APPENDIX A: BIOLOGICAL ASSESSMENT

Introduction

The purpose of this BA is to document the likely effects of the proposed action of the forest-wide travel management plan to federally listed proposed, threatened, and endangered species. The action area for this BA is the lands within the White River National Forest boundary. Decisions made based on the travel management plan BA will pertain only to National Forest System lands; lands under other ownerships will not be affected by decisions made under the proposed action and will not be addressed.

Consultation History

The actions associated with travel management that were included in the decisions made during the revision of the forest plan in 2002 (USDA Forest Service/WRNF 2002a) were included in the consultation for that decision. These actions include management area delineations, including standards and guidelines regarding travel management; recreation opportunity spectrum delineations; and forest-wide standards and guidelines concerning travel, including restrictions of summer motorized and mechanized travel to designated routes only. No consultation has occurred on the site-specific decisions being made based on results of this document.

A programmatic Biological Opinion for Bureau of Reclamation's operations and depletions, other depletions, and funding and implementation of recovery program actions in the Upper Colorado River above the confluence with the Gunnison River was completed in December 1999 covering Colorado pikeminnow, razorback sucker, humpback chub, and bonytail. The historic depletion associated with this project is expected to fall under this programmatic biological opinion. There is no programmatic consultation to tier to in the White River drainage.

Purpose of and Need for Action

The purpose of this initiative is to identify the transportation system with the goal of balancing the physical, biological, and social values of the forest. It responds to several needs:

Need: To identify an official designated travel system on the White River National Forest

Need: To identify what is not on the official designated travel system on the White River National Forest and be able to restore lands back to their natural state.

Need: Designate a travel system that is aligned with the Forest Service mission including the need to manage the land by providing a system that attempts to balance social and resource demands.

Decisions to be Made

The travel management plan is an assessment of how and where travel should occur on the forest. The development of this document is an accumulation of ideas, concepts, and analyses from forest specialists, district personnel, other agency personnel, and interested members of the public.

The decisions to be made in the travel management plan are:

1) Designation of the summer road and trail system:
   a) Defining the designated forest roads and trails;
   b) Defining what modes of travel are accepted on each road and trail;
   c) Deciding whether to incorporate or rehabilitate user-created routes;
   d) Determining if certain forest routes are no longer needed as part of the system and identified those for decommissioning.
2) Designation of winter uses:
   a) Designating open areas and routes for motorized use by vehicles made for over-snow travel.

Species Considered and Species Evaluated

On March 8, 2008 the U.S. Department of the Interior (USDI) Fish and Wildlife (FWS) approved the White River National Forest list of threatened, endangered, and candidate species (table BA-1). The following species were listed as potentially occurring on the forest or as potentially affected by management actions occurring on the forest: Canada lynx, Mexican spotted owl, Uncompahgre fritillary butterfly, and Penland alpine fen mustard. These species will be evaluated in this BA.

DeBeque phacelia and boreal toad are both federally listed candidate species that are listed as "warranted, but precluded", because of higher priority for listing other species. Potential impacts to both species are analyzed and included in the BE.

Table BA-1. Threatened, endangered, and candidate species found on the White River National Forest*

Category	Species	Status
Terrestrial animals	Canada lynx	Threatened
	Uncompahgre fritillary	Endangered
	Mexican spotted owl	Threatened
Terrestrial plants	Penland alpine fen mustard	Threatened
Aquatic species	Colorado pikeminnow	Endangered
	Humpback chub	Endangered
	Razorback sucker	Endangered
	Bonytail	Endangered
	Greenback cutthroat trout	Threatened

**Aquatic species all occur downstream of the White River National Forest in the Colorado, White, and Yampa rivers. The primary threat to these species from activities on the WRNF is water depletion.*

Evaluated Species Information

All the species included in the approved species list from the USFWS were described and analyzed in the BA for the forest plan. The basic life history information included in that document is considered up-to-date and valid for this document and will not be repeated here. The only new forest occurrence records since the release of the forest plan are for lynx. Radi location information indicates that several lynx have been using portions of the forest, mainly south of Interstate 70. No other occurrence records have been

documented for any of the other species, so distribution information included in the forest plan BA is considered valid.

Environmental Baseline for the Species Evaluated

Most of the activities that have had affects on the White River National Forest lands occurred prior to the signing of the forest plan and are described in the BA for that document. Since the approval of the forest plan, several areas of the forest have seen wide-spread beetle epidemics that have affected large areas of forested stands in both spruce and lodgepole pine. These epidemics currently are centered around the Fourmile Creek/Baylor Park area and Triangle Park for spruce bark beetle and throughout Eagle and Summit Counties for mountain pine beetle on lodgepole pine. An increase in the development for natural gas has occurred on the western portion of the forest, and several of the ski areas have undergone expansions, but other activities have been minor in scope and have not changed the basic appearance or function of the forest. The forest updates lynx habitat changes when projects are applied to the land. The current (May 2008) information for forest-wide lynx habitat is included in table BA-2.

Table BA-2. Baseline lynx habitat on the White River National Forest, December 2008.

Total White River National Forest acreage	Total non-NFS* acreage	Denning habitat	Winter foraging habitat	Other habitat	Currently unsuitable habitat	Total habitat	Percent currently unsuitable habitat
----------Acres----------							
2,504,131	195,041	449,946	316,593	344,665	44,125	1,155,329	3.8 %

Management Area Prescriptions

The forest is made up of a variety of repeating management area prescriptions (MA) under the forest plan. Each MA provides various levels of management activities that are allowed or prohibited based on the theme and desired future condition for the MA. Each MA has a set of desired condition statements, standards and guidelines that drive the type and amount of management for that MA. Some MAs prohibit motorized and mechanized travel, while others allow mechanized but not motorized travel, and others prohibit motorized travel during the summer while allowing it during the winter months.

Assumptions

Assumptions were made concerning the effects of the travel management plan as it relates to species analyzed. These assumptions are used for the BA, BE, and MIS reports.

- No new road or trail construction is considered in the proposed action.
- The only new ground-disturbing activities resulting from the proposed action will be routine maintenance activities and decommissioning of existing roads and trails.
- Changes will be made to the category of uses among motorized, mechanized, and non-motorized/non-mechanized uses that will result in various levels of impacts on individual species across the forest.

- There will be two types of impacts on species: (1) impacts related to the actual footprint of the road or trail affecting habitat, and (2) disturbance activities resulting from the use of the travelways.
- Each species discussed may have different reactions to motorized, mechanized, or non-motorized/non-mechanized use.
- Decommissioning of identified travelways may take years to be fully rehabilitate and resemble surrounding habitats.
- Alternative A, the No Action Alternative, is considered the current, existing situation on the forest. Alternative A is not compliant with direction in the forest plan. There are a significant number of user-created roads and trails on the forest that are identified under this alternative. These ways are not a part of the legal White River National Forest transportation system. Motorized or mechanized use of these routes is not legal. There currently is some level of illegal activity from both motorized and mechanized users on some of these ways on the forest. This illegal use does create some level of impacts to wildlife. The level of illegal use is likely to be more prevalent where prisms remain on the ground. Each of these user-created routes will either be incorporated into the system or decommissioned under Alternatives F or G. The less user-created routes left on the landscape the less chance of disturbance to wildlife is likely to occur. The analyses concentrate on what legal uses occur on each system by alternative.
- Alternative F is a minimal action alternative that makes Alternative A compliant with the current forest plan, current laws and direction. For the majority of the analyses completed for wildlife species, below, the results for alternative A and F are very similar or identical. Alternative A differs from alternative F in that action would be taken to rehabilitate user-created routes in alternative F. Motorized and mechanized human use currently occurring on user-created routes impact wildlife in a variety of ways. That use will be unauthorized on those routes scheduled for rehabilitation, and those impacts should be ameliorated as the routes are reclaimed.
- Alternative G is the preferred alternative based on the analysis from the original DEIS, public input, and the application of the national motorized use rule.
- Many of the tables displayed in this document standardize the changes in travelways for comparison purposes. To make comparisons of differing types of habitats and differing sizes of habitats for the various species considered, most analyses use density of miles of travelway per square mile of habitat or the amount of change in travelway density for each alternative rather than the total number of miles of change within a habitat over the entire forest. For example: the addition of 10 miles of road within a species range of only 20 square miles of habitat would normally be more significant than the addition of 10 miles of road within 1,000 square miles of habitat for another species. Standardization of the analysis displays this as 0.5 new miles of travelway per square mile of habitat in the first scenario, compared to 0.01 miles of travelway per square mile of habitat for the second. It is felt that this comparison is more meaningful than a comparison of total miles of road or trail for each alternative. Similarly, it is felt that more meaningful comparisons among alternatives can be made by using the amount of change based on miles per square mile rather than overall number of miles of change for a relatively large land base across the forest.

- Travel-management-related impacts on wildlife vary with the volume, timing, and type of travel; the species of wildlife in the area; the habitats involved; time of day or season of year; and a myriad of other factors. Several recent literature reviews of recreation impacts on wildlife have been completed. Literary reviews include: Effects of Winter Recreation on Wildlife of the Greater Yellowstone Area: A Literature Review and Assessment (Olliff et al. 1999); Effects of Recreation on Rocky Mountain Wildlife Habitat (Joslin and Youmans 1999); The Environmental Impacts of Recreation: A Bibliography (Anon. 1999); Forest Roads: A Synthesis of Scientific Information (USDA Forest Service 2000c); Wildlife and Recreationists: Coexistence Through Management and Research (Knight and Gutzwiller 1995); Effects of Off-road Recreation on Deer and Elk (Wisdom et al. 2004)); The Effects of Highways on Elk (*Cervis elaphus*) Habitat in the Western United States and Proposed Mitigation Approaches (Ruediger et al 2006); and the Colorado Division of Wildlife 2006 report on the Colorado Inventoried Roadless Areas Petition.These exhaustive reviews of past studies contain a wealth of information concerning the impacts on wildlife from vehicular and other types of recreation use. Many of the reports cite effects of roads such as:
    a) Habitat fragmentation,
    b) Isolation of rare and unique habitats such as bogs or alpine areas,
    c) Direct effects such as collisions with animals,
    d) Physical destruction of habitats,
    e) Abandonment of habitats, and
    f) Physiological reactions to stress related to the impacts of travel management.

The widespread, detrimental impacts of human disturbance on wildlife are well documented throughout these reports. No positive benefits to wildlife have been identified from increases in travel management access. Direct and indirect effects on wildlife that have been identified in the literature indicate negative impacts to all studied species as motorized, mechanized and foot and horse uses increase.

Effects of the Alternatives on the Species Evaluated

Uncompahgre Fritillary Butterfly

Direct and Indirect Effect

The following information adds to that found on pages 19–21of the BA for the forest plan (USDA Forest Service/WRNF 2002b, appendix N). The Uncompahgre fritillary butterfly (*Boloria acrocnema*) occurs only in alpine tundra habitats above 12,500 feet. All known colonies of this invertebrate inhabit snow willow (*Salix reticulata* L. ssp. *nivalis* Hooker) above 12,500 feet (Wallis et al. 1994). Suitable habitat has been reported in the Maroon Bells Wilderness and along Independence Pass; however, no colonies of this butterfly have been documented through surveys in these areas thus far. Potential habitat has been identified as far north as Interstate 70 in the 10-mile range (Terry Ireland, USFWS, pers. comm.) but no populations have been documented there. No populations of this species have been reported or found during surveys from the White River National Forest. The nearest known population is south of U.S. Highway 50, south of Monarch Pass, approximately 40 miles south of the White River National Forest.

Uncompahgre fritillary butterflies require snow willow habitat found above timberline. Approximately 304,000 acres (475 square miles, or 13 percent of the forest) of the White River National Forest is considered to be alpine; 5,800 acres (less than 1 percent of the forest) is above the 12,500 feet considered to be the minimum habitat for this species.

The primary threats to known populations of the Uncompahgre fritillary butterfly are intensive collecting pressure; intensive grazing or trampling by humans and domestic livestock; disease; parasitism; predation; and periods of prolonged drought conditions (Wallis et al. 1994). Construction of new roads or trails in snow willow habitats could potentially affect the habitat or populations for this species. Until populations are identified and studied on the White River National Forest, it is assumed that these threats are the same on this forest as they are elsewhere. The only identified threat that may be influenced by the decisions in the travel management plan is trampling by humans. Access provided by the roads and trails discussed in the travel management plan has the potential to provide for human intrusion into potential Uncompahgre fritillary butterfly habitat. No new ground-disturbing activities other than routine maintenance and road and trail decommissioning will occur under this proposed action.

The travel management plan would not directly increase collecting pressure. However, any increase in access into high alpine areas that are potential habitat for this species could lead to more people using the areas, with a consequent increase in the potential for collecting activities. No changes in the amount, distribution, or timing of domestic livestock grazing would occur because of the decisions made under any of the alternatives. Drought is outside of the control of the Forest Service and will not be affected by actions allowed under any alternative. No new trail or road construction is being proposed under this action; therefore, no construction activities would occur that might affect this species due to the proposed action or any alternative. Because of planned decommissioning and rehabilitation of roads and trails, all action alternatives would result in an overall reduction in the number of miles of roads and trails in potential Uncompahgre fritillary butterfly habitats.

The analysis for Uncompahgre fritillary butterfly included miles of roads and trails by use type by alternative associated with willow habitats above 12,500 south of Interstate 70, excluding the Hoosier Pass to Loveland Pass area (table BA-4). The Hoosier Pass-Loveland Pass area was removed from consideration for this species based on information concerning potential habitats (Terry Ireland, USFWS, pers. comm.).

Table BA-4. Miles of roads and trails, by use type, for willow-associated lands above 12,500 feet, south of Interstate 70 and excluding Hoosier Pass to Loveland Pass, for each alternative.*

Type of use	Density (miles per square mile)		
	Alternative A	Alternative F	Alternative G
Motorized	0.00	0.00	0.00
Mechanized	0.04	0.04	0.04
Motorized/mechanized	0.04	0.04	0.04
Foot/horse	0.21	0.21	0.24
Total	0.24	0.24	0.27
Scheduled for decommission (reduction in density)	0.00	0.08	0.04

**9 square miles*

For Uncompahgre fritillary butterflies, alternative G would slightly increase foot and horse trails over alternative A. Although the entire forest is open foot and horse use, this may result in a slight increase over alternatives A and F in the potential recreation use of

these areas due to increased identified access. Under alternatives F and G, roads and trails are scheduled for decommissioning or rehabilitation, with the largest number planned under alternative F. Compared to the existing condition, alternatives F and G would result in reduced road and trail densities in Uncompahgre fritillary habitat due to decommissioning of roads and trails.

The forest plan has specific direction included to protect Uncompahgre fritillary butterfly habitat and populations (USDA Forest Service/WRNF 2002a, page 2-22). These two standards state that:

1) Before any ground-disturbing activity (such as trail building), livestock driveways, or bedding grounds are allowed in potential Uncompahgre fritillary butterfly habitat, a survey shall be conducted to determine the presence of the species. Potential habitat and survey protocols are found in the recovery plan. Avoid actions that would negatively impact the species' known habitat or populations.

2) If any new Uncompahgre fritillary butterfly populations are discovered, a "no-collecting" regulation shall be placed on the area.

Winter

The majority of the fritillary habitat on the White River National Forest occurs within designated wilderness where motorized travel is prohibited year-round. The high elevation and inaccessibility of potential fritillary habitat on the forest makes it unlikely that there would be high levels of winter use. In areas where motorized travel may occur, the forest plan prohibits over-the-snow motorized vehicle use where it would cause soil or vegetation resource damage. Winter recreation use is not identified as a limiting factor for this species. There would be no direct impacts to Uncompahgre fritillary butterflies from any of the alternatives since this species overwinters as egg cases that would not be affected by winter uses of the forest. Indirect impacts would be limited to the unlikely impacts to snow willow stands from motorized or non-motorized use. The potential for detrimental impacts to snow willow stands from any of the alternatives is felt to be very unlikely to occur anywhere on the forest.

Cumulative Effects

This draft environmental impact statement covers all National Forest System lands within the proclaimed boundary of the White River National Forest. As such, it does not cover any changes in the travel management options or other activities on private or state lands within the proclaimed national forest boundary. This species has been recorded only above 12,500 feet in elevation. The only private lands that occur at that elevation within the boundary of the White River National Forest are mining claims where no development has been identified that is reasonably certain to occur in the future. The Forest Service is actively acquiring these isolated, high-elevation mining claims. No state lands are within or adjacent to Uncompahgre fritillary butterfly habitat on the White River National Forest. No other actions on private or state lands have been identified that would affect the potential habitat for this species.

Mexican Spotted Owl

Direct and Indirect Effects

The following information is in addition to that found on pages 6 to 9 of the BA for the forest plan (USDA Forest Service/WRNF 2002b, appendix N). None of the alternatives would result in any new construction of roads or trails on the forest. However, some

current, existing user-created roads and trails may be added to the forest transportation system. A maximum of 6.58 miles of these currently user-created roads and trails would be added for foot and horse access under alternative G within a 2-mile radius of potential habitat for the Mexican spotted owl (*Strix occidentalis lucida*) on the forest (table BA-5). High levels of hiking and dispersed recreation use of Mexican spotted owl habitat areas may be detrimental to these birds but they are not likely threatened by an occasional hiker (Swarthout and Steidel 2001). Of the roads or trails occurring within the identified habitat, potential impacts would be limited to those associated with the increased access provided by these and adjacent roads and trails. Because of planned decommissioning or rehabilitation of roads and trails, all action alternatives would result in an overall reduction in the number of miles of roads and trails in potential Mexican spotted owl habitats.

Table BA-5. Miles of roads and trails within 2 miles of potential Mexican spotted owl habitat on the White River National Forest for all alternatives

Type of use	Density (miles per square mile)		
	Alternative A	Alternative F	Alternative G
Motorized	0.58	0.58	0.51
Mechanized	0.29	0.29	0.29
Motorized/mechanized	0.87	0.87	0.80
Foot/horse	0.33	0.33	0.38
Total	1.20	1.20	1.18
Scheduled for decommission (reduction in density)	0.00	0.24	0.27

Approximately 130 square miles of potential habitat.

Alternative G would increase foot/horse use over Alternative A. Alternative G would reduce motorized use and both F and G and maintain existing levels of mechanized use. Alternative G would add approximately 6.58 miles of horse/foot use. F and G would reduce overall travelway densities over current, existing uses because of planned decommissioning and rehabilitation.

Winter

MSO habitat on the WRNF occurs within steep, rugged, inaccessible canyons. These areas are currently very inaccessible during the winter months to motorized uses. Limited non-motorized uses occur during the winter months, and that use is limited to the existing trail system. No direct or indirect impacts to MSO or MSO habitat is expected to occur under any of the alternatives.

Cumulative Effects

This draft environmental impact statement covers all National Forest System lands within the proclaimed boundary of the White River National Forest. As such, it does not cover any changes in the travel management options or other activities on private or state lands within the proclaimed national forest boundary.

No state lands occur within the general vicinity of the identified habitat for Mexican spotted owl on the White River National Forest (Glenwood Canyon and its tributary canyons). Therefore, no state actions are anticipated that would affect the Mexican spotted owl or its habitats.

Several parcels of private land occur within the confines of Glenwood Canyon. The largest of these is the Bair Ranch on the east end of the canyon. A conservation easement has been negotiated for this parcel. As this conservation easement is applied, the land will retain its undeveloped character and no activities that affect Mexican spotted owl are anticipated. No developments are anticipated on the other parcels of private land in the vicinity of potential Mexican spotted owl habitat.

Canada Lynx

Direct and Indirect Effects

The forest plan incorporates a substantial level of management direction associated with Canada lynx (*Lynx canadensis*) and lynx habitat. This direction was based in large part on the Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000). Extensive coordination meeting between the WRNF and the Fish and Wildlife Service resulted in the LCAS direction being modified for the local situations on the White River National Forest. This direction package received formal consultation as a part of the forest plan BA and BE. This direction promotes affirmative management actions to conserve lynx habitat conditions across the forest.

Summer

Summertime casual use of forest system roads by recreationists and other forest users has not been shown to be a significant issue for lynx (Ruediger et al. 2000). Concentrated human use areas and roads carrying traffic loads of more than 4,000 vehicles per day may deter lynx movements across the landscape. Interstate 70, Highway 82, Highway 9, and the highly developed areas around the communities associated with the forest all may affect lynx movements. There have been at least two lynx road kills on highways associated with the White River National Forest; both lynx (1999 and 2004) were killed within 1 mile of each other on Interstate 70 on the west side of Vail Pass. Two additional lynx were killed on Interstate 70 a few miles east of the White River National Forest boundary. Most other forest system roads do not carry vehicle loads approaching the level identified that affects summer lynx movements or deter lynx use of suitable habitats throughout the forest. Temporary displacement of some lynx individuals may occur because of vehicles and human uses but any displaced animals are expected to return to normal behavior patterns soon after disturbance is gone. The interiors of large blocks of denning habitat are generally secure from significant impacts of travel management because of high levels of downfall, which restricts human access including motorized vehicles and mechanized uses.

Several analyses were completed to assess how the different alternatives may impact lynx or lynx habitats across the forest. The number of miles of roads and trails by use type, by alternative was evaluated for the total forest (assuming that lynx may use all portions of the forest at some time, regardless of whether or not it is in one of the categories of lynx habitat)(table BA-6). A similar analysis was completed specifically for the categories of lynx habitat (1,153,000 acres)(table BA-7) and another similar analysis was completed for management areas considered important as movement linkage zones (MA 5.5 and regionally identified landscape linkages)(table BA-8).

Table BA-6. Travelway densities by alternative for the entire White River National Forest

Type of use	Density (miles per square mile)		
	Alternative A	Alternative F	Alternative G
Motorized	0.56	0.56	0.50
Mechanized	0.20	0.20	0.16
Motorized/mechanized	0.76	0.76	0.66
Foot/horse	0.36	0.36	0.39
Total	1.13	1.13	1.05
Scheduled for decommission (reduction in density)	0.70	0.25	0.32

Approximately 3574 square miles of potential habitat were analyzed for this species based on the entire forest

Alternative F maintains the current authorized level of use for motorized, mechanized, and foot and horse access across the forest. Alternative G reduces both motorized (by 234 miles) and mechanized (143 miles) while increasing foot and horse access by 95 miles. Foot and horse recreational use has not been identified in the literature as being a significant issue to lynx use of habitat areas. Because of planned decommissioning of travelways, both F and G would result in fewer miles of roads and trails than under the current, existing situation.

Table BA-7. Travelway densities by alternative for lands within potential lynx habitat on the White River National Forest

Type of use	Density (miles per square mile)		
	Alternative A	Alternative F	Alternative G
Motorized	0.49	0.49	0.44
Mechanized	0.21	0.21	0.19
Motorized/mechanized	0.70	0.70	0.63
Foot/horse	0.37	0.37	0.38
Total	1.06	1.07	1.00
Scheduled for decommission (reduction in density)	0.00	0.26	0.32

Approximately 1786 square miles of potential habitat were analyzed for this species.

Alternative F would slightly decrease the miles of mechanized use (approximately 1 mile) over alternative A and would increase foot/horse use by 3 miles across the Forest. Alternative G would reduce about 92 miles of motorized routes and about 34 miles of mechanized use while increasing foot and horse use by 16 miles. Because of planned decommissioning of travelways, all alternatives would result in fewer miles of roads and trails than under the current, existing situation.

Table BA-8. Travelway densities by alternative for lands within management areas considered important as movement linkage zones (management area 5.5 and regionally identified landscape linkages)

Type of use	Density (miles per square mile)		
	Alternative A	Alternative F	Alternative G
Motorized	1.55	0.96	0.85
Mechanized	0.57	0.32	0.33
Motorized/mechanized	2.12	1.29	1.19
Foot/horse	0.58	0.16	0.11
Total	2.70	1.44	1.30
Scheduled for decommission (reduction in density)	0.00	0.40	0.47

Approximately 230 square miles of potential habitat were analyzed for this species.

Alternatives F and G both would provide less motorized, mechanized and foot/horse use than alternative A within the 5.5 and landscape linkage areas. Alternative F results in a reduction of almost one half and Alternative G is over one half. Because of planned decommissioning and rehabilitation of travelways, all action alternatives would result in fewer miles of roads and trails than under the current, existing situation.

All analyses indicate that any of the alternatives would result in reduced mileage of roads and trails over the existing situation because of rehabilitation of user-created roads and trails. This should result in a slight beneficial effect to lynx due to a reduction in the areas affected by motorized, mechanized, and foot/horse travel. The roads and trails being considered for removal do not carry the heavy traffic loads that have been identified as significant to lynx. Since general summer recreation use of forest roads is not identified as a risk factor for lynx, this reduction in potential harassment is not expected to result in a measurable effect on lynx or lynx habitat conditions across the forest

Winter

The primary concern for lynx from travel-management-related winter use of roads, trails, and routes is associated with snow compaction, because snow compaction can lead to increased access for other predators that compete with lynx for snowshoe hare and other prey species (Ruediger et al. 2000). The White River National Forest prepared a database of existing routes and play areas compacted in the winter. A subset of these existing routes and areas are “designated routes and play areas” from a lynx management standpoint. The term designated is defined as routes or areas that are authorized, managed, and promoted by the forest. This baseline map of designated compaction has been formalized through the U.S. Fish and Wildlife Service as a condition of the biological opinion in response to the BA prepared for the forest plan (USDI/FWS 2002). Most additions to the designated routes or play areas must be accompanied by a one-to-one reduction in the existing baseline within the same lynx analysis unit (USDA Forest Service/White River National Forest 2002a, Guideline 12).

For winter alternative A is equal to that of alternative F because the forest plan did, through standards and guidelines, dictate where motorized activity can occur. Note the decision to be made for winter is only for where motorized activity over snow can occur, as the forest is open to foot and other non-mechanized (wheeled) travel such as x-c, snowshoeing. (See Chapter 1 for purpose and need, and decisions to be made.)

The forest plan did not designate any specific routes or play areas however in the management area prescriptions that had over-snow restrictions to designated routes and

play areas for motorized travel. Therefore, alternative A and alternative F show no motorized routes or open play areas in the restricted management areas. These need to be designated in the action alternative. Alternative G for winter proposes for designation routes and play areas in the restricted areas.

Table BA-9. Designated winter travelway miles and play area acres by alternative for lynx habitat on the White River National Forest*

Type of use	Alternative A	Alternative F	Alternative G
Motorized Prohibited areas	526,372	526,372	526,372
Restricted -Motorized Routes	210,096	210,096	246,362
Open Motorized Areas	380,142	380,142	343,876

Includes approximately 1786 square miles of lynx habitat.

All alternatives maintain the same amount of motorized prohibited areas, while Alternative G reduces the amount of open motorized areas and increases the amount of the restricted motorized use areas. The decisions made under the travel management plan do not increase the "authorized, managed, and promoted" routes or play areas identified under the snow compaction map described above. None of the alternatives affect the designation shown on that map.

Recreation use of the forest during both summer and winter seasons has the potential of displacing lynx from preferred habitats. This harassment effect would be short-term and limited to the area adjacent to the activity. Displaced lynx are expected to return to favored habitats and normal behavior soon after the displacement activity is completed.

Cumulative Effects

This draft environmental impact statement covers all National Forest System lands within the proclaimed boundary of the White River National Forest. As such, it does not cover any changes in the travel management options or other activities on private lands within the proclaimed national forest boundary for either state or private lands. At the scale of this document, it is impossible to identify site-specific actions on either private or state lands that may affect listed species.

The majority of the state lands included with the proclaimed national forest boundary or immediately adjacent to the forest will continue to be managed very similarly to the current situation. Use is limited in scope and duration because most of these lands are either state parks that are managed to provide recreational opportunities for a wide range of users (Rifle Gap, Harvey Gap, and Sylvan Lake State Recreation Areas), or state wildlife management areas that are managed specifically for the benefit of wildlife and recreation (Christine, Toner Creek, Garfield Creek, Jenson, Coke Oven, and Radium State Wildlife Areas). No new major developments are expected to occur on these lands that will significantly affect lynx habitats.

Private lands within the proclaimed boundary are expected to continue to be developed as private home sites, housing developments, and commercial developments under county planning regulations. Many of these developments will take place within or adjacent to suitable lynx habitats. New home sites that are developed will generally have associated plowed roads that would result in increased winter use and compaction.

Penland Alpine Fen Mustard

Direct and Indirect Effects

The following information is addition to that found on pages 113 to 120 of the BA for the forest plan (USDA Forest Service/White River National Forest 2002b, appendix N). Penland alpine fen mustard (*Eutrema penlandii*) is a small alpine forb with thick, fleshy leaves and small white flowers; this plant exists at 12,300 to 13,100 feet. An ice-age relict, it is separated from its closest relative by about 1,000 miles (NatureServe 2005). Penland alpine fen mustard inhabits moss-covered peat fens subirrigated by melting upslope snowfields, occurring primarily on soils developed from a calcareous substrate (Center for Plant Conservation 2005).

Known threats to this species include mining and associated ditching activities, which disrupt the necessary hydrology upon which this species relies (Center for Plant Conservation 2005). Although these threats are not currently affecting the species on the White River National Forest, known populations are close to inactive mines and would be threatened if mineral extraction activities were to resume.

Recreational use also has been identified as a threat that may be increasing (NatureServe 2005). In this case the threat would include possible trampling by hikers moving off-trail. Any activity that directly or indirectly alters the surface or ground water supply and alters the wetland habitat required by this species could also pose a significant threat (NatureServe 2005).

This species occurs adjacent to the White River National Forest as a small population within the Hoosier Ridge Research Natural Area (RNA), which the White River shares with the Pike-San Isabel National Forests. Intensive surveys for this species were conducted within suitable habitats during the establishment of the Hoosier Ridge RNA. It is felt that these surveys were successful in identifying the majority of existing populations. The forest plan designated the area surrounding the White River portion of the Hoosier Ridge RNA as management area 1.31, which is backcountry recreation, non-motorized. This designation means that no roads would be built in the area and activities are geared toward the primitive; the area should have little evidence of recent human-caused disturbance. The RNA designation allows only low-level recreation activities and prohibits motorized vehicle travel. These designations offer some protection for the known population and make enforcement of travel restrictions and curtailment of undisciplined recreational use somewhat easier.

Direct or indirect impacts on Penland alpine fen mustard and its habitat by implementation of any of the alternatives would not be significant. None of the alternatives would result in any new construction of roads or trails on the forest. The population is within an established research natural area surrounded by a non-motorized management area prescription. Occurrences of accidental or unauthorized vehicle use should be very limited both summer and winter. Since the species is within the established Hoosier Ridge Research Natural Area, the population of Penland alpine fen mustard in the very small watershed above the White River National Forest is protected from vehicle use, grazing use, and road and trail construction. Since this watershed is protected, water quality critical to the species would not be changed or impaired.

BA-10. Travelway densities by alternative for lands within the alpine habitats on the White River National Forest

Type of use	Density (miles per square mile)		
	Alternative A	Alternative F	Alternative G
Motorized	0.11	0.11	0.10
Mechanized	0.07	0.07	0.06
Motorized/mechanized	0.18	0.18	0.16
Foot/horse	0.26	0.26	0.26
Total	0.44	0.44	0.42
Scheduled for decommission (reduction in density)	0.00	0.00	0.03

**Approximately 474 square miles of potential habitat were analyzed for this species.*

Within alpine habitats, alternative F does not change any travelways from alternative A. Alternative G reduces motorized use by about 3 miles, mechanized by 7 miles and foot/horse by 3 miles. Planned decommissioning and rehabilitation of travelways would reduce open travelway density in alternative G when compared to the current, existing situation and alternative F. For the Penland alpine fen mustard, changes among alternatives in motorized or mechanized uses do not apply, because the currently identified, suitable habitat on the White River National Forest is within the Hoosier Ridge RNA. Because there are no current designated travelways within the RNA, no maintenance or decommissioning activities would occur. Additionally, no new construction is proposed with this analysis.

Cumulative Effects

Penland alpine fen mustard mostly occurs on federally administered lands within the Pike, San Isabel, and White River National Forests. Some populations occur on public lands managed by the Bureau of Land Management and some are on private lands. One of the largest populations is within the Hoosier Ridge Research Natural Area (the part of the RNA that is located on the Pike National Forest). The soils where this species occurs are fine-textured and relatively deep and loamy for alpine environs. Natural rehabilitation of alpine ecosystems is slow to very slow (Forbes et al. 2001). Any damage to the plants or their habitat requires decades for recovery. Repeated damage would be cumulative and result in degradation of the species and its habitat.

The Penland alpine fen mustard is partially protected by White River National Forest management area prescriptions that prohibit motorized and mechanized use. The population within the Hoosier Ridge Research Natural Area is more protected by restrictions on road or trail building. The White River National Forest population might come under increasing threats from unauthorized vehicle use, because recreational vehicle pressure is increasing in the surrounding area. On private lands, human population pressure and vehicle use will probably continue to increase in future years. The probability of damaging events from unauthorized vehicle use is increasing; the damage would be cumulative and likely lead to degradation of the populations and their habitat on unprotected lands.

Colorado Pikeminnow, Humpback Chub, Razorback Sucker, and Bonytail

Direct and Indirect Effects

Colorado Pikeminnow, Humpback Chub, Razorback Sucker, and Bonytail species all occur downstream of the White River National Forest in the Colorado, White, and Yampa rivers. The primary threat to these species from activities on the WRNF is water depletion. The proposed action will not change the amount of water used in road maintenance. Water used annually on the White River National Forest for dust abatement and road maintenance activities ranges from 1.3 to 2.2 acre-feet per year depending on budgets and the amount of planned activity. Water use is primarily on arterial and collector roads, which do not vary between alternatives. Specific records are not available, but it is estimated that use of this amount of water use has been relatively constant since about 1970, with water use on roads beginning around 1950. In general, water use is expected to be proportional to Forest Land distribution, with over 80% in the Upper Colorado drainage and less than 20% in the White River drainage. No water depletions are expected in the Yampa River basin due to the lack of major roads.

Cumulative Effects

This SDEIS covers all National Forest System lands within the proclaimed boundary of the White River National Forest. Water development on Private lands within the Forest Service boundary is expected to continue as inholdings are developed. Water use associated with these developments is expected to be minor residential use. There are no known proposals for changes in water use associated with reservoirs on State lands. There is currently a large proposal to develop water for use on the Front Range in the Eagle River. It is not known at this time when, where, and if this project will be developed.

Greenback Cutthroat Trout

Direct and Indirect Effects

Recent improvements in genetic analysis techniques appear to have made it possible to differentiate Colorado River cutthroat trout from greenback cutthroat trout. Although this differentiation is still considered somewhat preliminary, it is considered best available science and therefore populations identified as “GBlineage” are considered greenback cutthroat trout. The WRNF has five populations to date which have been identified as GBlineage: Three Licks Creek, Frey Gulch, Cunningham Creek, Park Creek, and Cache Creek. Genetic results received in 2007 and 2008 from collections processed at Pisces Molecular using AFLP procedures are presented in Table F. These results have not been confirmed with a complementary genetic analysis (e.g., mitochondrial DNA).

Table BA-11. Genetic results from GBlineage cutthroat trout populations on the White River National Forest

Population	N	Greenback	Colorado River	Rio Grande	Yellowstone
Three Licks	25	86%	12%	trace	1%
Frey Gulch	25	98%	1%	trace	none
Cunningham	40	100%	none	none	none
Park	27	93%	3%	trace	3%
Cache	30	91%	7%	trace	2%

"N" is the number of fish sampled.

Twenty-five miles of roads are removed from the GBlineage watersheds in alternative G and seven are removed in alternative F. Some are converted to motorized trails and others are scheduled for decommissioning. Four of these watersheds would have roads decommissioned within the occupied part of the watershed. The fifth (Cache Creek) also has a trail along the creek which would be removed from the system (allowed to revegetate). There may be shortterm negative impacts to these populations from decommissioning activity, however, the long-term effect would be beneficial as watershed function improves and road-derived sediment is reduced. Alternative G decommissions and rehabilitates more roads than alternative F, but both offer a long-term benefit over the alternative A-no action alternative.

Table BA-12. Comparison of roads and motorized trails in each alternative in watersheds containing a cutthroat trout population believed to be greenback cutthroat trout

Population (watershed)	Three Licks (Big Hole Creek)	Frey Gulch (Frey Gulch)	Cunningham (North Fork Fryingpan)	Park Creek (North Thompson)	Cache Creek (Cache Creek)
NA – roads	3.73	5.37	30.97	28.41	0.36
NA – trails	0	1.42	0	0	0
F – roads	3.73	5.37	30.97	21.39	0.36
F – trails	0	1.42	0	0	0
G – roads	1.24	1.03	19.87	20.76	0.36
G – trails	2.11	5.57	8.98	0	0

The subwatershed or catchment containing the population used for analysis is in parenthesis below the population name.

Cumulative Effects

With the exception of Cunningham Creek and Frey Gulch, the lower distributions of these populations are not known, therefore for this cumulative effects discussion, it is assumed that the entire stream is occupied in Three Licks, Park, and Cache creeks. Frey Gulch, Park Creek, and Cunningham Creek occur entirely on the White River National Forest with no private inholdings. The lower approximately onehalf mile of Three Licks Creek is on private land. The Cache Creek population occurs primarily downstream of the forest on private and BLM lands. There are no state lands along any of these occupied streams. Private lands on Three Licks Creek are currently used as a ranch with grazing and this use is expected to continue. It is possible this land could be developed into ranchettes. Extensive natural gas development is occurring in the region which includes Cache Creek. It is expected that natural gas development will occur on the private land in the Cache Creek watershed potentially impacting this population.

Determinations of Effects and Rationale

Uncompahgre Fritillary Butterfly—All Alternatives

There would be no new construction of travelways in Uncompahgre fritillary butterfly habitat on the White River National Forest under any of the alternatives. Only limited increases in human use of Uncompahgre fritillary butterfly habitats are anticipated due to overall increased human use of the forest. Overall mileage of roads and trails open to human uses on the White River National Forest would decrease in comparison to the existing situation under Alternatives F and G. No impacts to Uncompahgre fritillary butterfly habitats are expected due the proposed action or any alternative identified for this project. There is no information in the available literature that indicates that general recreation use of existing roads and trails is a risk factor for this species. The forest plan has specific direction to protect Uncompahgre fritillary butterfly habitat and populations from adverse actions. Therefore, there will be **NO EFFECT** to Uncompahgre fritillary butterfly or its habitats, by any of the alternatives under consideration in this DEIS.

Mexican Spotted Owl—All Alternatives

There would be no new construction of travelways in potential MSO habitat under any of the alternatives. The increase in recreation use of the forest in the vicinity of spotted owl habitat is expected to be negligible and due to general increase in human uses on existing trails within a 2-mile radius of potential Mexican spotted owl habitat. All alternatives would result in a reduction in the overall miles of open roads and trails over the existing situation. The literature does not indicate that general recreation use is a risk factor for Mexican spotted owl. Therefore, there will be **NO EFFECT** to Mexican spotted owl or its habitats, by any of the alternatives under consideration in this draft environmental impact statement.

Canada Lynx—All Alternatives

The number of miles of roads and trails would be reduced across the entire forest, over the portion of the forest that is lynx habitat, and for the areas within management area prescription 5.5 and regional linkages from the current situation, under all alternatives. This reduction in mileage would result in less summer motorized and mechanized harassment potential across each of the areas analyzed. Foot and horse traffic is not generally restricted anywhere on the forest; however, most of those uses are contained on established trail systems. The reduction in mileage for these trail systems would generally reduce access, with a consequent potential reduction in harassment of lynx over the current situation. Winter designated routes and play areas do not change under each alternative over the current winter use on the forest. Lynx habitat would not be significantly affected by any of the actions proposed under any alternatives. The overall result for all alternatives when considering summer and winter uses is that there should be a slight beneficial effect from the reduction in the mileage of roads and trails open to use across the forest. This reduction should result in a slight reduction in potential harassment of lynx due to human use of the forest. This beneficial effect is anticipated to be too slight to be measurable at the scale of the forest. No cumulative impacts have been identified on private or state lands that are expected to change lynx habitats or affect lynx on the White River National Forest. Any potential impacts from this action are considered to be insignificant due to the fact that there will be an overall reduction in road and trail miles, and discountable due to the fact that no lynx are expected to be directly or indirectly affected by this action. Overall, the determination for lynx is **MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT.**

Penland Alpine Fen Mustard—All Alternatives

No new construction of roads or trails in the Penland alpine fen mustard habitat would be added to the White River National Forest transportation system under any of the alternatives in this draft environmental impact statement. Human use of this species' habitat is expected to be limited because of the protection afforded by research natural area designation and management area prescription. Overall, mileage of roads open to human uses on the White River National Forest would decrease in comparison to the existing situation under all alternatives. Trail mileage will increase under both of the action alternatives, but the majority of the increase is in non-motorized use. None of the increase in use will occur within the RNA or fen mustard habitats. The BA for the revised forest plan described the ineffectiveness of current barriers to motorized and mechanical travel for access to this species' habitat; this is a law enforcement issue, outside the scope of the travel management plan. As mentioned in the BA, the ineffectiveness of the barriers could be resolved by signing a closure order and building better, more competent barriers. Under the assumption that compliance with travel restrictions and prohibitions will occur, the determination for Penland alpine fen mustard is **MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT.** Any impacts will be insignificant due to the lack of roads and trails within suitable habitat for this species, and discountable due to the protections under the RNA designation.

Colorado Pikeminnow, Humpback Chub, Razorback Sucker, and Bonytail—All Alternatives

The historic water depletion associated with road maintenance is expected to continue with all alternatives. Approximately 1.3 to 2.2 acre-feet of water will be depleted per year from the White and Upper Colorado rivers. As stated in the December 1999 Biological Opinion: Providing adequate flows in the 15 Mile Reach, downstream of the project area, in combination with other recovery actions, has been identified as important to achieving recovery of these species. The water depletion associated with this project is small, yet is counter to these recovery efforts. Therefore, the determination for Colorado pikeminnow, humpback chub, razorback sucker, and bonytail is **MAY AFFECT, LIKELY TO ADVERSELY AFFECT.**

Greenback Cutthroat trout – All Alternatives

For all occupied watersheds, roads and trails are removed and/or the level of use is reduced (e.g., from a road to a motorized or non-motorized trail) in alternative G. In alternative F, roads are removed only from the North Thompson watershed (Park Creek population). Reducing the road and trail networks in these watersheds would have long-term benefits to greenback cutthroat trout as road-derived sediment and other road-related impacts are reduced. There may be a short-term increase in disturbance and sediment inputs into occupied habitat during decommissioning activities, however, these impacts are likely to be insignificant. Therefore, the determination for greenback cutthroat trout is **MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT.**