption to the resource is taking place.

Table 4-1, List of Alternatives

Alternative 1 - No Action
Alternative 2 - Consent/Approval of Project as Proposed
Alternative 3 - Approval of the Project with Supplemental FS Mitigations

4.2 DIRECT AND INDIRECT EFFECTS OF ALTERNATIVE IMPLEMENTATION

4.2.1 Surface Water

Alternative 1 - No Action

Direct and Indirect Effects

No change from those described in Chapter 3.

Cumulative Impacts

No change from the existing condition.

Irreversible and Irretrievable Commitment of Resources

None.

Alternative 2 - Approval of the Lease Modification as Proposed

Direct and Indirect Effects

Full extraction mining could cause fractures to extend from the mine to the surface where overburden (Figure 2, page 15) is less than approximately 50 times the height of the extracted coal (Peng, BLM communication November 2004). The maximum depth that tension fractures extend below the surface is approximately 50 feet (Maleki, FS communication November 2004). Based on these data, the overburden necessary to prevent fracturing that could extend from the surface to the mine workings would be 50 times the thickness of the coal plus 50 feet. Figure 2 depicts a 300 foot overburden contour for a 5 foot seam (5 feet of coal x 50 plus 50 feet = 300 feet). These fractures could divert water (which would normally flow down the drainages) from the surface into the mine workings. The result would be a decrease in flow with associated impacts to drainages. The fractures would tend to heal within a few years by a combination of sloughing of sediments into the fractures and swelling of the clays. The loss of water could impact the riparian habitat around the springs, along the drainages, and the stock watering rights held by the FS.

Cumulative Impacts

The impacts to surface water may add incrementally to the impacts to surface water by other past, present, and future mining activities in Huntington Canyon. Subsidence and surface cracking may result in alteration of surface and subsurface water flow paths, ultimately affecting the springs and seeps supplying water to the drainages.

Huntington Creek is currently experiencing reduced flows due to long term drought conditions and limited releases from Electric Lake.

Irreversible and Irretrievable Commitment of Resources

Crandall Canyon Mine seldom has a need to discharge water to Crandall Canyon Creek. Most of the water seeping into the mine is utilized as process water. Therefore, surface water diverted to the mine might not be discharged back into the Huntington Creek watershed through the mine portal in Crandall Canyon. The water would be irretrievably lost as far as its use in supporting the riparian system and stock watering along Shingle Canyon Creek and Blind Canyon.

Alternative 3 - Approval of the Lease Modification with Supplemental Mitigations

Direct and Indirect Effects

Not allowing surface subsidence in areas with insufficient overburden would limit fractures from connecting the surface with the mine workings, and thus would prevent water from being diverted into the mine. The surface water would be kept on the surface to support the riparian systems and stock watering rights in the drainages. There would be no direct or indirect effects to surface water resources.

Cumulative Effects

Mining in the area of the lease modification would not increase cumulative impacts to the surface water resources of the Huntington Creek drainages. Impacts of other mining activities in the area would continue.

Irreversible and Irretrievable Commitment of Resources

None.

4.2.2 Ground Water

Alternative 1 - No Action

Direct and Indirect Effects

No change from those described in Chapter 3.

Cumulative Impacts

No change from the existing condition.

Irreversible and Irretrievable Commitment of Resources

None.

Alternative 2 - Approval of the Lease Modification as Proposed

Direct and Indirect Effects

Surface subsidence effects could affect flow patterns to existing springs and seeps that are located in areas with insufficient overburden. Several springs and seeps (Figure 2, page15) are located in areas with insufficient overburden (5 ft coal seam thickness x 50 plus 50 feet = 300 feet). With insufficient overburden, subsidence cracks could reach from the mine to the ground surface, providing a direct hydraulic connection. Surface water (interflow, through flow, and sheet flow) and groundwater (springs and seeps)

would be intercepted by the mine workings in this case, depriving the drainage of the water it would normally receive. Riparian areas are probably associated with each of these springs/seeps. Loss of this water could affect the production of forage available for cattle, sheep, and wildlife, resulting in a reduction in the cattle and sheep allotments and in a change of wildlife habitat.

Cumulative Impacts

The past, present or reasonably foreseeable future actions that may add incrementally to impacts to the ground water resources of the area are mining activities within:

1) Mill Fork Coal Tract (Deer Creek Mine, Energy West Mining Company).

2) South Crandall Revision (Crandall Canyon Mine, Genwal Mining Company).

3) Crandall Canyon Mine.

Subsidence and surface cracking from underground coal mines in the area may result in alteration of flow paths to springs and seeps with potential loss of water.

Irreversible and Irretrievable Commitment of Resources

If a sufficient overburden were not maintained, there would be an irreversible loss of ground water captured by the mine. The amount of water lost to the mine would be irretrievable.

Alternative 3 - Approval of the Lease Modification with Supplemental Mitigations

Direct and Indirect Effects

Requiring an overburden of 50 times the coal seam thickness plus 50 feet would limit the possibility of subsidence cracking providing a direct hydraulic connection between the mine and surface. In this case, the mine would not capture surface runoff and alluvial ground water flow and there would be no direct or indirect effects to ground water resources in the proposed lease modification.

Cumulative Impacts

Cumulative impacts to ground water resources would not be expected under this alternative.

Irreversible and Irretrievable Commitment of Resources

None.

4.2.3 Escarpment Failure

Alternative 1 - No Action

Direct and Indirect Effects

No change from those described in Chapter 3.

Cumulative Impacts

No change from the existing condition.

Irreversible and Irretrievable Commitment of Resources

None.

Alternative 2 - Approval of the Lease Modification as Proposed

Direct and Indirect Effects

The estimated surface subsidence is approximately 3 ½ feet, based upon a 5 feet coal seam thickness. Approximately 1400 feet of the Castlegate sandstone escarpment is susceptible to subsidence (Figure 3, page 17). Subsidence could result in tension racking and the possible separation of blocks from the escarpment. The small size of the escarpment, its remoteness, the fact that no man-made structures are present in the lease modification area, and its distance from the nearest road all tend to mitigate the effects of undermining the escarpment.

The projected amount of subsidence in ledges associated with this project would not be expected to create apparent visual changes. The subsidence in ledges would appear as natural occurrences and blend with existing ledge features. This result is consistent with the Visual Quality Objectives of Modification and Partial Retention for the area.

There are no raptor nests located within or near the tract; therefore there would be no direct or indirect effects to raptors.

Erosion would be slightly increased over natural conditions. However, this would not lead to a substantial increase in sedimentation received by any of the drainages within or near the tract.

Cumulative Impacts

None.

Irreversible and Irretrievable Commitment of Resources

None.

Alternative 3 - Approval of the Lease Modification with Supplemental Mitigations

Direct and Indirect Effects

Same as Alternative 2.

Cumulative Impacts

Same as Alternative 2.

Irreversible and Irretrievable Commitment of Resources

Same as Alternative 2.

4.2.4 Wildlife

Alternative 1 - No Action

Direct and Indirect Effects

No change from those described in Chapter 3.

Cumulative Impacts

No change from the existing condition.

Irreversible and Irretrievable Commitment of Resources

None.

Alternative 2 - Consent/Approval of the Lease modification as Proposed

Direct and Indirect Effects

The proposed lease modification would not likely directly or indirectly impact any threatened, endangered, proposed or candidate wildlife species or their preferred or critical habitat (Figure 4, page 26). However one sensitive wildlife species, the spotted bat, could potentially be impacted.

Spotted bats are known to occur in Huntington Canyon, which is located just east of the proposed lease modification area. Rock outcrops in the project area may provide

marginally suitable roost habitat; however since there is an abundance of cliff faces more suitable for roosting throughout Huntington Canyon and its tributaries, roosting in the project area is not expected to be common. Therefore, there is not likely to be appreciable direct or indirect affects to roosting spotted bats or roosting habitat.

Spotted bats may forage in the proposed lease modification area; however proposed activities in the project area would not alter foraging habitat and the project would not likely directly or indirectly impact foraging spotted bats.

Macroinvertebrates could be impacted by a loss of water in Shingle Canyon Creek under this alternative. Without an adequate overburden thickness, the mine could intercept water that would normally enter the drainage.

Cumulative Impacts

Under this alternative, there would be cumulative impacts to the macroinvertebrate population downstream of the lease modification area. The drainage would be deprived of the water that the macroinvertebrates require to survive.

Irreversible and Irretrievable Commitment of Resources

An irreversible commitment of resources would be associated with the loss of habitat supporting the macroinvertebrate population.

The loss of habitat supporting the macroinvertebrate population would be an irretrievable commitment for the time that surface water is intercepted by the mine.

Alternative 3 - Approval of the Lease Modification with Supplemental Mitigations

Direct and Indirect Effects

Under this alternative, an adequate overburden thickness would be maintained, flows would remain intact and effects to the macroinvertebrate population would be mitigated.

Cumulative Impacts

Since the proposed lease modification area would not appreciably directly or indirectly affect aquatic macroinvertebrates, there would be no cumulative impacts as a result of the proposed project.

Irreversible and Irretrievable Commitment of Resources

Under this alternative, there would be no irreversible or irretrievable commitment of resources.

CHAPTER 5
COMMENTS AND RESPONSES

5.1 INTRODUCTION

This chapter presents the comment letters received by the Forest Service in response to public scoping and the Forest Service responses to those comment letters. Four letters were received and each one was assigned a number based upon the order in which it arrived. The letters are presented in their entirety in Section 5.3, following the responses. A bracket in the left column identifies individual comments in each letter; the number accompanying the bracket keys the comment to the appropriate response.

The 4 letters received are listed below:

Letter Number	Letter Date	Affiliation
1	June 2, 2004	Utah Environmental Congress
2	June 3, 2004	The Hopi Tribe
3	July 8, 2004	U.S. Fish and Wildlife Service
4	July 13, 2004	The Navajo Nation

5.2 RESPONSES

The responses to comments are presented below in the order the letters were received.

Comment Letter 1
Utah Environmental Congress

Comment 1.1:
"The Legal Notice of opportunity to comment on the Proposed Action states that an 'Environmental Analysis' will be conducted".

"Coal lease modifications may not be Categorically Excluded from NEPA because they trigger the environmental assessment/environmental impact statement process".

"Is the Forest actually intending to CE the proposed coal lease modification?"

FS Response:
The Forest Service and the BLM will prepare an Environmental Analysis for this project.

Comment 1.2:
"The Legal Notice of Proposed Action does not provide an adequate description of the Proposed Action. All that exists is a general township and range description of the area

of concern (in Township 16 South, Range 7 East, SLM) and a statement that a coal lease modification is proposed in that location".

FS Response:
The original legal notice (published on May 4, 2004) incorrectly stated that the lease modification was located in Township 16 South. It was republished on June 8, 2004 to correctly state Township 15 South. However, the public scoping letters that were sent out to 77 recipients (including UEC) on May 10, 2004 correctly stated that the lease was located in Township 15 South.

Both the revised legal notice and public scoping letter adequately describe the location of the proposed coal lease modification and the purpose of adding the 120 acre tract to the existing lease.

Comment 1.3:
"There is no description of any restrictions, allowances, stipulations or mitigation that may or may not be associated with the proposed action".

FS Response:
It is Forest Service policy to develop stipulations and mitigations during the NEPA process; therefore, the Forest Service does not identify mitigations at the time of scoping.

Comment 1.4:
"The UEC is concerned that the Proposed Action described in the Legal Notice of Opportunity to Comment on the Proposed action may be part of a larger action or plan but is being analyzed separately in a manner that is not consistent with NEPA".
"Located immediately south of Rilda Canyon, this Proposed Action appears to be an interdependent part of a larger action or plan to expand a coal mine further under the southern end of the East Mountain roadless area".

"Accordingly, these analyses should be combined into one NEPA analysis, and not inappropriately compartmentalized".

FS Response:
As explained under the response to Comment 2, the proposed lease modification area is in Township 15; approximately 5 miles north of the proposed Rilda Canyon portal facilities. The coal reserves in the proposed 120 acre lease modification would be approached from existing underground mine workings in the Crandall Canyon Mine. No roads or portal facilities would be constructed for this project. The proposed lease modification area is an isolated area adjacent to the current lease; it contains only a small amount of mineable coal accessible only through the current lease. The proposed action would not lead to other future mining actions. The maximum modification for any lease is 160 acres. That puts a limit on how much acreage could be added as a lease modification without issuing a new lease.

Comment 1.5:
"Furthermore, we are concerned that many of the current and proposed oil, gas and coal projects on the Wasatch Plateau have cumulative impacts that were not included or anticipated in the scope of the 1986 Manti-La Sal Forest Plan FEIS, or the 1992-1994 amendments that dealt solely with oil/gas cumulative effects and NOT the cumulative effects of subsidence coal mining".

FS Response:
Cumulative impacts, including associated subsidence related impacts, for coal areas were addressed in the 1986 Manti-La Sal Forest Plan FEIS. Cumulative effects for oil and gas projects were addressed in the 1992 Oil and Gas FEIS, in the EA completed for the original lease to be readjusted, and in the EA for the adjacent Mill Fork Tract (currently leased as State Coal Lease ML 48258).

Comment 1.6:
"Because of the adverse, long term cumulative effects to forest resources that have not been adequately disclosed or analyzed, we urge the Forest to develop a new programmatic EIS or SEIS that would disclose, discuss, and analyze the significant cumulative impacts to the watershed, Threatened, Endangered species (including Threatened and Endangered fish who may be adversely impacted downstream off of the Forest), as well as Proposed (ESA), FS Sensitive species".

FS Response:
The Forest Plan is currently under revision. The associated environmental analysis will include a cumulative effects analysis, as appropriate, including an assessment of effects to Threatened, Endangered, and Sensitive species.

Comment 1.7:
"Cumulative effects to wolverine have never been disclosed or analyzed, and need to be with this analysis".

FS Response
The Utah Division of Wildlife Resources (DWR) has stated that "the species was probably never common in Utah..." and that "Wolverines prefer alpine tundra and mountain forests that are not frequented by humans." Sightings have been reported in parts of Utah, but not near the project area. DWR has recently mapped potential wolverine habitat, which includes the lease modification area. However, underground coal mining within the lease modification area would not impact possible wolverine habitat on the Forest.

Comment 1.8:
"We are also concerned that the irretrievable and irreversible commitments of roadless and wilderness resources have not been disclosed or properly analyzed for this region".

FS Response:
No roads or surface facilities are anticipated for this project; there would be no effects to

the roadless character caused by the project.

Comment 1.9:
"Perhaps most importantly, there needs to be a rigorous analysis of the cumulative effects to the watersheds originating on the Wasatch Plateau from the extensive oil, gas, AND coal mining. Most, if not all perennial streams, reservoirs, and springs in this part of the Wasatch Plateau have been affected by the cumulative impacts of oil, gas and coal mining, but there has never been an adequate analysis of the cumulative effects".

FS Response:
As noted in the response to Comment 5, cumulative effects for coal areas were addressed in the 1986 Forest Plan FEIS; additionally, cumulative effects for oil and gas development were addressed in the 1992 Oil and Gas FEIS.

Comment 1.10:
"The Migratory Bird Treaty Act (MBTA) makes it unlawful to take, kill, or possess migratory bird resources, which includes individuals, their young, their parts, nests, or eggs".

"To help meet responsibilities under Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), the UEC recommends that you conduct activities outside critical breeding seasons for migratory birds, minimize temporary and long-term habitat losses, and mitigate all unavoidable habitat losses".

FS Response:
As described previously, no surface facilities or roads are anticipated for this project. The coal lease modification would be mined entirely by underground mining methods and adjacent existing underground mine workings would access the tract. The amount of subsidence would be minimal and it is not anticipated that migratory birds would suffer adverse effects.

Comment 1.11:
"Consultation with U.S. Fish and Wildlife Service should be conducted for the Mexican Spotted Owl (MSO) and Lynx since this area may contain suitable habitat for both listed species, and this is close to the only recent, confirmed lynx in Utah. Population and habitat surveying for MSO should be conducted throughout the project area and cumulative effects analysis area(s) (which are not disclosed in the Scoping Notice), focusing on cliffs, rock outcroppings, and other escarpments, which may contain MSO or their habitat".

"The Township and Range description provided identifying the Proposed Action is very close to at least one confirmed active Golden eagle nest that needs to be closely monitored and appropriate mitigation measures need to be provided in the Proposed Action.

FS Response:
The land surface elevation in the proposed lease modification area is above potential MSO habitat. There is no suitable MSO or lynx habitat in the proposed lease modification area. Consultation with the U.S. Fish and Wildlife Service will take place as appropriate based on conclusions of the Biological Evaluation/Biological Assessment and agreements between the agencies. The selected alternative will provide for monitoring and protection of wildlife determined necessary.
There are no raptor nests in or near the proposed lease modification area that could potentially be affected by subsidence.

Comment 1.12:
"Mule deer, Rocky mountain elk, macroinvertebrates (BCI), goshawk, three toed woodpecker are MIS that should be central issues with the proposed subsidence mining".

"Specifically, any site-specific analysis must address the impacts of development to MIS, MIS populations, as well as MIS habitat".

FS Response:
An impact analysis for MIS species will be provided in the EA and/or supporting documents for the proposed lease modification. The Three-toed woodpecker is not an MIS for the Manti-La Sal N.F.

Comment 1.13:
"Subsidence of the surface may disrupt the soils, hydrology and physiological integrity of the plants that comprise the mixed conifer forest on the surface, making the forest more susceptible to insect and disease. Stressed and insect-infested coniferous forests may or may not present greater risk of wildfire (in terms of ignitability and intensity of burn)".

FS Response:
The vegetative cover on the proposed coal lease modification is not mixed aspen-conifer. Aspen Plant Community covers 86 of the 120 acres; grass and Big Mountain Sagebrush cover the remaining 34 acres. The effects of subsidence have been evaluated in the EA and mitigations developed as necessary to minimize effects to meet Forest Plan direction for the area.

Comment Letter 2
The Hopi Tribe

Comment 2.1:
"As you know, the Hopi Cultural Preservation Office supports the identification and avoidance of prehistoric archaeological sites and Traditional Cultural Properties. Therefore, to assist us in determining if the area of potential effect for this proposal contains cultural resources significant to the Hopi Tribe, please provide us with a copy of the cultural resource survey report of the project area for review and comment".

FS Response:
The cultural resource survey report for the project has been submitted to the Hopi Cultural Preservation Office.

Comment Letter 3
U.S. Fish and Wildlife Service

Comment 3.1:
"During a conversation between Diana Whittington of our office and Karl Boyer from the Forest (June 24, 2004), we learned that the area under consideration for mining in this current lease addition presents conditions that may lead to loss of perennial surface water from mining subsidence".

FS Response:
Mr. Erik Petersen performed a hydrologic investigation of the proposed coal lease modification area. Two visits were performed during May and June 2004. A hydrologic report based on the findings was submitted to the Forest Service in late June. On the first visit, all of the springs and seeps that had been identified in the study area during past surveys were monitored for discharge and water quality. The drainage in the southern portion of the study area, referred to as No-Name Canyon, was also monitored for discharge and water quality on both visits. Recent and historical data indicate that the springs and seeps are not supported by a deep-seated reservoir capable of sustaining flow throughout the year. Rather, they are supported by snowmelt during the spring and early summer. The flows recorded in No-Name Canyon also reflect these findings. The basic conclusion of the report was that No-Name Canyon is not perennial.

Mr. Patrick Collins performed a field investigation of the same area in May and June 2004. Mr. Collins' investigation relied mainly on biological resource indicators. Relative comparisons of stream flows were also made on the three visits to the area; actual discharges were not recorded. Macroinvertebrate species in No-Name Canyon indicate that it is not perennial. However, certain plant species found in the drainage leave open the possibility that the stream could be given a perennial designation. Mr. Collins stated that it is possible that No-Name Canyon could be intermittent in the upper reaches and perennial in the lower reaches. Mr. Collins also stated that the only method to make a conclusive determination regarding perennial status was to conduct another survey of the area later in the growing season. With regard to Blind Canyon, Mr. Collins stated that a perennial designation could be assigned to that drainage with much more confidence at this time.

Comment 3.2:
"In general, areas with shallow overburden will be more prone to surface cracks from subsidence, and thus more prone to loss of surface water. Also, given the close proximity of the coal seam to the surface, there may be an increased risk to wildlife from contamination of water that seeps through the subsidence cracks and then resurfaces quickly".

FS Response:
Approximately 25% of the proposed coal lease modification has 300 feet or less of overburden. The two areas of concern are in the northern and southeastern portions of the lease modification. Many of the springs and seeps are located in the southeastern area. Studies and experience have shown that an overburden equal to 50 times the coal seam thickness plus 50 feet is required to prevent structural cracking reaching from the mine to the ground surface. Since the coal seam thickness is expected to be approximately 5 feet, the overburden required is 300 feet. If less overburden is present a direct connection (through ground cracking) to the surface would be established, resulting in the capture by the mine of surface runoff, interflow, and throughflow. In order to prevent this, the FS has required a stipulation that will limit full extraction mining to areas with overburden equal to 50 times the coal thickness plus 50 feet.

Comment 3.3:
"These aspen stands are in the immediate vicinity of the springs and seeps that might be affected by mining subsidence. Loss of these springs and seeps may result in loss of the aspen stands, a primary breeding habitat for a Service Bird of Conservation Concern, the red-naped sapsucker. In addition, aspen stands provide high-value habitat for big game species such as elk and mule deer".

"In light of the aforementioned value of perennial surface waters to fish and wildlife resources, we recommend that any mining permitted be limited to mining for non-subsidence in areas where loss of springs or seeps may occur".

FS response:
Mining subsidence, in itself, might not result in the loss of the seeps and springs as long as sufficient overburden is present to prevent a direct connection between the mine and ground surface. Additionally, aspen stands are not linked to springs and seeps.

Comment 3.4:
"Federal agencies have specific additional responsibilities under Section 7 of the ESA. To help fulfill these responsibilities, we are providing an updated list of threatened (T) and endangered (E) species that may occur within the area of influence of your proposed action".

"The proposed action should be reviewed and a determination made if the action will affect any species or their critical habitat. If it is determined by the Federal agency, with the written concurrence of the Service, that the action is not likely to adversely affect listed species or critical habitat, the consultation process is complete, and no further action is necessary".

"Formal consultation (50 CFR 402.14) is required if the Federal agency determines that an action is 'likely to adversely affect' a listed species or will result in jeopardy or adverse modification of critical habitat (50 CFR 402.02)".

"A written request for formal consultation or conference should be submitted to the

Service with a completed biological assessment and any other relevant information (50 CFR 402.12).

FS Response:
A thorough wildlife analysis will be performed, in which the effects to each listed species resulting from the proposed project will specifically be addressed, and the results presented in the BE/BA. If it is determined that a listed species would be adversely affected, the Service would be consulted.

Comment 3.5:
"Candidate species have no legal protection under the Endangered Species Act (ESA). Identification of candidate species can assist environmental planning efforts by providing advance notice of potential listings, allowing resource managers to alleviate threats and, thereby, possibly remove the need to list species as endangered or threatened".

"Only a Federal agency can enter into formal Endangered Species Act (ESA) section 7 consultation with the Service".

"The ultimate responsibility for compliance with ESA section 7, however, remains with the Federal agency".

"Your attention is also directed to section 7(d) of the ESA, as amended, which underscores the requirement that the Federal agency or the applicant shall not make any irreversible or irretrievable commitment or implementation of reasonable and prudent alternatives regarding their actions on any endangered or threatened species".

FS Response:
If consultation is necessary, the Forest Service will enter into that consultation. No irreversible or irretrievable commitment will occur during the consultation period.

Comment 3.6:
"Raptor surveys and mitigation measures are provided in the Raptor Guidelines as recommendations to ensure that proposed projects will avoid adverse impacts to raptors, including the peregrine falcon".

FS Response:
A recent raptor survey was conducted of the proposed coal lease modification. No nests are located in or near the proposed project area. Guidelines in the "Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances" will be adhered to.

Comment 3.7:
"Threats that warrant a species listing as a sensitive species by state and federal agencies and as threatened or endangered under the ESA should be significantly reduced or eliminated through implementation of the Conservation Agreement. Project plans should be designed to meet the goals and objectives of these Conservation Agreements".

FS Response:
The Colorado River Cutthroat Trout is not found in the proposed project area. Subsidence in the project area would not result in a detectable increase in sedimentation in nearby streams that contain Colorado River Cutthroat Trout.

Comment Letter 4
Navajo Nation Historic Preservation Department (HPD)

The HPD stated that after reviewing our scoping letter describing the project and cross referencing their sacred sites database, they did not have any immediate concerns with the project and that the project would not impact any Navajo Traditional Cultural Properties.

5.3 COMMENT LETTERS

COMMENT LETTER 1

Providing a voice for the voiceless

Utah Environmental Congress

June 2, 2004

Alice Carlton, Forest Supervisor
Manti-La Sal National Forest
599 West Price River Drive
Price, UT 84501

Dear Ms. Carlton,

The substantive Utah Environmental Congress (UEC) comments in response to the Legal Notice of Proposed Action published in the Newspaper of Record on May 4, 2004 for a lease modification to UTU-68082 are below. Please provide a written response to all of our comments in the environmental assessment/environmental impact statement that is prepared, and include them in the project file.

COMMENT 1.1

The Legal Notice of opportunity to comment on the Proposed Action states that an "Environmental Analysis" will be conducted. What is that? Coal lease modifications may not be Categorically Excluded from NEPA because they trigger the environmental assessment/environmental impact statement process. We therefore assume that this is not in reference to the more generic 'environmental analysis' that the Manti-La Sal National Forest (MLSNF) usually conducts for CEs. Is this a mistake in the Legal Notice? Is the Forest actually intending to CE the proposed coal lease modification?

COMMENT 1.2

The Legal Notice of Proposed Action does not provide an adequate description of the Proposed Action. All that exists is a general township and range description of the area of concern (in Township 16 South, Range 7 East, SLM) and a statement that a coal lease modification is proposed in that location. Because the Proposed Action has not been adequately described, the ability of the public and other Agencies to provide comments that are within the scope of the proposed action, that are specific to the proposed action, have a direct relationship to the proposed action and include supporting reasons for the Responsible Official to consider has been diminished. The Legal Notice of Proposed Action has been attached to these comments for reference with attachment #1.

This concerned me so I contacted Carl Boyer (the contact person listed in the Legal Notice for more information) this morning, expressing my concern that the Legal Notice did not contain an adequate description of the proposed action that the public is expected to provide substantive comment upon. I asked Mr. Boyer for more detail on what the Proposed Action entails. As an example of what is missing from the Legal Notice, I pointed out to Mr. Boyer that all that is provided is a township and range description identifying the location of the proposed coal lease modification along with a statement that the lease will be modified.

COMMENT 1.3

There is no description of any restrictions, allowances, stipulations or mitigation that may or may not be associated with the proposed action. Mr. Boyer explained that it would not make sense to attach stipulations and

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The UEC is concerned that the Proposed Action described in the Legal Notice of Opportunity to Comment on the Proposed Action may be part of a larger action or plan but is being analyzed separately in a manner that is not consistent with NEPA. The CEQ Regulations at 40 CFR part 1508.25(a) (1) state that to determine the scope of EISes, among other things, agencies shall consider three types of actions as "connected" if they:

- Automatically trigger other actions which may require environmental impact statements.
- Cannot or will not proceed unless other actions are taken previously or simultaneously.
- Are interdependent parts of a larger action and depend on the larger action for their justification.

COMMENT 1.4

Located immediately south of Ridla Canyon, this Proposed Action appears to be an interdependent part of a larger action or plan to expand a coal mine further under the southern end of the East Mountain roadless area. The UEC just submitted scoping comments on another related aspect of this action: the proposed new mine portal roughly 1 mile to the north. Because these two proposals are directly related to, and dependant upon the larger action or plan to expand this mine and provide the necessary new portal(s), we have attached our scoping comments on that project to these comments and hereby incorporate them in their entirety. The UEC believes that the factors listed above apply to these two proposals because they are interdependent parts of the larger action to expand the mine and are dependant on that expansion for their justification. Accordingly, these analyses should be combined into one NEPA analysis, and not inappropriately compartmentalized. In evaluating the intensity of a proposed action to determine its significance, the CEQ regulations at section 1508.27(7), tell agencies to consider whether "the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or breaking it down into small component parts." The courts have consistently ruled that Agencies are not allowed to avoid their responsibilities for cumulative effects analysis under NEPA by artificially dividing a larger plan or action into smaller components. For example, in Thomas v. Peterson, 753 F.2d 754-158 (9th Cir. 1985), the court found that section 102(2) (c) of NEPA requires an EIS for "major federal actions significantly affecting the quality of the human environment." 42USC 4332 (2) (C) (1982). While it is true that the administrative agencies must be given considerable discretion in defining the scope of the environmental impact statements there are situations in which the agency is required to consider several related actions in a single EIS. Not to require this would permit dividing a project into multiple "actions", each of which individually has an insignificant environmental impact, but which collectively have a substantial impact.

Furthermore, we are concerned that many of the current and proposed oil, gas and coal projects on the Wasatch Plateau have cumulative impacts that were not included or anticipated in the scope of the 1986 Manti-La Sal Forest Plan FEIS, or the 1992-1994 amendments that dealt solely with oil/gas cumulative effects and NOT the cumulative effects of subsidence coal mining.

'OMMENT 1.5

Because of the adverse, long term cumulative effects to forest resources that have not been adequately disclosed or analyzed, we urge the Forest to develop a new programmatic EIS or

:C ENT

SEIS that would disclose, discuss, and analyze the significant cumulative impacts to the watershed, Threatened, Endangered species (including Threatened and Endangered fish who may be adversely impacted downstream off of the Forest), as well as Proposed (ESA), Forest Service Sensitive and proposed FS Sensitive species. Cumulative effects to wolverine have never been disclosed or analyzed, and need to be with this analysis. We are also concerned that the irretrievable and irreversible commitments of roadless and wilderness resources have not been disclosed or properly analyzed for this region. Perhaps most importantly, there needs to be a rigorous analysis of the cumulative effects to the watersheds originating on the Wasatch Plateau from the extensive oil, gas AND coal mining. Most, if not all, perennial streams, reservoirs, and springs in this part of the Wasatch Plateau have been affected by the cumulative impacts of oil, gas and coal mining, but there has never been an adequate analysis of the cumulative effects.

'OMMENT 1.7
'OMMENT 1.8
)MMENT 1.9

The UEC hereby incorporates by reference GIS coverage of our roadless area inventory into these comments. This has been submitted to your Supervisor and/or Forest Planners for inclusion in the Forest Plan Revision record. It is also available in GIS and PDF formats at www.uec-utah.org. The UEC also requests that the development and analysis of the proposed action and range of alternatives treat our roadless area inventory as a driving issue. We believe that our roadless area inventory should be a driving issue because you are currently in Forest Plan Revision and are in the process of developing a roadless inventory pursuant to the same System-wide criteria that we used (Chapter 7 of FSM 1909.12). Forest Service approval of new, additional subsidence coal mining underneath qualifying roadless lands while you are concurrently preparing your Forest Plan revision may be significant evidence of biased decision making.

The Migratory Bird Treaty Act (MBTA) makes it unlawful to take, kill, or possess migratory bird resources, which includes individuals, their young, their parts, nests, or eggs.[1] Executive Order 13186 issued in January of 2001 re-instituted the responsibilities of Federal agencies to comply with the MBTA. "Take" is defined at 50 CFR 10.12, and includes both "intentional" and "unintentional" take. "Unintentional take" means take that results from, but is not the purpose or, the activity in question. The Forest Service is directed "to support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions". (E.O. 13186 §3(e)) It has been documented that migratory bird species are currently declining across the intermountain west. We recommend the Forest conduct a rigorous evaluation using the newest data and research to minimize impacts to migratory birds (and their habitat), including a focus on species on the 2002 List of Birds of Conservation Concern and species that are listed among the Partner's in Flight Priority Species. To help meet responsibilities under Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), the UEC recommends that you conduct activities outside critical breeding seasons for migratory birds, minimize temporary and long-term habitat losses, and mitigate all unavoidable habitat losses. If your activities occur in the spring or summer, we recommend you conduct surveys for migratory bird resources to assist you in your efforts to comply with the Migratory Bird Treaty Act (16 U.S.C. 703-712) and E.O. 13186. If some portion of your mitigation includes off-site habitat enhancement, it should be in-kind and either within the watershed of the impacted habitat or within the foraging range of the habitat-

'OMMENT 1.10

[1] 16 U.S.C. § 703-712.

dependent species. To be in compliance with the language and intent of the MBTA and EO 13186, and NEPA's mandate for rigorous analysis, the environmental assessment must disclose and rigorously analyze how the proposed activities would or would not be in compliance with the Migratory Bird Treaty Act and Executive Order 13186. The Forest has been instructed to "develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations." (EO 13186 § 3) We are not aware of any current MOUs. Please demonstrate within the environmental analysis for this project that such an MOU has been developed and entered into with the USFWS. Because this is an important issue that should inform the public and the decision maker, we request a copy be provided within or as an appendix to the final document, and not simply included in the project file. Writing off this obligation as a vague requirement specific only to the WO is not acceptable, as it is the individual Units of the National Forest System that implement projects that impact migratory bird resources that are protected under this EO and Act.

Rigorous and detailed analysis that constitutes the mandated 'hard look' at the (cumulative) effects to threatened, endangered, proposed, and FS sensitive species from the Proposed Action and alternatives needs to be included in the environmental assessment. This should be informed by accurate quantitative population trend data for all TEPS species. Consultation with U.S. Fish and Wildlife Service should be conducted for the Mexican Spotted Owl (MSO) and Lynx since this area may contain suitable habitat for both listed species, and this is close to the only recent, confirmed Lynx in Utah. Population and habitat surveying for MSO should be conducted throughout the project area and cumulative effects analysis area(s) (which are not disclosed in the Scoping Notice), focusing on cliffs, rock outcroppings, and other escarpments, which may contain MSO or their habitat. The Township and Range description provided identifying the Proposed Action is very close to at least one confirmed active Golden eagle nest that needs to be closely monitored and appropriate mitigation measures need to be provided in the Proposed Action. No mitigation measures have been included in the Proposed Action that the public has been permitted to review and comment upon.

OMMENT

Mule deer, Rocky mountain elk, macroinvertebrates (BCI), goshawk, three toed woodpecker are MIS that should be central issues with the proposed subsidence mining. The Forest Service must comply with applicable law and regulations and conduct a quantitative analysis of population trends of these MIS prior to project approval, in the body of the environmental assessment. (36 C.F.R. §§219.19 and 219.26). The Forest Service needs present population trend data for MIS, and must use this data to determine relationships between the habitat impacts and population changes. Such data must be provided and evaluated in the EA/EIS that is prepared for the project. Specifically, any site-specific analysis must address the impacts of development to MIS, MIS populations, as well as MIS habitat. This is a management short cut that is fundamental in meeting your regulatory mandate to maintain the minimum viable populations and diversity of all native and desirable non-native flora and fauna.

OMMENT 1.12

Compliance with the direction, standards, guidelines and other requirements set forth in the MLSNF Forest Plan is also required and must be demonstrated in the EA/EIS and Decision Documents.

The subsidence from mining the proposed new coal lease area may have direct, indirect, and cumulative effects to clean water, and compliance with the Clean Water Act must be demonstrated.

Subsidence coal mining is also known to impact soils and other large woody plants on the surface. Maintenance of the sustainability and diversity of these biotic and abiotic resources (some of which are not renewable) must be demonstrated. Subsidence of the surface may disrupt the soils, hydrology and physiological integrity of the plants that comprise the mixed conifer forest on the surface, making the forest more susceptible to insect and disease. Stressed and insect-infested coniferous forests may or may not present greater risk of wildfire (in terms of ignitability and intensity of burn). These cumulative effects should be disclosed and analyzed. This is important because actions that indirectly increase the probability or risk of hot crown fire on the surface may involve additional, subsequent cumulative effects that result from loss of species habitat, soils, sedimentation and damage to the blue ribbon trout fishery/sensitive aquatic resources immediately downstream from this area.

OMMENT 1.13

We request the opportunity (that is mandated by NEPA) to review and comment on the analysis of the effects that the range of alternatives may have on the environment. Forest Service Handbook, chapter 20, section 23.2 states that the purpose and intent of alternatives are to "ensure that the, range of alternatives does not foreclose prematurely any option that might protect, restore and enhance the environment." NEPA regulations require that agencies should "(r)igorously explore and objectively evaluate all reasonable alternatives ... " This regulatory mandate is NOT limited only to environmental impact statements and includes environmental assessments. Case law has also established that consideration of alternatives which lead to similar results is not sufficient to meet the intent of NEPA.

Please keep the UEC on the mailing list for this project and all projects on the Forest. We also request an opportunity to provide comments on the environmental assessment/environmental impact statement before a decision has been made. If the Forest decides to not grant this request, we ask that a written rational be provided for that decision. We also ask the Forest to explain how that decision would not constitute a barrier to the public involvement mandated by NEPA.

Sincerely,

Kevin Mueller,
Roadless/Program Coordinator

CC:

Wildlaw
Stephanie Tidwell, UEC Executive Director
Denise Boggs, UEC board

COMMENT LETTER 2

THE HOPI TRIBE

Wayne Taylor, Jr.
CHAIRMAN

June 3, 2004

Alice Carlton, Forest Supervisor
Attention: Bruce Ellis
Manti-La Sal National Forest
599 West Price River Drive
Price, Utah 84501

Dear Supervisor Carlton,

This letter is in response to your correspondence dated May 10, 2004, regarding Genwal Resources, Inc. submitting an application to add 120 acres to their Federal Coal lease on Manti-La Sal National Forest. As you know, the Hopi Tribe claims cultural affiliation to the prehistoric cultural groups in Utah and Manti-La Sal National Forest, and therefore we appreciate your continuing solicitation of our input, and your efforts to address our concerns.

As you also know, the Hopi Cultural Preservation Office supports the identification and avoidance of prehistoric archaeological sites and Traditional Cultural Properties. Therefore, to assist us in determining if the area of potential effect for this proposal contains cultural resources significant to the Hopi Tribe, please provide us with a copy of the cultural resource survey report of the project area for review and comment.

If you have any questions or need additional information, please contact Terry Morgart at the Hopi Cultural Preservation Office at 520-734-3619. Thank you again for your consideration.

Respectfully,

Leigh J. Kuwanwisiwma, Director
Cultural Preservation Office

xc: Utah State Historic Preservation Office

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UTAH 84119

In Reply Refer To
FWS/R6
ES/UT
04-0694

July 8, 2004

Alice Carlton
Forest Supervisor
Manti-La Sal National Forest
599 West Price River Drive
Price, Utah 84501

Dear Ms. Carlton:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter of May 10, 2004 announcing your intent to conduct, with the Bureau of Land Management (BLM) State Office, an Environmental Analysis on the Genwal Resources, Inc. (Genwal) application to add 120 acres to Federal Coal Lease UTU-68082, for the Crandall Canyon Mine. The Utah State Director of BLM must decide whether or not to modify the lease. The Forest Supervisor of the Manti-La Sal National Forest (Forest) must decide whether or not to consent to the lease modification by BLM, and prescribe lease stipulations needed to protect non-mineral resources. The Office of Surface Mining (OSM), Reclamation and Enforcement, is participating as a cooperating agency. We are providing the following comments for your consideration in your analysis.

Pursuant to the Migratory Bird Treaty Act (MBTA)(16 U.S.C. § 703) and the Fish and Wildlife Act of 1956 (16 U.S.C. §§ 742a – 742j, not including 742 d-l), in Section 1 of this letter we identify issues that should be addressed relative to fish and wildlife resources for this project. Section 2 of this letter addresses your responsibilities under section 7 of the Endangered Species Act (ESA) of 1973, 16 U.S.C. § 1536.

Section 1.

In the fall of 2003 (e-mails, September 23 and December 22, 2003), Diana Whittington of our office suggested to several members of an interagency coal team, including Forest Service personnel, that involved agencies should conduct a cumulative effects analysis of the loss or relocation of perennial surface waters from mining subsidence. We appreciate the support we have received from your staff regarding this issue, because it has broad implications for fish and wildlife resources.

In a response to a request from Diana Whittington (email from John Krummel, January 15, 2004), researchers from the environmental Assessment Division of Argonne National Laboratory provided the following preface to an outline for a cumulative effects analysis:

> Coal mining operations in small watersheds can impact existing streams and their associated riparian areas and wetlands. Perennial water sources, such as springs, can be completely lost, subsidence can eliminate viable stream reaches, and canalizations and the use of culverts can alter the existing water balance and dynamics of a small watershed. Changes in the water balance and dynamics of a watershed can then affect ecosystems that depend on the water. These ecosystems include the riparian zone adjacent to the affected stream, associated wetlands, fish populations and macro-invertebrates (e.g., benthic organisms such as mollusks) in the stream, ungulates and other mammals and birds in the vicinity of the impacted reach, and the occurrence and severity of fires.

In addition, loss or relocation of perennial surface water may affect terrestrial species that lack mobility. Such species include mollusks, amphibians, and floral species that are either riparian or seep-obligate.

OMMENT 3.1

During a conversation between Diana Whittington of our office and Karl Boyer from the Forest (June 24, 2004), we learned that the area under consideration for mining in this current lease addition presents conditions that may lead to loss of perennial surface water from mining subsidence. According to Mr. Boyer, there are numerous springs in the lower quarter of the 120-acre addition, and the overburden in most of the lower half of the addition is less than 200 feet.

OMMENT 3.2

In general, areas with shallow overburden will be more prone to surface cracks from subsidence, and thus more prone to loss of surface water. Also, given the close proximity of the coal seam to the surface, there may be an increased risk to wildlife from contamination of water that seeps through the subsidence cracks and then resurfaces quickly.

In a follow-up email (July 1, 2004), Mr. Boyer relayed the information that 86 acres of the 120-acre proposed lease expansion are dominated by the aspen plant community, with the aspen stands mostly open, with short, scrubby trees. These aspen stands are in the immediate vicinity of the springs and seeps that might be affected by mining subsidence. Loss of these springs and seeps may result in loss of the aspen stands, a primary breeding habitat for a Service Bird of Conservation Concern, the red-naped sapsucker. In addition, aspen stands provide high-value habitat for big game species such as elk and mule deer.

COMMENT 3.3

The Service appreciates the continued efforts of the Forest to conserve and protect perennial surface waters. In light of the aforementioned value of perennial surface waters to fish and wildlife resources, we recommend that any mining permitted be limited to mining for non-subsidence in areas where loss of springs or seeps may occur.

COMMENT 3.4

Section 2. Federal agencies have specific additional responsibilities under Section 7 of the ESA. To help you fulfill these responsibilities, we are providing an updated list of threatened (T) and endangered (E) species that may occur within the area of influence of your proposed action.

Common Name	Scientific Name	Status
EMERY		
Barneby Reed-mustard	*Schoenocrambe barnebyi*	E
Jones Cycladenia	*Cycladenia humilis* var. *jonesii*	T
Last Chance Townsendia	*Townsendia aprica*	T
Maguire Daisy	*Erigeron maguirei*	T
San Rafael Cactus	*Pediocactus despainii*	E
Winkler Cactus	*Pediocactus winkleri*	T
Wright Fishhook Cactus	*Sclerocactus wrightiae*	E
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[1]	*Haliaeetus leucocephalus*	T
Mexican Spotted Owl[1,4]	*Strix occidentalis lucida*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footed Ferret[6]	*Mustela nigripes*	E
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E

[1] Nests in this county of Utah.
[4] Critical habitat designated in this county.
[6] Historical range.
[10] Water depletions from *any* portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery programs.

The proposed action should be reviewed and a determination made if the action will affect any listed species or their critical habitat. If it is determined by the Federal agency, with the written concurrence of the Service, that the action is not likely to adversely affect listed species or critical habitat, the consultation process is complete, and no further action is necessary.

Formal consultation (50 CFR 402.14) is required if the Federal agency determines that an action is "likely to adversely affect" a listed species or will result in jeopardy or adverse modification of critical habitat (50 CFR 402.02). Federal agencies should also confer with the Service on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10). A written request for formal consultation or conference should be submitted to the Service with a completed biological assessment and any other relevant information (50 CFR 402.12).

COMMENT 3.5

Candidate species have no legal protection under the Endangered Species Act (ESA). Candidate species are those species for which we have on file sufficient information to support issuance of a proposed rule to list under the ESA. Identification of candidate species can assist environmental planning efforts by providing advance notice of potential listings, allowing resource managers to alleviate threats and, thereby, possibly remove the need to list species as endangered or

threatened. Even if we subsequently list this candidate species, the early notice provided here could result in fewer restrictions on activities by prompting candidate conservation measures to alleviate threats to this species.

Only a Federal agency can enter into formal Endangered Species Act (ESA) section 7 consultation with the Service. A Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment by giving written notice to the Service of such a designation. The ultimate responsibility for compliance with ESA section 7, however, remains with the Federal agency.

Your attention is also directed to section 7(d) of the ESA, as amended, which underscores the requirement that the Federal agency or the applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which, in effect, would deny the formulation or implementation of reasonable and prudent alternatives regarding their actions on any endangered or threatened species.

Please note that the peregrine falcon which occurs in all counties of Utah was removed from the federal list of endangered and threatened species per Final Rule of August 25, 1999 (64 FR 46542). Protection is still provided for this species under authority of the Migratory Bird Treaty Act (16 U.S.C. § 703-712) which makes it unlawful to take, kill, or possess migratory birds, their parts, nests, or eggs. When taking of migratory birds is determined by the applicant to be the only alternative, application for federal and state permits must be made through the appropriate authorities. For take of raptors, their nests, or eggs, Migratory Bird Permits must be obtained through the Service's Migratory Bird Permit Office in Denver at (303) 236-8171.

We recommend use of the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* which were developed in part to provide consistent application of raptor protection measures statewide and provide full compliance with environmental laws regarding raptor protection. Raptor surveys and mitigation measures are provided in the Raptor Guidelines as recommendations to ensure that proposed projects will avoid adverse impacts to raptors, including the peregrine falcon.

COMMENT 3.6

The following is a list of species that may occur within the project area and are managed under Conservation Agreements/Strategies. Conservation Agreements are voluntary cooperative plans among resource agencies that identify threats to a species and implement conservation measures to pro-actively conserve and protect species in decline. Threats that warrant a species listing as a sensitive species by state and federal agencies and as threatened or endangered under the ESA should be significantly reduced or eliminated through implementation of the Conservation Agreement. Project plans should be designed to meet the goals and objectives of these Conservation Agreements.

COMMENT 3.7

Common Name	Scientific Name
EMERY	
Colorado River Cutthroat Trout	*Oncorhynchus clarki pleuriticus*

If we can be of further assistance, or if you have any questions, please feel free to contact Diana Whittington of our office at (801) 975-3330 extension 128.

Sincerely,

Henry R. Maddux
Utah Field Supervisor

cc: UDWR – SLC and Price (Attn: Craig Walker)
OSM- Denver (Attn: Ranvir Singh), 1999 Broadway, Suite 3320, Denver, Colorado 80202
BLM Sate Office (Attn: Stan Perkes) and Price FO (Attn: George Tetrault)
UDOGM (Attn: Pam Grubaugh-Littig)

COMMENT LETTER 4

THE NAVAJO NATION

JOE SHIRLEY, JR.
PRESIDENT

FRANK DAYISH, JR.
VICE-PRESIDENT

July 13, 2004

Karl Boyer
Supervisor's Office
599 West Price River Drive
Price, UT 84501

Subject: PROPOSED LEASE MODIFICATION AREA T15S R7E SEC. 32.

Dear Mr. Boyer,

The Navajo Nation Historic Preservation Department (HPD) Traditional Cultural Program (TCP) is in receipt of your letter dated May 10, 2004. The letter informs the Navajo Nation of the proposed lease modification, which involves National Forest System lands, administered by the Manti-La Sal National Forest in Emery County, Utah as follows T15S R7E. The current lease will acquire additional coal reserves for their Crandall Canyon Mine.

After reviewing your letter and cross referencing our sacred sites database, the Navajo Nation does not have any immediate concerns with the project and it will not impact any Navajo Traditional Cultural Properties. Your projects are outside of the Navajo Nation aboriginal land use area. Proper planning for these projects is in the best interest of all concerned communities.

HPD-TCP extends our appreciation for including the Navajo Nation's concerns regarding the proposed project and for consulting with the Navajo Nation, pursuant to 36 CFR 800. Should you have any questions or concerns, contact our office at (928) 871-7148. Thank you.

Sincerely,

Robert Begay, Program Manager
Navajo Traditional Culture Program

TCP 04- 033

HISTORIC PRESERVATION DEPARTMENT P.O. BOX 4950 WINDOW ROCK, ARIZONA 86515 928.871.6437 (v) 928.871.7886 (fax)

CHAPTER 6
LIST OF PREPARERS

The following is a list of personnel from the responsible agencies and cooperating agencies included on the project Interdisciplinary Team (IDT):

Karl Boyer. Geologist, USDA Forest Service, Manti-La Sal National Forest, Forest Supervisor's Office, Price, Utah

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Katherine Foster. Forest Hydrologist, USDA Forest Service, Manti-La Sal National Forest, Forest Supervisor's Office, Price, Utah

Gregg Hudson. Geologist, USDI Bureau of Land Management, Solid Minerals Group, State Office, Salt Lake City, Utah

Brent Hanchett. Forest Landscape Architect, USDA Forest Service, Ashley National Forest, Forest Supervisor's Office, Vernal, Utah

John Healy. Range Specialist, USDA Forest Service, Manti-La Sal National Forest, Ferron/Price Ranger District, Ferron Office, Ferron, Utah

Floyd McMullen. Senior Environmental Project Manager, USDI Office of Surface Mining, Western Regional Coordinating Center, Denver, CO

Terry Nelson. Wildlife Biologist, USDA Forest Service, Manti-La Sal National Forest, Forest Supervisor's Office, Price, Utah

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Robert Thompson. Forest Botanist, USDA Forest Service, Manti-La Sal National Forest, Forest Supervisor's Office, Price, Utah

CHAPTER 7
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CHAPTER 8
GLOSSARY

Affected Environment: Surface resources (including social and economic elements) within or adjacent to a geographic area that could potentially be affected by proposed activities. The environment of the area that would be affected by the alternatives under consideration.

Allotment: See Range Allotment.

Alluvial Material: Material transported and deposited by running water in riverbeds, lakes, alluvial fans and valleys. Includes clay, silt, sand, gravel, and mud.

Alternative: A combination of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. One of several policies, plans, or projects proposed for decision making. One alternative need not substitute for another in all respects.

Analysis Area: A delineated area of land subject to analysis.

Animal Unit Month (AUM): The amount of forage necessary to sustain one cow and one calf or its equivalent for one month.

Aquatic Ecosystem: All organisms in a water-based community plus the associated environmental factors.

Aquatic Wildlife or Species: Animal species that inhabit and/or depend on the aquatic ecosystems for their life processes.

Aquifer: A layer of geologic material that contains water.

Big Game Winter Range: The area available to and used by big game through the winter season.

Big Game: Larger species of hoofed, protected, wildlife that are hunted such as elk, deer, and moose.

Biological Assessment (BA): A document that discloses potential effects to Threatened, Endangered, and Candidate plant and animal species and consistency with the Endangered Species Act relative to a proposed action.

Biological Diversity: The diversity or numbers of species that collectively represent the living plants and animals within a local, regional, or continental landscape.

Biological Evaluation (BE): A document that discloses effects to Forest Service Sensitive plant and animal species relative to a proposed action.

Browse: That part of the current leaf and twig growth of shrubs, wood vines, and trees available for animal consumption.

Bureau of Land Management (BLM): The U.S. Department of the Interior agency responsible for managing most Federal government subsurface minerals. It has surface-management responsibility for Federal lands designated under the Federal Land Policy and Management Act of 1976.

CEQ: See Council on Environmental Quality.

Contrast: The effect of a striking difference in the form, line, color, or texture of an area being viewed.

Council on Environmental Quality: An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their affect on the environment, conducts environmental studies and advises the President on environmental matters.

Cultural Resources Inventory: A survey of existing conditions and data.

Cultural Resources: Those fragile and nonrenewable remains of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works or art, architecture, and natural features that were or importance in human events.

Cumulative Impact: The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

Developed Recreation Sites: Relatively small, distinctly defined areas where facilities are provided for concentrated public use (i.e., campgrounds, picnic areas, and swimming areas).

Developed Recreation: Recreation that occurs a man-made developments such as campgrounds, picnic grounds, resorts, ski areas, trailheads, etc.

Dispersed Recreation: That portion of outdoor recreation use that occurs outside of developed sites in the unroaded and roaded Forest environment (i.e., hunting, backpacking, and camping).

Displacement: As applied to wildlife, forced shifts in the patterns of wildlife use either in location or timing of use.

Distance Zone: The divisions of a landscape being viewed. Three zones are used to describe a landscape: foreground, middleground, background.

Diversity: (1) The relative abundance of wildlife species, plant species, communities, habitats, or habitat features per unit of area; or (2) The distribution and abundance of different plant and animal communities and species within the area covered by a Land Resource Management Plan (36 CFR Part 219.3).

Duration: The length of time the management activity and its impacts will be taking place.

Ecosystem: All organisms in a community plus the associated environmental factors.

Effects (also see Impacts):

Direct Effects - Caused by the action and occur at the same time and place.

Indirect Effects - Caused by the action later in time or farther removed in distance but still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related affects on air and water and other natural systems, including ecosystems.

Endangered Species: See Threatened and Endangered species.

Environmental Analysis: An analysis of alternative actions and their predictable short and long- term environmental effects that include physical, biological, economic, social, and environmental design factors and their interactions.

Environmental Assessment (EA): A formal public document prepared to analyze the impacts on the environment of the proposed project or action and released for comment and review. An EIS must meet the requirements of NEPA, CEQ guidelines, and directives of the agency responsible for the proposed project or action. It includes a brief discussion of the need for the proposal, alternatives considered, environmental impact of the proposed action and alternatives, and a list of agencies and individuals consulted. Prepared by the responsible Federal agency consistent with 40 CFR 1508.9.

Erosion: (1) The wearing away of the land surface by running water, wind, ice, or other geological agents including such processes as gravitational creep; or (2) Detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

Exotic: Foreign, not native

Fauna: Species of the animal kingdom.

Federal Land Policy and Management Act of 1976 (FLPMA): Public Law 94-579 signed by the President on Management October 21, 1976. Established public land policy; to establish guidelines for its administration; to protect for the management, protection, development, and enhancement of the public lands; and for other purposes.

Federal Lands: Lands owned by the United States, without references to how the lands were acquired or what Federal agency administers the land, including surface estate, mineral estate and coal estate, but excluding lands held by the United States in trust for Indians, Aleuts or Eskimos.

Floodplain: The lowland and relatively flat area adjoining inland waters including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Flora: Plants

Forage: All browse and herbaceous foods that are available to grazing/browsing animals. Also, food source areas for goshawks.

Forest Service (FS): The agency of the United States Department of Agriculture responsible for managing National Forests and Grasslands under the Multiple Use and Sustained Yield Act of 1960.

Fossil: The remains or traces of an organism or assemblage of organisms that have been preserved by natural processes in the earth's crust exclusive of organisms that have been buried since the beginning of historical time.

Game Species: Any species of wildlife or fish for which seasons and bag limits have been prescribed and that are normally harvested by hunters, trappers, and fishermen under State or Federal laws, codes, and regulations.

Gradient: The slope (rise/run) of a surface or stream profile.

Habitat Type: An aggregation of all land areas potentially capable of producing similar plant communities at climax.

Habitat: A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Human Environment: The factors that include, but are not limited to, biological, physical, social, economic, cultural, and aesthetic factors that interrelate to form the environment.

Impact (See Effects): The effect, influence, alteration, or imprint caused by an action.

Indicator Species: A species of animal or plant whose presence is a fairly certain indications of a particular set of environmental conditions. Indicator species serve to show the effects of development actions on the environment.

Indirect Effects: Secondary effects that occur in locations other than the initial action or significantly later in time.

Inventoried Roadless Area: Area identified in a set of inventoried roadless area maps, contained in Forest Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, which are held at National headquarters office of the Forest Service or any subsequent update or revision of those maps.

Invertebrate: An animal lacking a spinal column.

IRA: Inventoried Roadless Area.

Irretrievable: A term that applies to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume timber production.

Irreversible: A term that describes the loss of future options. Applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity that are renewable only over long periods of time.

Leaseable Minerals: Minerals acquired only by lease and generally include oil, gas, coal, oil shale, sodium, potassium, phosphate, native asphalt, solid and semi-solid bitumen, and deposits of sulfur.

Lease Stipulations: Additional specific terms and conditions that change the manner in which an operation may be conducted on a lease or modify the lease rights granted.

Lease: A Federal lease, issued under the oil and gas leasing provisions of the mineral leasing laws, which grants the exclusive right to explore for and produce oil and gas from the lease area.

Macroinvertebrates. Aquatic insects.

Management Indicator Species (MIS). Management Indicator Species (MIS) are a select group of wildlife species that can indicate change in habitat resulting from activities on the Forest. MIS species for the Manti-La Sal National Forest are elk, Mule deer, macroinvertebrates, Goshawk, Golden eagle and Abert squirrel (FLRMP). With

the exception of Abert Squirrels these species utilize the habitats found within the project area.

Mineral Leasing Laws: The Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.), and the Mineral Leasing Act for Acquired Lands of 1947, as amended (30 U.S.C. 351-359).

MIS: Management Indicator Species.

Mitigation: Includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree of magnitude of the action and its implementation.
(c) Rectifying the impact of repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

Multiple-use: Management of the surface and subsurface resources so that they are jointly used in the manner that will best meet the present and future needs of the public without permanent impairment of the productivity of the land or the quality of the environment.

National Environmental Policy Act of 1969 (NEPA): Public Law 91-190. Established environmental policy for the nation. Among other items, NEPA requires Federal agencies to consider environmental values in decision-making processes.

National Forest Management Act (NFMA): A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of Regional and Forest plans and the preparation of regulations to guide that development.

National Forest System: All National Forest Systems lands reserved or withdrawn from the public domain of the United States; all National Forest System lands acquired through purchase, exchange, donation, or other means the National Grasslands and land use projects administered under Title III of the Bankhead-Jones Farm Tenant Act (7 U.S.C. 1010 et seq.); and other lands, waters, or interests therein which are administered by the U.S.D.A. Forest Service or are designated for administration through the U.S.D.A. Forest Service as a part of the system (16 U.S.C. 1609).

National Register of Historic Places (NRHP): A listing of architectural, historical, archaeological, and cultural sites of local, state, or national significance established by the Historic Preservation Act of 1966.

Negligible Effect or Impact: An effect or outcome that it very small in magnitude or importance and is inconsequential.

NEPA: See National Environmental Policy Act of 1969.

No Action Alternative: No action or activity would take place. Another definition is where ongoing programs described within the existing Land Management Plan continue. No decision would be made and no leases would be offered.

Nongame Species: Species of animals that are not managed as a sport hunting/fishing resource.

Noxious Weeds: Rapidly spreading plants that cause a variety of major ecological impacts to both agriculture and wild lands.

Off-Highway Vehicle (OHV): Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice, marsh, swampland or other natural terrain. It includes, but is not limited to, four-wheel drive or low-pressure-tire vehicles, motorcycles and related two-wheel vehicles, amphibious machines, ground-effect or air-cushion vehicles.

Operator: A lessee, exploration licensee or one conducting operations on a lease under the authority of the lessee.

Overstory: The portion of a plant community consisting of the taller plants on the site; the forest or woodland canopy.
PAOT (People at one Time): Unit of measure for recreation representing the number of people using a facility simultaneously or at the same time.

Prehistoric Site: Archaeological sites associated with American Indians and usually occurring before contact with Europeans.

Prevention of Significant Deterioration (PSD): A classification established to preserve, protect, and enhance the air quality in National Wilderness Preservation System areas in existence prior to August 1977 and other areas of National significance while ensuring economic growth can occur in a manner consistent with the preservation of existing clean air resources. Specific emission limitations and other measures, by class, are detailed in the Clean Air Act (42 U.S.C. 1875, et seq.).

Project Area: The area to be disturbed by the proposed project and adjacent lands that could be affected.

Range Allotment: A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under an allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System lands administered by the U.S.D.A. Forest Service.

Rare Plants: A plant species, or subspecies, that is limited to a restricted geographic range or one that occurs sparsely over a wider area.

Reasonably Foreseeable Development Scenario (RFDS): The prediction of the most likely future actions in the project area that would likely result from the proposed action.

Reclamation: Returning disturbed lands to a form and productivity that will be ecologically balanced and in conformity with a predetermined land management plan.

Record of Decision (ROD): A document separate from, but associated with, an environmental impact statement that publicly and officially discloses the responsible official's decision on the proposed action.

Recreation Opportunity Spectrum (ROS): Land delineations that identify a variety of recreation experience opportunities in seven classes along a continuum from primitive to urban. Each class is defined in terms of natural resource settings, activities and experience opportunities. The six classes are: Urban, Rural, Roaded, Natural, Semiprimitive Motorized, Semiprimitive Nonmotorized, and Primitive.

Recreation Visitor Day (RVD): A unit of measure for recreation use. It represents one day of use by one person.

Reserves: Recoverable Oil and Gas deposits.

Responsible Official: Official of the Forest Service and/or Bureau of Land Management authorized to make the decisions required under the proposed action.
Restore: To bring back landscape to a former or original condition or appearance.

Revegetation: The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as seed bed preparation, reseeding, and mulching.

Riparian Ecosystem: A transition between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water.

Riparian: Riparian areas consist of terrestrial and aquatic ecosystems, those lands in a position to directly influence water quality and water resources, whether or not free water is available. This would include all lands in the active flood channel and lands immediately upslope of stream banks. These areas may be associated with lakes, reservoirs, estuaries, potholes, marshes, streams, bogs,, wet meadows, and intermittent or permanent streams where free and unbound water is available.

Roaded, Natural (RN): A recreation opportunity classification term describing a land area that has been predominately a natural appearing environment with moderate evidence of sights and sounds of humans. Concentration of users is moderate to low. Roads of better than primitive class are usually with 0.5 mile. A broad range of motorized and nonmotorized activity opportunities are available. Management activities, including timber harvest, are present and harmonize with the natural environment.

Roadless: Refers to the absence of roads that have been constructed and maintained by mechanical means to ensure regular and continuous use.

Scoping Process: An early and open public participation process for determining particular issues to be addressed in an environmental document and for identifying the significant issues related to a proposed action.

Sensitive Species: Those plant and animal species identified by a Regional Forester for which population viability is a concern as evidenced by: (a) significant current or predicted downward trends in population numbers or density or (b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Small Game: Birds and small mammals normally hunted or trapped.

Stipulation: A provision that modifies a standard lease right and is attached to and made a part of the lease.

Surface Management Agency: The Federal agency with jurisdiction over the surface of federally owned lands containing coal deposits, and, in the case of private surface over Federal coal, the Bureau of Land Management, except in areas designated as National Grasslands, where it means the Forest Service.

TEPS: Threatened, Endangered and Sensitive Species.

Threatened And Endangered Species: Definitions: Federal codes are defined as follows:

Endangered (E): Any species that is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the ESA would present an overwhelming and overriding risk to man.

Threatened (T): Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Candidate Species (C): Status review taxa for which the USFWS currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list the taxa as an endangered or threatened species.

Forest Service Sensitive: Those plant and animal species identified by a Regional Forester for which population viability is a concern as evidenced by: (a) significant current or predicted downward trends in population numbers or density or (b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Vertebrate: An animal having a spinal column.

Visual Quality Objectives (VQO): Based upon variety class, sensitivity level, and distance zone determinations. Each objective describes a different level of acceptable alteration based on aesthetic importance. The degree of alteration is based on contrast with the surrounding landscape.

Preservation: In general, human activities are not detectable to the visitor.

Retention: Human activities are not evident to the casual Forest visitor.

Partial Retention: Human activities may be evident, but must remain subordinate to the characteristic landscape.
Modification: Human activity may dominate the characteristic landscape, but must, at the same time, use naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in middleground or background.

Maximum Modification: Human activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background.

Visual Resource: The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal of the unit.

Wetlands: Lands where saturation with water is the primary factor determining the nature of soil development and the kinds of animal and plant communities living under or on it surface.

APPENDIX A
PAST, PRESENT, AND REASONABLY FORSEEABLE FUTURE ACTIONS

Past Actions	Implementation Dates (Begin and End)	Residual Effects
I. Minerals		
Coal Mining. Tip Top Mine. On the south slope of Crandall Canyon (SE 1/4 NE 1/4, Sec 5, T 16 S, R 7 E, SLM). The Crandall Canyon Road (FDR 50248), now on the Transportation System, was most likely originally constructed for the mine and coal exploration. The Road is now a Forest Development Road from the SR 31 intersection to just above the Crandall Canyon Mine. The old road that continued up the canyon from the mine (now Forest Development Trail 390) was was most likely originally build as a coal exploration/drilling road.	1939-1956	Very small mine. Naturally revegetated. Disturbed area not evident. No residual effects.
Crandall Canyon Mine. In Crandall Canyon (S 1/2 NW 1/4, Sec 5, T 16 S, R 7 E, SLM) - The mine was constructed in 1980 and is still an active mine. The mine has disturbed approximately 5.4 acres, not including the Crandall Canyon Road. The Crandall Canyon Road was widened to two lanes and asphalt paved to accommodate coal haul traffic.	1980 - Present	The mine operates 24 hours a day, every day at differing intensities depending on production shifts. 13.6 acres are permitted for disturbance; however, only 9.9 acres have actually been disturbed: 8.2 acres on Genwal fee and 5.4 acres of vegetation/habitat has been removed for operations on the Forest. The physical activity and operations/haul traffic on the Crandall Canyon and Huntington Canyon roads impacts other resources and uses. Approximately 3,900 acres of NFS, State, and private lands included in permit area. Subsidence of mined lands has occurred. No subsidence of Crandall Creek is permitted.
Old Leamaster Mine. In Mill Fork Canyon (NE 1/4 SE 1/4 SW 1/4, Sec 16, T 16 S, R 7 E, SLM). The original Mill Fork Road, now a Forest Development Road (FDR 50245), was probably constructed prior to 1943 for access to the mine and for coal exploration. The Forest Development Trail that extends several miles up the canyon, beyond the	1943 – 1964	The old mine was reopened in 1976 as the Huntington Canyon #4 Mine (see below). Most of the original disturbed area was re-disturbed and expanded for the new surface facilities.

Forest Development Road (171, 391); and Trails 086 and 394 on the north slope of the canyon, were most likely originally constructed prior to 1943 as coal exploration roads. The road and trails are maintained on the Forest Transportation System.		
Huntington Canyon #4 Mine. SW 1/4SW 1/4, Sec 16, T 16 S, R 7 E, SLM. The mine was reconstructed at the Old Leamaster Mine in 1976 with a total surface disturbance of approximately 12.5 acres (almost all on pvt. inholdings). A 25KV powerline was constructed from the Huntington Canyon Power Plant in Huntington Canyon over the south Huntington Canyon slope to Mill Fork Canyon. Surface disturbance was minimized by helicopter installation and was designed to minimize impacts to raptors. The powerline remains today under a special-use permit and was extended in 1986 to provide service to the Crandall Canyon Mine. The mine was reclaimed in 1985 (recontoured to approximate original contour) and determined to be successful in 1995. Remnants of the highwalls are still visible. In 1985, the Mill Fork Road was reduced from two lanns to a single-lane (with turnouts). The second lane was recontoured and has been successifully revegetated. The permit area of 1,320 acres (pvt. and NFS lands) were only partially mined. No visible signs of subsidence.	1976 - 1985	The area was reclaimed in 1985. Final bond release was made in 1998. There are no residual effects.
Deer Creek Mine, Rilda Canyon Fan Portal. The breakout pad and access road (from forks to breakout) have disturbed approximately 2 acres. Underground mining has subsided extensive areas on East Mountain and the south slope/escarpment of Rilda Canyon and the Left Fork of Rilda Canyon. One small rock fall (probably induced by subsidence) on the Castlegate Sandstone cliff along the south slope of Rilda Canyon has been observed in the NE corner of Sec. 33. The Rilda Canyon Road, from the intersection with Hwy. 31 to the forks, was widened to two lanes, improved, and gravelled by Emery County in 1995 and 1996 (See Transportation Section). Deer Creek Mine, Deer Creek Canyon. Portal facilities. The facilities have disturbed 20 acres. A paved Emery	1995 – Present 1946 – Present	The breakout pad removed approx. 2 acres of overstory riparian vegetation and non-riparian understory vegetation. Approximately 200 feet of the Left Fork creek channel is culverted. Fan noise and limited activity at the pad would affect wildlife until they become accustomed to the disturbance. Subsidence has caused one small failure that damaged some trees and vegetation as described above. This is the only evidence of subsidence on the ground surface and no impacts have been discovered by monitoring.

County road runs up Deer Creek Canyon from the intersection with Hwy. 31 to the mine, a distance of approximately 3 miles. Road width averages 20 feet. Most of the drainages in the vicinity of the mine are culverted.		
Coal Exploration. Genwal has drilled 3 coal exploration borings from the surface and 12 from within Crandall Canyon Mine.	All drilled prior to mid-1990's.	All have been reclaimed and the reclamation bonds have been released. There are no residual effects.
Gas Exploration/Production. Flat Canyon /Indian Creek Gas Field (East Mountain Unit). Several wells produced gas but have been plugged.	1950 – 1970	These wells have been abandoned and have been revegetated. They are visible only from related slope changes.
Meridian Oil drilled 6 wells since the early 1980's which are producing natural gas. There is a pipeline on the surface and a compressor station.	1982 – Present	Approximately 6 acres (1 acre/well) remains disturbed for gas production. Negligible residual effects are due to drainage and sediment control. Five of the wells are visible from Cottonwood Canyon Road.

II. Recreation		
Flat water fisheries improvements to Cleveland Reservoir, Huntington Reservoir and Potters Ponds	1995-2002	Improved access, containment of motorized use, and designation of campsites has tended to improve soil, water, and vegetative components associated with these sites.
Huntington Canyon Restoration Project. Improvement of over 60 sites and closure and rehabilitation of over 50 sites located along the U31 Highway corridor.	1998-99	Improved access, containment of motorized use, designation of campsites, and streamside restoration activities have all combined to improve soil, water, and vegetative components along the Huntington Canyon corridor. Some displacement of dispersed camping to Lake Canyon area.

III. Range/Vegetation		
Grazing by sheep and/or cattle started shortly after settlement of Emery County.	1870's	Agriculture remains a basic industry in the county.
Rangeland improvements included installation of water troughs, to improve livestock distribution, and drift fences to better control cattle.	Early 1900's	Water troughs made water more available from small springs and seeps. Short fences kept cattle from drifting too far up canyons.

Initiation of improved grazing systems.	1950's and 60's	More formal management prescriptions were established based on evolving scientific information.

IV. Timber		
Spoon Creek Timber Sale. Four units sold, totaling 413 acres; to remove decadent aspen and promote aspen regeneration.	1993-2000	The first two units have been certified as meeting the objective of 5000 trees per acre and a height of 5 feet. Units 3 and 4 are regenerating well and should be certified in 2005 and 2007.

V. Surface Structures		
Power Lines. Utah Power 345 KV line. Crosses the southwest corner of the Mill Fork Tract (Energy West Mining Co.) in Section 22, T16S, R6E.	1977-Present	Access roads have been reclaimed. Powerline is visually prominent.
Genwal Mine 25 KV line. Carries electricity from Mill Fork Canyon over Mill Fork Ridge and down into Crandall Canyon to power the Genwal Mine.	1989-Present	Access roads have been reclaimed. Powerline is visually prominent.

Present Actions	Implementation Dates (Begin and End)	Residual Effects
I. Minerals		
Coal Mining. Crandall Canyon Mine. Portal and entry development is currently underway on fee property in the South Crandall Lease.	1980 – Present	The mine is in continuous operation. The impacts will continue until the mine is reclaimed.
Deer Creek Mine. Entry development in the Mill Fork Tract is currently underway. Access to the Mill Fork Tract is currently provided through the Deer Creek Mine.	Present	The mine is in continuous operation. The impacts will continue until the mine is reclaimed.
II. Recreation		
Ongoing recreation use on East Mountain.	Present	Dispersed recreation affects soils and vegetation. These impacts are similar to what occurs elsewhere on the forest.
Lake Canyon Trail System Project. Construction of approximately 9.5 miles of new multiple use trails and closure and reclamation of approximately 7 miles of user created trails.	Present	Soils and vegetative conditions improved. Impacts to riparian areas minimized. Miller Flat Road improved to accommodate increased traffic volumes.
Indian Creek Campground Reconstruction Project. New roads, water system, bathrooms, and other improvements are currently being made.	Present	Increased use of facilities once improvements are in place. Increased visitor satisfaction.
III. Range/Vegetation		
Livestock reductions and consolidation of allotments on sheep allotments: Crandall Ridge and Crandall Canyon. A portion of the Crandall Ridge Allotment was moved into the Trail Mountain cattle allotment. Permitted livestock within the area: Gentry Mt. Allotment 1440 cattle, 6/27-9/30. Trail Mt. Allotment 901 cattle, 6/21-9/20. East Mt. Allotment 341 cattle, 6/21-9/10. Crandall Canyon and	2001	Due to changes in sheep operators and concerns for resource conditions, livestock reductions and consolidation of allotments was initiated. Allotment boundaries have been adjusted and permits modified. This will reduce/eliminate grazing impacts on steep head walls in the head of Crandall Canyon mostly on SITLA lands. Monitoring of vegetative and soil trends continue.

Crandall Ridge Allotment, approximately 900 sheep, 7/1-9/30. Horse Creek Allotment 666 sheep, 7/1-9/30.		
Range improvement inventory.	1998 – 2001	Prescribed burning of aspen and sagebrush stands on East Mountain were completed to maintain healthy plant communities.
Range improvement inventory.	2002	Many water troughs needed replacement or heavy maintenance. Drift fences are still functioning as intended.

IV. Timber		
No timber sales are presently occurring.	Present	No effects.

V. Surface Structures		
Power Lines. None are under construction.	Present	No effects.

Future Actions	Implementation Dates (Begin and End)	Residual Effects
I. Minerals		
Coal Mining. Crandall Canyon Mine, Modification of Federal Coal Lease UTU-68082. 120 acres will be added to the lease. No roads or surface facilities. Underground access will be through the Genwal Mine. Crandall Canyon Mine, South Crandall Lease. 880 acres will be added to the Crandal Canyon Mine. Access will be through a portal on the south side of Crandall Canyon on fee property. No additional surface facilities will be constructed. A water replacement agreement between Genwal, PacifiCorp, and water users has been completed to assure an uninterrupted supply of water.	2005 2005	Surface subsidence will occur. Some escarpment failure of the Castlegate Sandstone is possible. Loss of wildlife habitat is not expected. Some disruption of surface and ground water flow paths may occur. Surface subsidence will occur. Some escarpment failure of the Castlegate Sandstone is possible. Loss of wildlife habitat is not expected. Some disruption of surface and ground water flow paths may occur.
Deer Creek Mine. Rilda Canyon Portal Facilities for Mill Fork Tract Access. Approximately 14 acres of new surface disturbance will occur, including a fan portal, access portal, bathhouse, parking lot, and storage areas. The gravel road from Huntington Canyon to the portal facilities will be paved. A new spring development is planned upstream from the portal facilities at the Right Fork of Rilda Canyon.	2005	Big game winter range will be impacted.
Gas Exploration/Production. Petro-Canada (formerly Prima Oil & Gas Company) has proposed to drill a gas exploration well just to the south of the intersection of Big East Road (NFSR 50244) and Flat Canyon Road (NFSR 50145) in T16S R6E, SE ¼, Sec 23. A short access road (approximately 100 to 200 feet long) to the well pad would be required. The well pad dimensions would be approximately 200 feet x 300 feet. Fortuna Oil Company has proposed to drill a gas exploration well in T16S R6E, Sec 36 (SITLA owned land). Access to the well site would be provided by Forest System roads.	2005 2005	If economically recoverable gas reserves are found the well could be in production for an estimated 20-25 years. A 1-acre production pad would be required during the production period. Following that, the production pad would be reclaimed. Reclamation would require an additional 3-5 years. If economically recoverable gas reserves are found the well could be in production for an estimated 20-25 years. A 1-acre production pad would be required during the production period. Following that, the production pad would be reclaimed. Reclamation

		would require an additional 3-5 years.

II. Recreation		
Improving FR 50244 by widening and gravelling.	2005	Improved access to East Mountain would increase recreation use over time. Increased land disturbance and instances of off-road travel are probable. Impacts to wildlife habitat and to soils and vegetation are anticipated.
Improvement and maintenance of nearby existing developed recreation sites such as Flat Canyon Campground, sites in Huntington Canyon, and Indian Creek Campground	Indefinite	Increased use of facilities due to population growth and demand for recreation opportunities. Increased human activity in the area year-round.
Improvement of existing cabins and construction of new cabins on private lands. Potential for construction of new private roads for access to these facilities.	Indefinite	Increased land disturbance, sediment production, and year-round human presence and activity.

III. Range/Vegetation		
SITLA Access Route on East Mountain. Implementation of the project would involve road and well site construction on the Forest and removal of timber outside the Forest boundaries.	2005	An area may need to be closed to grazing unless sheep and cattle can be kept away from areas where new vegetation is being established. It is likely that grazing will need to be withdrawn on most of the SITLA lands during road construction, high logging activity, and while disturbed sites are reclaimed. This would result in an estimated reduction of 159 AUM's. During implementation or recovery periods, transitory range would be recognized and utilized, allowing a temporary increase in grazing. The proposed roads and drill pad construction sites do not have any noxious weeds at this time. Occasionally musk thistle (Carduus nutans) is found in the project area. Sites within 2 miles of this project have dense stands of musk thistle. During the administration of project-related activities, the implementation of noxious weed BMPs would be required in order to prevent the introduction and spread of noxious weeds.
Rangeland monitoring and coordination	Indefinite	New range improvements may be

of grazing with other resource activities.		initiated due to continued monitoring that would include water troughs, and prescribe burning. Through adaptive management new grazing systems may be implemented as scientific information becomes available. The area within the proposed lease area would remain unsuitable for livestock grazing due to steep slopes.

IV. Timber		
SITLA timber harvest on State-managed land could impact deer and elk by removing or degrading cover habitat on State-managed land on East Mountain.	2005	The timber sale has the potential to affect the following types and amounts of habitat plus whatever is needed for skidding and loading: 161 acres of aspen/mixed conifer, 123 acres of spruce/fir, and 147 acres of mixed conifer/Douglas fir. Increased traffic during timber harvest would also cause increased disturbance in potentially suitable deer and elk habitat along travel routes. Beneficial effects may include reducing conifer encroachment in aspen stands, and reducing fuels build up in conifer stands.

V. Surface Structures		
Power Lines. No new power lines are currently planned.		No effects.

APPENDIX B
FS AND BLM COAL LEASE STIPULATIONS
FEDERAL COAL LEASE UTU-68082

1. The Regulatory Authority shall mean the State Regulatory Authority pursuant to a cooperative agreement approved under 30 CFR Part 745 or in the absence of a cooperative agreement, Office of Surface Mining. The authorized officer shall mean the State Director, Bureau of Land Management. The authorized officer of the Surface Management Agency shall mean the Forest Supervisor, Forest Service. Surface Management Agency for private surface is the Bureau of Land Management. For adjoining private lands with Federal minerals and which primarily involve National Forest Service issues, the Forest Service will have the lead for environmental analysis and, when necessary, documentation in an environmental assessment or environmental impact statement.

2. The authorized officers, of the Bureau of Land Management, Office of Surface Mining (Regulatory Authority), and the Surface Management Agency (Forest Service) respectively, shall coordinate, as practical, regulation of mining operations and associated activities on the lease area.

3. In accordance with Sec. 523(b) of the "Surface Mining Control and Reclamation Act of 1977," surface mining and reclamation operations conducted on this lease are to conform with the requirements of this Act and are subject to compliance with the Office of Surface Mining Regulations, or as applicable, a Utah program equivalent approved under cooperative agreement in accordance with Sec. 523(c). The United States Government does not warrant that the entire tract will be susceptible to mining.

4. Federal Regulations 43 CFR 3400 pertaining to Coal Management make provisions for the Surface Management Agency, the surface of which is under the jurisdiction of any Federal agency other than the Department of Interior, to consent to leasing and to prescribe conditions to insure the use and protection of the lands. All or part of this lease contain lands the surface of which are managed by the United States Department of Agriculture, Forest Service Manti-La Sal National Forest.

The following stipulations pertain to the lessee responsibility for mining operations on the lease area and on adjacent areas as may be specifically designated on the National Forest System lands.

5. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory and a paleontological appraisal of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists or qualified paleontologists, as appropriate, and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified cultural or paleontological resources.

If cultural resources or paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the lessee prior to disturbance shall, immediately bring them to the attention of the appropriate authorities. Paleontological remains of significant scientific interest do not include leaves, ferns, or dinosaur tracks commonly encountered during underground mining operations.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the lessee.

6. If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory bird species of high Federal interest occur in the area the lessee shall be required to conduct an intensive field inventory of the area to be disturbed and/or impacted. The inventory shall be conducted by a qualified specialist and a report of findings will be prepared. A plan will be prepared making recommendations for the protection of these species or action necessary to mitigate the disturbance.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the lessee.

7. The lessee shall be required to perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. Existing data may be used if such data is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

8. Powerlines used in conjunction with the mining of coal from this lease shall be constructed so as to provide adequate protection for raptors and other large birds. When feasible, powerlines will be located at least 100 yards from public roads.

9. The limited area available for mine facilities at the coal outcrop, steep topography, adverse winter weather, and physical limitations on the size and design of the access road, are factors which will determine the ultimate size of the surface area utilized for the mine. A site specific environmental analysis will be prepared for each new mine site development and for major modifications to existing developments to examine alternatives and mitigate conflicts.

10. Consideration will be given to site selection to reduce adverse visual impacts. Where alternative sites are available, and each alternative is technically feasible, the alternative involving the least damage to the scenery and other resources shall be selected. Permanent structures and facilities will be designed, and screening techniques employed, to reduce visual impacts, and where possible achieve a final landscape compatible with the natural surroundings. The creation of unusual, objectionable, or unnatural land forms and vegetative landscape features will be avoided.

11. The lessee shall be required to establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data.

12. The lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal handling and storage facilities. On Forest Development Roads (FDR), lessees may perform their share of road maintenance by a commensurate share agreement if a significant degree of traffic is generated that is not related to their activities.

13. Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to existing surface structures, or (3) damage or alter the flow of perennial streams. The lessee shall provide specific measures for the protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created.

14. In order to avoid surface disturbance on steep canyon slopes and to preclude the need for surface access, all surface breakouts for ventilation tunnels shall be constructed from inside the mine, except at specifically approved locations.

15. If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with the regulations of the surface management agency.

16. The coal contained within, and authorized for mining under this lease, shall be extracted only by underground mining methods.

17. Existing Forest Service owned or permitted surface improvements will need to be protected, restored, or replaced to provide for the continuance of current land uses.

18. In order to protect big game wintering areas, elk calving and deer fawning areas, sagegrouse strutting areas, and other critical wildlife habitat and/or activities, specific surface uses outside the mine development area may be curtailed during specific periods of the year.

19. Support facilities, structures, equipment, and similar developments will be removed from the lease area within 2 years after the final termination of use of such facilities. This provision shall apply unless the requirement of Section 10 of the lease form is applicable. Disturbed areas and those areas previously occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to a pre-mining land use.

20. The lessee at the conclusion of the mining operations, or at other times as surface disturbance related to mining may occur, will replace all damaged, disturbed, or displaced corner monuments (section corners, quarter corners, etc.) their accessories and appendages

(witness trees, bearing trees, etc.) or restore them to their original condition and location, or at other locations that meet the requirements of the rectangular surveying system. This work shall be conducted at the expense of the lessee, by a professional land surveyor registered in the State of Utah and to the standards and guidelines found in the manual of surveying instruction, U.S. Department of Interior.

21. The lessee at his expense will be responsible to replace any surface water identified for protection, that may be lost or adversely affected by mining operations, with water from an alternate source in sufficient quantity and quality to maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses.

22. The lessee must comply with all the rules and regulations of the Secretary of Agriculture set forth at Title 36, Chapter II, of the Code of Federal Regulations governing the use and management of the National Forest System (NFS) when not inconsistent with the rights granted by the Secretary of the Interior in the lease. The Secretary of Agriculture's rules and regulations must be complied with for (1) all use and occupancy of the NFS prior to approval of a permit/operation plan by the Secretary of Interior, (2) uses of all existing improvements, such as Forest Development Roads, within and outside the area licensed, permitted or leased by the Secretary of Interior, and (3) use and occupancy of the NFS not authorized by a permit/operation plan approved by the Secretary of the Interior.

All matters related to this stipulation are to be addressed to :

Forest Supervisor
Manti-La Sal National Forest
599 West Price River Drive
Price, Utah 84501
Telephone No.: (435) 637-2817

who is the authorized representative of the Secretary of Agriculture.

23. The lessee/operator will be requied to drill horizontally ahead of the advance of development workings to the west in the vicinity of the Joes Valley fault zone to locate any faults and determine if they contain significant amounts of water. If significant water is encountered, the operator will be required to take appropriate measures, subject to approval of the Bureau of Land Management and Forest Service, to prevent diverting this water into the mine workings.

24. Except at specifically approved locations, mining that would cause subsidence will not be permitted within a zone along the Joes Valley Fault determined by projecting a 22 degree angle-of-draw (from vertical) eastward from the surface expression of the Joes Valley Fault, down to the top of the coal seam to be mined.

APPENDIX C
SUPPLEMENTAL FS STIPULATION
MODIFICATION OF FEDERAL COAL LEASE UTU-68082

Stipulation #1
Except at locations specifically approved by the Authorized Officer, with concurrence of the surface management agency, full extraction mining will not be authorized where the fracture zone created by subsidence is projected to reach the surface, as calculated by 50 times the thickness of coal removed plus 50 feet.

The United States Department of Agriculture (USDA) prohibits discrimination in it's programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-2791.

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C., 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal opportunity employer.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations": Based on comments received during scoping, no adverse environmental or human health effects on minority or low-income populations have been identified that could result from the proposed action and subsequent decisions. Environmental justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, and not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment. Decisions must be consistent with this Order. The decisions of the responsible officials will seek and incorporate public involvement. The decisions must not have a discernible effect on minorities, American Indians, or women, or the civil rights of any United States citizen. Nor must they have a disproportionate adverse impact on minorities or low-income individuals.

APPENDIX 3-21

APPENDIX 3-21

PERENNIAL STREAM CONSIDERATIONS AT

"NO-NAME CREEK' & BLIND CANYON CREEK,

TRIBUTARIES TO HUNTINGTON CANYON CREEK

(MT. NEBO SCIENTIFIC)

PERENNIAL STREAM CONSIDERATIONS AT "NO-NAME CREEK" & BLIND CANYON CREEK, TRIBUTARIES TO HUNTINGTON CANYON CREEK

PREPARED FOR
CRANDALL CANYON MINE
EMERY COUNTY, UTAH

Prepared by

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Patrick D. Collins, Ph.D.

for

ANDALEX RESOURCES
P.O. Box 1077
Price, Utah 84501

June 2004

TABLE OF CONTENTS

PERENNIAL STREAM CONSIDERATIONS AT "NO NAME CREEK" & BLIND CANYON CREEK, TRIBUTARIES TO HUNTINGTON CANYON CREEK

SUMMARY

A survey of some of the biological resources in Blind Canyon Creek and "No-Name Creek" suggests that the former could be considered a perennial stream. No-Name Creek, on the other hand, may *not* be perennial due to a variety of considerations, especially in its upper reaches. A conclusive statement at the time of this report regarding its perennial status in the lower section would be premature.

INTRODUCTION

Operators of Crandall Canyon Mine have been interested in ascertaining the perennial status of two creeks that exist somewhat near their current coal mining activities. The first creek has an outlet to Huntington Creek and is located approximately 1 mile north of Crandall Canyon via SR-31 (T15S, R7E, Section 32). This creek has been called "No Name Creek" in this report because it has not been named on the USGS quadrangle maps. The outlet to Huntington Creek for the second stream, or Blind Canyon Creek, is located about 0.5 mile north of No-Name Creek (T15S, R7E, Sections 29 and 32).

Field work on the creeks was accomplished to survey the stream reaches and to obtain data in order to make a determination whether or not they should be considered "perennial", "intermittent" or "ephemeral" based on some biological indicators.

METHODS

Field visits were made to the creeks on three different occasions to assess the biological resource indicators and to note the stream flows. In addition, offices of the State of Utah, Division of Water Rights were contacted and later visited to research any information that they had on file regarding the creeks, especially, No Name Creek. Meetings and correspondence with staff at the USDA Forest Service in Price, Utah were also accomplished to compare definitions and requirements for determinations of perennial stream status.

The field visits of the study area were conducted on May 6, May 14, and June 18, 2004. On each field trip, qualitative notes were recorded pertaining to the creeks and riparian plant communities in the drainages. On the second field visit (May 14, 2004) invertebrate "grab" samples were taken at several locations in the main channels of each creek and were combined to make two composite samples (one composite sample for each creek). Macroinvertebrate species were identified by Dr. Dennis K. Shiozawa (Brigham Young University, Provo, Utah).

RESULTS

Perennial Steam Definition

There are several definitions one could use to determine whether a stream is "perennial" or not. One such definition that has been used in studies conducted or reviewed by the USDA Forest Service is shown below:

"A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Ground water is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for streamflow (USACE, definitions for 2002 Nationwide Permits). The importance of springs in maintaining perennial streamflow is variable and ranges from a major to a supplemental source. A perennial stream is made up primarily of gaining or effluent segments. However, in arid environments, a stream may have losing or influent segments and still be considered perennial if the influent segment has perennial segments up- and downstream of it. Note that the alluvial ground water that supports perennial stream segments originates in a variable source area upstream/up-gradient of the perennial segment. Intermittent streams typically occur in these portions of the source area. Intermittent streams flow during snowmelt runoff and are usually dry by late summer and early fall. Ephemeral streams only flow as a direct response to storm events."

No-Name Creek

As one walks up No-Name Creek from Huntington Canyon Creek, the channel remains fairly straight and consistent, the streambed often comprised of Star Point sandstone (see Fig. 1). At a point nearly 3,000 ft from the outlet there is a confluence called the "Left Fork" and "Right Fork" of No-Name Creek in this report (Figs. 2-4).

No-Name Creek was flowing during each field survey, although the flow decreased with each successive visit. At the time of the last field trip to the site (June 18), less water was flowing from the Left Fork and only a trickle of water was flowing from the Right Fork of the creek. Consequently, most of the water present in the main channel was coming from the Left Fork, gaining flow as it moved downstream.

Species identified by macroinvertebrate sampling suggested that this stream is *not* perennial. The species identified were taxa that do not require year-round flow to complete their life cycles [mostly present were Chironomids (midges) and Simulids (blackflies)].

Plant species existing in the riparian zones of No-Name Creek strongly suggested the presence of wet or moist soils – but these species could be a result of a perennial *or* intermittent stream. Some of these plants included woody species such as Red-osier dogwood (*Cornus sericea*), quite common in the drainage, and water birch (*Betula occidentalis*), less common in the drainage.

Moreover, herbaceous species such as the grass, redtop (*Agrostis stolonifera*) and pretty shooting-star (*Dodecatheon pulchellum*) also suggested contact with water during much of the year, especially the shooting-star species. However, absent (at least inconspicuous during the time of the field visits) were wetland/riparian species such as rushes (*Juncus* spp.), sedges (*Carex* spp.), bulrushes (*Scirpus* spp.) and spikerushes (*Eleocharis* spp.).

Blind Canyon Creek

The initial field trips to Blind Canyon Creek suggested that the stream *is* indeed perennial (Figs. 5-6). Indicators for this assumption were many of the plant species mentioned above, active beaver ponds and a host of macroinvertebrate taxa that usually require a year-round water source [i.e. Perloidids (*Isoperla*), Baetids (Baetis), Hydropsychids, Oligochaetes, Pteronarcids and *Ephemerella grandis*].

DISCUSSION

No information about the two streams was available at the State of Utah, Division of Water Rights. The time line for a perennial stream determination study happened to come at a difficult time of the year to make conclusive findings for some creeks in the Wasatch Plateau. No-Name Creek was one such stream. For example, the study was conducted mostly during peak runoff periods. Moreover, some plant species were in a difficult stage to identify by species. Finally, it was necessary to conduct the last field survey (June 18) on a day following a significant storm event, which undoubtedly influenced the stream flows in the area.

Macroinvertebrate species present in the main channel of No-Name Creek suggested the stream was *not* perennial. However, due to some of the plant species present near this creek, a perennial designation with field work conducted later in the year is certainly a possibility. It does seem more likely than not that the No-Name Creek is *not* perennial, but a survey later in the growing season is the only method to make a conclusive determination of this reach.

As a side note, with more stream monitoring it is also possible that No-Name Creek could be intermittent in the upper reaches (beginning at the fork or confluence described above), but perennial in the lower reaches (main channel) where underground mining has not been proposed. *In other words, the upper reaches near the locations where mining has been proposed near No-Name Creek could probably be classified as "intermittent" in the very near future because these areas had rapidly decreasing flows over time, most of which were already dry by the end of the field portion of the study.*

On the other hand, Blind Canyon Creek drains a much larger surface area when compared to No-Name Creek, supports a variety of macroinvertebrate species that require a continuous water source, sustains more wetland/riparian plant species and supports active beaver populations. A perennial designation of this creek could be assigned with much more confidence at this time.

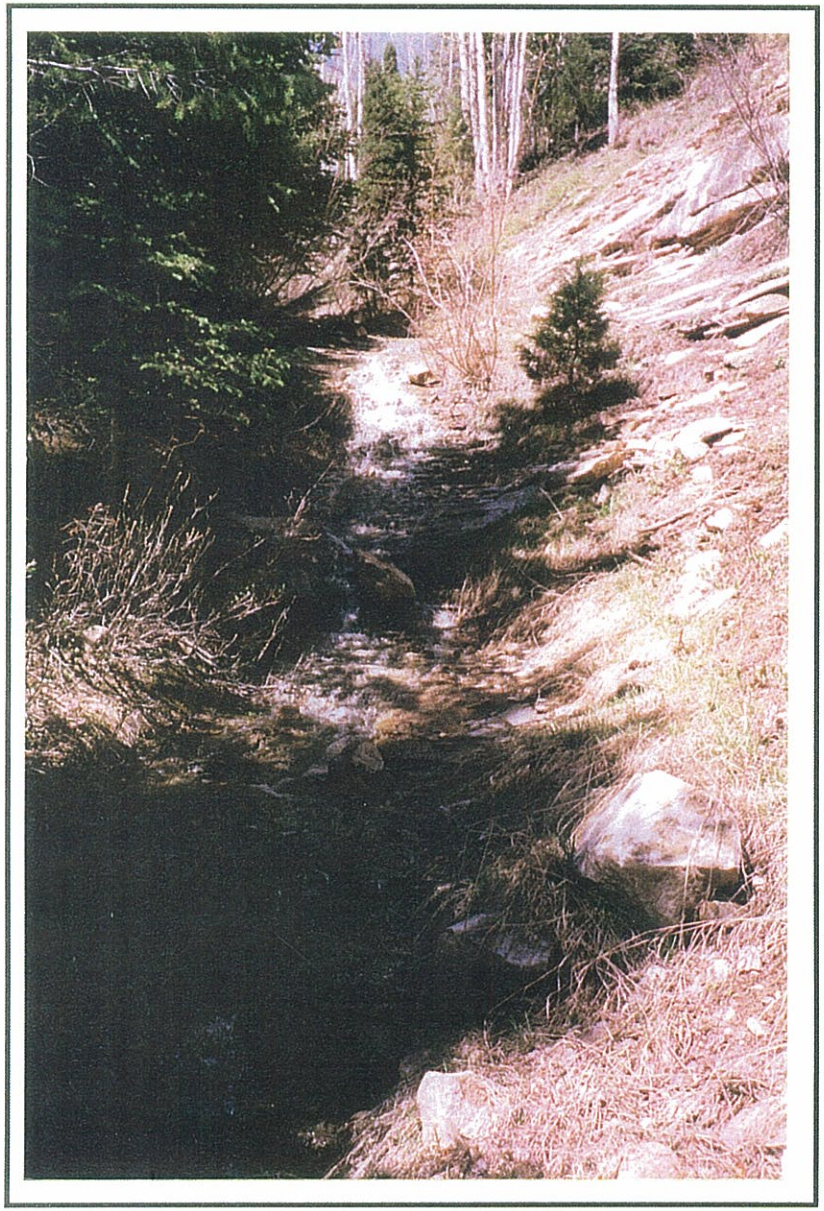

Fig. 1. No-Name Creek Main Channel (May 6, 2004)

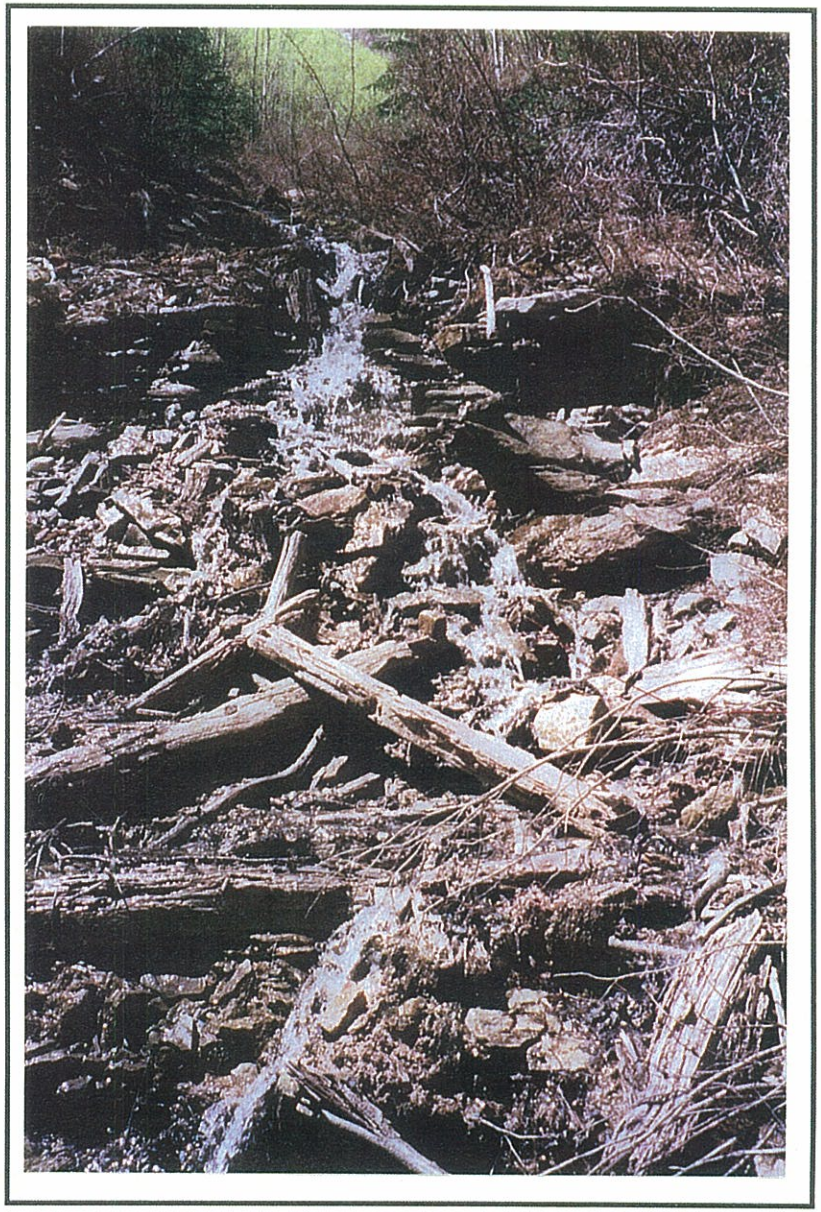

Fig. 2. No-Name Creek Left Fork Near Confluence (May 6, 2004)

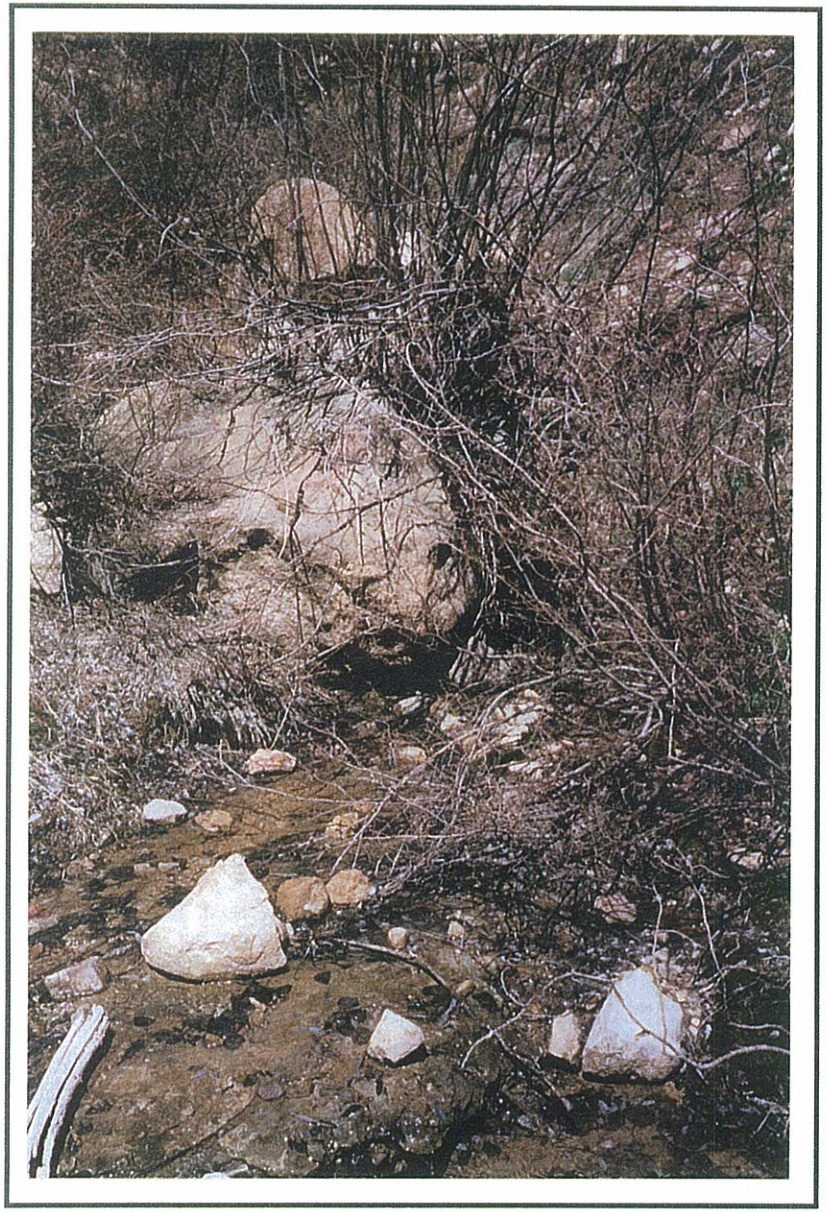

Fig. 3. No-Name Creek Right Fork Near Confluence (May 6, 2004)

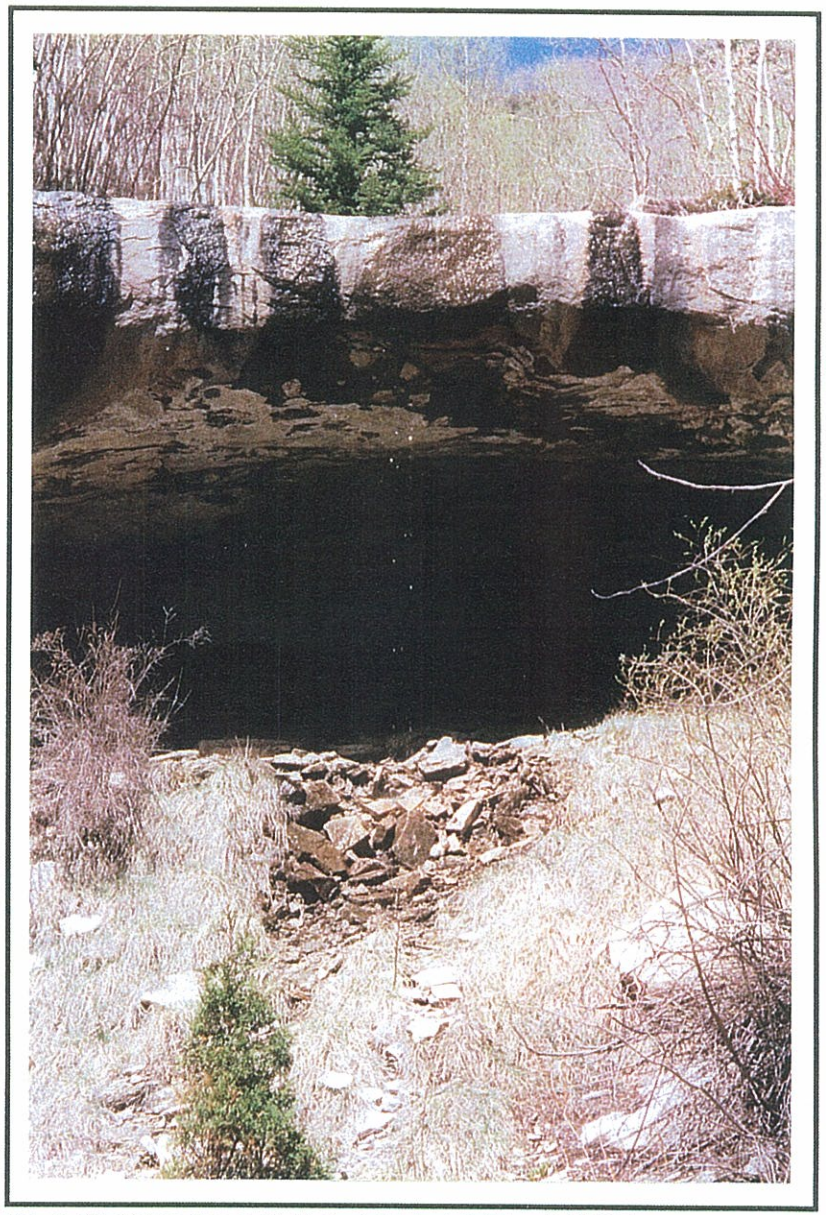

Fig. 4. No-Name Creek Right Fork Waterfall (May 6, 2004)

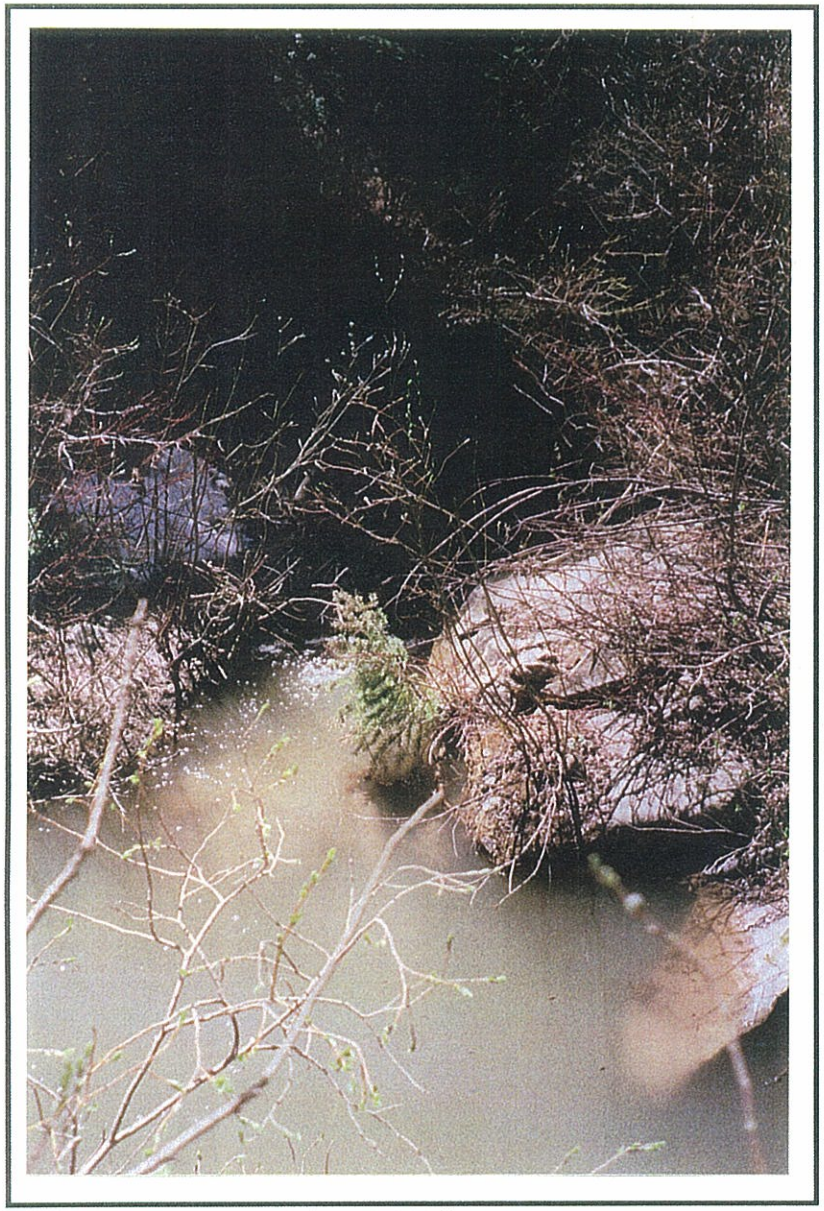

Fig. 5. Blind Canyon Creek (May 6, 2004)

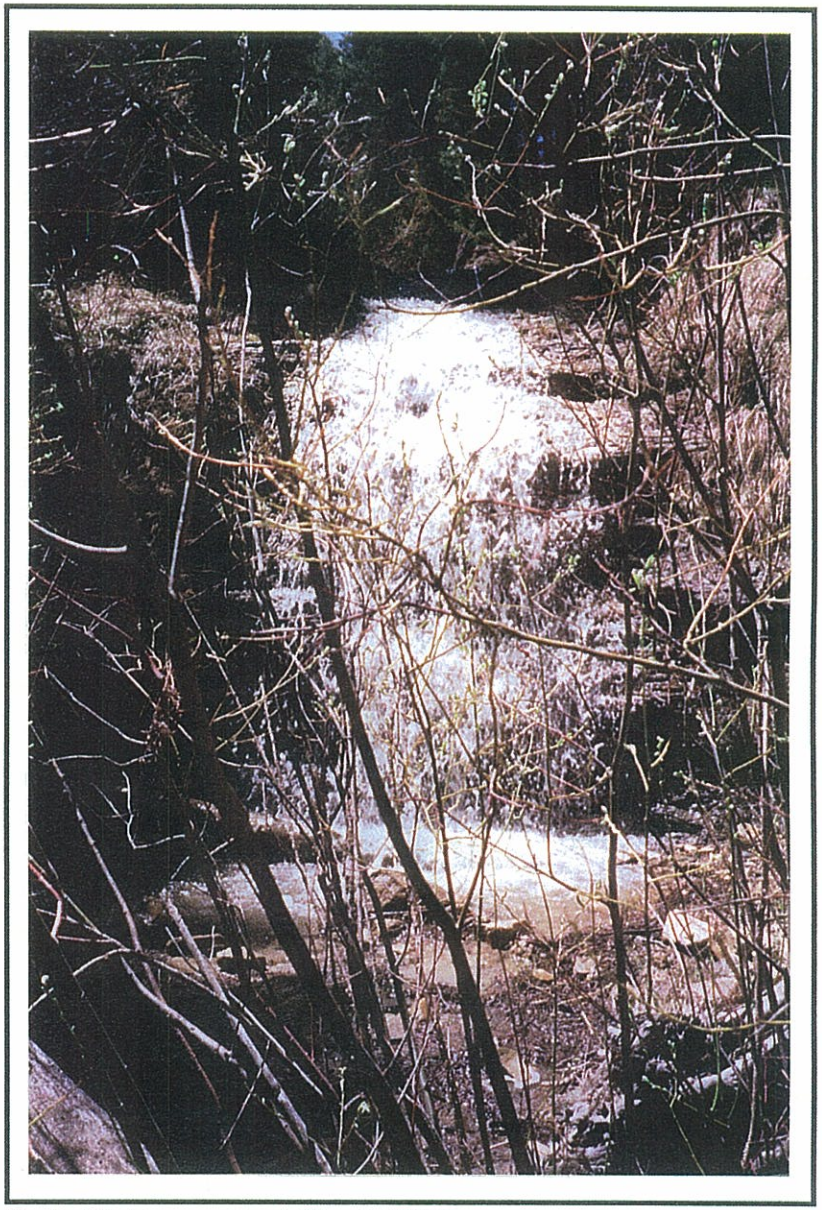

Fig. 6. Blind Canyon Creek (May 6, 2004)