Monticello-Blanding Watershed Improvement Project
Specialist's Report- Wildlife & Plants
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INTRODUCTION

All threatened, endangered, candidate, sensitive, management indicator and concern wildlife and plant species are analyzed for effects in this Specialist Report and associated biological assessment and evaluation (located in the project file). Three levels of analysis were developed depending on the affects due to habitat, species range, project impacts, or the ability for impacts to be mitigated.

The following four species were analyzed in depth in the EIS and used to measure impacts and evaluate comparisons among alternatives. These four species represent the greatest potential for impacts:

Northern goshawk
Three-toed woodpecker
Mule deer
Rocky mountain elk

WILDLIFE RESOURCES (Northern Goshawk & Three-Toed Woodpecker) - Implementation of the proposed actions, insect epidemic, or fire occurrence may impact the habitat and behavior of the northern goshawk or three-toed woodpecker (Region 4 designated Sensitive Species).

Indicators:

- *Impact determination for the northern goshawk:*
  Acres of habitat meeting Forest Plan guidelines
- *Impact determination for the three-toed woodpecker:*
  Acres disturbed
  Aspen Regeneration (acres)

WILDLIFE RESOURCES (Deer and Elk) - Implementation of the proposed actions, insect epidemic, or fire occurrence may impact the habitat and behavior of deer and elk (Management Indicator Species – MIS). The analysis of this issue will be included in the sections with the Significant Issue – Wildlife Resources (Northern Goshawk & Three-Toed Woodpecker) in the remainder of this document. It will be titled Wildlife Resources.

Indicators:

- *Deer and Elk Forage Habitat Assessment:*
  Acres of forest canopy opened to allow increased ground vegetation.
  Aspen Regeneration (acres)
- *Deer and Elk Vulnerability Assessment:*
  Road Density (miles/square mile)
  Road Standard Upgrade (miles)

The following nine species are not analyzed in the EIS, but are given full consideration in the Specialist Report and associated BA/BE. Although there may be impacts to these species, it is

less likely, and managing for impacts to the above four species would likely cover the needs of these:

Flammulated owl
Spotted bat
Townsend's bat
Colorado River Cutthroat
Blue grouse
Macroinvertebrates
Merriam's turkey
Cavity nesting/Neotropical migrant birds
Abajo daisy

The remaining plants and animals on the list for the Monticello portion of the district were analyzed briefly in the Specialist Report and BA/BE, but no impacts were determined due to the absence of appropriate habitat, project not occurring within their range or impacts being mitigated.

Threatened, endangered, and candidate species are managed under the authority of the Federal Endangered Species Act (PL93-205, as amended) and the National Forest Management Act of 1976. The Endangered Species Act requires federal agencies to ensure that all actions are not likely to jeopardize the continued existence of any threatened, endangered, proposed and candidate species (section 7).

The USDA Forest Service has developed policy regarding the designation of sensitive plant and animal species. A sensitive species is defined (FSM 2670.5) as those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by: 1) significant current or predicted downward trends in population numbers or density or 2) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

The Forest Service objective for sensitive species management (FSM 2670.22) states that we will "develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions," In addition, the National Environmental Policy Act (42 U.S.C. 4321-4346) directs that the Forest Service "review programs and activities ... to determine their potential effect on sensitive species."

The Sensitive Plant Program Handbook (R-4 FSH 2609.25) specifies that in all planning and land management activities, wild populations of all species listed on the Region 4 Sensitive Plant Species List will be given the same management considerations as though they were already officially classified, unless it is determined on a case-by-case basis that verified data concerning a species is adequate to allow other specific action. All necessary steps will be taken to assure that agency actions do not jeopardize the continued existence of the species or result in the destruction or modification of their essential habitat until such time as their status is determined. This document is prepared using direction from Forest Service Manual 2672.4.

Direct and indirect effects are measured within the project site on 9,634 acres. This is the area where changes may occur and include the spruce/sub-alpine fir; aspen/spruce/sub-alpine fir; and aspen/mixed conifer vegetation types.

Direct Effects of the Alternatives on Stand Composition and Structure (Acres) if all stands are treated.

Vegetation Type	Structure	*Alt. A Short Term*	*Alt. B Short Term*	*Alt. C Short Term*		*Alt. A Long Term*	*Alt. B Long Term*	*Alt. C Long Term*
Spruce-Sub-alpine fir	Early	0	162	139		0	194	415
	Young	0	0	0		397	397	261
	Mid-Aged	30	30	30		1,191	383	400
	Mature	1,558	1,396	1,419		0	614	512
Total Acres		1,588	1,588	1,588		1,588	1,588	1,588
Aspen-Spruce-Sub-alpine fir	Early	0	162	91		0	194	273
	Young	0	0	0		582	582	945
	Mid-Aged	292	292	292		1,647	838	674
	Mature	1,934	1,775	1,846		0	615	337
Total Acres		2,229	2,229	2,229		2,229	2,229	2,229
Aspen-Mixed Conifer	Early	0	192	150		0	192	150
	Young	29	29	29		29	29	29
	Mid-Aged	3,288	3,288	3,288		3,288	3,288	3,288
	Mature	2,500	2,308	2,350		2,500	2,308	2,350
Total Acres		5,817	5,817	5,817		5,817	5,817	5,817

The cumulative effects analysis for vegetation is based on the boundary used to analyze the cumulative effects to vegetation. This boundary included most of the significant spruce-fir and aspen-spruce stands in close proximity to the spruce beetle populations within the project area and totals 22,380 acres.

Cumulative Effects of the Alternatives on Stand Composition and Structure (Acres) if all stands are treated.

Vegetation Type	Structure	*Alt. A Short Term*	*Alt. B Short Term*	*Alt. C Short Term*		*Alt. A Long Term*	*Alt. B Long Term*	*Alt. C Long Term*
Spruce-Sub-alpine fir	Early	0	162	139		0	194	415
	Young	0	0	0		667	667	1,042
	Mid-Aged	51	51	51		2,000	1,187	697
	Mature	2,616	2,454	2,477		0	619	513
Total Acres		2,667	2,667	2,667		2,667	2,667	2,667
Aspen-Spruce-Sub-alpine fir	Early	0	162	91		0	194	273
	Young	0	0	0		846	946	1,515
	Mid-Aged	401	401	401		2,523	1,614	1,244
	Mature	2,968	2,806	2,877		0	615	337
Total Acres		3,369	3,369	3,369		3,369	3,369	3,369

Aspen-Mixed Conifer	Early	0	192	150		0	192	150
	Young	176	176	176		176	176	176
	Mid-Aged	9,719	9,719	9,719		9,719	9,719	9,719
	Mature	6,332	6,140	6,182		6,757	6,140	6,182
Total Acres		16,227	16,227	16,227		16,227	16,227	16,227

CURRENT MANAGEMENT DIRECTION

Current policy as stated in the Forest Service Manual (FSM 2670.32) includes the following (USFS 1991):

1. Assist states in achieving their goals for conservation of endemic species.

2. As part of the National Environmental Policy Act process, review programs and activities through a biological assessment/evaluation to determine their potential effect on sensitive species.

3. Avoid or minimize impacts to species whose viability has been identified as a concern.

4. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and/or the species as a whole.

5. Establish management objectives in cooperation with the states when projects on National Forest System lands may have significant effect on sensitive species population numbers or distributions. Establish objectives for Federal candidate species, in cooperation with the U.S. Fish and Wildlife Service (FWS) and the states.

Further direction as outlined in the Land and Resource Management Plan for the Manti-La Sal National Forest states (USFS 1986), "Manage habitat for recovery of endangered and threatened species. Where activities or uses may impact T&E species or their habitat, initiate consultation procedures. Include the results of consultation in determining the viability of the activity or use. Manage habitat of sensitive species to keep them from becoming threatened or endangered" (Page III-21).

Several listed species were dropped from further analysis based on the results of the Biological Assessment and Evaluation. A summary of these species is as follows with a brief description as to why they are not being carried through the analysis. More in-depth discussions follow.

Listed wildlife species located within San Juan County, Utah:

1. Mexican Spotted Owl (Strix occidentalis lucida) Threatened
2. Bald Eagle (Haliaeetus leucocephalus) Threatened
3. California Condor (Gymnogyps californianus) Endangered
4. Colorado Pikeminnow (Ptychocheilus lucius) Endangered

5. Razorback Sucker (Xyrauchen texanus)	Endangered
6. Bonytail Chub (Gilia elegans)	Endangered
7. Humpback Chub (Gilia cypha)	Endangered
8. Black-footed Ferret (Mustela nigripes)	Endangered
9. Southwestern Willow Flycatcher (Empidonax traillii extimus)	Endangered
10. Gunnison Sage-Grouse (Centrocercus minimus)	Candidate
11. Western Yellow-billed Cuckoo (Coccyzus americanus occidentalis)	Candidate
12. American Peregrine Falcon (Falco peregrinus anatum)	Sensitive
13. Flammulated Owl (Otus flammeolus)	Sensitive
14. Northern Goshawk (Accipiter gentilis)	Sensitive
15. Three-toed Woodpecker (Picoides tridactylus)	Sensitive
16. Boreal Owl (Otus funereus)	Sensitive
17. Spotted Bat (Euderma maculatum)	Sensitive
18. Townsend's Big-Eared Bat (Corynorhinus townsendii)	Sensitive
19. Colorado River Cutthroat Trout (Oncorhynchus clarki pleuriticus)	Sensitive
20. Spotted Frog (Rana pretiosa)	Sensitive
21. Mule Deer (Odocoileus hemionus)	Mgmt. Indicator
22. Rocky Mountain Elk (Cervus canadensis)	Mgmt. Indicator
23. Abert's Squirrel (Sciurus abertii)	Mgmt. Indicator
24. Golden Eagle (Aquila chrysaetos)	Mgmt. Indicator
25. Blue Grouse (Dendragapus obscurus)	Mgmt. Indicator
26. Macroinvertebrates	Mgmt. Indicator
27. Merriam's Turkey (Meleagris gallopavo merriami)	Special Interest
28. Cavity Nesting/Neotropical Migrant Birds	Special Interest

The following listed plant species are located in San Juan County, Utah:

1. Jones cycladenia (Cycladenia humilis var. jonesii)	Threatened
2. Navajo Sedge (Carex specuicola)-	Threatened
3. Boreal Rockjasmine (Androsace chamaejasme var. carinata)	Sensitive
4. LaSal Daisy (Erigeron mancus)	Sensitive
5. Canyonlands Lomatium (Lomatium latilobum)	Sensitive
6. Kachina Daisy (Erigeron kachinensis)	Sensitive
7. Pinnate Spring Parsley (Cymopterus beckii)	Sensitive
8. Chatterley Onion (Allium geyeri chatterleyi)	Sensitive
9. Abajo Daisy (Erigeron abajoensis)	Sensitive
10. La Sal Groundsel (Senecio dimorphophyllus var. intermedius)	Special Interest
11. Spineless Hedgehog Cactus (Echinocereus trigochidiatus var. inermis)	Special Interest

1. Mexican Spotted Owl

Life History: The Mexican spotted owl (MSO) currently occupies a broad geographic area, but does not occur uniformly throughout its range. 91% of these owls known to exist between 1990 and 1993 occurred on lands administered by the Forest Service. The Mexican spotted owl is

found in mature, mixed spruce/fir forests with dense, uneven-aged stands. Breeding owls in southern Utah primarily utilize deep, steep-walled canyons with mature coniferous or deciduous trees in the bottoms. Nest sites are generally found on cliff ledges in Douglas fir (Pseudotsuga menziesii) and to a lesser extent ponderosa pine (Pinus ponderosa) and Gambel's oak (Quercus gambelii). They forage in mature forests of mixed spruce/fir and Gambel's oak, possibly due to the availability of preferred prey (woodrat, Neotoma sp.) and avoidance of great horned owls (Bubo virginianus). Spotted owls are relatively intolerant of high temperatures and roost and nest in shady forests, or in southeastern Utah, in the cracks of deep slot canyons. Females usually lay one to three eggs but do not nest every year. Courtship begins in March, eggs are laid in early April. Incubation takes approximately 30 days. Eggs typically hatch in early May, with nestling owls fledging in early to mid June. Predators of the MSO include great horned owls, northern goshawks, red-tailed hawks and golden eagles.

Current Status: The MSO was federally listed in 1993. A Recovery Plan for the Mexican Spotted Owl was completed in December 1995 (Kaufman, USFWS). Critical habitat for the MSO was designated in July 1995 and again in February 2001. This designation includes the western half of the Monticello portion of the district. Most habitat deemed appropriate for the Mexican Spotted Owl has been surveyed on the Moab/Monticello Ranger District. To date, all nests located have been within canyon country, and PACs (Protected Activity Centers) have been designated.

Effects: Habitat within the project area is not suitable for Mexican Spotted Owls. These birds have been located on the western portion of the Monticello District in canyons with associated large trees at the bottom of the canyons. The eastern portion of the District does not contain the canyon landscape suitable for MSO nesting. Surveys for MSO were conducted in 1990 and 1991 within the watershed project boundary from Buckboard campground, over North Creek pass to Red Bluffs Campground. The survey detected 10 flammulated owls, one great-horned owl, and 2 long-eared owl responses. No effect to MSO is expected as a result of this project.

2. Bald Eagle

Life History: The bald eagle is a large raptor classified as a sea or fish eagle. During the breeding season, bald eagles are closely associated with water, feeding mainly on fish along coasts, lakeshores or riverbanks. They are very opportunistic predators, especially during the winter. They will eat whatever is available including fish, waterfowl, small mammals and carrion. In winter, they tend to concentrate wherever food is available, roosting in forested stands that provide protection from harsh weather. During winter, eagles generally move south to open water. They can be found in almost every state in North America for all or part of the year.

Bald eagles establish pair bonds and are assumed to mate for life. Start of the breeding season varies with location. In the Intermountain region, bald eagles initiate nesting from February to March. Nests are generally built in trees although cliffs are also used. Nests are usually located within two miles of water. Bald eagles lay 1-3 eggs around March or April and incubation lasts around 35 days. Only one young usually survives to fledge, however. Breeding territories are typically 250-500 acres in size. During the winter, they commonly roost in large groups and it is not unusual to find several bald eagles feeding on the carcass of a large animal in southeast Utah.

Current Status: Four pairs of bald eagles are known to nest in Utah. There are no breeding or nesting pairs known or suspected on the Moab/Monticello District. Bald eagles are migratory in the area. Nesting is unlikely except around large bodies of water where they have ample fish for food. The closest known nesting pair of bald eagles is along the Colorado River. Isolated sightings of bald eagles have occurred near Buckeye Reservoir on the Colorado side of the Moab portion of the district.

Effects: No nests have been located within the vicinity of the Monticello District. The largest body of water near the project area where fish may be available for food for bald eagles is Foy Lake. No bald eagles have been sighted in the vicinity of this lake. No effect to bald eagles is expected as a result of this project.

3. California Condor

Life History: Adult condors weigh 17-24 pounds and have a wingspan of up to 9.5 feet. Prior to the arrival of pioneers, the condor's range extended from British Columbia south through Baja California. It's most immediate range was limited to the coastal ranges of southern California with nesting occurring primarily in the chaparral-covered mountains and foraging in the grasslands. Condors do not kill prey, but feed only on carrion. Historically, they fed on bison, deer and pronghorn as well as beached marine animals. Most recently, their diet consisted largely of cattle and native deer and smaller animals. A condor can eat up to 3-4 pounds at a time but will not need to eat again for 3-4 days. Sexual maturity is reached at 5-7 years of age. Nesting takes place in caves, potholes and sheltered rock outcrops. Young hatch after 54-58 days of incubation but usually can't fly until about 6 months of age. Parents will continue to feed a fledgling for more than a year as it learns foraging skills.

Current Status: As part of a captive breeding and reintroduction program, California condors were released into the wild at the Vermilion Cliffs near the Grand Canyon in 1997. Condors from this release site have been observed in various locations in southern Utah since that time. These sightings appear to be isolated incidents, and the birds returned to the Vermilion Cliffs. These individuals are part of a nonessential, experimental population and are not subject to the same level of protection as naturally-occurring populations of threatened and endangered species. An experimental population area has been designated which includes portions of southeast Utah and the project area. Within the experimental area, the condors maintain the status of nonessential experimental. Current and future land uses, including forest management, should not be restricted due to the nonessential experimental population of California condors (USDI FWS 1996).

Effects: While condors have the potential to occur within the District, this species is not known to nest or roost here and occurs on a transient basis. Therefore, the proposed project would have no effect on this species.

4-7. Colorado Pikeminnow, Razorback Sucker, Bonytail Chub and Humpback Chub

Life History:
The *Colorado pikeminnow* eats other fish and some insects and invertebrates. The species spawns during the spring and summer over riffle areas with gravel or cobble substrate. Eggs are randomly broadcast onto the bottom and usually hatch in less than one week. They prefer medium to large rivers where they can find a variety of habitats ranging from deep turbid rapids to flooded lowlands. Colorado pikeminnow rarely reach more than one foot in length, although historically they reached up to 6 feet.

Razorback suckers eat algae, zooplankton and other aquatic invertebrates. They prefer slow backwater habitats and impoundments. Their current range is the Colorado River and Gila River basins. This species spawns from February to June depositing over 100,000 eggs during spawning.

Bonytail chub feed on insects with the larger fish eating terrestrial insects such as beetles, grasshoppers and ants. They prefer swift water in larger channels of the Colorado River System. Females produce between 1,000-17,000 eggs that begin hatching about 9 hours after fertilization. Survival rate of young is 17-38%.

Humpback chub feed on aquatic arthropods, smaller fishes and algae. They are spring and summer spawners, preferring river discharges near seasonal highs. Spawning takes place at cobble or gravel bars in the river. They are native to the upper Colorado River system originally thriving in fast, deep, white-water areas of the Colorado River and its major tributaries. Flow alterations which have changed the turbidity, volume, current speed and water temperature have had negative impacts on the species.

Current Status: These are large fish native to the Colorado River system. Due to flow regulations, habitat loss, migration barriers, and the introduction of nonnative fishes, the current range and numbers of these fish have diminished. They now exist only in small portions of the Colorado River System. A recovery program agreement was signed in 1988 for these fish species.

Effects: This project would maintain Best Management Practices and therefore will not cause measurable changes in water flow or sediment yields to the Colorado River. The closest the project area would be to the Colorado River is at least 35 miles away. The distance to the San Juan River, a tributary of the Colorado River, is even farther. See the section on Macroinvertebrates for more specific reasons as to why there would be no impact to Colorado River fishes.

8. Black-footed Ferret

Life History: The black-footed ferret has been considered the most endangered mammal in North America for many years. Although probably never abundant, it historically occurred throughout

the Great Plains in 12 states and two Canadian provinces. The range of the black-footed ferret coincides with that of three species of prairie dogs on which the ferret depends for food and habitat. Ninety percent of the black-footed ferrets diet is prairie dogs. Prairie dog and ferret habitat was destroyed during western settlement when large tracts of land were plowed for farmland. Prairie dogs occupied an estimated 700 million acres in the Great Plains in the late 1800s but now only occupy about 1.5 million. Poisoning campaigns also helped to decimate these rodents, as their burrows and foraging habits were assumed to be detrimental to livestock operations. Black-footed ferrets are nocturnal and spend most of their time in underground tunnels. They breed in March and April, having 3-4 young approximately 45 days following breeding.

Current Status: The only known population of black-footed ferrets in 1960s was a small colony in southwestern South Dakota. That colony was studied from its discovery in 1964 until the last member died in captivity in 1979. The black-footed ferret was given federal legal protection as an endangered species in 1967. Another small population was found in Wyoming, but after serious disease outbreaks the population declined from 130 to 18 animals. The remaining animals were taken into captivity between 1985-1987. Since the captive-breeding program began, more than 3000 ferrets have been raised. Starting in 1991, ferrets have been released at nine sites in six western states, including northwestern Colorado and northeastern Utah. There are occasional unconfirmed sightings from Grand and San Juan counties and other areas of the state, and they may have historically occupied areas near the Manti-La Sal National Forest. Remaining ferret habitat is now fragmented and extremely limited. The U.S. recovery plan for the black-footed ferret calls for the establishment of a pre-breeding population of 1,500 animals in 10 or more populations by the year 2010 with no fewer than 30 breeding adults in any population. If those objectives are met, the ferret could be down-listed from endangered to threatened status.

Effects: The project area does not contain appropriate habitat for black-footed ferrets and has no known prairie dog colonies, required by this animal for food and burrows. No effect to this species is expected from this project.

9. Southwestern Willow Flycatcher

Life History: One of four subspecies of willow flycatcher, the SWWF occurs in New Mexico, Arizona, southern California, and southern parts of Utah and Colorado. The southwestern willow flycatcher is a riparian obligate species, nesting in dense clumps of willow-- or shrubs with similar structure (alder, some tamarisk)-- along low-gradient streams, wetlands, beaver ponds, wet meadows and rivers. They are also found in brushy margins of fields. They prefer areas of high shrub densities interspersed with openings or meadows. The shrub component is almost exclusively deciduous and includes willows, alders, cottonwoods, aspens, chokecherry, hawthorn, sumac and wild rose. This riparian habitat tends to be linear, sometimes only one shrub in width. Dense bunchy multi-stemmed shrubs (willow esp) appear to be key, though continuous dense acreage is not required (ie, openings often present). Thickets of trees and shrubs approximately 4-7 m tall, with a high percentage of canopy cover and dense foliage from 0-4 m off ground, form preferred nest sites for this bird.

The USFWS announced listing of the southwestern willow flycatcher as an endangered species on February 27, 1995 (50 CFR Part 17). This species is endangered by extensive loss of habitat, brood parasitism, and lack of adequate protective regulations.

Identification to subspecies may be problematic near the limits of SWWF range, eg. in southern Utah. Based on current and historical information, USFWS will consider a willow flycatcher to be a Southwest Willow Flycatcher, if it: a) occurs within a given boundary drawn to mark approximate limits of this bird's range; and 2) occurs at elevations at or less than 8500'. Note that identification at species level is based on the typical "fitz-bugh" song, and not on visual characteristics alone.

Current Status: Surveys to date have not located southwestern willow flycatcher on the Moab/Monticello District, though not all potential habitat has been searched according to protocol (Tibbits et al. 1994). A survey in 1991 by C. Landis showed potential habitat does exist in Vega, Indian and Johnson creeks on the Monticello portion of the district. The Utah Division of Wildlife Resources surveyed 5 sites on Moab and 2 sites on Monticello portions of the district in 1998. Of the sites surveyed, 3 on the La Sal Mountains were considered to have potential habitat with a recommendation for future surveys (Howe 1998). Suitable and potential habitat as described by USFWS does occur on the district, in willow patches along waterways or near small lakes or wet meadows. Some conflict exists as to whether the range of this subspecies extends any farther north than 20 miles into Utah. Until this is resolved, we must assume that any willow flycatcher found on the district may be a Southwestern willow flycatcher. The following mitigations are standard operating procedure for the Moab/Monticello Ranger District, based on a letter from USFWS dated October 3, 2001.

1. Inventory areas of suitable habitat following USFWS protocol. For record, map areas where suitable habitat occurs (stream reaches or wet meadows with willows or willow-like shrubs). If SWWF are found, proceed according to USFWS protocol and follow mitigation measures for known territories.

2. To protect and/or enhance areas of suitable/potential habitat, follow riparian guidelines for forage utilization, browse use, and soil disturbance as outlined in the Manti-La Sal National Forest Land and Resources Management Plan (1986). Maintain and/or enhance willow habitat, and monitor its condition and regeneration. Monitor for PNC (Potential Natural Community) and use PNC as a reference point.

3. Known SWWF habitat and areas with potential to support more robust willow patches may require fencing to protect the willow component and allow regeneration.

4. Monitoring of riparian habitat and all monitoring proposals include set time limits, beyond which decisions will be made whether or not to continue, modify, or end the existing grazing and if restoration is needed.

5. Fencing should be required when impacts approach, but are not allowed to exceed, set thresholds to such factors as willow regneration, bank erosion, macroinvertebrate populations and invasive species.

Effects:

Alternative A:

Direct and Indirect: Continued water seepage from the old water pipe would help maintain SWWF habitat of small pools if willows were present. Surveys show little wetland/riparian development at any of the sites, and certainly not well-

developed willow patches. Extensive tree kill from bug infestations raises the risk of catastrophic fires which could damage any riparian vegetation in its pathway.

Cumulative: This alterantive would not substantially influence cumulative effects.

Alternative B:

Direct and Indirect: The existing pipeline and catchments are old and rusted, leaking in several locations (Cirrus Ecological Solutions, Contract #43-84N8-1-0122). These areas provide water and in some cases support small wetlands and can be important to wildlife. Based on survey results, little to no developed willow patches were located in association with pooled water caused by pipeline leaking.

The primary North Creek road would be improved, including widening along road curves and pull-outs. This may remove small areas of riparian habitat where the improved road crosses creeks (North Creek, Indian Creek, Johnson Creek). In most of these cases, however, the stream gradient and vegetation would not support SWWFs. This proposal reduces the risk of catastrophic wildfires, which is a concern under the Alternative A. Riparian areas would not be disturbed during the vegetation treatment. Noise disturbance from construction of the pipeline, road improvement, road closures, and vegetation treatment may disrupt nesting birds (April 15-July 20), if suitable habitat is occupied adjacent to project work.

Cumulative: The greatest threat to this species is the loss of woody/shrubby riparian habitat. This alternative does not add to the cumulative effects by drying up water seeps along the existing pipelines because of the absence of willow riparian areas. On a large scale basis, anything that disrupts riparian vegetation such as developed and dispersed recreation, livestock grazing, dewatering through ditches, road construction, or extensive fires can add to cumulative effects on this species and it's habitat. On a more local basis, this project occurs within the Blanding-Monticello watershed where livestock grazing and recreational camping are prohibited. This would offset much of the potential for cumulative effects to riparian habitat and to this species.

Alternative C

Direct and Indirect: Same as the Alternative B

Cumulative: Same as the Alternative B

10. Gunnison Sage Grouse

Life History: Historically, Gunnison sage-grouse were found throughout the southwestern portion of Colorado and southeastern Utah. Now they are thought to occur in 6-7 counties in Colorado and only 1 county in Utah. Their known historic habitat consisted of sagebrush communities below 6000 feet elevation in both Grand and San Juan counties in Utah. They prefer large sagebrush expanses with a diversity of grasses, forbs and healthy riparian ecosystems. The current total estimated spring breeding population is less than 4,000 individuals. They were listed as globally endangered in 2000 by the International Union for the Conservation of Nature. Habitat loss and fragmentation has resulted from increased roads, Blue Mesa Reservoir, housing developments, uranium mill tailings, powerlines and a decline in riparian areas. Habitat quality

has also diminished through livestock grazing, drought, land treatments and increased elk populations. Since such a small percentage of males in any given lek actually do the mating (10-15%), small fragmented populations often result in a loss in genetic variability through in-breeding.

Current Status: Since the 1970s researchers became aware that the sage-grouse in Gunnison Basin, Colorado were unique from sage-grouse found elsewhere. A possible historic sighting of a Gunnison sage-grouse near the La Sal Guard Station was reported about 5 years ago. The Gunnison sage-grouse was petitioned as a new species in 1995, recognized as such by the American Ornithological Union in 2000 and designated a Candidate species by the USFWS in 2000.

Effects: No sagebrush openings occur in the location of the vegetation treatment. Portions of the pipeline runs through sagebrush complexes with black sagebrush and mixed shrubs such as mahogany and oak. A total of 65 acres of sagebrush occur where pipeline construction may take place. The largest continuous area is 21 acres. The elevation of the sagebrush openings is approximately 8,000 feet, which is at least 2,000 feet higher in elevation than where Gunnison sage-grouse occur. The project will not disturb habitat suitable for Gunnison sage-grouse occupancy and therefore would have no effect.

11. Western Yellow-billed Cuckoo

Life History: The yellow-billed cuckoo is a migratory, riparian obligate bird that feeds in cottonwood groves and nests in willow thickets. It arrives in the United States in late June or early July and migrates south in August to South America. It nests in open-cup structures that are small, flat, shallow and flimsy, made of twigs, vines and rootlets. Cuckoos have the shortest combined incubation/nestling period of any bird species. Nest sites have been correlated with large and relatively large willow-cottonwood patches, dense understories, high local humidity, low local temperature, and in proximity to slow or standing water. Cuckoos feed on insects, primarily caterpillars and grasshoppers. Their habitat requirements include low dense understories with branches 3-5 m (9-15 feet) above the ground, typically willow. They are rarely found in forest patches less than 24 ha (59 acres) in size.

In addition to outright destruction of riparian habitat, the yellow-billed cuckoo is intolerant of forest fragmentation. Overgrazing is thought to be the most significant threat to the yellow-billed cuckoo range wide (Center for Biological Diversity 1998). Grazing reduces/eliminates willow understories and the recruitment of cottonwoods through the trampling and grazing of young shoots. The invasion of tamarisk generally means extirpation of willow-cottonwood complexes. Water diversions and damming have also diminished willow-cottonwood complexes.

Current Status: Since 1990 there have been several casual observations of yellow-billed cuckoos in Utah, including documented breeding in Moab in 1991 (Center for Biological Diversity 1998) and birds located along the San Juan River (Personal Communication, UDWR).

Effects: No large expanses of cottonwood trees would be affected by this project and therefore no effect is expected to this species.

12. American Peregrine Falcon

Life History: Peregrine falcons occupy a wide range of habitats, utilizing open country near rivers, marshes and coasts. They prey on a variety of birds, including shorebirds, waterfowl and grouse, usually while in flight. Some peregrines migrate, but with an adequate food supply, some remain on breeding territories through the winter. Courtship and breeding activity begin in February. Although still considered rare, these birds have become much more abundant throughout their range in recent years. The widespread use of the pesticide DDT in the 1940-1960's caused a drastic reduction in peregrine falcon numbers. A consequence of chemicals concentrating up the food chain, raptors foraging on rodents killed by DDT laid thin-shelled eggs that would break during incubation. DDT was banned in early 1970s. By August 1999, the peregrine falcon had recovered to the point that it was removed from the Federal endangered species list.

Current Status: Suitable nesting areas in southeastern Utah consist of sheer cliffs with associated canyon riparian areas for foraging. Peregrine falcons have been located nesting on the Monticello portion of the district. The nearest documented territory is 15 miles from the project area, although peregrines have been observed foraging on the boundaries of the area.

Effects: The habitat where this species occurs is not found within the project boundary and therefore no effect on peregrine falcons is expected.

13. Flammulated Owl

Life History: This small, insectivorous owl, a neotropical migrant, inhabits mature mixed pine, aspen and second growth ponderosa pine forests in the west. Nearly all nest sites in this region occur in mature or old growth stands of ponderosa pine and Douglas fir. As secondary cavity nesters, flammulated owls depend on holes excavated by large woodpeckers, generally in large diameter (>20" dbh) trees. They also nest in aspen, which may be a function of the availability of woodpecker holes excavated in this tree species. Pinyon/juniper may be used as nesting and foraging habitat on the Colorado Plateau (Romin and Muck 1999, Hayward and Verner 1994). The nesting period for flammulated owls is April 1-July 31. Vegetative structure, rather than plant species composition, may be the most important habitat factor to these owls (Hayward and Verner 1994). They hunt their insect prey (moths, beetles, caterpillars and crickets) by aerial pursuit or gleaning of foliage. They tend to avoid young dense tree stands where hunting is difficult.

Current Status: Several studies have occurred on the Moab/Monticello district, resulting in numerous site locations for flammulated owls. The Mexican Spotted Owl study that ran from 1990-1995 resulted in flammulated owl responses at 115 locations. The project area was surveyed during 1990-1991 and 5 flammulated owl responses were found each year. Another study on South Elk Ridge on the Monticello portion of the district resulted in 25 flammulated owl responses from 54 calling stations. Each response may not indicate a new owl.

Effects:

Alternative A:

Direct and Indirect: Little to no effect is expected to occur to Douglas-fir stands in the project area. Expansive loss of large spruce trees from the spruce beetle

epidemic could reduce habitat quality (nesting and roosting) for this species. Large quantities of dead and down trees as would result from a massive spruce beetle epidemic would increase the potential for fire hazard, which if it occurred, would diminish habitat as well. On the other hand, small pockets of dead trees would result in greater ground vegetation diversity. This would improve owl habitat by increasing prey species such as ground squirrels, chipmunks and other small rodents and insects.

Cumulative: The loss of roosting and nesting habitat would add to the continued loss of habitat elsewhere on the Monticello district (Elk Ridge). This island ecosystem of owl habitat is declining as bug epidemics and associated tree removal become more widespread.

Alternative B:

Direct and Indirect: Loss of large trees from silvicultural treatment, road improvements and pipeline construction would remove nest and roost trees, while at the same time opening the forest floor and adding vegetation diversity and increased prey availability. There are design features (#2 and #11) for retaining snags that would reduce impacts to this species. The risk of large extensive fires and associated habitat loss would be reduced. Noise disturbance from road, pipeline, or vegetation treatment activities, if performed during the breeding season (April 1-September 30), could cause disturbance and/or nest abandonment. The construction of temporary roads and improvements to the main road may result in an increase in forest visitors. Although this alternative includes the closure of roads, the improvement to FR #50079 would negate benefits of reduced road densities. This project May Impact individual flammulated owls or their habitat, but would not likely contribute to a trend towards federal listing or loss of population viability.

Cumulative: Maintaining forest health while providing for large diameter trees and reducing the risk of extensive bug kills and/or wildfires would provide for this species in the long term. This benefit added to the fact that road densities would be reduced (per recommendation from roads analysis) plus the absence of recreational camping in the watershed, results in greater long-term benefits for this species.

Alternative C

Direct and Indirect: Loss of large spruce trees from silvicultural treatment could reduce habitat quality for this species, by removing nest and roost trees. This alternative, however, maintains more of the larger diameter trees than Alternative B. This would provide for the short-term needs of this species while attempting to stop the bug epidemic. In the long run, however, more trees may be lost from bugs than from Alternative B. Noise disturbance from road, pipeline or vegetation treatment activities, if performed during the breeding season (April 1- September 30), could cause disturbance and or nest abandonment. The improvement to the main road may result in an increase in forest visitors. Although this alternative includes the closure of roads, the improvement to FR #50079 would negate benefits of reduced road densities. This project May Impact individual flammulated owls or

their habitat, but would not likely contribute to a trend towards federal listing or loss of population viability.

Cumulative: Maintaining forest health while providing for large diameter trees and reducing the risk of bug epidemics and/or extensive wildfires would provide for this species in the long term. This benefit added to the fact that roads would be closed (as recommended through roads analysis) and the project occurs within the Blanding-Monticello watershed where livestock grazing and recreational camping are restricted, results in greater long-term benefits for this species.

14. Northern Goshawk

Life History: Goshawks inhabit mixed deciduous and coniferous forests in temperate and boreal regions, from sea level to tree line. They have large home ranges; a male goshawk may forage over 6,000 acres (2,000 ha). Goshawks are adapted to catching prey in a mature forest/open understory environment, but need a diversity of tree age classes to support a diversity of prey species (Reynolds et al. 1992). They have been found in a variety of forest ecosystems including lodgepole pine, ponderosa pine, Douglas fir, mixed spruce/fir and aspen. Pinyon /juniper forests are not known to be used for nesting in Utah (Graham et al. 1999). In addition, riparian areas are used for both nesting and foraging. Many of the nest sites on the Moab/Monticello District are located in aspen/mixed conifer stringers within small drainages with running water. Nesting success is dependent on a variety of factors such as weather, prey availability and age of the breeding birds, and numerous studies have concluded that not all territorial pairs of long-lived raptors such as goshawks produce eggs in a given year (Braun et al. 1996, DeStefano et al. 1994, Doyle and Smith 1994). In winter, radio-tracked goshawks remained on their breeding territories or similar habitat or migrated to pinyon/juniper habitats up to 190 miles away (Graham et al. 1999). Prey species include small mammals and birds such as rabbits, squirrels, chipmunks, grouse, woodpeckers, jays and robins. Young hatch the first half of June with fledging usually in mid July. Typically 1-3 eggs are laid.

Current Status: A Conservation Strategy and Agreement for the Management of Northern Goshawk Habitat in Utah was developed in 1999 (USDA Forest Service). In the November 9, 1999 Federal Register, notice was given by the Intermountain Region of the Forest Service that the Environmental Assessment for the Utah Northern Goshawk project was available for review and comment for 60 days. On March 14, 2000, Regional Forester Jack A. Blackwell made his decision to implement Alternative F as the management direction to maintain and restore habitat for the northern goshawk on the National Forests in Utah. The Utah Northern Goshawk Forest Plan Amendment was signed on April 14, 2000. This decision amends the goals, objectives, standards, guidelines and monitoring requirements established in the current land and resource management plans. All these documents provide the tools needed to conserve, restore, and protect native processes and disturbance regimes important to northern goshawks.

Extensive surveys over several years have occurred on this district (District field notes, Moab Office). Seventeen known goshawk territories occur on the Moab/Monticello District. Nests have been found in mixed spruce/fir/aspen and ponderosa pine habitats.

The criteria used in the EIS to evaluate affects on goshawks from each alternative are as follows:

-Acres of habitat meeting guidelines
-Impact Determination

Only those areas in the project or cumulative effects area that are being affected are used in the determination. These are the acres of spruce/subalpine fir; aspen/spruce/subalpine fir; and aspen/mixed conifer that are changing from mature to younger age classes (9,634 acres in project area and 22,380 acres in cumulative effects area).

Alternative A
Direct/Indirect Effects

Little change in forest structure is expected to occur in the short-term. In the long-term, loss of mature and large mature spruce trees over nearly 3,500 acres would occur from spruce beetle epidemics reducing habitat quality for this species by removing nest and roost trees. Forest canopy cover would be reduced to <40%. The loss of spruce would allow for some aspen sprouting, helping to sustain this tree species in the landscape. However, young conifers will remain undamaged by spruce beetles and would quickly out compete with aspen. Large quantities of dead and down trees as would result from a massive spruce beetle epidemic would increase the potential for fire hazard and the potential for large-scale habitat loss. This alternative would result in 9,634 acres meeting goshawk guidelines in the short-term resulting in a No Impact determination. Only 6,142 acres would meet guidelines in the long-term, resulting in a May Impact Individuals.

No change in the prey base for goshawks is expected in the short-term for this alternative. Direct and indirect impacts to prey species used by the goshawk will occur over the long-term. Goshawks in the area are known to prey largely on small mammals and birds such as flickers. Changes in vegetation structure from the spruce beetle epidemic would increase small mammal populations since ground cover is increased when canopy cover is opened. Other prey species such as woodpeckers would be reduced. Overall, little change in prey availability would occur.

Cumulative Effects

Loss of habitat in the North Creek area would add to additional habitat loss on the Abajo Mountains from spruce beetle infestation, wild fire, and conifer encroachment. Eighty-eight percent of the total cumulative effect analysis area (22,380 acres) contains aspen mixed with conifer tree species. These areas could have substantial aspen loss from conifer trees out-competing for sunlight in the next half-century. The total area impacted is substantial to forest dependent species like the goshawk.

In the long-term, given the level of spruce beetle epidemic within the cumulative effects analysis area (22,380 acres), 25% of the area (5,584 acres) would be converted from mature trees to early, young and mid-age trees. Acres meeting goshawk guidelines would total 16,796. This would reduce the canopy cover from 75-100% to <40%. It is unlikely that these areas would continue to meet Forest Plan guidelines for goshawk habitat. Where canopy cover is opened, some aspen sprouting may occur, allowing for aspen regeneration until conifers once again out-compete.

No change in the number, kind, or maintenance standard of roads or the pipeline would occur from this alternative. However, continued development of unauthorized roads would increase disturbance and reduce habitat over time for this species.

Relationship Between Short-Term Use and Long-Term Productivity

The relationship between short-term use and long-term productivity from Alternative A concerning goshawks is described in Section 1.1.1.2.1.

Irreversible/Irretrievable Commitment of Resources

Irreversible refers to the loss of future options- it cannot be reversed. No irreversible commitment of resources would occur from implementation of this alternative. Irretrievable commitment of resources refers to the loss of production or use of natural resources for a time. The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. Irretrievable commitments would occur when the annual productivity of the species involved is reduced, in this case, goshawks. The time it takes to recover may vary according to the treatment, the vegetation type, and the species involved, but eventually it is expected to recover.

Forest Plan Consistency

This alternative would not comply with Forest-wide direction to manage habitat for goshawks, a sensitive species. The direction provided by the Forest Plan provides the objective to protect, maintain, and/or improve habitat for sensitive animals. A no-action alternative would not move us towards keeping goshawks from becoming Federally listed and maintaining and/or improving habitat and habitat diversity for minimum viable populations (Wildlife and Fish Resource management 04, 05, Amendment to the Forest Plan dated April 14, 2000). Allowing the epidemic to go unmanaged would likely not lead to the Federal listing of northern goshawks. Also, this alternative would not comply with Forest-wide direction to manage habitat of goshawks, a sensitive species, due to non-vegetative management activities (water pipeline maintenance) that may result in loss of suitable goshawk habitat due to dewatering. This alternative may impact individuals or habitat, but would not likely contribute to a loss of population viability of sensitive wildlife species.

Alternative B
Direct/Indirect Effects

Loss of trees from silvicultural treatment and residual spruce beetle infestations would reduce habitat quality for this specie, by removing nest and roost trees and changing mature forests to early/young trees on 513 acres in the short-term and 2,455 acres in the long-term. Canopy cover would range from 40-69%, a reduction from current conditions, but higher than expected following a no-action spruce beetle epidemic (<40%). The vegetation treatment would result in more trees remaining alive, benefiting this species in the long-run. Goshawk guidelines would be met except for the “clumpiness” in forest structure required by this species. This alternative evenly spaces trees and opens canopy cover to obtain maximum protection from further spruce beetle infestations. Snag and woody debris would be retained according to goshawk guidelines (See Design Features). In the short term 9,121 acres would meet goshawk guidelines and in the

long-term, 7,179 acres would meet guidelines. In both cases, the determination is a "May Impact Individuals".

A primary objective of this alternative would be to regenerate aspen, which would have short-term impacts on goshawks but long-term benefits. Maintaining aspen into the future for goshawk habitat is a great concern, and this alternative would aid in achieving this objective. Approximately 192 acres of aspen would be harvested to provide for aspen regeneration.

Timber harvest has a direct and indirect impact to prey species used by the goshawk. Goshawks in the area are known to prey largely on small mammals and birds such as flickers. Timber harvest would likely increase small mammal populations since ground cover is increased when canopy cover is opened. Other prey species such as woodpeckers would be reduced with the change in vegetation structure following harvest. Overall, little impacts to prey availability would be expected.

The primary North Creek road (FR# 50079) would be improved (16 miles) and temporary roads constructed (2.3 miles), allowing for increased visitor access. By the end of this project, 8.5 miles of road would be decommissioned, reducing road density, access, and associated disturbance. Overall, wildlife habitat security would be reduced from the Alternative A. Although the road density within the project area would decrease from 2.3 to 2.0 miles/square mile when the project is complete, impacts from improving FR# 50079 out-weighs any benefits.

Perhaps the greatest concern regarding the reconstruction of the pipeline and it's many collection points is the potential for dewatering existing streams. This alternative improves the pipeline system where the diversion of water occurs at the head of the stream as well as several places along the stream where springs usually replenished stream flow. Removing this water can have a substantial impact on the use of the stream corridor by wildlife, including the goshawk. Not only does the water meet a basic need of the bird itself, but of it's prey as well. Water also helps to keep the ambient temperature under the canopy lower than if no water were there. The Gold Queen/Dickson Gulch areas provide some of the best habitat on the district for goshawks, and both these drainages could be dewatered from an improved water system.

Noise disturbance from pipeline construction and maintenance, vegetation treatment, and road construction and maintenance during the breeding season (March 1 –September 30) could cause disturbance. Unlike ground-based logging where noise is relatively localized to the harvest area, the noise from helicopter logging spans a greater area due to the aerial transport of logs from the harvest unit to the landing area. Alternative B would treat 1,265 acres through helicopter harvest methods.

This alternative does delineate known goshawk territories within the project area (See attached maps) and therefore, does protect them according to management recommendations. A total of 84 acres of vegetation treatment occur within goshawk Post-Fledging Areas (PFAs) and have restrictions according to the Forest Plan Amendment. Few restrictions occur in goshawk foraging areas. This alternative contains 1,420 acres of foraging area within the vegetation treatment units.

Cumulative Effects

Goshawk habitat has been reduced across the Monticello Ranger District over the past 15+ years. This has been a result of bark beetle infestations and associated timber sales. In addition, the

removal of historic fire intervals and intensities ended a natural source of disturbance that sustained healthy forests. The loss of aspen from conifer encroachment is evidence of this.

In the long-term, given the level of spruce beetle epidemic within the cumulative effects analysis area (22,380 acres) and after implementation of the vegetation treatment proposed in this alternative, 20% of the area (4,542 acres) would be converted from mature trees to early, young and mid-age trees. This would reduce the canopy cover from 75-100% to between 40-69% in harvest areas and less than 40% where spruce beetles continue to flourish. This leaves a total area of 17,838 ac meeting forest plan guidelines for goshawks. Since this alternative does not follow goshawk guidelines for the timber sale and residual spruce beetle kill would continue in areas not thinned, the 4,542 acres affected would likely not meet goshawk guidelines in the Forest Plan.

The cumulative effect of reduced road densities outside the project area and in association with this project (as per roads analysis recommendations) would benefit this species over the entire landscape. Reducing motorized roads and trails in the Abajo Mountain area by 29 miles increases wildlife habitat security and reduces wildlife:forest visitor conflicts.

Relationship Between Short-Term Use and Long-Term Productivity

The relationship between short-term use and long-term productivity from Alternative B concerning goshawks is described in Section 1.1.1.3.1.

Irreversible/Irretrievable Commitment of Resources

Irreversible refers to the loss of future options- it cannot be reversed. No irreversible commitment of resources would occur from implementation of this alternative. Irretrievable commitment of resources refers to the loss of production or use of natural resources for a time. The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. Irretrievable commitments would occur when the annual productivity of the species involved is reduced, in this case, goshawks. The time it takes to recover may vary according to the treatment, the vegetation type, and the species involved, but eventually it is expected to recover.

Forest Plan Consistency

This alternative would not comply with Forest-wide direction to manage habitat of goshawks, a sensitive species, due to non-vegetative management activities (water pipeline improvement) that may result in loss of suitable goshawk habitat. The direction provided by the Forest Plan would keep goshawks from becoming Federally listed, and maintain and/or improve habitat and habitat diversity for minimum viable populations (Wildlife and Fish Resource management 04, 05, Amendment to the Forest Plan dated April 14, 2000). Additionally, goshawks would be protected by following the Conservation Strategy and Agreement for the Management of Northern Goshawk, except for the forest structure providing for “clumpiness”. Despite the deviation from Forest Plan and Conservation Strategy direction, this alternative may impact individuals or habitat, but would not likely contribute to a loss of population viability of sensitive wildlife species.

Alternative C
Direct/Indirect Effects

Loss of trees from silvicultural treatment and residual spruce beetle infestation would reduce habitat quality for this species, by removing nest and roost trees and changing mature forests to early/young trees on 377 acres in the short-term and 2,793 acres in the long-term. This timber sale would leave more trees of higher diameter in a clumpy pattern than Alternative B, benefiting this species in the short-run. Goshawk guidelines would be met including the "clumpiness" required by this species. This alternative does not evenly spaces trees to obtain maximum protection from further spruce beetle infestations, and therefore provides for the immediate needs of the goshawk. This type of treatment comes with a higher risk of tree loss in the long-run due to spruce beetle infestation (estimated to be an additional 35%). Snag and woody debris would be retained according to goshawk guidelines (See Design Features). In the short-term, 9,634 acres would meet goshawk guidelines having a No Impact determination. In the long-term, 6,841 acres would meet guidelines, resulting in a determination of "May Impact Individuals".

A primary objective of this alternative would be to regenerate aspen, which would have short-term impacts on goshawks but long-term benefits. Maintaining aspen into the future is a great concern and this alternative would aid in achieving this objective. Approximately 164 acres of aspen would be harvested to provide for aspen regeneration.

Timber harvest has a direct and indirect impact to prey species used by the goshawk. Goshawks in the area are known to prey largely on small mammals and birds such as flickers. Timber harvest would likely increase small mammal populations since ground cover is increased when canopy cover is opened. Other prey species such as woodpeckers would be reduced with the change in vegetation structure following harvest. Overall, little impact to prey availability is expected.

Perhaps the greatest concern regarding the reconstruction of the pipeline and it's many collection points is the potential for dewatering existing streams. This alternative improves the pipeline system where the diversion of water occurs at the head of the stream as well as several places along the stream where springs usually replenished stream flow. Removing this water can have a substantial impact on the use of the stream corridor by wildlife, including the goshawk. Not only does the water meet a basic need of the bird itself, but of it's prey as well. Water also helps to keep the ambient temperature under the canopy lower than if no water were there. The Gold Queen/Dickson Gulch areas provide some of the best habitat on the district for goshawks, and both these drainages could be dewatered from an improved water system.

Noise disturbance from pipeline construction and maintenance, vegetation treatment, and road construction and maintenance during the breeding season (March 1-September 30) could cause disturbance. Unlike ground-based logging where noise is relatively localized to the harvest area, the noise from helicopter logging spans a greater area due to the aerial transport of logs from the harvest unit to the landing area. Alternative C would treat 1,148 acres through helicopter harvest methods.

This alternative does delineate known goshawk territories within the project area and therefore, does protect them according to management recommendations. A total of 84 acres of vegetation treatment occurs within goshawk Post-Fledging Areas (PFAs) and have restrictions according to the Forest Plan Amendment. Few restrictions occur in goshawk foraging areas. This alternative contains 1,289 acres of foraging area within the vegetation treatment units.

The primary North Creek road (FR#50079) would be improved (16 miles) and numerous temporary roads constructed (2.3 miles), allowing for greater visitor access and potential disturbance to goshawks. Road densities would be reduced at the end of the project reducing access, and associated disturbance by decommissioning 8.5 miles of road. The impacts of improving FR#50079 outweigh the benefits and increase the loss of wildlife habitat security.

Cumulative Effects

Cumulative effects are basically the same as Alternative B, Proposed Action. However, given the level of spruce beetle epidemic within the cumulative effects analysis area (22,380 acres) and after implementation of the vegetation treatment proposed in this alternative, 22% of the area (5,016 acres) would be converted from mature trees to early, young and mid-age trees. This would reduce the canopy cover from 75-100% to between 40-69% in harvest areas and less than 40% where spruce beetles continue to flourish. This alternative does follow goshawk guidelines in the timber sale so for a short-term, approximately 1,617 acres more than Alternative B would meet goshawk guidelines. However, since these acres would be harvested in a "clumpy" pattern (containing tree patches, unevenly spaced), it is anticipated that spruce beetles will eventually reduce this area to an early/young forest age class. In the long-run, only 17,364 acres would meet forest guidelines for goshawks.

Relationship Between Short-Term Use and Long-Term Productivity

The relationship between short-term use and long-term productivity from Alternative C concerning goshawks is described in Section 1.1.1.4.1.

Irreversible/Irretrievable Commitment of Resources

Irreversible refers to the loss of future options- it cannot be reversed. No irreversible commitment of resources would occur from implementation of this alternative. Irretrievable commitment of resources refers to the loss of production or use of natural resources for a time. The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. Irretrievable commitments would occur when the annual productivity of the species involved is reduced, in this case, goshawks. The time it takes to recover may vary according to the treatment, the vegetation type, and the species involved, but eventually it is expected to recover.

Forest Plan Consistency

This alternative would not comply with Forest-wide direction to manage habitat of goshawks, a sensitive species, due to non-vegetative management activities (water pipeline improvement) that may result in loss of suitable goshawk habitat. The direction provided by the Forest Plan would keep goshawks from becoming Federally listed, and maintain and/or improve habitat and habitat diversity for minimum viable populations (Wildlife and Fish Resource management 04, 05, Amendment to the Forest Plan dated April 14, 2000). Additionally, this sensitive specie would be protected by following the Conservation Strategy and Agreement for the Management of Northern Goshawk Habitat. This alternative may impact individuals or habitat, but would not likely contribute to a loss of population viability of sensitive wildlife species.

Northern goshawk- Direct/Indirect Effects (9635 acres)	Alt.1	Alt.2	Alt.3
Acres of habitat meeting Forest Plan guidelines	9,634- short-term 6,142- long-term	9,121- short-term 7,179- long-term	9,634- short-term 6,841- long-term
Impact determination	No Impact-short-term May Impact Indv.-long-term	May Impact Indv.-short and long term	No Impact-short term May Impact Indv.-long-term

Northern goshawk- Cumulative Effects (22,300 acres)	Alt.1	Alt.2	Alt.3
Acres of habitat meeting Forest Plan guidelines	16,796 long-term	17,838- long-term	17,364- long-term
Impact determination	May Impact Indv.-long-term	May Impact Indv.	May Impact Indv.-long-term

Perhaps an easier way to compare the differences among the alternatives is as follows:

	Acres meeting goshawk guidelines		
Time Period	Alt. A	Alt. B.	Alt. C
Short-term	9,634	9,121	9,634
Long –term	6,142	7,179	6,841
Cumulative	16,796	17,838	17,364

▸ Calculations Strategy ◂

Acres of Habitat Meeting F.P. Guidelines

Alt. A- Short-term: Entire Project Area affected (9,634 ac.)
Long-term: Total Area affected (9,634 ac.) minus (trees will die & open canopies) acres changing from mature trees to younger age class (3,492) =6,142 acres.

Alt. B- Short-term: Total Project Area affected (9,634) minus acres of mature trees changing to younger age classes and not meeting guidelines for clumpiness, 513 acres=9,121

Long Term: Total Project Area affected (9,634) minus acres of mature affected by timber harvest and residual spruce beetle kill changing forest structure to younger age classes (2,455 acres)=7,179.

Alt. C- Short-term: Total Project Area affected (9,634) would meet guidelines since even within the area changing from mature to younger age classes (377 acres) guidelines are being met.

Long Term: Total Project Area affected (9,634) minus acres of mature affected by both timber harvest and residual spruce beetle kill (2,793 acres) =6,841. Spruce beetles will continue to affect harvested acres due to continued susceptible forest structure (clumpiness) plus nonharvested areas.

Cumulative effects numbers were calculated using this same strategy for the cumulative effects area (22,380 ac) and for only the long-term.

(location in computer files-final mbwip)
Within goshawk PFA, acres are the same between alternatives.
84 treatment unit acres w/in PFAs for Alt B & C
Out of 3 identified PFA's (total of 2309 ac) there are 84 treated acres+
17 ac in Ski lift PFA
67 ac in N. Creek

In Alt. C- 6000 ac NOGO foraging area
Alt B has 1420 treatment ac in foraging areas

Both alternatives include optional units
Alt B, 210 ac optional units in North Creek (Not in PFA); Alt. C, 177 ac optional units.
(these optional units are included in total treatment acres in foraging areas above)

1245 ac in N. Creek foraging area
175 ac in Ski Lift
1420 ac Alt. B

1157 ac N. Creek foraging area
132 ac Ski Lift foraging area
1289 ac Alt. C

Units (or part of units) within NOGO PFA's for Alt B and C:

Unit___	Log_Meth	System	Veg_type	Acres	Newacres
1b	Tractor	even	aspen	12	12
3	Tractor	even	aspen	17	17
5	helicopter	uneven	spruce	14	9
4a	helicopter	uneven	mix	101	28
4b	helicopter	even	mix	3	3
6	helicopter	uneven	spruce	58	2
4c	helicopter	even	mix	5	2
1a	Tractor	even	aspen	11	11
					84 Acres

17 ac in Ski Lift PFA
67 ac in North Creek PFA

15. Three-Toed Woodpecker

Life History: The three-toed woodpecker, a circumboreal species, inhabits mixed spruce/fir and pine forests in North America. This bird relies on older stage forests, foraging in areas having abundant dead and/or decayed trees infested with wood-boring insects (especially recently burned areas). It nests and winters in coniferous forests generally above 8,000 feet elevation. Three-toed

woodpeckers stay on their territories year-round, though insect outbreaks may cause irregular movements. They breed in May-July and both sexes excavate a new nest cavity each year high in a dead or live tree where they incubate an average of four eggs for 11-14 days. Young fledge 22-26 days later and remain with their parents for another month. Three-toed woodpeckers depend on live and dead trees for both nesting and foraging. They require soft wood for excavation because of morphological adaptations associated with three toes on each foot, therefore the presence of heart rot is important. Trees with scaly bark remaining on the tree are important to support their forging technique. Three-toed woodpeckers require trees infested with bark- and wood-boring insects for foraging. These woodpeckers have been found to forage heavily on moderately charred spruce trees the first three years after a fire.

Although it has been the goal of managers to remove all standing beetle-infested trees, Hill 2000 recommends a large portion of these trees should be left for at least 3-4 years to maintain food resources for woodpeckers. Although this raises a concern over further spread of beetle infestation, three-toed woodpeckers function as a very efficient biological control against spruce bark beetles, and have been called "one of the most valuable insectivorous birds that inhabit our forests". In fact, few birds are thought to consume more of the pests of the forest than the three-toed woodpecker. Intermountain Region guidelines (Spahr et al. 1991) recommend leaving 42-52 snags per 100 acres in logged areas and emphasized that snags should be left in clumps rather than isolated patches. These snags should have a high percentage of bark remaining and have diameters of 12-16 inches at breast height.

Current Status: On the Moab/Monticello district, the three-toed woodpecker has been found in spruce/fir and ponderosa pine/aspen habitat types. Territories have been established in areas where known nesting is occurring prior to project implementation. In some cases, we know of nesting that has occurred over numerous years in the same location, although new nest sites are excavated each year. A concentration of sightings and/or call responses is used to document a nesting territory, rather than an exact nest tree location, since they are hard to locate and are changed each year. With the increase in bug outbreaks on this district in both spruce and pine trees, the three-toed woodpecker population is considered abundant and healthy. This however, can change with changes in food source….decreasing with salvage timber harvests but increasing with fire kills.

For overall viability, management for three-toed woodpeckers in Region 4 (Spahr et al 1991) calls for a landscape-level approach that provides for the following:

-Feeding areas on an ecosystem-wide basis
-Provide/maintain insect outbreaks
-Promote fire on a level comparable to historic potential of area

Criteria used to evaluate effects from various alternatives in the EIS are as follows:

-Acres disturbed
-Acres of aspen regeneration
-Impact determination

Only those areas in the project or cumulative effects area that are being affected are used in the determination. These are the acres of spruce/subalpine fir; aspen/spruce/subalpine fir; and

aspen/mixed conifer that are changing from mature to younger age classes (9635 acres in project area and 22,380 acres in cumulative effects area).

Alternative A

Direct/Indirect Effects

This bird tends to move around being opportunistic where bug epidemics occur. Although the project area currently provides an influx of food for this bird, loss of large spruce trees from the spruce beetle epidemic over nearly 3,500 acres would reduce habitat quality (foraging and roosting trees) in the long-term. Canopy cover would also be reduced to <40%. As prey species (spruce beetle) decline, the density of three-toed woodpeckers would decrease (Koplin 1968). Three-toed woodpeckers would continue to inhabit the area but at much lower populations densities. Studies indicate that outside of large bark beetle infestations, three-toed woodpeckers maintain low population levels by foraging on beetle infested fallen trees and cull logs, and in areas where beetles are present at endemic levels. Three-toed woodpeckers are thought to be the most efficient bark beetle forager of the woodpeckers, important in keeping infestations to an endemic level. They not only remove the beetles themselves, but by flicking bark off from trees with beetles, they remove beetle habitat and reduce their ability to survive.

Although populations of three-toed woodpeckers can fluctuate according to population levels of bark beetle, the typical pattern is a flush of woodpeckers (increased reproduction and immigration) during beetle epidemics. If nothing is done to reduce the beetle population, trees will start to die. High populations of woodpeckers would remain for 2-5 years after trees die. Since not all trees would die at the same time, woodpeckers would be sustained over the period of time it took for all beetle infested trees to die. Even when that has occurred, there would still be some trees that do not die and some that would maintain low numbers of beetles and so three-toed woodpeckers could be present, just at a much reduced population level. Therefore, although the population would decline from the peak of the beetle epidemic, the decline would not be an abrupt crash but prolonged over an approximate a 10-year period.

The loss of spruce would allow for some aspen sprouting helping to sustain this tree species used for woodpecker nesting. However, young conifers would remain undamaged by spruce beetles and would quickly out-compete aspen. Large quantities of dead and down trees as would result from a massive spruce beetle epidemic may increase the potential for fire hazard. Since spruce beetle populations explode following fire (not low, ground fires), three-toed woodpeckers would benefit in the short-term from the increased food source. Once the food is gone, since roost and nest trees are destroyed, most woodpeckers would move out of the area.

Cumulative Effects

In the short-term, the North Creek area provides an ample food source for three-toed woodpeckers. In the long-term, however, loss of habitat in the North Creek area would add to additional habitat loss on the Abajo Mountains from spruce beetle infestation, wild fire, conifer encroachment and subsequent loss of aspen forests. Eighty-eight percent of the total cumulative effect analysis area (22,380 acres) contains aspen mixed with conifer trees. These areas are in danger of complete aspen loss in the next half-century. The total area impacted is substantial to forest dependent species like the three-toed woodpeckers, which often nest in aspen trees.

The loss of mature conifer trees from the spruce beetle epidemic would allow sunlight to hit the ground promoting aspen sprouting. Totaling acres of all mature spruce that will be changed to younger age classes provides the total acres disturbed that could affect three-toed woodpeckers. This total is 5,584 acres.

No change in the number, kind, or maintenance standard of roads or the pipeline within the project area would occur from this alternative. However, continued development of unauthorized roads would increase disturbance and reduce habitat over time for this species.

Relationship Between Short-Term Use and Long-Term Productivity

The relationship between short-term use and long-term productivity from Alternative A concerning three-toed woodpeckers is described in Section 1.1.2.2.1.

Irreversible/Irretrievable Commitment of Resources

Irreversible refers to the loss of future options- it cannot be reversed. No irreversible commitment of resources would occur from implementation of this alternative. Irretrievable commitment of resources refers to the loss of production or use of natural resources for a time. The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. Irretrievable commitments would occur when the annual productivity of the species involved is reduced, in this case, three-toed woodpeckers. The time it takes to recover may vary according to the treatment, the vegetation type, and the species involved, but eventually it is expected to recover.

Forest Plan Consistency

No specific guidelines are in the Forest Plan for this species. This alternative would comply with Forest-wide direction to manage habitat for sensitive species. The direction provided by the Forest Plan through goshawk guidelines would keep three-toed woodpeckers from becoming Federally listed, and maintain and/or improve habitat and habitat diversity for minimum viable populations (Wildlife and Fish Resource management 04, 05, Amendment to the Forest Plan dated April 14, 2000). This alternative may impact individuals or habitat, but would not likely contribute to a loss of population viability of sensitive wildlife species.

Alternative B

Direct/Indirect Effects

Little change in current conditions would occur in the short-term with a total of 513 acres changed from mature to young. In the long-term, loss of large trees from silvicultural treatment and residual beetle infestations would reduce habitat quality (foraging and roosting trees) for this species. This alternative changes 2,455 acres of mature forest into early/young age class trees. Canopy cover is reduced to between 40-69%. Their food source would be reduced as spruce beetle numbers are reduced. However, the timber sale should result in more trees remaining alive in the long-run providing for long-term foraging and nesting opportunities. Goshawk guidelines would be met which would help this species, except for the forest structure termed “clumpiness”. This alternative evenly spaces trees and reduces canopy cover to obtain maximum protection from further bug infestations. This would be to the detriment of three-toed woodpeckers which prefer closed canopies and a continued source of dead trees for feeding. Snag and woody debris would be

retained according to goshawk guidelines that should more than cover the needs of three-toed woodpeckers (See Design Features). Intermountain Region guidelines for three-toed woodpeckers (Spahr et al. 1991) recommend leaving 42-52 snags per 100 acres in logged areas and emphasized that snags should be left in clumps rather than isolated patches. These snags should have a high percentage of bark remaining and have diameters of 12-16 inches at breast height.

Hill, 2000, found from preliminary observations that moderate numbers of three-toed woodpeckers were supported 1 year following harvest if standing trees were left at a minimal density of 12 trees per acre or 100-150 board feet. Areas cut at this or higher levels contained very few three-toed woodpeckers, except along the periphery of cut areas. If left, three-toed woodpeckers occupy areas heavily infested with bark beetles for at least three years or until the majority of the trees are completely debarked. Territory size for three-toed woodpeckers also varies according to the density of dead or beetle-infested trees. Hill infers that following harvest, territory sizes are increased due to decreased food supply.

A primary objective of this alternative would be to regenerate aspen, which would have short-term impacts on three-toed woodpeckers but long-term benefits. Three-toed woodpeckers readily nest in mature aspen trees. Maintaining aspen into the future is a great concern and this alternative would aid in achieving this objective. Approximately 192 acres of aspen would be harvested to provide for aspen regeneration.

The primary North Creek road (FR#50079) would be improved (16 miles) and temporary roads constructed (2.3 miles), allowing for greater visitor access. By the end of the project 8.5 miles of roads would be closed reducing total road density, access, and associated disturbance. Overall, wildlife habitat security would be reduced from the Alternative A. Although the road density within the project area will decrease when the project is complete, impacts from improving FR#50079 out weigh any benefits.

Perhaps the greatest concern regarding the reconstruction of the pipeline and it's many collection points is the potential for dewatering existing streams. This alternative improves the pipeline system where the diversion of water occurs at the head of the stream as well as several places along the stream where springs usually replenished stream flow. Removing this water can have a substantial impact on the use of the stream corridor by wildlife, including three-toed woodpeckers. Not only does the water meet a basic need of the bird itself, but the water helps to keep the ambient temperature under the canopy lower than if no water were there.

Noise disturbance from pipeline construction and maintenance, vegetation treatment, and road construction and maintenance during the breeding season (May 15-July 1) could cause disturbance. Unlike ground-based logging where noise is relatively localized to the harvest area, the noise from helicopter logging spans a greater area due to the aerial transport of logs from the harvest unit to the landing area. Alternative B would treat 1,265 acres through helicopter harvest methods. This alternative does not delineate known three-toed woodpecker territories (83 acres) within the project area and therefore, does not provide short-term protection according to management recommendations.

Cumulative Effects

Three-toed woodpecker habitat has been reduced across the Monticello Ranger District over the past 15+ years. This has been a result of bark beetle infestations and associated timber sales. In

addition, the removal of historic fire intervals removed a natural source of disturbance that kept forests healthy. The loss of aspen from conifer encroachment is evident of this.

Although only a small portion of the cumulative effects analysis area (192 acres) is being harvested to promote aspen regeneration, the loss of mature conifer trees elsewhere in the project area should allow sunlight to hit the ground, promoting aspen sprouting. Totaling acres of all mature spruce that would change to younger age classes gives us the greatest number of acres that may promote aspen sprouting from spruce beetle disturbance. This total is 4,542 acres.

The cumulative effect of reduced road densities outside the project area and in association with this project (as per roads analysis recommendations) would benefit this species over the entire landscape. Reducing motorized roads and trails in the Abajo Mountain area by 32 miles increases wildlife habitat security and reduces wildlife:forest visitor conflicts.

Relationship Between Short-Term Use and Long-Term Productivity

The relationship between short-term use and long-term productivity from Alternative B concerning three-toed woodpeckers is described in Section 1.1.2.3.1.

Irreversible/Irretrievable Commitment of Resources

Irreversible refers to the loss of future options- it cannot be reversed. No irreversible commitment of resources would occur from implementation of this alternative. Irretrievable commitment of resources refers to the loss of production or use of natural resources for a time. The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. Irretrievable commitments would occur when the annual productivity of the species involved is reduced, in this case, three-toed woodpeckers. The time it takes to recover may vary according to the treatment, the vegetation type, and the species involved, but eventually it is expected to recover.

Forest Plan Consistency

No specific guidelines (like for northern goshawk habitat) are in the Forest Plan for this species. Best Science practices applied elsewhere in Region are used as guidelines (Spahr et al. 1991; Hill 2000; Egnew Pers. Com.). This alternative does not delineate known three-toed woodpecker territories and place buffers around them for protection, like Alternative C. Otherwise, this alternative would comply with Forest-wide direction to manage habitat of sensitive species, in general. The direction provided by the Forest Plan for goshawks would likely keep three-toed woodpeckers from becoming federally listed, and maintain and/or improve habitat and habitat diversity for minimum viable populations (Wildlife and Fish Resource management 04, 05, Amendment to the Forest Plan dated April 14, 2000). This alternative may impact individuals or habitat, but would not likely contribute to a loss of population viability of sensitive wildlife species.

Alternative C
Direct/Indirect Effects

Little change in current conditions would occur in the short-term. A total of 377 acres would be changed from mature to young. In the long-term, loss of large trees from silvicultural treatment

and residual spruce beetle infestation would reduce habitat quality (foraging and roosting trees) for this species. This alternative changes mature forests to early/young trees on 2,793 acres over the long-term. Their food source would be reduced as spruce beetle numbers are reduced. The timber sale leaves more trees of larger diameter, which would be to the benefit of this species in the short-run. Goshawk guidelines, including the "clumpiness", would be provided for in this alternative, benefiting three-toed woodpeckers. This alternative does not evenly spaces trees to obtain maximum protection from further spruce beetle infestations, therefore provides for the immediate needs of the species. This type of treatment comes with a higher risk of tree loss in the long-run due to spruce beetle infestation (estimated to be an additional 35%). Snag and woody debris would be retained according to goshawk guidelines which should more than cover the needs of three-toed woodpeckers (See Design Features). Intermountain Region guidelines for three-toed woodpeckers (Spahr et al. 1991) recommends leaving 42-52 snags per 100 acres in logged areas and emphasized that snags should be left in clumps rather than isolated patches. These snags should have a high percentage of bark remaining and have diameters of 12-16 inches at breast height.

Hill, 2000, found from preliminary observations that moderate numbers of three-toed woodpeckers were supported 1 year following harvest if standing trees were left at a minimal density of 12 trees per acre or 100-150 board feet. Areas cut at this or higher levels contained very few three-toed woodpeckers, except along the periphery of cut areas. If left, three-toed woodpeckers occupy areas heavily infested with bark beetles for at least three years or until the majority of the trees are completely debarked. Territory size for three-toed woodpeckers also varies according to the density of dead or beetle-infested trees. Hill infers that following harvest, territory sizes are increased due to decreased food supply.

A primary objective of this alternative would be to regenerate aspen, which would have short-term impacts on three-toed woodpeckers but long-term benefits. Maintaining aspen into the future is a great concern and this alternative would aid in achieving this objective. Approximately 164 acres of aspen would be harvested to provide for aspen regeneration.

Perhaps the greatest concern regarding the reconstruction of the pipeline and it's many collection points is the potential for dewatering existing streams. This alternative improves the pipeline system where the diversion of water occurs at the head of the stream as well as several places along the stream where springs usually replenished stream flow. Removing this water can have a substantial impact on the use of the stream corridor by wildlife, including three-toed woodpeckers. Not only does the water meet a basic need of the bird itself, but the water helps to keep the ambient temperature under the canopy lower than if no water were there.

Noise disturbance from pipeline construction and maintenance, vegetation treatment, and road construction and maintenance during the breeding season (May 15-July 1) could cause disturbance. Unlike ground-based logging where noise is relatively localized to the harvest area, the noise from helicopter logging spans a greater area due to the aerial transport of logs from the harvest unit to the landing area. Alternative C would treat 1,148 acres through helicopter harvest methods. This alternative does delineate known three-toed woodpecker territories within the project area and therefore, does protect them in the short-term according to management recommendations. A total of 83 acres were removed from vegetation treatment in this alternative due to three-toed woodpecker territory protection.

The primary North Creek road (FR#50079) would be improved (16 miles) with additional temporary roads constructed (2.3 miles), allowing for greater visitor access. Although over-all

road densities would be reduced at the end of the project reducing access, and associated disturbance by decommissioning 8.5 miles of road, the impacts of improving FR#50079 out-weigh benefits and increases the loss of wildlife habitat security.

Cumulative Effects

Although only a small portion of the cumulative effects analysis area (164 acres) is being harvested to promote aspen regeneration, the loss of mature conifer trees elsewhere in the project area should allow sunlight to hit the ground, promoting aspen sprouting. Totaling acres of all mature spruce that would change to younger age classes gives us the greatest number of acres that may promote aspen sprouting from spruce beetle disturbance. This total is 5,016 acres. Other cumulative effects are the same as Alternative B.

Relationship Between Short-Term Use and Long-Term Productivity

The relationship between short-term use and long-term productivity from Alternative C concerning three-toed woodpeckers is described in Section 1.1.2.4.1.

Irreversible/Irretrievable Commitment of Resources

Irreversible refers to the loss of future options- it cannot be reversed. No irreversible commitment of resources would occur from implementation of this alternative. Irretrievable commitment of resources refers to the loss of production or use of natural resources for a time. The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. Irretrievable commitments would occur when the annual productivity of the species involved is reduced, in this case, three-toed woodpeckers. The time it takes to recover may vary according to the treatment, the vegetation type, and the species involved, but eventually it is expected to recover.

Forest Plan Consistency

No specific guidelines (like for northern goshawkhabitat) are in the Forest Plan for this species. Best Science practices applied elsewhere in Region are used as guidelines (Spahr et al. 1991; Hill 2000; Egnew Pers. Com.). This alternative does delineate known three-toed woodpecker territories and places a buffer around them for protection. This alternative would comply with the general Forest-wide direction to manage habitat of sensitive species, with the added protection of territory buffers. The direction provided by the Forest Plan for goshawks would likely keep three-toed woodpeckers from becoming federally listed, and maintain and/or improve habitat and habitat diversity for minimum viable populations (Wildlife and Fish Resource management 04, 05, Amendment to the Forest Plan dated April 14, 2000). This alternative may impact individuals or habitat, but would not likely contribute to a loss of population viability of sensitive wildlife species.

Three-toed woodpecker-Direct and Indirect Effects (9635 acres)	Alt.A	Alt.B	Alt.C
Acres disturbed	-0- short-term 3,492-long-term	513-short term 2,455-long-term	377- short term 2,793-long term
Aspen regeneration	-0- short & long-term	192 short & long-term	164 short & long-term
Impact determination	Beneficial-short-	May Impact Indv.	May Impact Indv.

	term May Impact Indv. - long-term		

Three-toed woodpecker-Cumulative Effects (22,380 acres)	Alt.A	Alt.B	Alt.C
Acres disturbed	5,5840	4,542	5,016
Aspen regeneration	-0-	192	164
Impact determination	Beneficial-short-term May Impact Indv. - long-term	May Impact Indv.	May Impact Indv.

Perhaps an easier way to compare the differences among the alternatives is as follows:

	Acres Disturbed (Mature→Younger)		
Time Period	Alt. A	Alt. B.	Alt. C
Short-term	0	513	377
Long –term	3,492	2,455	2,793
Cumulative	5,584	4,542	5,016

▸ Calculations Strategy ◂

Acres Disturbed

Alt. A- Short Term: 0 acres would be disturbed
Long Term: 3,492 ac in long-term (acres of forest structure going from mature to young)

Alts. B&C- Short Term: Technically, all acres being harvested would be considered disturbed and possibly opening the canopy. However, the figures I used are only those acres that are changing forest structure from mature to early/young in the short term. This figure was used because this is what would be most likely to open the forest canopy, allowing ground vegetation to sprout.

Therefore, the total acres in mature is 5,992. In the short-term, acres remaining in that forest class would be 5,479 for Alt. B and 5,615 for Alt. C. Subtracting each from the original acres leaves us with 513 disturbed for Alt. B and 377 disturbed for Alt. C in the Short-term.

Long Term: The total number of acres changing from mature to early/young is being considered for acres disturbed in the long-term. The total acres remaining in mature for Alt. B is 3,537. Subtracting that from the original total of 5,992 gives us 2,455 acres disturbed in the long-term. Using this same calculation for Alt. C. 5,992- 3,199 (trees remaining mature) shows a total acre change of 2,793.

Aspen Regeneration

Alt. A – Short Term: 0 acres
Long Term: 0 acres

Alt. B- Short and Long Term: 192 Acres actually harvested for aspen sprouting

Alt. C- Short &n Long Term: 164 Acres

Note: Additional aspen sprouting will occur through loss of large spruce trees, but it's not considered aspen regeneration in a strict silvicultural sense. Also, in the case of loosing large spruce, small spruce trees remain and will take over sprouting aspen in a much quicker timeframe than if they were removed, as in a true aspen regeneration treatment.

Impact Determination

Alt. A- Beneficial Impact in Short-term because all habitat requirements are present & abundant food source. – May impact in long term as trees die & bugs begin to leave, birds will need to move to other areas to meet all their needs.

Alt. B- May Impact (from harvest activities both disturbance & habitat modification).

Alt. C- Same as Alt. B but territories would remain undisturbed. This would hold birds in the area longer and provide for needs while forest recovers. However, protected territories would succumb to beetles and eventually not meet birds needs.

(location in computer files- final mbwip)
Alt B 51 units
1858 ac = difference of 170 ac
Alt C 44 units
1688 ac

The difference in ac mainly comes in Indian Canyon and dropping 83 ac of TTWO buffers in Alt.C.

16. Boreal Owl

Life History: The range of the boreal owl is primarily Canada, Alaska and the northwest United States, however it does extend down into the northern most counties of Utah. It winters thoughout its breeding range, but some migrate south. Potential sightings have occurred in mountainous areas of Colorado. Boreal owls are closely associated with high elevation mature spruce-fir forests due to their dependence on this forest type for foraging year round. Nesting habitat structure consists of forests with a relatively high density of large trees, open understory, and multi-layered canopy. Owls nest in cavities excavated by large woodpeckers in mixed spruce/fir, aspen, Douglas-fir and spruce-fir habitat types. Eggs are laid in the spring with an average clutch size of five. They are incubated for approximately one month with young fledging about four weeks later. In summer, owls roost in cool spruce-fir stands. Boreal owls are nocturnal, primarily eating small mammals and some birds and insects.

Current Status: The boreal owl is not known to occupy the Manti-La Sal National Forest. A few owls have been located on the neighboring Uncompahgre, Grand Mesa and Gunnison National Forests in Colorado as a result of a nesting survey. They have also been located in northern Utah. A nest box survey has been conducted since 1995 on the Moab portion of the Moab/Monticello District with no boreal owls located to date.

Effects: No boreal owls have been sighted on the Monticello District. They do prefer spruce/fir habitat types near tree line that can occur within the project area. However, nearby nest box surveys show no evidence that their range includes the mountain islands of southeast Utah. Therefore, no effect to this species is expected.

17. Spotted Bat

Life History: These bats occur in a variety of habitat types including open ponderosa pine, desert scrub, pinyon/juniper and agricultural land. They roost singly in rock crevices high on steep cliff faces, and may be limited by suitable roosting sites. Their apparent preference for relatively remote, undisturbed areas suggests sensitivity to human disturbance, particularly at the roost. The preferred food of spotted bats appears to be moths, though they also eat beetles, katydids, and grasshoppers. Spotted bats usually take prey in flight but ground feeding also occurs (CDW 1984). Bats are long-lived, slowly reproducing animals adapted to a relatively stable environment.

Current Status: On the district, spotted bats have been located foraging in ponderosa pine community types, selecting for areas with open (0-25%) canopy cover, 200-300 m from water and 2500-2600 m (8200-8530 ft) in elevation (Toone 1991). Spotted bat activity was in proportion to the availability of cliff habitat along the survey routes. Spotted bats were also detected in pinyon/juniper types at elevations of 2340-2540 m (Toone 1991 and 1994). Spotted bats have been documented below the Forest boundary in Natural Bridges National Monument (Ramotnik and Bogan 1995) and lactating females were captured in the Needles section of Canyonlands National Park (Armstrong 1979).

Effects: See below, Townsend's bat.

18. Townsend's Bat

Life History: The Townsend's or western big-eared bat occurs in a variety of habitats including pinyon/juniper, shrub steppe grasslands, deciduous forests and mixed spruce/fir forests from sea level to 10,000 feet elevation. This bat roosts in cool places such as caves, rock fissures, mines and buildings. They hibernate colonially in mines and caves, and females gather in spring and summer maternity colonies. Temperature is a critical factor in site selection. Highly sensitive to human disturbance, Townsend's big-eared bat will abandon roosts when disturbed. Moths are the preferred prey, and their diet may be over 90% moths (Idaho State 1995). A foraging activity study of these bats in Nevada found they foraged almost exclusively in forested habitats, preferring pinyon/sagebrush (60% of activity) and pinyon/juniper (21%) over the dominant sagebrush, salt desert shrub and riparian wetland habitats (Bradley 1995).

Current Status: This species has not been detected on the La Sal Mountains in the few formal bat surveys on the Moab/Monticello district. A Townsend's big-eared bat was detected during surveys of inactive mines on the southeast side of Elk Ridge on the Monticello district (Perkins and Patterson 1996). The leading factor contributing to population declines in bats (including spotted

and Townsend's big-eared) is loss and/or disturbance of roosting habitat. Loss and/or degradation of foraging habitat may also contribute to population declines for this bat.

Effects:

Alternative A:

Direct and Indirect: Water seepage from the pipeline would maintain small, scattered pools of water where moths congregate and provide forage for bats. The presence of spruce beetles and the associated loss of trees have little effect on bat species because of the type of trees involved in this project. Bats do not readily feed on bark beetles. And, although they like to roost in dead trees, it's usually trees with bark that provides crevices for them to crawl in, like ponderosa pine, not spruce. Tree loss through bug infestation and/or fire may impact foraging habitat in a positive way. Where vegetation diversity increases, a more diverse insect population for feeding would likely result. The greater limiting factor for bats, however, would likely be the lack of caves, mines and rock cliffs in the area used for nesting and roosting. The existing water tunnel may provide roosting habitat for bats.

Cumulative: This alternative would not substantially influence cumulative effects.

Alternative B:

Direct and Indirect Water seepage from the pipeline would be reduced because of increased efficiency in the system. This would reduce potential foraging areas where moths congregate, providing food for bats. Epidemic spruce beetle kill trees would be reduced given silvicultural treatment, providing for future forest health and foraging habitat for bats. The removal of trees along the pipeline corridor and during the vegetation treatment would open dense forests up to ground vegetation providing diversity in vegetation. The greater limiting factor, however, would likely be the lack of caves, mines and rock cliffs in the area used for nesting and roosting. Improvements to the water tunnel would likely cause disturbance to roosting bats that occupy the tunnel. Noise disturbance during construction would occur during daylight hours, minimizing impacts to this species, which is active at night.

Cumulative: The limiting factor for this species is most likely the lack of rock crevices and caves. Therefore, disturbance to the water tunnel would likely be the greatest contributor to cumulative effects. At a large scale, the closing of mines in South Cottonwood and elsewhere in the area would reduce maternity roosts. However, in canyon country, rock crevices are abundant on a district-wide basis. None the less, site specific bat populations may be impacted by large-scale closure of roosts.

Alternative C

Direct and Indirect Water seepage from the pipeline would be reduced because of increased efficiency in the system. This would reduce potential foraging areas where moths congregate, providing food for bats. Epidemic bug kill trees would be reduced given silvicultural treatment, providing for future forest health and foraging habitat for bats. The removal of trees along the pipeline corridor and during the vegetation treatment would open dense forests up to ground vegetation

providing diversity in vegetation. This alternative provides for uneven spacing of trees providing clumps of dense canopy cover, adding diversity. The greater limiting factor, however, would likely be the lack of caves, mines and rock cliffs in the area used for nesting and roosting. Improvements to the water tunnel would likely cause disturbance to roosting bats that occupy the tunnel. Noise disturbance during construction would occur during daylight hours, minimizing impacts to this species, which is active at night.

Cumulative: Same as the Alternative B.

19. Colorado Cutthroat Trout

Life History*:* Colorado cutthroat trout require cool, clear water and well vegetated streambanks for cover and bank stability. Instream cover, in the form of deep pools and structures such as boulders and logs, is also important. This subspecies is adapted to relatively cold water and prospers at high elevations. It is limited by habitat alteration from grazing, logging, mining, and water diversions for irrigation as well as loss of genetic purity from hybridization with introduced non-native trout (Spahr et al. 1991).

Current Status: A Conservation Agreement for preservation and enhancement of native Colorado cutthroat trout within Utah was finalized in March 1997. This species of fish has been located in streams on the La Sal Mountains, in the Uintas, Boulder Mountain and several streams in the state of Colorado. The Colorado cutthroat trout occurs on the Moab portion of the Moab/Monticello Ranger District, specifically within three streams and locations. It has also been located in Indian Creek on the Monticello portion of the district. Rob Davies, USFS Fishery Biologist, surveyed Indian Creek in 2000-2001 for Colorado Cutthroat trout and reported that "They are the only remnant population on the Monticello District and although they are not a pure strain, should be managed under the Conservation Agreement".

The primary past action that has directly affected this species is the placement of ditches and the dewatering of portions of streams. Some analysis has occurred on restructuring streams and ditches to promote a more connective system for this species. This is only in its initial planning stage. Surveys of other streams on the Moab and Monticello district continue, in search of cutthroat populations and/or suitable habitat (UDWR 2000 and 2001 reports).

Effects:

Alternative A:

Direct and Indirect: No effect is expected in the short-term. An expansive loss of trees from spruce beetle epidemic would likely occur over time allowing for ground cover to sprout and become established. This, along with tree root masses, would help to hold soil in place. However, large quantities of dead and down trees increase the fire hazard. A large fire in this area could result in soil movement and stream sedimentation, impacting habitat for the Colorado Cutthroat trout.

Cumulative: No cumulative effects are expected unless an expansive fire occurs. Then, any impact on existing cutthroat habitat would add to additional concerns through out it's range including dewatering through ditches, impacts from livestock grazing, recreational camping along streams and roads that contribute to stream sediment.

Alternative B:

Direct and Indirect: Some sedimentation may occur in Indian Creek as a result of soil disturbance in the upper benches of the watershed but it would be unlikely. The removal of trees, reconstruction of the pipeline, road improvement, and associated soil disturbance and exposure may result in sediments reaching the creek following heavy summer thunder storms or spring run-off. Maintaining Best Management Practices should prevent this from happening. Helicopter logging in remote areas would minimize ground disturbance by reducing the need for temporary road construction. This concern would likely be short term. As sunlight begins to hit the forest floor, ground vegetation would sprout. In the long run, bringing vegetation back to the forest floor would likely improve watershed conditions over the current no action situation. This would be particularly true in the regeneration of aspen woodlands. The reduction of fire hazard as a result of this alternative would minimize the risk of sediment reaching streams.

Cumulative: No cumulative effects are expected unless unrestrained sedimentation occurs, which is not expected since Best Management Practices would be adhered to. If any sediment reaches Indian Creek, impacts would likely be minimal and short term. Any impact on existing cutthroat habitat, however, would add to additional concerns through out it's range including dewatering through ditches, impacts from livestock grazing, recreational camping along streams and roads that contribute to stream sediment.

Alternative C:

Direct and Indirect: Some sedimentation may occur in Indian Creek as a result of soil disturbance in the upper benches of the watershed but it would be unlikely. The removal of trees, reconstruction of the pipeline, road improvement, temporary road construction, and associated soil disturbance and exposure may result in sediments reaching the creek following heavy intense summer thunder storms or spring run-off. Administering Best Management Practices should prevent this from happening. Helicopter logging in remote areas would minimize ground disturbance by reducing the need for temporary road construction. This concern would likely be short-term. As sunlight begins to hit the forest floor, ground vegetation would sprout. In the long run, bringing vegetation back to the forest floor would likely improve conditions over the current no action situation. This would be particularly true in the regeneration of aspen woodlands.

Cumulative: No cumulative effects are expected unless extensive sedimentation occurs, which is not expected because of applying Best Management Practices. If any sediment reaches Indian Creek, impacts would likely be minimal and short term. Any impact on existing cutthroat habitat, however, would add to additional concerns through out it's range including dewatering through ditches, impacts from livestock grazing, recreational camping along streams and roads that contribute to stream sediment.

20. Spotted Frog

Life History: The spotted frog ranges from Alaska south to scattered areas in northern Utah. These frogs are most likely found near permanent water such as marshy edges of ponds or lakes, in algae-grown overflow pools of streams or near springs with emergent vegetation during the breeding period. They may move considerable distances from water after breeding, often

frequenting mixed spruce/fir and sub-alpine forests, grasslands and brushlands of sage and rabbitbrush. Spotted frogs are thought to hibernate in holes near springs or other areas where water is unfrozen and constantly renewed.

Current Status: No surveys for spotted frogs have been conducted on the Moab/Monticello Ranger District. Their range does not include this district.

Effects: The range of the spotted frog is not thought to reach this far south in Utah. Therefore, no effect is expected from this project.

21-22. Deer and Elk

Because **deer and elk** are very important to the analysis area ecologically and economically they serve as Forest Management Indicator Species (MIS). They represent overall health of several habitat types including aspen, oak and sagebrush/grasslands. By extension, they also represent habitat quality for other wildlife species occupying the same vegetation types.

Summer range is a limiting factor for deer and elk for the Monticello Ranger District. Forest Plan direction for deer and elk is to maintain adequate hiding cover around fawning/calving areas. Recommendations describe optimum habitat as 25% hiding cover, 15% thermal cover, 10% hiding or thermal cover and 50% foraging area. Hiding cover is generally any vegetation used by elk and deer for security or escape from danger, therefore, it is vegetation that is between the ground and 6 feet in height. Thermal cover is vegetative structure that shields the animal from the effects of weather. For deer this may include sapling trees, shrubs or trees at least 5 feet tall with 75% crown closure. For elk, this involves trees 40 feet or more in height with 70% or more crown closure. Foraging areas are all areas such as natural openings, burns, or harvested areas which provide an adequate level of browse and non-woody plants for food. Forage areas may also include hiding/thermal cover but would also include openings with grass/shrub ground cover (Thomas 1979). The habitat mix in the project area is considered to be at risk because of a lack of aspen regeneration. Aspen stands require regeneration in order to fulfill long-term calving and fawning habitat needs. The loss of aspen and resulting conifer stands also reduces foraging areas, providing an unequal balance towards cover.

The current status of the deer and elk population in southeast Utah is determined through pellet counts (droppings), herd composition counts (i.e. buck:doe or doe:fawn ratios), harvest records and winter aerial surveys.

Mule deer (Odocoileus hemionus) populations are below management objective levels. Factors affecting deer populations include predators (mountain lions, coyotes, bears), competition among big-game species and with livestock, roads, noxious weeds and vegetation change (fire exclusion,

pinyon-juniper encroachment, loss of aspen). The 2002 data shows a post season fawns per 100 does ratio of 26:100.

The post-hunting season status of the San Juan herd (2002) is as follows*:

	OBJECTIVE	CURRENT STATUS
Deer Population	20,500	9,850
Buck:Doe Ratio	40:100	20:100

*From the Utah Division of Wildlife Resources Deer Herd Management Plan.

Drought alternating with heavy winter snows has probably played a major factor in the low deer population. Buck:doe ratios have dropped to an all time low of 7:100. Fawn production is chronically low, suggesting a population crash which we are probably starting to realize. Deer permits for the southeastern region have been reduced by 20% as a result of these concerns. The unit has been reduced to a 5-day hunting season.

Rocky Mountain elk (Cervus canadensis) populations are increasing, which may increase competition with other ungulates. There are currently 22 bull elk permits issued for the San Juan limited entry bull hunt, with anticipation for more in future years.

The post-hunting season status of the San Juan herd (2001) is as follows*:

	OBJECTIVE	CURRENT STATUS
Elk Population	1,200*	1,200**
Bull:Cow Ratio	35:100	65:100

*From the Utah Division of Wildlife Resources Elk Herd Management Plan and most recent winter counts.

**Based on a recorded 900 individual elk during survey plus estimated 20% missed animals.

The elk population seems to be healthy with additional antlerless permits issued to maintain the population at the objective level.

There is no deer/elk winter range identified in the project area, although use does occur, particularly during years with low snow levels. Portions of conifer/aspen and aspen stands that are near water are especially important for deer and elk fawning and calving. This habitat provides the needs for does and cows to give birth and raise their young the first few critical weeks of their life. Road densities and road condition also play a part in the security of wildlife habitat. Increased vulnerability leads to fewer and younger bucks and bulls, and lower male to female ratios in the herds. The greater the road density and/or the higher the road standard, the less habitat security exists for wildlife. This is based on studies showing big game avoidance of roads depending on the type of road, its location and degree of use. Studies have shown (Lyon 1979) that big-game will avoid areas up to one half mile wide on each side of a road. It has been determined (Thomas 1979) that 1 mile of road per sq mile equates to a 43% loss of wildlife habitat security for roads

that are described as “main roads”(one and one-half lanes wide, improved, good condition, main route of travel). For “secondary roads” (one and one-half lanes, somewhat improved, good to fair condition, irregular use), 1 mile of road/sq mile equates to a 26% loss of wildlife habitat security.

Criteria used in the EIS to evaluate affects on deer and elk from the various alternatives are as follows:

-Acres of forest canopy opened allowing increased ground vegetation
-Acres of aspen regeneration
-Forage:cover ratio
-Road density and changes in road standards to determine percent habitat security

Alternative A
Direct/Indirect Effects

Little change in forest structure would occur in the short-term. Long-term loss of large trees from a spruce beetle epidemic would open the forest floor and allow for shrubs, forbs and grasses to increase on approximately 3,500 acres. This would improve forge availability while reducing cover. The ratio of forage:cover, however, would be improved since it is primarily just cover now. Schmid and Frye (1977) state that deer and elk can benefit from the loss of canopy cover from beetle activity because forage production increases. However, such a benefit is important only in areas, and at times, when forage is limiting. Keeping in mind the preferred forage:cover ratio of 50%:50%, and the current condition is a 42:58 ratio, calculations show that given the predicted beetle kill of trees, the long-term result of the Alternative A would be a forage:cover ratio of 45%:55%. Large quantities of dead and down trees are expected from a massive beetle epidemic that would increase the potential for fire hazard. An extensive fire would result in improved forage approximately one year following the fire (depending on moisture and fire intensity).

The existing pipeline is old and rusted, leaking in several locations. These areas provide water and in some cases, support small wetlands that can be important to deer, elk and other wildlife. Maintenance of the existing pipeline will continue under the Alternative A, improving the efficiency of the system, ultimately drying up some small seeps.

Given existing road densities and standards, there is currently a 61% loss in wildlife habitat security within the project area.

Cumulative Effects

As beetle epidemics and associated timber harvests continue, there will continue to be a major shift in vegetation from late to early successional species, increasing forage and reducing cover for these animals. Calculating the change in acres from mature forest to younger age classes, shows there is potentially 5,159 acres that could result in open canopies and increased ground cover. Since elk/deer mostly use the mountain as summer range, cover for hiding and shade are more important than thermal cover and forage is more important than an over-abundance of cover.

Within the cumulative effects analysis area (22,380 acres), this alternative would result in a forage:cover ratio of 46%:54%.

The loss of mature conifer trees from the spruce beetle epidemic would allow sunlight to hit the ground and promote aspen sprouting. Totaling acres of all mature or large/mature spruce where aspen trees are still present within the cumulative effects analysis area will give us the greatest number of acres that may promote aspen sprouting from spruce beetle disturbance. This total is 1,513 acres.

High tree mortality and/or harvest results in habitat fragmentation and the disruption of migration corridors on a localized basis for those animals dependent on continuous dense mature forests. Since the watershed area provides a large continuous expanse of dense mature forest, however, opening the canopy in areas may also add habitat diversity which would benefit many species, while still providing for the safe travel corridors.

The current motorized road and trail density within the cumulative effects analysis area is 2.3 miles of road per square mile. This equates to an approximate total of 58% loss in wildlife habitat security.

Relationship Between Short-Term Use and Long-Term Productivity

The relationship between short-term use and long-term productivity from Alternative A concerning deer and elk is described in Section 1.1.3.2.1.

Irreversible/Irretrievable Commitment of Resources

Irreversible refers to the loss of future options- it cannot be reversed. No irreversible commitment of resources would occur from implementation of this alternative. Irretrievable commitment of resources refers to the loss of production or use of natural resources for a time. The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. Irretrievable commitments would occur when the annual productivity of the species involved is reduced, in this case, deer and elk. The time it takes to recover may vary according to the treatment, the vegetation type, and the species involved, but eventually it is expected to recover.

Forest Plan Consistency

This alternative would comply with Forest-wide direction to: provide habitat needs, as appropriate, for management indicator species; and manage down timber to provide habitat for wildlife; maintain or improve habitat capability; and use commercial and non-commercial practices to accomplish wildlife habitat objectives (Wildlife and Fish Resource Management 01, 07; Wildlife Habitat Improvement and Maintenance 01, 04). Several project requirements demonstrate consistency: maintaining adequate cover in calving areas, promoting aspen clones where they exist in treated areas, precluding harvest during calving and fawning periods, restricting harvest activities during the hunting season; closing temporary project roads to the public, maintaining appropriate forage to cover ratios; and meeting specified log, slash, and woody debris requirements.

Alternative B
Direct/Indirect Effects

Loss of large trees from silvicultural treatment and residual beetle epidemic on 1,663 acres would open the forest floor and allow for shrubs, forbs and grass to encroach. This would improve forge availability while reducing high-level canopy cover. The ratio of forage:cover, however, would be improved since it is primarily only thermal cover now. Keeping in mind the preferred forage:cover ratio of 50%:50%, calculations show that given the predicted beetle kill of trees, the long-term result of Alternative B would be a forage:cover ratio of 47%:53%.

Aspen regeneration treatments on 354 acres would reduce the current quality of the area for deer and elk by disturbing cover and ground forage temporarily, but would help to assure future habitat is maintained for these animals. The aspen vegetation community provides calving/fawning habitat, forage, and cooling cover (shade) during summer months.

Pipeline construction would open a pathway through the forest for it's alignment. Since trees would remain cleared from this corridor, forage species would replace cover.

Improvement of the main North Creek road (FR#50079) and construction of temporary roads could increase visitor use, extend the season of use, and increase travel speed. The North Creek road, however, is planned for seasonal closure, and signs will be posted on temporary roads telling people to keep off. These practices would reduce some of these potential impacts. Road densities would increase during the life of the project with the construction of temporary roads during the vegetation treatment. This would be short-term, however, since once the project is complete, road closures would reduce road densities from the current situation. When calculating wildlife habitat security, impacts from improving FR#50079 outweigh benefits from reduced road densities. Given road densities and standards, there would be a 72% loss in wildlife habitat security during project implementation and a 65% loss following project completion.

Perhaps the greatest concern regarding the reconstruction of the pipeline and it's many collection points is the potential for dewatering existing streams. This alternative improves the pipeline system where the diversion of water occurs at the head of the stream as well as several places along the stream where springs usually replenished stream flow. Removing this water can have a substantial impact on the use of the stream corridor by wildlife, including deer and elk. Not only does the water meet a basic need of the animal itself, but the water helps to keep the ambient temperature under the canopy lower than if no water were there.

Noise disturbance during project implementation could disrupt animal movements and disturb calving/fawning (May 15-July 5). A Design Feature that helps to protect against disturbance is that activities are suspended during calving/fawning times unless authorized. An area may be surveyed prior to fawning/calving and if no animals are located, the District Ranger can authorize operations to proceed. This may however, impact animals that would otherwise move into the area. Unlike ground-based logging where noise is relatively localized to the harvest area, the noise from helicopter logging spans a greater area due to the aerial transport of logs from the harvest unit to the landing area. Alternative B would treat 1,265 acres through helicopter harvest methods.

The existing pipeline and catchments are old and rusted, leaking in several locations (Cirrus Ecological Solutions, Contract #43-84N8-1-0122). These areas provide water and in some cases support small wetlands and can be important to deer, elk and other wildlife. Although

improvements to the existing water system are being conducted, extensive reconstruction would remove additional isolated water sources resulting from seepage.

Cumulative Effects

As beetle epidemics and associated timber harvests continue, there would continue to be a major shift in vegetation from late to early successional species, increasing forage and reducing cover for these animals. Calculating the change in acres from mature forest to younger age classes, shows there is potentially 4,542 acres that could result in open canopies and increased ground cover. Reduced cover increases visibility between animal and forest visitor, elevating disturbance or vulnerability to hunting. Although the elk herd is doing great and has reached the herd objective for the Abajo Mountains, deer herds are substantially below desired numbers. Impacts to the deer herd include drought, increased hunter access, predators, possible competition with other big game animals, and mortality from vehicle collisions. Deer herd numbers are low enough at this point that any single factor affecting their survival can be important. Over the cumulative effects analysis area (22,380 acres), this alternative would result in a forage:cover ratio of 47%:53%.

Although only a small portion of the cumulative effects analysis area (354 acres) is being harvested to regenerate aspen, the loss of mature conifer trees elsewhere in the project area would allow sunlight to hit the ground promoting aspen sprouting. Totaling acres of all mature or large/mature spruce where aspen trees are still present within the cumulative effects analysis area would give us the greatest number of acres that may promote aspen sprouting from spruce beetle disturbance. This total is 2,193 acres.

The current motorized road and trail density within the cumulative effects analysis area is 2.3 miles of road per square mile. Recommendations from the ongoing Roads Analysis would reduce that number to 1.6 miles of road per square mile. This would increase wildlife habitat security over the 46 square mile cumulative effects analysis area to an overall 42% loss in wildlife habitat security.

Relationship Between Short-Term Use and Long-Term Productivity

The relationship between short-term use and long-term productivity from Alternative B concerning deer and elk is described in Section 1.1.3.3.1.

Irreversible/Irretrievable Commitment of Resources

Irreversible refers to the loss of future options- it cannot be reversed. No irreversible commitment of resources would occur from implementation of this alternative. Irretrievable commitment of resources refers to the loss of production or use of natural resources for a time. The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. Irretrievable commitments would occur when the annual productivity of the species involved is reduced, in this case, deer and elk. The time it takes to recover may vary according to the treatment, the vegetation type, and the species involved, but eventually it is expected to recover.

Forest Plan Consistency

This alternative would comply with Forest-wide direction to: provide habitat needs, as appropriate, for management indicator species; and manage down timber to provide habitat for wildlife; maintain or improve habitat capability; and use commercial and non-commercial practices to accomplish wildlife habitat objectives (Wildlife and Fish Resource Management 01, 07; Wildlife Habitat Improvement and Maintenance 01, 04). Several project requirements demonstrate consistency: maintaining adequate cover in calving areas, promoting aspen clones where they exist in treated areas, precluding harvest during calving and fawning periods, restricting harvest activities during the hunting season; closing temporary project roads to the public, maintaining appropriate forage to cover ratios; and meeting specified log, slash, and woody debris requirements.

Alternative C
Direct/Indirect Effects

Loss of large trees from silvicultural treatment and residual beetle epidemic on 2,146 acres would open the forest floor and allow for shrubs, forbs and grass to encroach. This would improve forge availability while reducing high-level canopy cover. The ratio of forage:cover, however, would be improved since it is primarily only canopy cover now. Keeping in mind the preferred forage:cover ratio of 50%:50%, calculations show that given the predicted beetle kill of trees, the long-term result of Alternative C would be a forage:cover ratio of 49%:51%. This alternative results in a "clumpy" forest structure that better meets cover needs. Because patches of trees are left close together, canopy cover is maintained in forest pockets but only in the short-term as residual beetle activity would likely target these areas eventually killing the trees. Aspen regeneration treatments on 241 acres would reduce the current quality of the area for deer and elk by disturbing cover and ground forage temporarily, but would help to assure future habitat is maintained for these animals. This vegetation community provides calving/fawning habitat, forage, and cooling cover (shade) during summer months. A Design Feature that helps to protect against disturbance is that activities are suspended during calving/fawning times unless authorized. An area may be surveyed prior to fawning/calving and if no animals are located, the District Ranger can authorize operations to proceed. This may impact animals that would otherwise move into the area.

Pipeline construction would open a pathway through the forest for it's alignment. Since trees would remain cleared from this corridor, forage species would replace cover.

Improvement of the main North Creek road (FR#50079) could increase visitor use, extend the season of use, and increase travel speed. The North Creek road, however, is planned for seasonal closure, and signs will be posted on temporary roads telling people to keep off. These practices would reduce some of these potential impacts. Road densities would increase during the life of the project with the construction of temporary roads during the vegetation treatment. This would be short-term, however, since once the project is complete, road closures would reduce road densities from the current situation. Given road densities and standards, there would be a 72% loss in wildlife habitat security during project implementation and a 65% loss following project completion. When calculating wildlife habitat security, impacts of improving FR#50079 outweigh benefits form reduced road densities.

Perhaps the greatest concern regarding the reconstruction of the pipeline and it's many collection points is the potential for dewatering existing streams. This alternative improves the pipeline system where the diversion of water occurs at the head of the stream as well as several places along the stream where springs usually replenished stream flow. Removing this water can have a

substantial impact on the use of the stream corridor by wildlife, including deer and elk. Not only does the water meet a basic need of the animal itself, but the water helps to keep the ambient temperature under the canopy lower than if no water were there.

Noise disturbance during project implementation could disrupt animal movements and disturb calving/fawning (May 15-July 15). Unlike ground-based logging where noise is relatively localized to the harvest area, the noise from helicopter logging spans a greater area due to the aerial transport of logs from the harvest unit to the landing area. Alternative C would treat 1,148 acres through helicopter harvest methods.

The existing pipeline and catchments are old and rusted, leaking in several locations (Cirrus Ecological Solutions, Contract #43-84N8-1-0122). These areas provide water and in some cases support small wetlands and can be important to deer, elk, and other wildlife. Although improvements to the existing water system are being conducted, extensive reconstruction would remove additional isolated water sources resulting from seepage.

Cumulative Effects

Cumulative effects are basically the same as Alternative B Proposed Action. However, given the level of spruce beetle epidemic within the cumulative effects analysis area (22,380 acres) and after implementation of the vegetation treatment proposed in this alternative, 21% of the area (4,884 acres) would be converted from mature trees to early, young and mid-age trees. This would reduce the canopy cover from >75% to between 40-69% in harvest areas and less than 40% where beetles continue to flourish. Forage plants would increase in areas where forest canopy is opened up and sunlight reaches the floor. Over the cumulative effects analysis area (22,380 acres), this alternative would result in a forage:cover ratio of 49%:51%.

Although only a small portion of the cumulative effects analysis area (241acres) is being harvested to regenerate aspen, the loss of mature conifer trees elsewhere in the project area would allow sunlight to hit the ground promoting aspen sprouting. Totaling acres of all mature or large/mature spruce where aspen trees are still present within the cumulative effects analysis area will give us the greatest number of acres that may promote aspen sprouting from spruce beetle disturbance. This total is 3,369 acres.

The current motorized road and trail density within the cumulative effects analysis area is 2.3 miles of road per square mile. Recommendations from the ongoing Roads Analysis would reduce that number to 1.6 miles of road per square mile. This equates to an approximate total of 42% loss in wildlife habitat security.

Relationship Between Short-Term Use and Long-Term Productivity

The relationship between short-term use and long-term productivity from Alternative C concerning deer and elk is described in Section 1.1.3.4.1.

Irreversible/Irretrievable Commitment of Resources

Irreversible refers to the loss of future options- it cannot be reversed. No irreversible commitment of resources would occur from implementation of this alternative. Irretrievable commitment of resources refers to the loss of production or use of natural resources for a time. The loss or

modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. Irretrievable commitments would occur when the annual productivity of the species involved is reduced, in this case, deer and elk. In this case, irretrievable loss of existing habitat through silviculture treatment and spruce beetle epidemic benefits these animals.

Forest Plan Consistency

This alternative would comply with Forest-wide direction to: provide habitat needs, as appropriate, for management indicator species; and manage down timber to provide habitat for wildlife; maintain or improve habitat capability; and use commercial and non-commercial practices to accomplish wildlife habitat objectives (Wildlife and Fish Resource Management 01, 07; Wildlife Habitat Improvement and Maintenance 01, 04). Several project requirements demonstrate consistency: maintaining adequate cover in calving areas, promoting aspen clones where they exist in treated areas, precluding harvest during calving and fawning periods, restricting harvest activities during the hunting season; closing temporary project roads to the public, maintaining appropriate forage to cover ratios; and meeting specified log, slash, and woody debris requirements.

Deer and Elk-Indicators Direct and Indirect Effects (9,635 acres-habitat & 31.9 sq.m. prj area)	Alt.A	Alt. B	Alt. C
Forest canopy opened to allow increased ground vegetation (acres) *same as acres disturbed in other analyses	-0- short-term 3,492- long-term	513- short-term 2,455- long term	377- short-term 2,793- long-term
Aspen regeneration (acres)	-0- short & long-term	192 short and long-term	164 short and long-term
Forage habitat assessment (Seeking Forage:Cover Ratio of 50%:50%)	Currently- 42:58% Long-term: 45%:55%	Long-Term: 47%:53%	Long-term: 49%:51%
Road Density (miles per square mile)	2.3 short & long-term	2.4 - short-term 2.1- long-term	2.4 - short-term 2.1 – long-term
Changes in road standard (miles)	0	16 miles road improved	16 miles road improved
Vulnerability assessment	Less Vulnerable 61% loss of habitat effectiveness	More Vulnerable 72% loss of habitat effectiveness-short-term 65.0% loss of habitat effectiveness-long-term	More Vulnerable 72% loss of habitat effectiveness-short-term 65.0% loss of habitat effectiveness-long-term

Deer and Elk- Cumulative Effects (22,380 acre-habitat & 46 sq.m.-roads)	Alt.A	Alt. B	Alt.C
Forest canopy opened to allow increased ground vegetation (acres)	5,159	4,542	4,884
Aspen regeneration (acres)	-0-	192	164
Forage habitat assessment (seeking 50%:50%)	Forage:cover ratio-46%:54%	Forage:cover ratio-47%:53%	Forage:cover ratio-49%:51%

Road Density (miles per square mile)	2.4	1.6	1.6
Changes in road standard (miles)	0	16 miles road improved	16 miles road improved
Vulnerability assessment	61 % loss of habitat effectiveness	Less Vulnerable 42% loss of habitat effectivenes-	Less Vulnerable 42% loss of habitat effectiveness

▸ Calculations Strategy ◂

Forest Canopy Opened----------

Alt. A- Short Term: 0 acres would be disturbed
Long Term: 3,492 ac in long-term (acres of forest structure going from mature to younger age classes)

Alts. B&C- Short Term: Technically, all acres being harvested would be considered disturbed and possibly opening the canopy. However, the figures I used are only those acres that are changing forest structure from mature to early/young in the short term. This figure was used because this is what would be most likely to open the forest canopy, allowing ground vegetation to sprout.

Therefore, the total acres in mature is 5,992. In the short-term, acres remaining in that forest class would be 5,479 for Alt. B and 5,615 for Alt. C. Subtracting each from the original acres leaves us with 513 disturbed for Alt. B and 377 disturbed for Alt. C in the Short-term.

Long Term: The total number of acres changing from mature to early/young is being considered for acres disturbed in the long-term. The total acres remaining in mature for Alt. B is 3,537. Subtracting that from the original total of 5,992 gives us 2,455 acres disturbed in the long-term. Using this same calculation for Alt. C. 5,992- 3,199 (trees remaining mature) shows a total acre change of 2,793.

----------*Cumulative Effects*

Acres of forest structure going from mature to younger age classes
Total acres of mature to start with: 2616+2968+6332=11,916

Mature left at long term: Alt. A=6757
Alt. B=7374
Alt. C=7032

The difference between what the total to start and what was left shows how many acres were opened up to allow ground cover to come in:
11,916-6757=5159
11,916-7374=4542
11,916-7032=4884

Forage Habitat Assessment----------

Young/Early with aspen= forage only
Mature with aspen= 50% forage/50% cover
Pure spruce= cover only

	Spruce/Fir	Aspen/Spruce	Aspen Mixed
Alt. A Short Term (Current)	1588 ac=cover	2229 ac=50%/50%	5788 ac=50%/50% 29 ac young=forage
Alt. A Long Term	1588 ac=cover	582 ac young/early 1647 mature=50%/50%	29 ac. young/early=forage 5788 mature=50%/50%
Alt. B Long Term	1588 ac=cover	776 ac young/early 1453 ac=50%/50%	221 ac young/early 5596 ac=50%/50%
Alt. C Long Term	1588 ac=cover	1218 ac young/early 1011 mature=50%/50%	179 ac young/early=forage 5638 mature=50%/50%

	Cover	Forage	=	Ratio
Current	5597 ac	4038 ac		58%:42%
Alt. A Long Term	5306 ac	4329 ac		55%:45%
Alt. B Long Term	5113 ac	4522 ac		53%:47%
Alt. C Long Term	4913 ac	4722 ac		51%:49%

----------*Cumulative Effects*

Total Cumulative Effects Areas: 22,380 ac.

	A	B	C
Spruce fir (Cover only) (total ac.=2667)	2000 ac mature/mid 667 young	1806 ac mature/mid 861 young	1210 ac mature/mid 1457 young
Aspen/Spruce Young/early=food Mature= >50% food}	2523 ac mature/mid 846 young	2229 ac mature/mid 1140 young	1581 ac mature/mid 1788 young

>50% cover}
(total ac.=3369)

Aspen Conifer	1605 mature/mid	15859 mature/mid	15901 mature/mid
(total ac.=16,227)	176 young	368 young	326 young
COVER			
Spruce/Fir =	2667 ac	2667 ac	2667 ac
Aspen/Spruce=	1262 ac	1115 ac	791 ac
Aspen/Conifer	8172 ac	8172 ac	8172 ac
	11,955	11,712	11,409
	=54%	=53%	=51%
FORAGE			
Spruce/Fir =	-0-	-0-	-0-
Aspen Spruce}	2107 ac	2254 ac	2578 ac
Aspen Conifer	8201	8297	8276
	10,308	10,551	10,854
	=46%	=47%	=49%
Forage:Cover	46:54%	47:53%	49:51%

Habitat Security ----------

(Based on Thomas 1979)

Main Road (1 ½ lanes improved)
1 mile = 43% loss in habitat effectiveness
Sq. mile

Secondary Roads
1 mile = 26% loss in habitat effectiveness
Sq. mile

Project Area:
Beginning Road density = 69.7 miles/30.2 sq. miles=2.31 miles/sq. mile

Existing – Since FH049 runs along North boundary of Project Area – It would influence habitat effectiveness only to the South within Project – So for area influenced in the analysis. Only half the road will be included 5.14/2 = 2.57 miles of main road.

Existing- FR# 50086 Goes to the Ski Area and would be considered a main road – wide & graveled – 1.1 miles

Proposed- North Creek/Indian Creek/Watershed Road #50079 is currently a primitive road to be up-graded to secondary or main road. 16 miles

Proposed- Jackson Ridge Road's (2 miles #354) currently primitive to be up-graded but only with spot gravel & turn outs but staying a primitive road.

Worst Case Scenario-We are labeling roads as either main or secondary, although many roads are not even up to secondary level standards. I think this is still ok, however, because it consistent among alternatives and can be used as a comparison.

Area of Project (NFS lands) = 30.2 sq. miles
Total Roads in Area: 69.7 miles
Main Roads: 2.57 m. (049)- existing (1/2 blue mtn-harts draw)
1.1 m. (354) –existing (ski lift)
3.67 miles/31.9 sq.m-existing main roads
+16.0 miles. (079) –proposed main road (Indian-North Creek)
19.67 miles/30.2 sq. m

Alt. A (existing condition)

Main Roads:
3.67 miles Main Roads
3.67m./30.2 sq.m.=.12m/sq m

1 mile/sq mile = .12 mile/sq.
43% loss
X= 5.2% loss of habitat security from main roads

Secondary Roads:
69.7 (all) -3.67 (main) =66.03 secondary
66.03 m./30.2 sq.m.=2.19 m/sq m

1 mile/sq mile = 2.19
26% loss
X=56% loss of habitat security from secondary roads

Total Loss of Habitat Security = 5.2% + 56%= 61.2% loss

Alts. B & C

Short term
72 (all roads)– 19.67 (main roads) = 52.33 Secondary roads
↑ ↑
Existing 69.7 16 miles (079)
Temp + 2.3 2.57 miles (049)
72 +1.1 miles (354)
19.67 miles

19.67(main) = .65 main rd./sq.mile
30.2 (total area)

1 miles/sq mile = 43% loss main road
.65 X
X=27% loss habitat security from main rds.

52.33 (secondary)=1.73 rd/sq mile
30.2

1 miles/sq = 26% loss
1.73 X
X = 45% loss of habitat security from secondary roads.

Total Loss of Habitat Security (short term) = 27% + 45%= 72% loss

Long term
63.5 (all roads) – 19.67 (main roads) = 43.83 Secondary roads
↑
72.0 (existing roads)
–8.5 (decommissioned roads)
63.5 long term total road density

1 mile/sq mile = 43%
.65 X= 27% loss from main roads

43.83 =1.45 1 mile/sq mile = 26%
30.2 1.45 X = 38% from secondary roads

Total Loss of Habitat Security (long term)= 27% + 38%= 65% loss

----------*Cumulative Effects*

Total area of Analysis for Cumulative effects for road analysis/habitat security–
29,413 Acres or 46 sq miles

Alt. A: 59.3m Classified Road
(Current) 22.7 m Classified Trail (motor)
+ 26.6m Unclassified Roads
108.6 m motorized Trail/Roads = 2.36 mile/sq mile

Alt. B&C {Based on Roads Analysis Recommendations}
29 miles road decommissioned

108.6m – 29m = 79.6 m motorized trail/roads. = 1.6 miles/sq miles

Alt. A (Current- if all roads were secondary Roads)

1m/sq miles 26% loss habitat security = 61% total loss in
2.36 m/sq mile = X habitat security

Alt. B&C (if all roads were Secondary Roads)

1m/sq mile 26% loss habitat Security = 42% total loss in*
1.6 m/sq. = X habitat security

Note: The reduction in habitat security for Alts. A&B would not be as great as this shows, however, since there are several roads being up-graded to main roads. This analysis only shows the difference that a reduction in road density would make, should all roads be considered the same level of standard within the cumulative effects analysis area.

23. Abert's squirrel

Life History: Abert's squirrel (Sciurus albertii) is the indicator species most directly dependent on ponderosa pine habitat on both the Moab and Monticello districts. Habitat requirements are described in Patton (1995) and Pederson et al (1976). Individuals may disperse across pinyon/juniper benches in search of new ponderosa pine habitat, and could find cover and forage in patches of pinyon/juniper adjacent to ponderosa pine. They feed on pine seeds, bark, buds, flowers and fungi that grows in association with mature ponderosa pine trees. This species mates in late April or May and females give birth to a litter of two to five young about forty days after mating. The Forest Plan provides specific guidelines for managing habitat for this species.

Current Status: Studies for Abert's squirrels have occurred on both the Moab and Monticello districts. On the Monticello portion of the district, studies have occurred in 1986, 1987, 1992, and 1993. The current study began in 2001 and will continue through 2003. The current study includes four survey grids on Elk Ridge and three on the Abajo Mountains. All grids showed the presence of Abert's squirrels. The following table presents the results:

Study Site	Squirrel Density (# squirrels/ha)	
	2001	2002
Elk Ridge Sites:		
Deadman point	0.04	0.01
Steamboat Point	0.28	0.10
Kigalia Point	0.06	0.06
South Long Point	0.10	0.05
Abajo Mtn. Sites:		
South Creek	0.08	0.01
Johnson Creek	0.17	0.04
Bulldog	0.24	0.04

Effects: Approximately 1,465 acres of ponderosa pine habitat falls within the project area. Of this, 1,045 acres is considered mature or large-mature, the preferred forest structure for Abert's squirrels. Little affect from the vegetation treatment should occur to this vegetation type. Portions of the re-routed pipeline do, however, cross this forest type. This means a pathway approximately 25 ft. wide would be cut through the forest, reducing habitat suitability for Abert's squirrels.

24. Golden eagles

Life History: Golden eagles (Aquila chrysaetos) breed across western North America from Alaska south to northern Mexico. Most golden eagles are year-round residents of the same area, except for those occupying northern ranges. They are considered a common resident in Utah. Typically found in open country, they nest on cliffs or in trees. They feed mainly on small mammals, especially rabbits, prairie dogs, ground squirrels as well as insects, snakes, birds and juvenile ungulates. Nesting pairs are monogamous, often using the same nest in consecutive years. Eggs are laid from late February to early march in Utah. One to three eggs can be laid with hatching occurring approximately 45 days later. Birds first breed at 4-5 years of age.

Current Status: Golden eagles can be found in southeast Utah any time of the year. They often congregate in fields feeding on dead livestock or big game. Jimmie Forrest, rangeland management specialist on the Monticello/Moab district since 1966 stated: *I have over the years*

also made sightings of both Golden and Bald eagles in the area [Monticello-Blanding watershed]. Sometimes they have been perched on dead snags in the area, on other occasions I've seen them flying over the area. Numerous surveys were conducted in the project area in 2002 (district files). Soaring eagles were often observed, but no eagle eyries located. It is suspected that eagles observed in the area come from nesting sites along the cliffs at lower elevations.

Effects: Changes in spruce habitat in the project area can result in changes in prey species and availability for golden eagles. As spruce trees die and the forest floor opens, rodents that depend on greater ground vegetation for cover benefit. The change in prey species, however, is not expected to have significant impacts on foraging for eagles since they are opportunistic feeders…preying on what is available. Gopher control (baiting) is planned to protect new tree plantings. A golden eagle could consume a treated gopher, however gopher control would utilize underground methods to prevent eagle and gopher interaction. Treatment of gophers would only occur where needed to re-establish new tree seedlings.

25. Blue Grouse

Life History: Blue grouse (Dendragapus obscurus) are considered a forest grouse, moving up in elevation from conifer/aspen and mountain brush summer range to dense, mature spruce/fir forest in the winter. Open stands of conifer or aspen with an understory of brush are preferred habitat. In spring, birds move to lower meadow/brush or open timber areas for mating. After mating in April, nesting occurs in May and June. The nest is located on the ground in a shallow depression lined with leaves and grass. The female lays 7-10 eggs and incubate them for 24 days. Summer food consists of green vegetation, seeds, buds, berries and insects. The winter diet is primarily the needles and buds of fir trees. They are found in most mountainous areas of Utah.

Current Status: Blue grouse are found in most mountainous areas of the Utah, however, the greatest densities occur in the northern Wasatch range. While the over-all population is healthy on a state-wide basis, annual population fluctuations are primarily the result of seasonal weather patterns. Cool wet springs, dry summers, and harsh winters depress blue grouse production. Unlike other grouse species, the historic habitat of blue grouse has remained relatively unchanged, allowing populations of this species to remain relatively stable.

The last Upland Game Annual Report, published by the Utah Division of Wildlife Resources was in 1999 (Pub. #00-27). Their findings state "The 1999 brood count surveys on blue grouse indicated that production increased 19 percent from 1998 and was 9 percent above average. This data is collected opportunistically. (pg. 102)" The trend for blue grouse young per 100 adults from 1989-1999 are as follows for San Juan and Grand Counties:

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Grand	300	---	200	286	289	200	---	---	400	---	---
San Juan	300	---	500	233	167	---	---	---	---	---	---

Because the data is collected opportunistically, not every year has data. Another way to look at this, is a count of the number of blue grouse observed per 100 hours which looks like this:

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Grand	89	---	300	540	875	467	---	---	---	---	---
San Juan	400	---	600	233	457	---	---	---	---	---	---

In both cases, there are fluctuations with 1993 being a peak year. When looking at the long range, blue grouse populations have increased over time, although individual years have fluctuated. According to UDWR data (Annual Report Pg. 122), there were 7,372 blue grouse harvested in the state of Utah in 1963. 1978 was a peak year with 46,651 blue grouse harvested. The 1999 count showed a total state-wide blue grouse harvest of 28,741. Looking at harvest levels from 1963-1999, populations seem to be cycling between high and low levels every 4-7 years. The following summarizes the cycles found in these 36 years of data:

Years	Total Years	Number harvested
1963 – 1967	4 yrs	4,659 - 7,372 harvested
1968 - 1972	4 yrs	10,419 - 19,221 harvested
1973 – 1980	7 yrs	23,138 - 46,651 harvested
1981 – 1986	5 yrs	12,138 – 17,852 harvested
1987 – 1992	5 yrs	26,115 – 29,146 harvested
1993 – 1999	6 yrs	11,040 – 31,355 harvested

To: Heather Musclow, Wildlife Biologist Moab/Monticello Ranger District.

As per your request here are my observations regarding Blue Grouse sightings in the Blue Mountain (Abajos) area, particularly as it refers to the Blanding & Monticello Watershed Improvement Project area. I first started working on the District in June of 1966. I have been in the subject area numerous times each year since that time. I have not observed Blue Grouse on every occasion but I'm certain that I have observed them during every spring, summer or fall season visit to the area. Normally I've observed the birds in the spruce and fir timber habitat areas but I've also observed them many times in the open Thurber's fescue grass meadows or crossing Forest Road #079 which passes through the area. Based on my judgment I believe that the Blue Grouse species is well established on this mountain range. I have not observed any activities in the area that I feel would threaten the species continued longevity.

/s/
Jimmie L. Forrest
Rangeland Management Specialist
Moab/Monticello Ranger District
Manti-La Sal National Forest

Effects:

Alternative A:

Direct and Indirect: Expansive loss of large trees from the spruce beetle epidemic would open the forest floor and allow shrubs, forbs and grass to encroach. This would improve forage and nesting habitat availability while reducing cover and roosting trees. The ratio of cover:forage, however, would be improved since it is primarily only thermal cover now. Large quantities of dead and down trees as would result from a massive beetle epidemic may increase the potential for fire hazard. A large stand-replacing fire could push the forage: cover ratio to the extreme providing ample summer and brood forage with little thermal/hiding cover. The value of the area as winter habitat would be reduced to nil.

Cumulative: There would be a continued reduction in thermal cover and roosting trees that would occur in the project area due to bark beetle infestations and

associated timber harvests. Should this pattern continue, impacts to blue grouse may become substantial.

Alternative B:

Direct and Indirect: Loss of large trees from silvicultural treatment would open the forest floor and allow for shrubs, forbs and grass to encroach. This would improve forage and nesting habitat availability while reducing thermal cover and roosting trees. The ratio of cover:forage, however, would be improved since it is primarily only thermal cover now.

Improvement of the main North Creek road could increase visitor use, extend the season of use, and increase travel speed. This road, however, is planned for seasonal closure, reducing these potential impacts. Road densities would increase during the life of the project with the construction of temporary roads during the vegetation treatment. This would be short term, however, since once the project is complete, road closures would reduce road densities to less than the current situation. The improvement of FR# 50079, however, would negate benefits from reduced road densities when it comes to habitat security for wildlife. Noise disturbance during project implementation could disrupt bird movements and nesting (April 20-July 1).

Cumulative: The reduction in thermal cover and roosting trees that has occured in the project area will continue to occur impacts a larger cumulative affects area. Should this pattern continue, impacts to roosting may become substantial.

Alternative C:

Direct and Indirect: Loss of large trees from silvicultural treatment would open the forest floor and allow for shrubs, forbs and grass to encroach. This would improve forge and nesting habitat availability while reducing thermal cover and roosting trees. Canopy cover would be greater under this alternative because of managing for a “clumpy” forest structure. Scattered pockets of trees would be allowed to remain in close vicinity to one another with interlocking canopy. The ratio of cover:forage, however, would be improved since it is primarily only thermal cover now.

Improvement of the main North Creek road could increase visitor use, extend the season of use, and increase travel speed. This road, however, is planned for seasonal closure, reducing these potential impacts. Road densities would increase during the life of the project with the construction of temporary roads during the vegetation treatment. This would be short term, however, since once the project is complete, road closures would reduce road densities to less than the current situation. The improvement of FR# 50079, however, would negate benefits from reduced road densities when it comes to habitat security for wildlife. Noise disturbance during project implementation could disrupt bird movements and nesting (April 20-July 1).

Cumulative: The reduction in thermal cover and roosting trees that has occured in the project area will continue to occur, impacting a larger cumulative affects area. Should this pattern continue, impacts to roosting may become substantial. Grazing

bylivestock and big-game can reduce seed sources for food and cover for brood rearing. Since livestock grazing is only incidental in the watershed area, impacts would likely occur from elk. Opening the forest canopy, however, would increase ground vegetation and ultimately improve summer foraging areas.

26. Macroinvertebrates

Life History: Benthic macroinvertebrates are organisms that dwell on stream bottoms, such as aquatic insects, mollusks, and worms. They live in, on, or near streambeds; have relatively long life cycles; and are relatively stationary in their larval stages. They are sensitive to both natural and human disturbances and are easy to sample, making them a good indicator of long-term site-specific water quality, sediment, and overall stream health.

Indices are numeric values calculated from a single sample in the laboratory and are used to assess water quality and stream health. There are many indices that can be calculated from a single sample. The *Forest Plan* identifies three indices, each of which has a specific Standard. They are Biotic Condition Index, Standing Crop, and Diversity Index, and are described below.

Biotic Condition Index (BCI)

This index has been developed by the USDA Forest Service, is referenced in the Forest Plan (pg. IV-6) and is a tool for assessing overall aquatic-ecosystem health. It is a measure of a stream against its own potential, not against another stream. It is independent of sample size and is based on tolerances of benthic invertebrate taxa. The Forest Plan Standard is 75 or greater. The National Aquatic Monitoring Center is phasing out the use of this index. For samples analyzed after 1997, the index must be calculated from the dominance-weighted community tolerance quotient (CTQd) and an assumed potential. No reference sites have been sampled or analyzed to verify potential. Following is the range of BCI values and their rating.

<72	Poor conditions
72–79	Fair conditions
80–90	Good conditions
>90	Excellent conditions

Standing Crop

This index is simply a measure of the abundance or weight of organisms per unit area (grams/m2), and is an indicator of aquatic production and fish food abundance. We did not use Standing Crop values in this analysis for two reasons. First, a single large organism captured in a sample can significantly affect the total weight of the sample (Mark Vincent, National Aquatic Monitoring Center, personal communication, 2001). Second, nutrient enrichment from a variety of sources and/or increases in sunlight from loss of riparian shrubs and trees, can increase stream production and macroinvertebrate biomass (Tait et al. 1994). These two factors could cause an increase in standing crop values and suggest that water quality is good, when the opposite could be true.

Diversity Index (DAT)

This index is calculated from the number of distinct taxa and their relative abundance in a single sample during the initial processing of the sample. When there is a wide diversity of aquatic macroinvertebrate taxa, the DAT is a higher number. Disturbed stream systems with lots of fine sediment tend to support only a narrow range of organisms, and DAT tends to be lower. The

Forest Plan Standard is 11–17. Processing procedures at the National Aquatic Monitoring Center have changed and this index is no longer calculated. DAT values are available only for samples collected through 1997. Following is the range of DAT values and their rating.

0–5	Poor diversity
6-10	Fair diversity
11-17	Good diversity
18-26	Very good diversity

Current Status*:*

The Forest Plan references three indices: DAT, BCI, and standing crop.

- DAT is a diversity index developed by the Aquatic Ecosystem Analysis Laboratory in Provo, Utah. It is calculated from the number of distinct taxa and their relative abundance in a single sample during the initial processing of the sample. When there is a wide diversity of aquatic macroinvertebrate taxa, the DAT is a higher number. Disturbed stream systems with lots of fine sediment tend to support only a narrow range of organisms, and DAT tends to be lower. Processing procedures at the National Aquatic Monitoring Center have changed and this index is no longer calculated. DAT values are available only for samples collected through 1997. The Forest Plan Standard is 11–17, or greater. The index values are interpreted as follows: 0-5, poor diversity; 6-10, fair diversity; 11-17, good diversity; 18-26, very good diversity.

- BCI is the biotic condition index. It was developed by the Aquatic Ecosystem Analysis Laboratory in Provo, Utah to assess overall aquatic-ecosystem health. It is a measure of a stream against its own potential, not against another stream. It is independent of sample size and is based on tolerances of benthic invertebrate taxa. The *Forest Plan* Standard is 75 or greater. The index values are interpreted at follows: less than 72, representing poor conditions; 72-79, fair conditions; 80-90, good conditions; and greater than 90, excellent conditions.

- The Forest Plan also includes a standard for macroinvertebrate standing crop. Standing crop is simply a measure of the abundance or weight of organisms per unit area (grams/m^2), and is an indicator of aquatic production and fish food abundance. We did not use standing crop values in this analysis for two reasons. First, a single large organism captured in a sample can significantly affect the total weight of the sample (Mark Vinson, National Aquatic Monitoring Center, personal communication, 2001). Second, nutrient enrichment from a variety of sources and/or increases in sunlight from loss of riparian shrubs and trees, can increase stream production and macroinvertebrate biomass (Tait et al. 1994). These two factors could cause an increase in standing crop values and suggest that water quality are good, when the opposite could be true.

  Macroinvertebrate samples have been collected at several locations on Indian Creek and Johnson Creek. Due to the inconsistencies in sampling locations, there is not enough data at any one location to evaluate trend. Therefore, I will only compare the data to the Plan standards for DAT and BCI.

  Indian Creek

There are seven samples collected from 1987 to 1994. DAT values range from 6.3 to 18.3; four meet the Forest Plan standard. BCI values range from 63 to 94; three meet the Forest Plan standard. Note that these samples are not all from the same locations.

Johnson Creek

There are four samples collected in 1987 and 1993. DAT values range from 9.4 to 14.6; one meets the Forest Plan standard. BCI values range from 77 to 94; all meet the Forest Plan standard. Note that these samples were not all collected in the same location.

Spring Creek, North Creek

No macroinvertebrate samples have been collected in these watersheds.

Effects:

Alternative A:

Direct and Indirect: No effect is expected in the short term. An expansive loss of trees from spruce beetle epidemic would likely occur over time allowing for ground cover to sprout and become established in the mean time. This, along with tree root masses, would help to hold soil in place. However, large quantities of dead and down trees increase the potential for fire hazard. A large fire in this area could result in soil movement and stream sedimentation, impacting habitat for macroinvertebrates.

Cumulative: No cumulative effects are expected unless an expansive fire occurs.

Alternative B:

Direct and Indirect: Some sedimentation may occur in Indian and North Creeks as a result of soil disturbance in the upper benches of the watershed but it would be unlikely. The removal of trees, reconstruction of the pipeline, road improvement, and associated soil disturbance and exposure may result in sediments reaching the creek following heavy intense summer thunder storms or spring run-off. However, with Best Management Practices employed, impacts are not expected. Helicopter logging in remote areas would minimize ground disturbance by reducing the need for temporary road construction. This concern would likely be short term. As sunlight begins to hit the forest floor, ground vegetation would sprout. In the long run, bringing vegetation back to the forest floor would likely improve watershed conditions over the current no action situation. This would be particularly true in the regeneration of aspen woodlands. The reduction of fire hazard as a result of this alternative would minimize the risk of sediment reaching streams.

Gully and sheet erosion are the erosion mechanisms of concern (Cirrus 2001). The implementation of the following soil and water conservation practices (SWCPs) will minimize the possible effects of activities occurring on soils with very high, high, or moderate levels of concern:

13.02 Slope limitations for tractor operations;
13.04 Revegetation of surface disturbed areas;
13.06 Soil moisture limitation for tractor operation;
14.04 Limiting the operation period of timber sales;
14.08 Tractor skidding design
14.09 Suspended log yarding in timber harvesting

14.11 Log landing erosion prevention and control:
14.15 Erosion control on skid trails
14.18 Erosion control structure maintenance
14.19 Acceptance of timber sale erosion control measures before sale closure;
15.06 Mitigation of surface erosion and stabilization of slopes
15.10 Control of road construction, excavation, and side-cast material;
15.22 Road surface treatment to prevent loss of materials;
15.23 Traffic control during wet periods;
15.25 Obliteration of temporary roads; and
18.03 Protection of soil and water from prescribed burning effects.

When these practices are fully and properly implemented, they are very effective in minimizing on-site erosion and off-site sedimentation. Implementation is typically good for timber sale operation and road and pipeline reconstruction. Inspection by timber sale administrators, engineering representations, and other technical specialists is important in ensuring proper implementation. Implementation of Alternative B would not increase soil erosion or adversely affect soil resources in the long-term.

Several stream segments in the project are sensitive to direct disturbance; the following SWCPs will minimize the possible effects of activities proposed in the action alternatives:

14.03 Use of sale area map for designating soil and water protection needs, including stream course protection;
14.06 Riparian area designation;
14.08 Tractor skidding design;
14.10 Log landing location and design;
14.17 Stream channel protection;
15.03 Road and trail erosion control plan;
15.04 Timing of construction activities;
15.07 Control of permanent road drainage;
15.12 Control of construction in riparian areas;
15.13 Controlling in-channel excavation;
1515 Stream crossings on temporary roads;
15.16 Bridge and culvert installation; and
15.19 Stream bank protection

Some of the practices prohibit activities within a specified distance of the stream channel; avoidance is very effective. The practices controlling operations adjacent to the stream network are effective in minimizing disturbance when fully and properly implemented. Implementation is typically good for timber sale operation and road and pipeline reconstruction. Reconstruction of FR 50079 and of Monticello City's water facilities will necessitate some disturbance in stream channels, approximately 20 acres of construction activities in the stream network at approximately 20 locations. Effectiveness of practices to minimize the effects of this type of disturbance is fair to good and the effects would be short-term and of limited extent. Inspection by timber sale administrators, engineering

representations, and other technical specialists is important in ensuring proper implementation.

Cumulative: No cumulative effects are expected unless expansive sedimentation occurs, which should not occur using Best Management Practices. If any sediment reaches Indian creek, impacts would likely be minimal and short term.

Alternative C

Direct and Indirect: Some sedimentation may occur in Indian and North Creeks as a result of soil disturbance in the upper benches of the watershed but it would be unlikely. The removal of trees, reconstruction of the pipeline, road improvement, temporary road construction, and associated soil disturbance and exposure may result in sediments reaching the creek following heavy intense summer thunder storms or spring run-off. This is not expected, however, because of the implementation of Best Management Practices. Helicopter logging in remote areas would minimize ground disturbance by reducing the need for temporary road construction. This concern would likely be short term. As sunlight begins to hit the forest floor, ground vegetation would sprout. In the long run, bringing vegetation back to the forest floor would likely improve conditions over the current no action situation. This would be particularly true in the regeneration of aspen woodlands.

Gully and sheet erosion are the erosion mechanisms of concern (Cirrus 2001). The implementation of the following soil and water conservation practices (SWCPs) will minimize the possible effects of activities occurring on soils with very high, high, or moderate levels of concern:

13.02 Slope limitations for tractor operations;
13.04 Revegetation of surface disturbed areas;
13.06 Soil moisture limitation for tractor operation;
14.04 Limiting the operation period of timber sales;
14.08 Tractor skidding design
14.09 Suspended log yarding in timber harvesting
14.11 Log landing erosion prevention and control:
14.15 Erosion control on skid trails
14.18 Erosion control structure maintenance
14.19 Acceptance of timber sale erosion control measures before sale closure;
15.06 Mitigation of surface erosion and stabilization of slopes
15.10 Control of road construction, excavation, and side-cast material;
15.22 Road surface treatment to prevent loss of materials;
15.23 Traffic control during wet periods;
15.25 Obliteration of temporary roads; and
18.03 Protection of soil and water from prescribed burning effects.

When these practices are fully and properly implemented, they are very effective in minimizing on-site erosion and off-site sedimentation. Implementation is typically good for timber sale operation and road and pipeline reconstruction. Inspection by timber sale administrators, engineering representations, and other technical specialists is important in ensuring proper implementation. Implementation of

Alternative C would not increase soil erosion or adversely affect soil resources in the long-term.

Several stream segments in the project are sensitive to direct disturbance; the following SWCPs will minimize the possible effects of activities proposed in the action alternatives:

14.03 Use of sale area map for designating soil and water protection needs, including stream course protection;
14.06 Riparian area designation;
14.08 Tractor skidding design;
14.10 Log landing location and design;
14.17 Stream channel protection;
15.03 Road and trail erosion control plan;
15.04 Timing of construction activities;
15.07 Control of permanent road drainage;
15.12 Control of construction in riparian areas;
15.13 Controlling in-channel excavation;
1515 Stream crossings on temporary roads;
15.16 Bridge and culvert installation; and
15.19 Stream bank protection

Cumulative: No cumulative effects are expected unless expansive sedimentation occurs, which is not expected because of applying Best Management Practices. If any sediment reaches Indian Creek, impacts would likely be minimal and short term.

27. Merriam's Turkey

Life History: Merriam's Turkey (Meleagris gallopavo merriami): Merriam's turkeys are associated with ponderosa pine, often mixed with a variety of other vegetation including pinyon-juniper, oak and aspen. The major contribution of these mixed woodland types is the production of mast in the form of juniper berries, pinyon nuts, grass seeds and acorns. All are utilized as food for turkeys. The important habitat component of horizontal cover is provided by slash, shrubs and rock outcrops. The birds use these features for hiding and nesting cover (Rumble and Anderson 1987). Specific habitat requirements may vary according to season and use. For example, studies have shown that turkey nesting generally occurs on slopes greater than 30% with overstory canopy cover within 4 feet above the nest and exceeding 80% cover. Horizontal cover is likely to be dense within a 5-7 foot radius of the nest. Brood rearing habitat may be in shrub thickets or large openings if shrub thickets or small tree patches are interspersed. Loafing sites are characterized by a dense overstory, an open understory and good visibility and the presence of large snags, fallen logs and/or low rock outcrops. Ponderosa pine is the most common roost tree species and an essential habitat requirement of these birds. Roost sites are frequently on ridges or near the top of slopes and include an average of 5-13 roost trees/site. Multi-story stands containing dominant trees with layered, open, horizontal branches spaced at least 24 inches apart are preferred. The diameter of roost trees can vary as long as they contain the above characteristics. Studies show in Arizona winter roosts, trees averaged 25" dbh and summer roosts averaged 16" dbh.

Current Status: Wild turkeys are not known to have existed in Utah during early white settlement. However, historical and archeological evidence suggests that wild turkeys co-existed with native

Americans. Attempts to introduce the eastern wild turkey failed. Seven Merriam's turkeys were first planted in the La Sal Mountains in 1952 from stock obtained from Colorado. Established populations now occur in nine counties in Utah. The first hunt in Utah was held in October 1963. Merriam's turkeys have been transplanted onto both the Moab and Monticello portions of the district several times and transplants continue depending on need. Winters in southeast Utah seem to be the greatest limiting factor for these birds. It is unclear at this point whether it is a factor of poor habitat or bad weather that claims the majority of the birds. The 1999 Upland Game Annual Report by the UDWR (Pub. 00-27) states that "Merriam's turkey populations remain stable"(Pg. 158). State-wide harvest statistics (Pg. 166) for Merriam's turkey from 1968-1999 show that 31 birds were harvested in 1968 with the peak harvest of 111 occurring in 1999. Harvest numbers show a steady and fairly consistent increase from 1968 to 1999.

Effects:

Alternative A:

Direct and Indirect: Expansive loss of large trees from a spruce beetle epidemic would open the forest floor and allow shrubs, forbs and grass to encroach. This would improve forage and nesting habitat availability while reducing cover and roosting trees. The ratio of cover:forage, however, would be improved since it is primarily only thermal cover now. Large quantities of dead and down trees resulting from a massive beetle epidemic may increase the potential for fire hazard. A large stand-replacing fire could push the forage:cover ratio to the extreme, providing ample forage with little thermal/hiding cover. The potential reduction in the amount of water available in streams and seeps from the existing pipeline would have an impact on the amount of habitat suitable for brood rearing.

Cumulative: There would be a continued reduction in thermal cover and roosting trees that would occur in the project area due to bark beetle infestations and associated timber harvests. Should this pattern continue, impacts to roosting may become substantial.

Alternative B:

Direct and Indirect: Loss of large trees from silvicultural treatment would open the forest floor and allow for shrubs, forbs and grass to encroach. This would improve forage and nesting habitat availability while reducing thermal cover and roosting trees. The ratio of cover:forage, however, would be improved since it is primarily only thermal cover now.

Improvement of the main North Creek road could increase visitor use, extend the season of use, and increase travel speed. This road, however, is planned for seasonal closure, reducing these potential impacts. Road densities would increase during the life of the project with the construction of temporary roads during the vegetation treatment. This would be short term, however, since once the project is complete, road closures would reduce road densities to less than the current situation. The improvement of FR# 50079, however, would negate benefits from reduced road densities when it comes to habitat security for wildlife. Noise disturbance during project implementation could disrupt bird movements and nesting. The potential reduction in the amount of water available in streams and seeps from the existing pipeline would have an impact on the amount of habitat

suitable for brood rearing. The installation of troughs and wildlife drinkers can partially mitigate for this loss.

Cumulative: The reduction in thermal cover and roosting trees that has occured in the project area will continue to impact a larger cumulative affects area. Should this pattern continue, impacts to roosting may become substantial.

Alternative C:

Direct and Indirect: Loss of large trees from silvicultural treatment would open the forest floor and allow for shrubs, forbs and grass to encroach. This would improve forge and nesting habitat availability while reducing thermal cover and roosting trees. Canopy cover would be greater under this alternative because of managing for a "clumpy" forest structure. Scattered pockets of trees would be allowed to remain in close vicinity to one another with interlocking canopy. The ratio of cover:forage, however, would be improved since it is primarily only thermal cover now.

Improvement of the main North Creek road could increase visitor use, extend the season of use, and increase travel speed. This road, however, is planned for seasonal closure, reducing these potential impacts. Road densities would increase during the life of the project with the construction of temporary roads during the vegetation treatment. This would be short term, however, since once the project is complete, road closures would reduce road densities to less than the current situation. The improvement of FR# 50079, however, would negate benefits from reduced road densities when it comes to habitat security for wildlife. Noise disturbance during project implementation could disrupt bird movements and nesting (April 20-July 1). The potential reduction in the amount of water available in streams and seeps from the existing pipeline would have an impact on the amount of habitat suitable for brood rearing. The installation of troughs and wildlife drinkers can partially mitigate for this loss.

Cumulative: The reduction in thermal cover and roosting trees that has occured in the project area will continue to occur, impacting a larger cumulative affects area. Should this pattern continue, impacts to roosting may become substantial. Grazing by livestock and big-game can reduce seed sources for food and cover for brood rearing. Since livestock grazing is only incidental in the watershed area, impacts would likely occur from elk. Opening the forest canopy, however, would increase ground vegetation and ultimately improve winter foraging areas.

28. Cavity Nesting/Neotropical Migrant Birds

Life History: Neotropical migratory birds are species that nest and raise young in North America and migrate to tropical areas in Mexico, the Caribbean, and Central and South America in the winter. Habitat requirements of neotropical migratory birds differ by species. For most wildlife species, the greater the diversity in both vertical and horizontal habitat structure, the greater the diversity of wildlife. Changes in vegetation that affect neotropical migratory birds include

alteration of species composition, changed vegetation density and vertical/horizontal structure and reduced cover allowing increased predation and/or parasitism by brown-headed cowbirds.

Riparian woodlands are habitats that provide the highest diversity and abundance of neotropical migratory birds. Therefore, management of riparian ecosystems has a high potential for significantly affecting many neotropical migrants. Birds typically found in riparian vegetation on the Moab/Monticello Ranger District include American robin, broad-tailed hummingbird, chipping sparrow, dusky flycatcher, green-tailed towhee and magnolia warbler.

The most abundant vegetation type along the lower benches of the Moab/Monticello Ranger District is pinyon/juniper. At mid elevations, mountain brush dominates along with scattered patches of sagebrush/grasslands. Several bird species use both of these vegetation types such as the mourning dove, common nighthawk, black-chinned hummingbird, Says phoebe, dusky flycatcher and violet green swallow. The pinyon and juniper trees are most often used for nesting and perching while the oak, sagebrush and grasslands provide the foraging opportunities. Several species prefer to stay in the sagebrush/grasslands, such as lark and vesper sparrows. They often nest under sagebrush on the ground. Other birds spend most of their time in pinyon and juniper. These birds often feed on the berries of junipers or pine nuts and other seeds. These birds include the ash-throated flycatcher, pinyon jay, gray jay, juniper titmouse, bush tit, Bewick's wren, blue-gray gnatcatcher and dark-eyed junco.

Higher elevations become more wooded with ponderosa pine, aspen, mixed conifer and spruce fir. Ponderosa pine habitat commonly supports American robin, broad-tailed hummingbird, chipping sparrow, dusky flycatcher, gray-headed junco, green tailed towee, pygmy nuthatch, rufous-sided towhee, and Virginia's warbler. Aspen vegetation types support American robin, gray-headed junco, Cassin's finch, house wren, hermit thrush, pine siskin, red-shafted flicker, tree swallow, warbling vire, and yellow-rumped warbler. Mixed-conifer habitats are typically occupied by rufous-sided towhees, gray-headed juncos and other birds, but none in great abundance. Finally, the spruce-fir forest is home to American robin, brown creeper, Cassin's finch, chipping sparrow, gray-headed junco, hermit thrust, mountain chickadee, pine siskin, red crossbill, ruby-crowned kinglet, Steller's jay, pygmy nuthatch and yellow-rumped warbler.

Current Status: Results from a 1994 neotropical bird survey on the Moab portion of the district indicate that 55 different bird species were observed using the aspen vegetation type, 42 inhabited mixed conifer, and 37 inhabited conifer/deciduous (Winn 1995).

This study also showed that three species were located that had ranked high in the "Importance of Area" and "Population Trend" categories. In general, species that rank high in these categories should be monitored since they are showing population declines. The three species are: Brewer's sparrow, ferruginous hawk, and sage thrasher. Of the three species of concern, the Brewer's sparrow is the only one known to occupy habitat found within the project area, ie. mixed conifer and aspen.

The Abajo Mountains contain a variety of forested types that provide suitable habitat for neotropical migrants. The project area, like the entire mountain, exhibits natural habitat fragmentation with some human influence. Typically, large to small continuous forest types with large and small open parks are scattered through the area. Forest types range from 5-acre to 300 acre continuous tree stands. Natural conditions such as beetle outbreaks are rapidly altering the habitat, especially for forest interior species dependant on thick forest stands. The continued

threat of stand-replacing fire is a concern for species that depend on large tracts of continuous forest.

Effects: Dead trees (snags) provide tree cavity habitat. All alternatives would continue to provide an abundance of tree cavity habitat. The larger diameter dead spruce trees are expected to provide tree cavity habitat for many years. Few trees would fall until they have been dead for at least 20 years. It is projected that it would take at least 75 years for 90% or more of the dead trees to fall (South Manti EIS, 2000). The removal of dead and dying spruce trees in Alternatives B and C would remove many of the potential snags. However, snag retention requirements are in place for both action alternatives and follow the goshawk guidelines (See Design Features).

Declines in interior forest species would occur with each alternative, due to either the natural loss of spruce trees from spruce beetle infestation or from silvicultural treatments. Because of the small area being affected within the watershed at this time, none of the alternatives should threaten the overall population viablity of neotropical migratory birds. In each alternative the forest floor is opened by spruce beetles, silvicultural treatments or both. This will favor the existence of neotropical migratory birds that prefer open forest ecosystems. By either letting the trees die or harvesting them, habitat fragmentation for neotropical birds may occur on a localized basis for those species dependent on continuous dense mature forests. Since the watershed area provides a large continuous expanse of dense mature forest, opening the canopy in areas may also add habitat diversity which would benefit many neotorpical bird species. Related impacts may occur such as disturbance to nest sites and/or habitat for neotropical bird prey species from the creation of skid trails, log landings, and incidental disturbances to adjacent trees being left. In addition, the opening up of the forest may encourage the occupation of cowbirds, which parasitize other bird's nests.

Perhaps the greatest concern regarding the reconstruction of the pipeline and it's many collection points is the potential for dewatering existing streams. This alternative improves the pipeline system where the diversion of water occurs at the head of the stream as well as several places along the stream where springs usually replenished stream flow. Removing this water can have a substantial impact on the use of the stream corridor by wildlife, including neotropical migratory birds. Not only does the water meet a basic need of the animal itself, but it also provides for the insects that many birds feed on. In addition, the water helps to keep the ambient temperature under the canopy lower than if no water were there.

TES PLANT SPECIES

Note: One of the scoping letters received expressed concern for the Lady Slipper Orchid, stating that "it only grows in the Uinta Mountains but has been located within the project area". We want to make a distinction between "Brownie Lady Slipper" (Cypripedium fasciculatum) and "Fairy Slipper" (Calypso bulbosa). The Brownie Lady Slipper Orchid is located in the Uinta and Wasatch Mountains and is listed for Forest Service Region 4 as "sensitive". This species has not been located in southeast Utah. The Fairy Slipper is found world-wide with only a few plants at any one location. This species is found both in the Uinta Mountains and on the Abajo Mountains in spruce/fir/aspen at elevations between 8,500-9,500 feet. It is located at the head of Indian Creek and below the tunnel in the watershed. Both areas are within the project area. This species is not listed with the US Forest Service.

1. Jones Cycladenia

This plant is restricted to the canyonlands of the Colorado Plateau in Utah and in adjacent to Coconino County in Arizona. It is a rhizomatous herb with round, somewhat succulent leaves and rosy-pink hairy flowers that bloom from mid April to early June. Jones' cycladenia grows in gypsiferous soils that are derived from the Summerville, Cutler and Chinle formations. These soils are shallow, fine textured and intermixed with rock fragments. Other plants that associate with Jones' cycladenia are eriogonum and ephedra, pinyon, juniper and other mixed desert shrub communities at elevations ranging from 3,500-6,000 feet elevation. This plant has not been located on the Moab-Monticello Ranger District. It's closest known location is adjacent to the forest on the north-west side of the La Sals.

Effects: The projects in question will not disturb individual plants or suitable habitat for Jones' cycladenia occupancy.

2. Navajo Sedge

This species was listed with critical habitat in 1985. It is a member of the sedge family, a grass-like plant. It reaches a height of 2.5-4 cm. It grows in a clumped form since stems grow from a rhizome. It is located in seeps and springs on vertical cliffs of pink-red Navajo sandstone at elevations between 5,000 and 5,900 feet. Other plants inhabiting the vertical seeps include monkey flower and weed orchid. Originally this plant was only known from sites in northern Arizona but has recently been located in extreme southeast Utah. Its rarity is a result of its limited geographic range, narrow habitat specificity and small populations. An approved recovery plan has been written. Critical habitat is on the Navajo reservation near Inscription House Ruins. No known populations exist on the Moab-Monticello Ranger District.

Effects: The projects in question will not disturb individual plants or suitable habitat for Navajo sedge.

3. Boreal Rockjasmine

This plant occurs on the high alpine rocky ridges on the high peaks of the LaSal Mountains at elevations of about 11,000 ft.

Effects: The projects in question will not disturb individual plants or suitable habitat for boreal rockjasmine.

4. LaSal Daisy

This plant is found on open alpine forb-grass-sedge vegetative types at high elevations on the La Sal Mountains. Plants are scattered and intermixed with the alpine vegetation. They seem to prefer sites with some disturbance or open exposed soil. They occur at elevations between 10,000 to 12,000 ft.

Effects: The projects in question will not disturb individual plants or suitable habitat for LaSal Daisy

5. Canyonlands Lomatium

One small population of this plant is known to occur near the Forest in the Meloy Park area on the northwest part of the Moab district. It is confined to sandstone outcrops in pinyon/juniper and mixed mountain brush vegetation types at elevations near 7,000 feet. Canyonlands lomatium is found on the Monticello district in lower Dark Canyon at 4,800-6,855 feet in pinyon/juniper and desert shrub communities on Entrada sandstone.

Effects: The projects in question will not disturb individual plants or suitable habitat for Canyonlands lomatium.

6. Kachina Daisy

This daisy occurs on the Monticello district in seeps and hanging gardens on Mossback and Navajo sandstone formations and in moist pockets in ponderosa pine habitat types at elevations of 7,000 to 8,000 feet. It has been found in widely scattered locations on the Monticello district. No impact is expected to occur to this species since it's occurrence and/or appropriate habitat would be avoided for projects covered under this BA/BE.

Effects: The projects in question will not disturb individual plants or suitable habitat for Kachina daisy.

7. Pinnate Spring-Parsley

The habitat for this plant is characterized as sandy soils weathered from Navajo sandstone and on slickrock ledges and cracks. It is generally in association with ponderosa pine/manzanita and oakbrush/snowberry community types. Populations have been located on Elk Ridge in Cliff Dwellers Pasture, the Causeway and Chippean Rocks areas.

Effects: The projects in question will not disturb individual plants or suitable habitat for pinnate spring-parsley

8. Chatterley Onion

This plant is found in pinyon/juniper and ponderosa pine areas where there is open, shallow, fine-textured sandy loam soil and rock outcrops. It has been found in the Chippean Rocks, Little Dry Mesa and Harts Draw areas.

Effects: The projects in question will not disturb individual plants or suitable habitat for Chatterley onion.

9. Abajo Daisy

While this species may occur from an elevation of 7,000 to 11,320 feet in ponderosa pine, pinyon/juniper and spruce/fir types in scattered locations in southeastern Utah (Welch et al. 1987), on the Monticello district it has been located only on the open rocky ridge tops of the Abajo Mountains.

Three individual *Erigerons* that are likely the species *abajoensis* were located within the project area on October 31, 2001. They were located in the grass/forb type on the south-facing slope at

North Creek Pass. No *Erigeron abajoensis* were observed during the survey along the south and east sides of the rock source location on the long talus slope above Indian Creek. The talus slope located .7 miles south of Jackson Ridge has previously been used as a rock source. *No Erigeron abajoensis* were observed. Other suitable areas surveyed, such as the south side of Abajo Peak and in upper Recapture Creek, support small populations of this species. None have been located in timbered areas.

A summer survey was conducted in July 2002. A complete search at North Creek Pass relocated two individuals. There are none growing on the road cut there. No abajo daisys were found at the Jackson Ridge saddle. There are no known conflicts with the specified rock sources and sensitive plant species.

The following notes were written by Barb Smith:

***Erigeron abajoensis* survey**

October 29, 2001

The rock source locations at Jackson Ridge and North Creek saddles are within the habitat parameters for the sensitive plant species Abajo daisy. The plant has been found growing on old road cuts, so it is certainly has the potential to occur on these sites…. The plant can flower up until frost, so it's possible it could still be identified late in the year….

October 31, 2001

Wildlife Technician Barb Smith conducted a preliminary survey for the sensitive species Abajo daisy in the North Creek project area. First, I looked at North Creek Pass as most closely matching the habitat description. I located three individual Erigerons that are likely are the species abajoensis. GPSed these locations, in the grass/forb type on the south-facing slope at North Creek Pass.

I conducted an ocular survey along the south and east sides of the rock source location on the long talus slope above Indian Creek. There are aspens, subalpine fir and Douglas-fir on the edges, and in scattered spots in the pile with exposed soil. On these spots, there may also be Carex, Senecio multilobatus, Achillea millefolium, Erigeron flagellaris and an unidentified composite (that is not Erigeron abajoensis). Erigeron speciosus occurs in the deeper soil under the aspens along the edge. No Erigeron abajoensis observed.

The talus slope located .7 miles south of Jackson Ridge has previously been used as a rock source. It has a plant composition similar to above, and no Erigeron abajoensis.

November 1, 2001

To confirm identification of the Erigeron abajoensis, I went to the location of the known population at Dickson Pass on the Abajo Peak road. Several individuals were located, and their characteristics at this time of year noted. Many retain their seedheads, and have fall regrowth.

I returned to the Jackson Ridge area, and searched along the terraces and roadcuts at the saddle. Observed lots of Heterotheca villosa and numerous other composites, making searching for the small E. abajoensis very difficult. Seems like there is a potential for it to occur on these rocky slopes with a high percentage of bare soil, but none were observed at this time. Continued survey across the grass/forb slope, down to the top of the rock source area. Seems like the most likely habitat, but none observed. On the east side of the rock source, under subalpine fir, Carex is the only herbaceous species present. No plants were observed while surveying across the rock pile. On the west side, along the road, under aspen, spruce, fir and doug-fir, Pyrola sp. and Carex were observed, with Lathryrus sp, lupine and snowberry in the openings. Recommendation: access the rock source from the west side along the road and avoid coming in from the very top or south side across the meadow.

In my opinion, there are no conflicts with the specified rock sources and sensitive plant species. However, I would like to do further surveys in the summer at North Creek Pass to confirm the presence of Erigeron abajoensis and determine the extent of the population. Further surveys should also be conducted in the summer at the top of the Jackson Ridge saddle if there is to be significant disturbance or a landing located there.

July 17, 2002

As a continuation of the survey for Erigeron abajoensis in the Monticello-Blanding Watershed Improvement Project area initiated in the fall of 2001, I returned to Dickson Pass to examine the known population. There were lots of Abajo daisy in bloom, varying from mat-like forms in rocky areas just off the road on the flat area of the pass where few other plants grow, to taller individuals growing in competition with other native plants on the slope, including the bunchgrass Festuca thurberi. It was not found in areas dominated by Bromus inermis.

There appear to be several hundred individuals in the population at the pass and on the south-facing slope above. I did not check the top of the ridge or the north side, which also may support Abajo daisy. The steep, south-facing slope has a user-created 4-wheeler trail straight up it, across the top and back down to the main road on the north side. No plants grow in the wheel tracks, but do occur immediately adjacent. Perhaps barriers could be put in these areas, along with a sign explaining the rationale of avoiding disturbance to a population of "rare or unique" plants.

ATVs are also climbing the south-west facing slope just below the towers on Abajo Peak, where a small population of 15 individuals was located. A survey of the ridge on the northeast side of Abajo Peak (where the buried lines go down the mountain) failed to locate a population of Abajo daisy.

I then traveled to North Creek Pass where a few (3) individuals were found last October. I relocated 2 of the plants, and confirmed the plants in flower as Erigeron abajoensis. There is also Erigeron speciosus, Erigeron compositus and an Astragalus species with a similar prostrate growth form and silvery-blue foliage color to the Abajo daisy. I did not

observe any Abajo daisy on the road cut, the individuals found are located approximately 50 feet above the road.

At the Jackson Ridge saddle, I surveyed the same area as I covered last year, and again did not find any Abajo daisy. The dominant composite species is Heterotheca villosa. There is also Erigeron speciosus, E. divergens and E. flagellaris. The open area of the saddle has all been terraced, and reseeded with smooth brome, orchardgrass and intermediate wheatgrass.

Effects:

Alternative A:

Direct and Indirect: No effects are likely to occur to this species, at least in the long term. Tree kill from epidemic beetle infestation may open the forest floor over time that could change the micro-climate this plant depends on to exist. This may enhance or hinder the existence of this plant species.

Cumulative: Other potential activities to impact this species in the watershed may be trampling from visitor use or wildlife foraging. Currently, the most significant impact is from illegal, off-road ATV use. The absence of livestock and the restriction on camping in the watershed minimizes disturbances to the plant and it's habitat. Road closures may provide additional habitat where this plant can get established.

Alternative B:

Direct and Indirect: Soil disturbance activities that could impact this plant would be mitigated by avoidance. An updated survey would be conducted during the flowering season, spring-summer 2002 which would eliminate concern for individual plants. The removal of trees through silvicultural means may have the same affect as canopy reduction from bug kills in the Alternative A.

Cumulative: No cumulative impacts are expected.

Alternative C:

Direct and Indirect: Soil disturbance activities that could impact this plant would be mitigated by avoidance. An updated survey would be conducted during the flowering season, spring-summer 2002 that would eliminate concern for individual plants. The removal of trees through silvicultural means may have the same affect as canopy reduction from bug kills in the Alternative A.

Cumulative: No cumulative impacts are expected.

10. La Sal Groundsel

La Sal groundsel (Senecio dimorphophyllus var. intermedius) is a plant restricted, in Utah, to the La Sal Mountains. It is not on the current R4 Sensitive Species list, but it is considered "rare" by the state of Utah. This plant is found in meadows that are wet in the early part of the season and then dry up. These meadows consist of sedge-hair grass and iris communities between 9,000 and

10,500 feet in elevation. The La Sal groundsel is considered to be a desirable species for this community and a fair forage plant.

Effects: The projects in question will not disturb individual plants or suitable habitat for La Sal Groundsel.

11. Spineless Hedgehog Cactus

Spineless hedgehog-cactus (Echinocereus trigochidiatus var. inermis) is found in the pinyon/juniper, yucca-black sage vegetative type that occurs at lower elevation (5,000-7,000 ft.) foothills on the west slope of the La Sal Mountains. This variety was previously listed as Endangered by the USFWS, but was delisted and reduced to non-candidate status in 1993 due to expansion of the known range and taxomomic problems.

Effects: The projects in question will not disturb individual plants or suitable habitat for spineless hedgehog-cactus.

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DETERMINATION

As a result of this assessment, our professional determination is shown in the following two Tables.

LISTED SPECIES BIOLOGICAL ASSESSMENT
SUMMARY OF CONCLUSION OF EFFECTS

Project Name: Monticello-Blanding Watershed Improvement Project
Analysis Alternatives: Proposed

Species	No Effect May Effect - Not Likely To Adversely Affect May Effect - Likely To Adversely Affect Beneficial Effect
1. Mexican Spotted Owl	No Effect
2. Bald Eagle	No Effect
3. Southwestern Willow Flycatcher	No Effect
4. California Condor	No Effect
5. Colorado Squawfish	No Effect
6. Razorback Sucker	No Effect
7. Bonytail Chub	No Effect
8. Humpback Chub	No Effect
9. Black-footed Ferret	No Effect
10. Gunnison Sage-Grouse	No Effect
11. Jones Cycladenia	No Effect
12. Navajo Sedge	No Effect

SENSITIVE SPECIES BIOLOGICAL EVALUATION
SUMMARY OF CONCLUSION OF IMPACTS

Project Name: Monticello-Blanding Watershed Improvement Project
Analysis Alternatives: Proposed

Species	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Loss Of Viability To The Population Or Species	Will Impact Individuals Or Habitat With A Consequence That The Action May Contribute To A Trend Towards Federal Listing Or Cause A Loss Of Viability To The Population Or Species	Beneficial Impact
1. Peregrine Falcon	No Impact			
2. Flammulated Owl		May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Loss Of Viability To The Population Or Species		
3. Northern Goshawk		May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Loss Of Viability To The Population Or Species		
4. Three-toed woodpecker		May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Loss Of Viability To The Population Or Species		
5. Boreal Owl	No Impact			
6. Spotted Bat	No Impact			
7. Townsend's Big-eared Bat	No Impact			
8. Colorado Cutthroat	No Impact			

9. Spotted Frog	No Impact
10. Boreal Rockjasmine	No Impact
11. LaSal Daisy	No Impact
12. Canyonlands lomatium	No Impact
13. Kachina daisy	No Impact
14. Abajo Daisy	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Loss Of Viability To The Population Or Species
15. Pinnate Spring Parsley	No Impact
16. Chatterley Onion	No Impact