



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/GJ-6-CO-03-F-018
MS 65412 GJ

October 14, 2003

Richard C. Stem, Deputy Regional Forester
U.S. Forest Service, Rocky Mountain Region
P.O. Box 25127
Lakewood, Colorado 80225-0127

Dear Mr. Stem:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the biological assessments (BA), for the 26 projects submitted for batched consultation and effects to the threatened Canada lynx (*Lynx canadensis*), in accordance with section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1531 *et seq.*). Your request for consultation was received on July 15, 2003.

As you may already know, the District Court for the District of Columbia issued an order on December 26, 2002, that enjoins the Service from issuing any written concurrence[s] that actions proposed by any Federal agencies "may affect, but are not likely to adversely affect" the threatened Canada lynx. Until further notice, all consultations concerning effects to the Canada lynx must be conducted in accordance with the direction of the Court. Specifically, any actions subject to consultation that may affect the Canada lynx require formal consultation as described in 50 CFR ' 402.14 and preparation of a biological opinion that addresses how the proposed action is expected to affect the Canada lynx in order to complete the procedural requirements of section 7.

In light of the court decision discussed above you requested formal consultation on 26 projects considered to be of "high priority" within Region 2 of the U.S. Forest Service (USFS). The National Forests involved in this consultation include; the White River National Forest (WRNF), the Grand Mesa National Forest (GMNF), the Arapahoe-Roosevelt National Forest (ARNF), the Rio Grande National Forest (RGNF), and the San Juan National Forest (SJNF). The biological opinion that follows, will address each project individually, consistent with the Court's ruling. All projects were determined, by the USFS, to "may affect, not likely to adversely affect" the Canada lynx. Effects assessments were made by comparing project effects to the standards and guidelines of the Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000), and the Colorado Canada lynx project screens, developed to streamline lynx consultations

within the State of Colorado. Criteria used within the project screens are biologically more conservative than LCAS standards and guidelines, and consultation resulted in concurrence for those actions that may affect, but are not likely to adversely affect at the project level.

This biological opinion is based primarily on our review of the biological assessments and supplemental information received in regards to the effects of the proposed actions on Canada lynx.

Other federally listed species were also included and handled under the context of normal section 7 consultation. Concurrences for these species were provided within individual project discussions under the “Description of the Proposed Action” section. Species that may be adversely affected by any one of the proposed actions are considered with that action and are included within this biological opinion.

Consultation History

Your letter requesting consultation regarding the batched projects was received in our office on July 23, 2003. A complete administrative record of this consultation is on file in the Western Colorado Ecological Services Field Office.

The Service issued a biological opinion in October 2000, which evaluated the effects of implementing the current Forest Plans and Land Use Plans of the USFS and the Bureau of Land Management. The October 2000 biological opinion concluded that the implementation of current Forest Plans, in conjunction with the Conservation Agreement between the USFS and the Service (February 7, 2000), which includes the consideration of the LCAS, may result in some level of adverse effects to lynx.

On May 30, 2001, the Service issued a concurrence letter subsequent to a request by the USFS to re-authorize the Programmatic Agreement for Canada lynx in Colorado. Included in the Agreement are criteria, in the form of screens, designed to evaluate the impacts of USFS actions to Canada lynx. Upon meeting the criteria set forth in the Agreement, individual actions were granted concurrence from the Service. Actions meeting the criteria were simple, straightforward actions, which will have documentation supporting insignificant and/or discountable effects to lynx. Subsequent to the Court’s December 26, 2002, decision, use of the screening process has been discontinued to comply with the Court’s order. Currently, these screens are being used as a tool to demonstrate that actions meeting the screening criteria result in insignificant and/or discountable effects to Canada lynx.

A few of the individual projects included in this batched consultation do have consultation history. Consultation histories for individual actions are provided below.

Crooked and Lincoln Creek Large Wood Habitat Placement Project

This project has received informal consultation in the form of a phone conversation between, Mark Lacy (WRNF) and Kurt Broderdorp (USFWS) with regard to potential effects to Canada lynx habitat.

Keystone Ski Resort's Little Bowl and Erickson Bowl Snowcoach Tours

Formal section 7 consultation was completed in 1985 (6-5-85-F-021) and 1987 (6-5-86-F-027) for water use associated with the existing snowmaking system for Keystone Ski Area (KSA). Both consultations resulted in "adversely affect" determinations for the Colorado pikeminnow, humpback chub, razorback sucker and bonytail. No additional depletions are associated with the purposed action and therefore water use is not addressed any further.

The Service concurred with a "not likely to adversely affect" determination for Keystone Resort's (KR) existing winter and summer operations on May 31, 2000. There have been no substantial changes to resort operations since that determination.

The Colorado Programmatic Agreement for Canada lynx screening process (Screen 3) indicates that the KR snowcoach tours project would screen to a "NLAA" determination because (1) the activity wholly occurs within the development area boundary that is being currently used for similar activities, (2) Section 7 consultation has not been done on the new (proposed) operating plan that includes the Proposed Action, and (3) the proposed action is consistent with historic operations. The proposed action appears to meet all criteria and stipulations for the blanket concurrence criteria.

Maintaining the functional value of the landscape linkage in Jones Gulch is of paramount importance and could be affected by the proposed action due to possible increase in noncompliance backcountry skiing in this area. Informal consultation associated with the withdrawn Ski Tip proposal, the Service (Broderdorp, USFWS, pers. comm., 2002) agreed that the current level of backcountry use in Jones Gulch is probably not adversely affecting lynx diurnal security use.

Crooked Creek Complex Timber Sale

No previous consultation history exists for this project.

Lodgepole Pine Rollerchopped Thinning Project

No previous consultation history exists for this project.

Million Fire Salvage Timber Sale

The Million Fire burned approximately 9,891 acres on the Divide Ranger District during the summer of 2002. Burn severity included 191 acres of low burn intensity, 4,008 acres of moderate burn intensity and 5,147 acres of high intensity burn. The Service was consulted regarding fire suppression efforts and also for the activities associated with the Burned Area

Emergency Rehabilitation (BAER) efforts. The Service concurred with the determinations of “may affect, not likely to adversely affect” the Canada lynx and “no effect” to bald eagle (*Haliaeetus leucocephalus*), Mexican spotted owl (*Strix occidentalis lucida*), Uncompahgre fritillary butterfly (*Boloria acrocneuma*) and southwestern willow flycatcher (*Empidonax traillii extimus*) on July 3, 2002. Work within the fire perimeter is now focusing on the burned area recovery and salvage efforts. To date, no previous consultation has been done for the Million Fire Salvage Timber Sale.

Avalanche Snowmobile Tours

On January 8, 2002, the Sulphur Ranger District prepared a map of snow compaction routes, including areas used by Avalanche Tours and by the public. These maps were submitted to the Regional Office for inclusion in the formal consultation packet for the Region-wide Forest Plan Amendment process for lynx.

White River Plateau Sheep Allotment

Prior to the listing of lynx, the WRNF conducted a NEPA analysis for the issuance of domestic livestock range allotment permits. The BA developed from this analysis resulted in a programmatic process to cover the majority of the impacts expected to occur from the proposed action. To address the lynx issues for the existing grazing activity, consultation using the “lynx screening” process (USFWS 2000a) was conducted. The Service concurred with a determination of “may affect, not likely to adversely affect” to lynx for the current grazing activity (USFWS 2000b). There has been no direct consultation concerning the modifications to the proposed White River Plateau Sheep Allotment project.

Beaver Creek Trail

On June 6, 2003, the WRNF initiated informal consultation concerning the construction of the Beaver Creek Trail with the Service in regards to impacts on lynx.

The Colorado Programmatic Agreement for Canada lynx decision tree was used by WRNF biologists to assist in project effect determinations. According to the tree, the construction of less than 3 miles of recreation trails during the summer in lynx habitat would reach a “may affect, not likely to adversely affect” determination. In addition, summer trail maintenance has been determined to have “no effect” on lynx by the Lynx Project Decision tree.

Buffalo Mountain Trail Project

There has been no previous consultation with the WRNF on the proposed Buffalo Mountain Trail project.

Hummer Tours for the D&L Ranches

An updated species list was received by the WRNF from the Service on June 6, 2003. On June 17, 2003, the WRNF discussed the action with the Service via telephone and a BA was prepared.

Grand Adventure Snowmobile Tours (GAST)

On January 8, 2002, the Sulphur Ranger District prepared a map of snow compaction routes, including those areas currently used by GAST and by the public. These maps were submitted to the Regional Office for inclusion in the formal consultation packet for the Region-wide Forest Plan Amendment process for lynx.

Hoop Creek Rehabilitation Project

No consultation has been recorded for this project area to date.

Trailblazer Snowmobile Tours (TST)

On June 29, 2001, Kurt Broderdorp (USFWS) met with the project's biologist, special uses administrator, and project consultant to discuss the proposal to re-authorize the TST permit. Kurt indicated that the project determination would be a "not likely to adversely affect" determination, if no new compaction was added and current routes were not already impairing the function of the LAUs involved. Mr. Broderdorp also suggested that the addition of new routes could be incorporated if the public was already using them on a regular basis (no net increase in compaction), and if TST had not begun grooming them.

On January 8, 2002, the Sulphur Ranger District prepared a map of snow compaction routes, including those areas currently used by TST and by the public. These maps were submitted to the Regional Office for inclusion in the formal consultation packet for the Region-wide Forest Plan Amendment process for lynx.

Mann Land Exchange

The Service, in a letter dated March 7, 2002, to the Routt National Forest (RNF) provided the USFS with a list of federally threatened, endangered, candidate and proposed species that may occur within the RNF. The seven federally listed species referenced included: bald eagle (*Haliaeetus leucocephalus*), bonytail (*Gila elegans*), Canada lynx (*Felis lynx canadensis*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), pallid sturgeon (*Scaphirhynchus albus*), and razorback sucker (*Xyrauchen texanus*). Three Federal candidate species, the boreal toad (*Bufo boreas boreas*), yellow-billed cuckoo (*Coccyzus americanus*) and slender moonwort (*Botrychium lineare*) were also identified in the Service letter.

Road Operations and Maintenance Activities on the Rio Grande National Forest

This action tiers to the RGNF Revised Land and Resource Management Plan (1996) and its update, which was signed by the Service the week of September 15, 2003.

Soil, Watershed and Fisheries Conservation treatments on the Rio Grande National Forest and the San Luis Resource Area (SLRA)

Soil, watershed and fisheries conservation treatments on the RGNF have received historic biological assessment through the revision of the Forest Plan. In 1996 the RGNF received Service concurrences for “may affect, not likely to adversely affect” for the bald eagle, peregrine falcon, Uncompahgre fritillary butterfly, Mexican spotted owl, and southwestern willow flycatcher (USFS 1996, USFWS 1996, 1998). The 1991 SLRA Resource Management Plan and 1997 amendment evaluated relative effects to federally listed species at the time, and received informal (courtesy) review by the Service. However, these Bureau of Land Management (BLM) planning efforts did not receive written specific concurrence regarding their effects to ESA species. Since the 1996 USFS and 1997 BLM planning revisions, the Service has determined that listing the mountain plover under the ESA is not warranted (2003), peregrine falcon has been de-listed (1999), and Canada lynx has been listed as threatened (2000). The RGNF Forest Plan has been updated and is in consultation (2003).

Lost Basin Ditch Renovation

There has been no prior consultation with the Service on this project. However, the Colorado Programmatic Agreement for Canada lynx decision tree (Screen B) indicates that “Ditches and Diversions (maintenance)” are a pre-screened activity leading to a potential “no effect” determination. Activities associated with the proposed action (i.e., vegetation removal) may result in an insignificant and discountable effect on lynx habitat where a “not likely to adversely affect” determination would be warranted.

San Juan-Rio Grande National Forests Wilderness Management Direction Amendments

Although the actions are existing in programs guided by the SJNF Land and Resource Management Plan (LRMP) (USFS 1992), and the RGNF Revised LRMP (USFS 1996) and their accompanying biological evaluations, this amendment did not include a biological assessment for changed conditions regarding certain resources (new information regarding species under the authority of the Endangered Species Act, as amended 1973 and under USFS policy in USFS Manual 2670). An assessment was prepared to validate that the San Juan/Rio Grande Wilderness Management Direction does not conflict with current terrestrial species status, such as the proposed listing of mountain plover (February 1999), the delisting of peregrine falcon (August 1999), and the listing of Canada lynx as threatened (March 2000).

Consultation has occurred for the bald eagle and peregrine falcon as a part of the SJNF LRMP (1983, amended 1992). The RGNF Revised LRMP (1996) received Service concurrences for determinations of “may affect, not likely to adversely affect” the bald eagle, peregrine falcon, Uncompahgre fritillary butterfly, Mexican spotted owl, and southwestern willow flycatcher (USFS 1996). The SJNF Revised LRMP (1992) received Service review for the Mesa Verde cactus, Mancos milkvetch, Knowlton’s cactus, Colorado pikeminnow, bonytail chub, humpback chub, razorback sucker, bald eagle, peregrine falcon, Uncompahgre fritillary butterfly, Mexican

spotted owl, and southwestern willow flycatcher. The SJNF consulted on all species for their 1992 Forest Plan Revision (USFWS 1992), however, the Service stated that “the management proposals were too general in the EIS to make any determination for any listed species with certainty, and that consultation should continue as specific actions are planned”. Subsequently, the peregrine falcon has been de-listed (1999), the mountain plover proposed listing, has been withdrawn (2003), and Canada lynx was listed as threatened (2000).

The assessment tiers to historical environmental analyses including Wilderness Management Amendments–Final Environmental Assessment (1998), the SJNF LMRP (1983, amended 1992) and 1983 Final Environmental Impact Statement (FEIS); and the RGNF Revised Land and Resource Management Plan (Revised Forest Plan) FEIS (USFS 1996), which includes biological assessments and evaluations.

WillSource Gas Exploration Project

A White River National Forest, Wildlife Biologist reviewed the project area on May 2 and May 20, 2003. Informal consultation occurred on May 16 and June 6, 2003 with the Service concerning the potential impacts of the proposed action on listed species.

Vail Valley Defensible Space Treatments

An updated list of threatened, endangered, proposed, and candidate species that occur in the Holy Cross Ranger District on the WRNF was received from the Service on June 6, 2003 thru the Consultation Streaming process. Informal consultation was done on June 17, 2003 to clarify the fuels management policy.

Spring Creek Salvage Harvest

The Service, under Section 7 of the ESA, provided the Rifle Ranger District a verbal list of species to address for consultation with the Service. On June 6, 2003, a written list of federally proposed, endangered and threatened species was received.

Grand Mesa Travel Management

March 2003, phone conversation between Tom Holland (USFS) and Kurt Broderdorp (USFWS).

April 2003, phone conversation between Tom Holland (USFS) and Terry Ireland (USFWS).

Letter from Service dated Feb 10, 2003.

Meetings between Tom Holland (USFS), Kurt Broderdorp (USFWS), and John Kleopfer (USFWS) occurred on May 9, 2003 and August 1, 2003.

Ward Lake Vegetation Management Project

On September 28, 2001, a scoping letter detailing the purpose, need, goals, and location of the proposed action was distributed to the Service in Grand Junction, Colorado. As a follow-up to this letter, Terry Ireland of the Grand Junction Field Office was contacted in order to identify the appropriate federally threatened, endangered, proposed, and candidate species that may occur on the Western Slope of Colorado and that, therefore, may potentially occur within the analysis area. This list was re-verified by Mr. Ireland on January 9, 2002. Mr. Kurt Broderdorp (USFWS) was also contacted regarding issues pertaining to Canada lynx.

In March 2003, USFS biologists, Kathy Abramson and Tom Holland, reviewed the Ward Lake Vegetation Treatments Biological Assessment authored by Greystone Environmental Consultants. Ms. Abramson and Mr. Holland felt that additional information and corrections were needed before submittal to the Service. The analysis documented herein is an emendation to the document provided by the contractor. The USFS contacted the Service to review past records regarding the Ward Vegetation Treatments and items that need to be identified or clarified in the biological assessment (Kathy Abramson, USFS, pers. comm., 2003). Discussion focused primarily on clearly identifying the fuels reduction treatments and defensible space: specifically, (1) will a defensible space/distance be identified (up to 200-feet from occupied or seasonally occupied structures and facilities)? (2) What do the suppressed trees less than eight-inches in diameter proposed for thinning look like and are they currently providing cover for snowshoe hare? (3) Is thinning along trails still proposed? (4) Will all ladder fuels within the identified fuels reduction units be removed?

A Programmatic Consultation Agreement for Canada Lynx in Colorado (USFS 2001) establishes the parameters under which both agencies agree to take actions to conserve lynx. As part of this agreement, a project decision screen (USFS 2001a) uses conservation objectives and measures identified in the Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000) as a guide to appropriate biological determinations regarding potential impacts to lynx. The screening process incorporates additional measures or considerations as deemed necessary or advisable to address conditions and circumstances in the Southern Rocky Mountains.

Informal consultation with the Service, regarding the fuels reduction project and the timber sale, included discussions and a field review of treatment units within lynx habitat by USFS and Service biologists (Steve Marquardt, USFS, pers. comm., 2002). No written information specific to those discussions has been documented. Biologists from the USFS and Service also discussed the use of defensible space in the fuels reduction project (Julie Grode, USFS, pers. comm., 2002). The USFS (Abramson, USFS, pers. comm., 2002) contacted the Service to confer on recommendations given to the contractor by the USFS regarding the LAU and potential influences of the proposed actions.

On July 17, 2003, John Kleopfer (USFWS) met with Kathy Abramson (USFS) and Carol McKenzie (USFS) of the GMNF to conduct a site review and discuss the objectives of the proposed project.

Information regarding habitat requirements of federally listed species and their distributions was

obtained through a review of species-specific publications and databases managed by the Colorado Natural Heritage Program and Colorado Division of Wildlife (CDOW).

Missionary Ridge Wildfire Suppression and Burned Area Emergency Rehabilitation Projects

The Missionary Ridge Wildfire started on June 9, 2002. On June 10, 2002, the fire began to burn into Canada lynx habitat. On June 11, 2002 the Service was contacted. At this time conversations between Anthony Garcia (USFS) and Kurt Broderdorp (USFWS) occurred and Emergency Consultation was initiated on the Missionary Ridge Wildfire. Informal consultations with the Service continued throughout the course of the fire and were generally in the form of email or telephone conversations, and often followed up with maps showing fire spread and progression.

During the months of July and August 2002, Anthony Garcia (USFS) and John Kleopfer (USFWS) discussed BAER efforts. At this time emergency consultation for BAER efforts were also initiated. In addition, discussions with Scott Wait of the CDOW occurred to discuss potential concerns and locations of radio collared lynx monitored by CDOW.

Missionary Ridge Fire Fence Rehabilitation and Installation Project

There has been no prior consultation with the Service concerning this project. However, consultation is ongoing concerning the Missionary Ridge Fire Salvage Project. That project and its affects to federally listed species are currently being evaluated in another BA.

On July 29, 2003, John Kleopfer (USFWS) and Anthony Garcia (USFS) discussed the issue of intermittent snow compaction. They concluded that the snow compaction associated with the project would only be intermittent, less than once a week.

Dutton Ditch Pipeline Project

No prior formal consultation has been initiated for this project in regards to wildlife concerns.

The July 6, 2001, version of the Southern Rocky Mountains Lynx Project Decision Tree Screen was used to assist in the analysis of this project. The screen, along with field visits, the Canada Lynx Conservation Assessment and Strategy (2000), and professional judgment, led Gary Voss (USFS) to determine that the activities associated with this project are outside blanket concurrence.

On June 30, 2003, the BA was submitted as part of a “batched” consultation process between the USFS and the Service.

On August 4, 2003, John Kleopfer (USFWS) discussed the project with Art Holloman from the Pagosa Area Water and Sanitation District (PAWSD). Mr. Holloman informed Mr. Kleopfer that the 6 acres affected by this project would be a short-term affect and the area would be

allowed to naturally regenerate. In addition, Mr. Holloman stated that there would not be any new roads constructed for this project.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

Crooked and Lincoln Creek Large Wood Habitat Placement Project

The proposed action will place multiple natural configurations of large wood debris structures in Lincoln and Crooked Creek to create complex habitat in the floodplains and within the active stream channels. The proposed action would help maintain and enhance watershed function, nutrient cycling, and species habitats. Work will take approximately 2 weeks in the fall of 2003. No new roads will be constructed.

Approximately five habitat structures composed of 3 to 5 unanchored whole trees will be placed in pinch points, meanders, and other areas where wood would naturally recruit in a 2.8 mile reach of Lincoln Creek and a 1.9 mile reach of Crooked Creek. Engelmann spruce or lodgepole pine, from along existing roads or from the edge of the forest will be selected so as not to create openings in the forest canopy. Approximately 25 whole trees in each project area will be uprooted and knocked over using a track hoe or similar heavy equipment adjacent to the road on the forest edge and then transported to the stream's edge. Heavy equipment will lift and place trees in a "jack-straw" configuration to mimic natural woody stream habitat structures.

Project Locations

1. Lincoln Creek is a tributary to the upper Roaring Fork River (T. 11 S., R. 83 W., Sections 14, 15 and 16) in Pitkin County, Colorado. The project reach is approximately 9500 feet in elevation and is located on WRNF approximately 12 miles southeast of the town of Aspen
2. Crooked Creek is a tributary of Lime Creek, which is a tributary to the Fryingpan River (T. 7 S., R. 83 W., sections 16, 17, 20 and 21) in Eagle County, Colorado. The project reach is at approximately 9200 feet in elevation on WRNF 17 miles south of the town of Eagle.

Conservation measures

- 1) Any active or inactive raptor nest found within proposed project areas will be protected. The extent of protection will be developed by a Forest or District Biologist and will involve consultation with Service, as appropriate. A no-disturbance buffer around any active nest found will be required from nest-site implementation to fledging (generally about March through July), if the activity will cause nesting failure or abandonment.
- 2) Mitigation measures for bird species: Trees used will be individually surveyed and marked by a Forest Biologist. Those green trees having visible cavities, nests, or adjacent to snags will not be removed for project structures. Shrub dominated meadows adjacent to the stream will be

surveyed prior to construction to identify any active or inactive nests. Nests will be marked and will be avoided by equipment that travels across meadows.

3) Mitigation measures for all mammal species: Trees used will be individually surveyed and marked by a Forest Biologist. Trees with evidence of large midden areas and trees that are burrowed at the roots will not be disturbed or removed. Shrub dominated meadows adjacent to the stream will be surveyed prior to construction to identify any active or inactive ground dens. Dens will be marked and will be avoided by equipment that travels across meadows.

4) No snags will be used or disturbed.

5) Any ground disturbed from uprooting trees or from moving trees to the stream with equipment will be reseeded with native seed, if deemed necessary by a Forest or District Biologist. All root holes created from knocking over trees will be filled with soil and forest duff.

6) Mitigation measures for all fish species: Fish will be avoided as much as possible when placing the wood in the active channel. If needed, fish will be moved prior to placing the wood in the selected sites using nets, electro-shocking equipment, and hauling tanks.

7) Sites of individual trees selected for instream wood habitat structures will be surveyed for plants prior to removal. If plants are observed, trees at another site will be selected.

Keystone Ski Resort's Little Bowl and Erickson Bowl Snowcoach Tours

Keystone Resort (KR) operates KSA for downhill skiing and non-motorized recreation activities on the WRNF in Summit County Colorado. KR proposes to modify the existing Ski Area Administrative Boundary within their existing 8,536-acre Special Use Permit (SUP) area and represents approximately 0.37 percent of the 2,286,400 acre WRNF. The modification would allow expansion of operations for winter daily roundtrip snowcoach tours for the purpose of providing skiing and sightseeing opportunities to two alpine glacier bowls (cirques), Little and Erickson Bowl located at the double summit of Keystone Mountain (12,408 feet). The proposed action would expand KR operations to include approximately 311 acres in the two bowls and 577 acres of undeveloped forested areas below the bowls. Because the cirques are windward facing and do not develop persistent snowfields tour operations are expected to be irregular and most likely unavailable at the start and end of the season when snow conditions are poor due to extreme winter weather conditions.

A snowcat (snowcoach) would transport up to 12 clients per tour up to 3 times daily (36 clients maximum) from the existing KSA Summit House, located a little more than midway up Keystone Mountain where most developed ski runs begin, to the upper portion of Little Bowl. The access route would utilize an existing Nordic trail/winter maintenance route. Skiers may return to developed ski area via the snowcat or use the de facto egress trail along the drainage bottom that gets packed out by backcountry skiers that presently ski the cirques.

Restrictions

1. Hours of operation: Touring operations would be conducted within the typical and historical hours of resort operation (daily and seasonally). No nighttime grooming or nighttime use of the cirques is proposed. The project area is and would remain open to hike-to skiing as conditions permit
2. There would be no structures, ground disturbance, or modifications to existing forest cover proposed under this alternative.
3. Appropriate signage and enforcement would be implemented to prevent out-of-bounds skiing into Jones Gulch along the northeastern edge of the revised administrative boundary.

Conservation measures

Measures are provided in the event that monitoring detects unauthorized backcountry skiing or other recreational activity into Jones Gulch, an important lynx landscape linkage.

1. Initiate consultation between the USFS and KR to develop measures that would make boundary management more effective and reduce backcountry skiing in Jones Gulch that originates from the ski area. Such measures may include, but not be limited to: (1) inform ski patrol and snowcoach operators that the public and all KR employees are prohibited from crossing the ski area boundary rope to enter Jones Gulch (except for emergencies), (2) developing appropriate penalties for violations, (3) post signs along the ski area administrative boundary paralleling Jones Gulch (e.g., “Closed, Wildlife Habitat Beyond, No Skiing/Riding in Jones Gulch”) to educate skiers and discourage backcountry use, (4) establish physical barriers (e.g., double rope along the ski area administrative boundary paralleling Jones Gulch) to further identify and discourage potential backcountry users from entering Jones Gulch, (5) development of other access control measures (e.g., barriers, signage, enforcement, monitoring), (6) trail maps identifying the closure, its purpose, and penalties for non-compliance, and (7) the USFS shall encourage KR and the Summit County Sheriff’s Department to develop an Memorandum of Understanding (MOU) to enforce wildlife closures.

2. The USFS Snow Ranger or authorized representative, will expand their survey area at KSA to include Jones Gulch for the purpose of monitoring unauthorized backcountry use, whose access originates from, and is facilitated by, KSA lifts. This monitoring may initially utilize transects along the ski area’s roped eastern periphery to determine access points and relative level of non-compliance. Such an approach would not contribute to potential disturbances in Jones Gulch as a result of monitoring.

3. In the event that the above periodic monitoring suggests an increased intensity or distribution of unauthorized backcountry use that could adversely affect lynx diurnal security habitat values, additional measures shall be undertaken to eliminate or reduce use levels to those compatible with effective security habitat contiguous to a large winter recreation complex that is important for landscape connectivity through one of a few continuously forested landscape linkages in

Summit County. Such additional measures to control unauthorized backcountry use, developed by the USFS in consultation with the Service, may include, but are not be limited to; 1) the implementation of a Forest Supervisor's closure along the eastern boundary of KSA's developed ski terrain. The closure would consist of a double-roped boundary with signs identifying the boundary, describing the purpose of the closure, and identifying penalties for non-compliance. KSA trail maps would identify the closure, its purpose, and penalties for non-compliance. 2) If needed, additional KR and USFS monitoring and enforcement of the closure.

Crooked Creek Complex Timber Sale

The Crooked Creek Timber Sale Project is a proposed commercial timber harvest on WRNF land in Eagle County, CO. The project lies on the west side of Forest Road 400 straddling Crooked Creek Pass in the headwaters of West Brush Creek on the Eagle Ranger District and the headwaters of Jakeman, Spring, Kuntz, and Lime Creeks on the Sopris Ranger District.

The action proposes a 554 acre commercial timber harvest on 29 units, associated road reconstruction and construction of temporary roads, and post-sale road decommissioning (i.e. scarification, seeding, water barring, and covering travelway with logging slash).

Silviculture Prescriptions:

1. 109 acres of clearcutting in lodgepole pine (16 acres) and mixed lodgepole/spruce-fir with lodgepole pine mostly dominant. Clearcut harvest would fall and remove all standing trees unless designated as leave trees. The objective of this treatment is to regenerate lodgepole pine.
2. 16.6 acres of coppice-cutting in aspen types (2.6 acres in aspen dominant-lodgepole pine subdominant forest and 14 acres of aspen with a subalpine fir/Engelmann spruce understory). Coppice harvest would fall and remove all standing trees unless designated as leave trees. Understory conifers would also be cut and left on site. The objective of this treatment is to regenerate aspen.
3. 5.2 acres of sanitation salvage harvest in mixed aspen/lodgepole/spruce-fir forest. Sanitation salvage harvest would remove about 20 to 30 percent of the basal area, targeting dead, dying, insect-infected, and diseased trees.
4. 205.5 acres of group shelterwood harvest (137.2 acres in spruce-fir dominant/lodgepole pine subdominant forest and the rest in spruce-fir). Group shelterwood cuts would reduce the overall basal area by about 20 to 30 percent. Up to 2-acre group fellings would be interspersed throughout the units. These openings would be no more than 300 feet in width, with irregular edges.
5. 218.1 acres of individual tree marking designed to maintain prey species for lynx post-harvesting (7 acres in lodgepole pine dominant/ spruce-fir subdominant forest, 185.5 acres in spruce-fir dominant/lodgepole pine subdominant forest, and 25.6 in spruce-fir

forest). Individual trees would be cut in between the group fellings, with marking guidelines targeting decadent lodgepole pine, diseased, lower quality, and suppressed trees. Some prescribed burning of large logging slash piles (e.g., “jack-pot” burning”) may occur, but the main method would be to lop and scatter the slash. Accumulations of large amounts of fuels in and around landings or yarding areas and along road construction/reconstruction areas would be piled for later burning.

Roads

Approximately 12.6 miles of existing USFS road will be reconstructed. About 1 mile of new temporary road will be constructed and decommissioned after use. Pre-haul maintenance would occur on approximately 9.9 miles of road. Dust abatement would be applied to about 2 miles of the Eagle/Thomasville Road near Sylvan Lake State Park prior to and during the timber-hauling period. A detailed description of the necessary roadwork by miles, area and individual roads is contained in the project record. The project record also documents which roads would be used to assess each timber unit.

Conservation measures

Logging activities will be halted during denning periods when an identified den site is within or in close proximity to the project area. Individual tree marking is implemented to maintain lynx winter foraging habitat and future potential denning habitat while providing for timber harvest. A wildlife biologist will participate with the timber crew in the marking of those units to assure that the lynx habitat mitigation objectives of the prescription are met. Individual tree marking units will have the following elements;

1. Maintain at least 40 percent crown cover in keeping with WRNF definitions of lynx winter foraging habitat in spruce/fir (USFS 2002a).
2. Retain trees with conifer foliage within 10 feet of the ground that would provide forage and hiding cover for hares during deep snow conditions.
3. Buffer areas around large squirrel middens by leaving all trees within 50 feet of the midden up to a density of 1 midden per acre. Where multiple middens exist in the same area, the priority will be on buffering the largest one within a 1-acre area.
4. Buffer areas around large piles of woody debris (greater than 14 logs 25 feet or more in length and 12 inches or more in diameter at the base in close proximity to each other) that would have potential value as hiding/denning cover for lynx by leaving all trees within 50 feet of the debris pile up to a density of 1 buffered debris pile per 5 acres. Where multiple debris piles exist in the same area, the priority will be on buffering the largest one within a 5 acre area.
5. Treated aspen units would be monitored by the wildlife staff about 3 years after treatment. If the regeneration of aspen by heavy browsing pressure is present, temporary fencing would be considered to promote aspen growth. Fencing would consist of “buck

and pole” fences that would allow passage of smaller mammals such as lynx.

6. Maintain snags and coarse woody debris in keeping with minimum forest-wide standards.
7. Logging activities should be halted during denning periods when an identified den site within or in close proximity to the project area.

Lodgepole Pine Rollerchopped Thinning Project

The proposed project area is located in the Sheep Creek area approximately 20 miles northwest of Saguache on the Saguache District of the USFS. The project site consists of 58 separate lodgepole treatment units ranging from 2 to 95 acres in size and ranging in elevation from 9,800 to 10,800 feet. The project area is a very small portion (265 acres or 1.13 percent) of a large lodgepole pine complex that covers approximately 23,400 acres. Of those 265 acres, 221 acres are within lynx habitat. The project area is a scattering of small rollerchopped areas that were previously doghair lodgepole pine. The stands were rollerchopped in 1983 in an effort to reinitiate biological and utilitarian productivity of some of the District’s lodgepole stands.

Since the 1983 treatment, areas have regenerated to a point where further treatment is necessary to prevent the stands from returning to their former condition. The objective for this initial thinning project is to open up tree spacing to 10 to 15 feet through removal of trees infected with gall rust to improve growth conditions, thereby delaying initiation of self-pruning for the next 15-20 years, prolonging the useful life of several of these rollerchopped stands of lodgepole pine on the Saguache District as snowshoe hare habitat.

A majority of the lodgepole in this area is roadless except for those roads that were constructed for the initial rollerchop treatments in 1983. The roads were then closed with gates following the completion of the project. These same roads will be used during thinning operations but will remain locked both during and following completion of the project.

It is anticipated that three weeks will be needed in late summer 2003, for mechanical treatment of the stands and an additional two and a half months for hand crews to finish removing the remaining trees immediately surrounding leave trees.

Million Fire Salvage Timber Sale

The USFS is proposing to salvage approximately 623 acres of timber damaged by the Million Fire in three separate units planned for implementation over the next several years. The Million Fire is located south of the town of South Fork within Rio Grande County. Four sub watersheds were involved in the burn and include Mill Creek, Church Creek, Willow Creek and Alamo (South Fork of the Rio Grande Composite). The proposed sales are located primarily within the Gerrard Gulch and West Fork Shaw Creek drainages on the Divide Ranger District. The legal description is T. 39 N., R. 4 E., portions of sections 5 through 8, 17 and 18; T. 39 N., R. 3 E., section 12. The treatment will include commercial sales and personal use firewood sales within

less than 10 percent of the burn perimeter on slopes of 40 percent or less.

The purpose of the proposed action is as follows:

1. To salvage sawtimber and provide other wood products to the local public from timber damaged by the Million Fire.
2. To take advantage of past investments by utilizing existing transportation systems.
3. To maintain or improve big game winter range habitat impacted by the fire by encouraging the regeneration of healthy plant communities with a variety of plants for food and cover in the burn area by ground scarification and by providing mulch (from slash) to the site.

The following parameters have been put on the sale;

- 1) All sales have existing road systems in place. No new roads will be constructed.
- 2) Only dead and dying trees will be removed. All green trees will remain.
- 3) A minimum of 2 to 3 snags per acre, have been marked as wildlife trees. The trees selected were among the largest and best suited as wildlife trees.
- 4) Leave trees will all be marked. All other trees less than 8 feet will remain.
- 5) In most cases, a minimum of 50 percent of the unit's biomass will be left remaining.
- 6) Roads which may potentially be used for winter logging, double as over-the-snow groomed trails, and will not result in an increase in compacted trails within the LAU.
- 7) Harvest activities are expected to begin as early as fall 2003 and continue throughout winter, spring and summer 2004. As the harvest is to be conducted in 3 units, it may take several years to complete and may be conducted year round until completion. Activities may be suspended periodically due to weather and soil moisture conditions.

The action would require reforestation within 5 years of the closure of the sale(s). Ponderosa pine, white fir and spruce will be replanted. Aspen is expected to regenerate naturally.

Avalanche Snowmobile Tours

The proposed action to re-authorize Avalanche Snowmobile Tours (AST) winter operations and includes all routes currently used by the operators. In addition to these groomed routes, the proposed action also includes continued use of 2 snowmobile "play meadows" and the location of base operations adjacent to County Road 3 including a trailer, portable toilets, grooming

equipment and snowmobiles. Reauthorization would allow a total 5 year increase from 1800 service days to 2100 service days by increasing double ridership only (no additional snowmobiles, only additional people per snowmobile).

Upon field review of Avalanche Tour's operating routes during the 2002 to 2003 operating season, the USFS mapped several additional routes being used by the operator that were not included on the original compaction maps. These additional routes total about 5 miles for a total operating mileage of 35 miles. Although such a discovery indicates an increase in snow compaction over what was mapped during the January 2002 mapping exercise, the increase is an artifact of omissions on the part of the USFS and not a result of increasing and expanding areas of use. The additional 5 miles of routes used by the operator all occur as short connector routes between parallel routes already included in the mapping. The routes follow existing summer roads and/or travel through recent cutting units. Although these routes accrue as additional mileage of snow compaction, they occur within and between mapped compaction routes and do not access any remote or inaccessible areas, nor do they bisect any large, contiguous blocks of denning habitat.

In addition to the 35 miles of groomed trail (8 feet wide) AST also use 2 snowmobile play areas within a meadow and a clear cut that total 25 acres of additional snow compaction. These play areas are currently part of the Sulphur District snow compaction baseline. The Williams Fork LAU contains a total of 140 miles of snow compaction as a result of winter activities.

White River Plateau Sheep Allotment

The WRNF initiated a landscape analysis of ongoing grazing activities on the forest. The change in scale from the standard allotment size perspective to a broader view provides an opportunity to manage resources at a level that considers the surrounding landscape patterns and habitat matrix. From the landscape analysis, the Forest developed the White River Plateau Sheep Allotment project to allow use of grazing allotments while protecting wildlife habitat.

The WRNF is proposing to revise grazing activities on 11 of the Forest's ongoing grazing allotments in Garfield County, Colorado. (Legal description: T. 2-5 S., R. 87-92 W.). The proposal would allow new grazing permits, renew old grazing permits and allow livestock driveways and revise boundaries on older allotments to create the new Sweetwater allotment.). For specifics on each allotment (i.e. acreage, disposition, etc.) please refer to the BA (Tables 1 and 2). For an illustration of allotment realignment and proposed grazing use, please refer to BA Figure 1. The proposed action will be consistent with the goals and objectives of the WRFS Land and Resource Management Plan (LRMP) (USFS 2002a).

Conservation measures

1. Grazing is to comply with (LRMP) 2002 Revision utilization standards and guidelines for woody species and riparian vegetation (No more than 50 percent of woody twigs allowed to be browsed per annum).

2. Utilization monitoring of key riparian and aspen areas in active allotments as part of the proposed action is to comply with LRMP 2002 Revision.
3. Manage livestock grazing to maintain or achieve mid-seral or later conditions in shrub-steppe habitats, riparian areas, and willow carrs.
4. Manage livestock use in post-fire and post-harvest created openings to assure successful regeneration of the shrub and tree components.
5. Manage livestock grazing in aspen stands to ensure sprouting and sprout survival sufficient to perpetuate the long-term viability of the clones.

Beaver Creek Trail

The proposed action is to authorize a special use permit for the construction of a 3-mile non-motorized (foot and horse only) trail for the purpose of providing access through private land that connects to a Forest trail that leads to public lands south of Tepee Park. The trail would overlap 1,484 ft. lynx denning, 985 ft. other suitable habitat, 0ft. winter foraging habitat, 12,070 private land, and 2,889 ft. lynx non-habitat. Located in Garfield, County, it is approximately 8 miles south-southwest of Rifle, Colorado. The legal description is: T. 7 S , R. 93 W , section 25 NE ¼, section 30 W ¼, section 31 W ½, and T. 8 S., R. 93 W., section 6 W¼, section 7 NW ¼, and T. 8 S., R. 94 W., section 12 NE ¼ (see BA vicinity map). From its north to south extent, elevations along the trail range approximately 8,600 to 10,400 feet. The trail will follow ⅛ to ¼ mile east of Beaver Creek and will connect at its southern end to the historic Battlement Trail Number 2160, which is designated for foot and horse travel and connects with other trails on the Mesa.

Site surveys determined that minimal vegetation clearing is needed for trail construction as the pathway (17,428 feet in length, 6 feet wide and 8 feet high) is generally in open woodlands where clearing would only involve digging the tread width. The trail will be constructed using hand tools and chainsaws. Standing timber and snags will be avoided. The total clearing would approximate 2.18 acres but may be less due to the project design to avoid vegetation removal by using a weaving trail design. Construction would begin in the fall of 2003, cease during winter, and continue in spring or summer of 2004, depending on weather conditions and previous year's work accomplishments.

The northern one third of the trail will traverse through relatively open stands of aspen with a mixed shrub understory on approximately 20 to 35 percent slopes. The southern two-thirds of the trail will weave through mature Engelmann spruce and subalpine fir habitat types on slopes ranging from about 40 to 60 percent.

Buffalo Mountain Trail Project

The proposed action is to reroute a middle section of an existing non-system trail that traverses a steep avalanche area in order to access the summit of Buffalo Mountain. The rerouting will

create a safer path for recreational users. The proposed project is located in Summit County, Colorado on the Dillon RD of the WRNF within the Eagles Nest Wilderness on the eastern flank of Buffalo Mountain between Salt Lick Gulch and South Willow Creek between 10,400 and 12,000 feet in elevation. The legal description includes portions of T. 5S, R. 78W, section 16.

The rerouted section of the trail would be constructed through approximately 1 mile of spruce-fir forest and 0.5 mile of talus slope. The footprint of the trail will be approximately one foot wide. Some vegetation will be cleared to a width of at least 4 feet and up to 8 feet high to allow for horses. Large trees will be avoided if possible and down logs will be moved aside or small sections will be cut out for the trail to pass through. The cut logs will not be removed from the project area.

Reclamation of the avalanched path area will be implemented over several years. Improvements include planting of the path with native plants. Water-bars will be constructed on the old slope to check further erosion.

Hummer Tours for the D&L Ranches

The project area is located on USFS lands and USFS roads north of the community of Vail on the Holy Cross Ranger District, WRNF, in Eagle County, Colorado. The project area lies between about 8,500 and 10,000 feet in elevation and is located in section 1, T. 5 S.; R. 81 W., and the eastern two-thirds of T. 4 S., R. 81 W.

The proposed action is to issue a Special Use Permit to D&L Ranches to allow winter operations to transport clients to the Piney River Ranch for evening dining. Piney River Ranch is a guest ranch leased by H&H Ranches that is located on Denver Water Board lands at Piney Lake. The Denver Water Board lands are within the WRNF and the only access is across USFS Road 700 from about one-half mile north of Vail to Piney Lake (about 11 miles). USFS Road 700 is one of several roads and trails in this area that are designated snowmobile routes that are groomed by a local snowmobile club on a regular basis.

The proposal is to allow D&L Ranches to use Hum V vehicles (Hummers) equipped with Mattracks (small snowcat track devices that replace the wheels and allow over-the-snow travel) to transport guests to Piney River Ranch. Each Hummer can carry from 9 to 11 passengers. For safety reasons these Hummers will be equipped with yellow or amber rotating beacons or strobe lights to warn any oncoming or overtaking snowmobiles. The lights are required since these vehicles are so large and take up more than ½ the trail width in places. Piney River Ranch has indicated that the maximum capacity for dinner service is 40 guests. Five vehicles would be used to transport the maximum number of guests.

The USFS would grant a maximum of 2,000 service days for this operation. Winter operations would be permitted for a 90-day winter season from about mid-December to mid-March. The frequency of the trips cannot be exactly determined. Using the maximum dinner guest capacity of the ranch for each trip, the allotted service days would result in a total of 50 days that the trips

would occur and the 50 days would be scattered over the 3-month season. Trips scheduled on a daily basis for the 3-month season would result in a maximum of 22 guests per trip and require only 2 or 3 Hummers per trip. At this time it is not possible to determine the actual frequency of the trips since the schedule would depend on consumer demand.

Transportation operations for the dinner tours would occur during nighttime hours. The proposal is to leave Vail about 4 p.m. and arrive at the ranch at about 5 p.m. with a departure time of about 9 p.m. and arrive back in Vail by 10 p.m. The trip from the Piney River Ranch to Vail would be after dark.

Grand Adventure Snowmobile Tours (GAST)

The USFS currently authorizes GAST to operate as snowmobile outfitters under a Special Use Permit (SUP) on the Sulphur Ranger District. Operations occur in the Rollins Road area, extend above treeline at Ptarmigan Point below Corona Pass, and travel north to a play area in Devil's Thumb Park. GAST currently operate in winter on 70 miles of USFS roads and trails, most of which are groomed by a snowmobile drag-groom or by a snowcat.

The proposed action is to reauthorize GAST winter operations and includes all routes currently used by the operator. In addition to these groomed routes, the proposed action also includes continued use of snowmobile "play meadows" in the Devil's Thumb Park, Ptarmigan Point and small meadows near Riflesight Notch and above South Fork Ranch Creek. The operator also places and maintains a portable toilet near Riflesight Notch during the winter, and provides a picnic table near the Ptarmigan Point play area. Reauthorization includes 9500 service days (no change from existing) with 7000 service days as single riders and an additional 2500 service days through double ridership.

The proposed action includes 70 miles of snow compaction along groomed routes (8 feet wide) and another 365 acres of snow compaction in 4 snowmobile play-areas. All of these routes and play areas are currently part of the Sulphur District snow compaction baseline and the proposed project will result in no net increase in snow compaction. GAST has not requested the addition of any new routes to their permitted system. There would be no nighttime tours, but some grooming is currently allowed at night. The proposed action would continue to allow nighttime grooming. Although the proposed action occurs on existing roads, the proposal will have no effect on the existing width or condition of those roads.

Hoop Creek Rehabilitation Project

The Berthoud Pass Ditch collects water from the west slope of the Continental Divide, routes water through a buried pipeline under the Berthoud Pass parking lot, and down into the Hoop Creek drainage on the east slope of the Continental Divide to be used ultimately by the cities of Northglenn and Golden. The ditch is used during the high water flow season and channels water from a creek that is part of the Fraser River drainage on the Sulphur Ranger District to Hoop Creek on the Clear Creek Ranger District, both Ranger Districts are within the ARNF. Water

flow is usually highest in April or May and continues flowing until September or October.

The objective of the proposed project is to rehabilitate Hoop Creek to mitigate impacts of increased water flow resulting from the discharge of west slope water into the creek, and to replace approximately 800 feet of buried pipeline under the Berthoud Pass parking lot in order to prevent line breakage in the old pipe.

The proposed rehabilitation of Hoop Creek involves the construction of a new outlet for the culvert outfall of the Berthoud Pass ditch at the upstream end of the creek and the placement of three, low rock weirs in the channel within the first 200 feet below the new outfall. A crane may be used to replace the culvert outfall outlet. The crane would operate near the Berthoud Pass parking lot where trees are sparse. A few trees in that area may be cut to allow room for the crane. This would be the only time and place that heavy equipment would be used for the project. Approximately 150 to 200 small diameter trees would be cut to provide logs to stabilize the banks in the channel below the ditch outlet. These trees would be selectively picked near the creek for easy hauling by the stabilization crew. Horses or mules may be used to help haul logs into place. Use of pack animals would be limited to places where the bank slopes are not too steep. Logs and rocks would be used as toe protection and weirs, which would provide grade control and would contribute to bank and side slope stability. After the logs and rocks are in place, the USFS would replant native plant seedlings to help further stabilize the slopes. It is anticipated that this project would be completed in two summers.

The pipeline replacement portion of the project would replace approximately 800 feet of the existing buried pipe (now about 100 years old) with a new pipe. The intent would be to replace the pipe before it collapses and causes an emergency situation resulting in serious resource damage. In 2000, an analysis was done to replace the first portion of the pipeline under the Berthoud Pass parking lot. That portion had collapsed and a replacement was required to provide adequate water to the cities of Northglenn and Golden. That project has been implemented and the cities are now asking to replace the last portion of the pipeline. Disturbance caused by the proposed pipeline replacement would occur mainly in the parking lot. There may be some disturbance to the area directly adjacent to the parking lot due to the use of heavy machinery to uncover, remove and replace the pipeline. The work would be expected to occur during the summer season and less than three acres of winter foraging habitat would be affected by the proposed project.

No additional volume of water is proposed to be transported from the west side of the Continental Divide to the east side as a result of the proposed pipeline replacement and Hoop Creek restoration.

Trailblazer Snowmobile Tours

The USFS currently authorizes Trailblazer Snowmobile Tours (TST) to operate as snowmobile outfitters under a Special Use Permit (SUP) on the Sulphur Ranger District within the ARNF. Operations extend from the Fraser area, west to the Williams Fork Valley. The TST currently

operates during winter on 120 miles of USFS roads and trails, most of which are groomed by a snowmobile drag-groom or by a snowcat. The proposed action includes 128 miles of snow compaction along groomed routes (8 feet wide) and another 470 acres of snow compaction in 12 snowmobile play-areas.

The proposed action to re-authorize TST winter operations includes all routes currently used by the operators, including the 2002 permitted addition of 2 winter areas already being used (snow compaction) by the public:

- Upper Beaver Creek: 3 additional miles on existing roads;
- Upper Muddy Creek: 5 additional miles on existing roads and some off-road areas.

In addition to these groomed routes, the proposed action also includes continued use of snowmobile “play meadows”, continued winter day use of Vasquez Mountain cabin; re-location of base operations on private property; and construction of a new winter day-use wall tent west of Church Park. Reauthorization would allow a 5 percent annual increase in service days (current authorization is for 6000 service days).

The USFS will not allow snowmobile play areas or other off-trail uses within patches of seedlings unless snow deposition is adequate to cover all the seedlings with at least a foot of snow. Limited nighttime use of the project area is already permitted. The proposed project would continue to allow limited nighttime trail use. Although the proposed action occurs on existing roads, the proposal will have no effect on the existing width or condition of those roads.

Mann Land Exchange

The USFS has entered into an agreement to initiate an exchange with Mr. James and Mrs. Lorraine Mann. The District has worked several years to develop a configuration that is in the public interest and meets Forest Plan standards and guidelines regarding land exchanges. The analysis area for the Mann Land Exchange is located on the Hahns Peak/Bears Ears Ranger District on the Routt National Forest in Routt County, east of Steamboat Springs, Colorado. The analysis area is located in the Middle Yampa Geographical Area and resides on the west side of the Continental Divide. The proposal is for Mr. Mann to convey two isolated parcels (two-40 acre blocks) to the United States. The parcels are located on the Rocky Peak Quadrangle in T. 7 N., R. 84 W., S. 18 SW¹/₄ NW¹/₄, lot 2 and T. 7 N., R. 84 W., S. 13 NE¹/₄ and SE¹/₄ both in the 6th P. M. In return the Forest Service would convey approximately 80 acres near Copper Ridge. The parcel that the Mann’s would like to obtain is located on the Rocky Peak Quadrangle in T. 7 N., R. 84 W., section 19, lots 5 and 6.

The 80 acres of private property proposed for transfer to USFS administration was surveyed and mapped; 20 acres as winter forage habitat and 60 acres as other habitat. The 80 acres of USFS land proposed for transfer to private ownership is mapped as other habitat (i.e., mature aspen). Neither land parcels are within landscape linkage areas.

Road Operations and Maintenance Activities on the Rio Grande National Forest

There are 2,154 miles of open-to-the-public Forest Development Roads on the RGNF. All road operations and maintenance activities occur exclusively on existing National Forest facilities. Road maintenance activities include a multitude of actions. The RGNF does not plow roads during winter. The table below lists potential actions that could occur during road operations and maintenance during spring, summer, and fall.

Seasonal activity is dependent upon associated ground conditions (e.g. snow cover, freezing temperatures) to either protect resources or to achieve specific desired maintenance results. Typical daily activities periods are 7:00 a.m. to 6:00 p.m.

Road Operations and Maintenance Activities on the RGNF

Safety signing during maintenance projects and daily work activities
Blading non-surfaced and aggregate roads. Restoring surface, crown, and super elevation of the traveled way.
Grading and reshaping road shoulders within the prism
Bringing road shoulders up to grade
Clean and reshape ditches using machinery and by hand
Spot surface repair using machinery, geotextiles and by hand
Surface restoration using machinery and by hand
Surface replacement
Cleaning of culverts, catchment basins, and leadout ditches with machines and by hand in dry ground conditions as needed and in variable conditions including live water. Lead out ditches drain to daylight. Material is deposited/scattered away from streams along edge of road or hauled to gently rolling uplands. Work by machine from the road surface.
Culvert replacement in dry ground conditions. Most work by machine parked upon road surface. Live water is not dammed nor is the existing grade changed. A machine may have to cross and even park in the stream on rare occasion.
Slide and slump repair of slopes using machinery, geotextiles, and by hand
Removal of hazard rock and debris using machinery, and by hand
Slide removal Includes loading, hauling, blading, and disposal/scattering of material.
Installation, repair, cleaning, and seeding of grade dips
Applying seed, fertilizer, and mulch by hand or machine
Placing erosion control structures and mats
Spot premix patching, seal cracks, chip seal, surface overlay, and fog seal of paved surfaces
Off-road equipment parking
Cattle guard installation, replacement, and repair in dry ground conditions. These are usually between allotments and on Forest/private property boundaries.
Cleaning cattle guards by hand and machine in dry ground conditions. Removing road and ditch erosion fines. Cattle guards may hold water for short periods. Some act as drainage structures.
Installation, repair, or replacement of gates within exiting access ROW.
Installation, repair, replacement, and cleaning of signs and hazard markers or delineators

Hauling materials to and from stockpiles and working the material at these locations
Dust abatement By spraying road surface with water, lignin, chlorides, or bituminous products.
Cleaning of culverts, catchment basins, and leadout ditches with machines and by hand in wet ground conditions. As needed and in variable conditions including live water. Lead out ditches drain to daylight. Material is deposited/scattered away from streams along edge of road or hauled to gently rolling uplands. Work by machine from the road surface.
Culvert replacement in wet ground conditions. Most work by machine parked upon road surface. Live water is not dammed nor is the existing grade changed. A machine may have to cross and even park in the stream on rare occasion.
Brush cutting and hazard tree removal and disposal/scattering by hand and machine
Minor bridge repair (e.g. railing, running surface, deck, and substructure). May include filling, compacting, and riprap around abutments and pilings. May need machinery in the stream course.
Removing loose/floating debris from stream channels to protect bridges, culverts, drainage structures, and their associated fill material (usually during high water). Most machine work done from road surface but may entail putting the machine along the edge of the water.
Removing stationary debris (willow and alders for example) from stream channels to protect bridges, culverts, drainage structures, and their associated fill material.
Cattle guard installation, replacement, and repair in wet ground conditions. These are usually between allotments and on Forest/private property boundaries.
Cleaning cattle guards by hand and machine in wet ground conditions. Removing road and ditch erosion fines. Cattle guards may hold water for short periods. Some act as drainage structures.
Use of explosives to clean, reshape, or spot repair, in areas such as: large slides, slumps, ditches, boulders, road sub-surface rock, and small-sized rock slides.

Soil, Watershed and Fisheries Conservation treatments on the Rio Grande National Forest and the San Luis Resource Area

The proposed action provides a programmatic analysis of the soil, watershed and fisheries conservation treatments routinely practiced on the RGNF and SLRA, thereby providing a consistent approach to analysis of effects. When projects are proposed, specialists would then conduct site-specific analysis using a checklist to assure that implementation is consistent with Plan goals and objectives, and that effects are consistent with those described. The following treatments are routine soils, watershed and fisheries conservation treatments that are typically implemented on the RGNF and SLRA.

Erosion and Sediment Control Practices

1. Use of erosion fabrics, mulches, hydromulches, tackifiers, fiber applications, sodding, fiber-filled wattles, plugging with native plants, weedfree straw and applications to stabilize soils from erosion.
2. Use of erosion control structures such as slash check dams, silt fence, mulch ridges, rock check dams, wire-bound rock check dams, single and double fence rock check dams are

structures designed to keep soils in place.

3. Use of sediment traps such as pit catchments or sediment collection basins.
4. Drainage structures, repairing, pulling, relocating or cleaning culverts, improving drainage spacing, waterbarring, drainage dips, creating filter strips.
5. Construct physical earth barriers to restrict uses in areas needing restoration.
6. Fencing areas in need of reclamation.
7. Head-cut control structures.
8. Structures to divert stream or ditch flow in order to prevent channel erosion or redirect flow while restoration work is occurring.
9. Minor stream restoration measures including vanes, jetties and grade control structures.
10. Planting of willows and other vegetation for restoration of riparian areas, stream banks or disturbed areas.

Reclamation or Restoration Practices

1. Adding soil amendments such as lime, fertilizer, organic matter, compost, manure, and topsoil to soils for enhanced productivity.
2. Bioremediation, which is the use of concentrated livestock to reclaim areas impoverished of topsoil.
3. Seeding native plant materials, if available, and when technically feasible. Use certified weed-free seed materials. Use local genotypes when available.
4. Planting trees or shrubs to stabilize soils and watersheds.
5. Using mechanical aerator on compacted soils. This is a farm implement that is drawn by tractor. Its knife-like teeth penetrate compacted soils, aerate the soil, without destroying the sod surface.
6. Rip or subsoil densely compacted layers to restore soil porosity, infiltration and productivity.

Streambank Stabilization and Aquatic Habitat Practices

1. Use of rip rap or other structures to stabilize streambanks only where necessary. Use natural reclamation and stabilization in other instances.
2. Use suction dredging to remove sediments from streams.

3. Construction of “soft “structures, using bio-engineering approaches. This technique includes the use of soft erosion control materials like straw wattles in combination with willow plantings.
4. Construct headgates, drop structures or other structures that create or enhance wetlands so long as they are compatible with fisheries goals.

Fisheries Improvements

1. Use rock or structural placements into stream systems to improve fish habitat.
2. Use logs, stumps and other structures to naturally restore fish habitat.
3. Use fencing to enhance fisheries habitat.
4. Remove unnecessary structures where they cause damages to streams or soils.
5. Construct or re-construct fish migration barriers for use in restoring native fish populations.
6. Remove fish migration barriers when they are not desired.
7. Develop spawning habitat through spawning channel development and placement of gravels.
8. Enhance pool habitat through reconstruction of stream channel (restore meander pattern) or pool excavation.

Soil, watershed and fisheries conservation treatments are generally applied to small areas, locations, and specific streams. Project size may be as small as a few acres up to several hundred acres in size. In many cases, the treatments are applied to areas that are already disturbed to some extent, so the treatments help restore damaged areas. Implementation of these treatments may last from a few days to a few months, depending on the combination of treatments needed, weather, and other factors. Actions may occur in combination as well. Treatments are generally focused in watersheds of need.

Treatment Design Features are, in effect, traditional specific mitigation measures for other projects on the RGNF. The conservation treatments are consistent with the RGNF Forest Plan forest-wide and management area prescription standards and guidelines and Watershed Conservation Practices Handbook (FSH 2509.25) direction to restore and protect watersheds and fisheries. The conservation treatments described are traditional measures of the BLM through direction of the Standards for Public Land Health (1997) RMP amendments.

A key design feature for this programmatic approach is to use Project-level Checklists (on-the-ground) specifically developed to avoid or reduce potential impacts to federally-listed species, and to achieve treatment goals in a timely manner. Some treatments (i.e., fencing, culverts, and

mechanical aeration) are not appropriate in designated wilderness areas. Except for Canada lynx, those projects that are consistent with the BA and documented through the Project Checklist to have determinations of “no effect”, “may affect, not likely to adversely affect”, or “not likely to jeopardize the continued existence of a species”, may proceed at the project level. Projects with determinations other than “no effect” to Canada lynx will require formal consultation with the Service. An annual review of completed projects will be conducted.

Lost Basin Ditch Renovation Project

The Lost Basin Ditch (LBD) is approximately four miles south-southeast of Carbondale Colorado, in Pitkin County within the Crystal East LAU. The ditch headgate is located at an elevation of 10,000 feet on the WRNF within the Maroon Bells - Snowmass Wilderness. The ditch conveys water from the base of Mt. Sopris through a combination of pipeline, wooden flume, and open ditch to its lowest terminus at approximately 8,000 feet on the private lands of Lost Basin Ranch. The ditch is part of a historic irrigation system that dates back to 1889. To comply with Colorado State law (CRS, 37-84-101 *et seq.*), ditch owners are required to conduct maintenance to their water conveyances structures. The Lost Basin Ditch is in need of repair for numerous ditch leaks and broken pipes.

The project area consists of a linear right-of-way (ROW) composed of 2.1 acres of predominantly mature forests of mixed conifer and aspen. Starting approximately 100 feet below the Maroon Bells-Snowmass Wilderness boundary and extending down to Lost Basin Ranch property at the upper end of the Bane Meadow, approximately 7,658 feet of the existing pipe and ditch segments would be replaced with new, 10 inch diameter steel pipe. Approximately 6,124 feet (80 percent) of the pipe to be replaced is located on WRNF land and 1,551 feet (20 percent) is located on private land belonging to LB Ranch. In addition, the existing “splitter box” that diverts water to different fields will be relocated from WRNF lands down to private lands within LB Ranch.

To protect the newly replaced pipe from damage and for esthetics reasons, approximately 80 percent of the pipeline will be buried. The other 20 percent will be placed “on-grade” due to slope gradient and other on-site conditions. With the exception of connecting the lateral, existing ditch that runs northwest from the existing splitter to the proposed splitter, no renovation work is required on the lateral ditch.

Cutting and removal of some timber would be needed within the 2.1 acres of the project area where trees have encroached upon the ROW to facilitate pipeline replacement. Based on the following reasons, it is expected that tree removal will impact less than the 2.1 acres; much of the ROW was historically cleared of trees, the pipeline would follow the existing ditch that does not contain trees, portions of the pipeline would be on grade (i.e., not buried), equipment used to install the pipe could maneuver around individual trees, and the pipeline would use angled joints to avoid trees and tree clumps. However, for purposes of this document, the 2.1 acre timber cut is evaluated to ascertain the maximum possible project impacts to lynx.

Water Depletion

In accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation Regulations (50 CFR 402), the Service transmits this correspondence to serve as the final biological opinion for the Lost Basin Ditch Renovation Project.

The Lost Basin Ditch water right was decreed in Civil Action No. 455 on February 9, 1892, for 6.2 cfs. Ditch work began on June 27, 1889 and water deliveries commenced soon thereafter and continue to the present. Please refer to the project description above for more detail on the project's 339 acre-feet water depletion.

A Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin was initiated on January 22, 1988. The Recovery Program was intended to be the reasonable and prudent alternative for individual projects to avoid the likelihood of jeopardy to the endangered fishes from depletions from the Upper Colorado River Basin. In order to further define and clarify the process in the Recovery Program, a section 7 agreement was implemented on October 15, 1993, by the Recovery Program participants. Incorporated into this agreement is a Recovery Implementation Program Recovery Action Plan (RIPRAP) that identifies actions currently believed to be required to recover the endangered fishes in the most expeditious manner.

On December 20, 1999, the Service issued a final 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. The Service determined that projects that fit under the umbrella of the Colorado River PBO would avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletion impacts. The Colorado River PBO states that in order for actions to fall within the umbrella of the PBO and rely on the Recovery Implementation Program Recovery Action Plan to offset its depletion, the following criteria must be met.

1. A Recovery Agreement must be offered and signed prior to conclusion of section 7 consultation.
2. A fee to fund recovery actions will be submitted as described in the proposed action for new depletion projects greater than 100 acre-feet/year. The 2003 fee is \$15.68 per acre-foot and is adjusted each year for inflation.
3. Reinitiation stipulations will be included in all individual consultations under the umbrella of this programmatic.
4. The Service and project proponents will request that discretionary Federal control be retained for all consultations under this programmatic.

The Recovery Agreement was signed by the Service and the Water User. The depletions associated with this project are under 100 acre-feet/year, therefore, the project sponsor does not

make a contribution to fund recovery actions. The WRNF has agreed to condition its approval documents to retain jurisdiction should section 7 consultation need to be reinitiated. Therefore, the Service concludes that the subject project meets the criteria to rely on the Recovery Implementation Program Recovery Action Plan to offset depletion impacts and is not likely to jeopardize the continued existence of the species and is not likely to destroy or adversely modify designated critical habitat.

San Juan-Rio Grande National Forests Wilderness Management Direction Amendments

The recent 1998 Wilderness Decision Notice Amending the LRMPs of the SJNF and the RGNF affects two congressionally, designated Wilderness areas, the Weminuche Wilderness Area (499,771 acres on the SJNF and RGNF), the South San Juan Wilderness Area (164,563 acres on the SJNF RGNF) as well as the Piedra Area (60,387 acres on the SJNF) with elevations ranging from 7,750 to 14,083 feet. These areas are to be managed for its wilderness character and potential for inclusion in the National Wilderness Preservation System. The SJNF and the RGNF are designated as the lead Forests for implementing management direction for the Weminuche and South San Juan Wilderness Areas, and the Piedra Area.

Activities associated with wilderness predominately occur as forest trail systems, designated dispersed campsites, and destination points (lakes, peaks). Specific duration of summer to fall activities occur during spring (May) through fall (November), and include;

- non-commercial and commercial
- hiking
- day-use horse- rides and fishing trips
- day-use fishing trips (non-horse)
- overnight camp trips
- hunting season base and drop camps, pack-in service, and big game pack-out service

Specific duration of activities associated with winter occurs during December through March and include;

- non-commercial and commercial
- Nordic skiing
- snowshoeing
- mountaineering
- mountain lion hunting

The 1998 decision amended the SJNF and the RGNF LRMPs as follows;

- Adds wilderness management goals to LRMP goals.
- Changes Management Area definitions and locations.
- Modifies Management Area Prescriptions.
- Adds wilderness management standards and guidelines for management areas forest-wide.
- Defines thresholds and possible management actions within wilderness when thresholds

are exceeded.

-Adds wilderness monitoring requirements.

-Adds wilderness management area map to LRMPs.

Specifically, the proposed amendments would improve wilderness qualities while maintaining recreation opportunities. To allow for the improvement of wilderness resource conditions, there would be an increase in the number of acres in the Pristine and Primitive Management Areas (MAs). Within the MAs, the following management practices would be implemented:

Set standards and guidelines for recreation use which, when implemented, may result in a decrease in existing use in areas where standards are exceeded.

Define and relocate (spatially) Wilderness MAs for the Weminuche and South San Juan Wilderness Areas and the Piedra Area.

Describe specific wilderness management direction for all wilderness areas on the SJNF and the RGNF. Direction for MAs will be amended to incorporate new standards and guidelines that better measure, monitor, and maintain wilderness conditions.

Use MA locations for the La Garita and Sangre de Cristo Wilderness that were defined in the recently approved RGNF Land Management Plan. For the Lizard Head Wilderness, the current Forest Plan MA locations will remain the same; however, the definitions will be changed to the new equivalents, which are described in the Environmental Assessment.

Define a subclass of the Pristine MA as 1.11a. This subclass defines some high elevation basins within the Weminuche Wilderness that are destination areas and the user-defined, non-system travel corridors leading to them. These areas will be managed as Pristine MAs, however to allow for higher use levels, the MA crowding standards are modified.

Reduce the total number of people allowed within a group to fifteen for all Wilderness Areas on the SJNF and the RGNF and the Piedra Area, except the Piedra River, however, the total number of people and stock within a group will remain consistent with current direction of twenty-five people and/or stock. For river-running groups on the Piedra River the group size will be a maximum of twenty people.

The USFS will institute new camping restrictions prohibiting overnight camping in the Twin Lakes Basin (near Needle Creek Basin in Weminuche Wilderness) and camping only in designated sites at Rainbow Hot Springs (Weminuche Wilderness) and Little Emerald and Emerald Lakes (Weminuche Wilderness). Use of campfires will be prohibited in Vestal Basin (Weminuche Wilderness). In addition, the USFS will institute new regulations prohibiting camping within 100 feet of water sources unless exceptions are justified by terrain or specific design. Dogs will be required to be under voice command and control at all times.

WillSource Gas Exploration

WillSource Enterprise, LLC (WillSource) is proposing to drill three gas exploration wells (Numbers 1-17, 1-18, and 1-20) within the Divide Creek LAU. The project area is located in Mesa County, Colorado on the WRNF. Well site legal descriptions are as follows:

Legal descriptions of proposed project gas well site locations.

Well	Well Name	Township	Range	Section	Quarter
#1-17	Northeast Haystack	9 South	90 West	17	Northwest
#1-18	Little Rock	9 South	90 West	18	Northwest
#1-20	Little Beaver	9 South	90 West	20	Northeast

For map locations, project schedules, and additional details of the following activities, please refer to the WillSource BA. The proposed actions will be inspected and approved by a WRNF biologist to ensure compliance with mitigation measures and design criteria.

Road Access

During the drilling phase, well sites will be accessed via existing county and WRNF roads. Traffic to the sites would include a truck-mounted drill rig, various equipment and pipe trucks, three crew shuttles per day, and approximately 4 water truck deliveries per day.

Approximately 6 miles of roadway improvements are proposed to existing portions of FSR 800, FSR 800.2A, FSR 800.2B, and FSR 808.1. Modification of vegetation within the roadway using selective, partial tree and shrub clearing would be necessary along narrow corners and pull-outs and to allow oversized equipment passing room. In some areas, tree limb removal may be needed further out from the roadway for safety reasons.

Successful wells are anticipated to produce for 10 to 15 years and would require ongoing service and maintenance throughout that period. The operator would access the well sites approximately 3 times per week and as needed to maintain and repair pipeline segments. A truck would be used for access during summer, and an ATV, snowcat, or snowmobile would be used during winter. A gate on FSR 800.2A would be maintained and kept closed at all times to prevent public access.

Well Pad Construction

Three well pads of less than two acres each would be constructed for gas exploration. Drilling activities would be completed at each well site in about 4 to 6 weeks. Vegetation would be removed and the site leveled using cut and fill construction techniques.

Drilling

Approximately 10 to 15 days of drilling would be required at each site. A closed loop drill system will be used and would entail truck-hauling water to the site. Estimated water use for

drilling is 0.25 acre-feet per site for a total of 0.75 acre-feet for the entire project. Spent drilling mud/water would be hauled off-site to supplement water at other drill rigs operating in the vicinity. If no other rigs in the region need the water, the mud/water would be hauled to a commercial disposal site south of DeBeque, Colorado.

Pipelines

Hand crews would install approximately 6 miles of 4½-inch surface-pipeline running parallel to the shoulder of access roads to transport gas from each well to existing pipelines. The pipeline identified as Segment G would follow an abandoned road that has an existing pathway width of 2 to 4 feet. Short segments of pipelines at road crossings or access points to dispersed campsites would be buried along roads.

The installation of the pipeline may require sawing 1 to 2 foot log sections and trampling of understory vegetation that occurs in the pipeline pathway. Any cut wood debris would be left on site. Where clearing is needed, only selected trees greater than five inches in diameter at breast height will be cut with exceptions at sharp curves where trees obscuring view may be removed for safety reasons. Minor additional clearing may be necessary for over-snow travel to access and repair pipeline segments on an as-needed basis. At creek crossings, pipelines would span drainages above the normal flood elevation. Span supports may be required in some circumstances, but would involve minor installation of support pipe.

Reclamation

Reclamation of interim and completed project sites would follow WRNF direction as soon as practicable.

Design Criteria and Mitigation Measures

A number of avoidance and mitigation measures have been incorporated into the project design to ensure consistency with the WRNF Plan (USFS 2002a) and to minimize potential impacts to environmental resources, including threatened and endangered species.

Water Depletion

Water use for project drilling would result in minor stream depletions that would affect downstream aquatic species. In accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation Regulations (50 CFR 402), the Fish and Wildlife Service transmits this correspondence to serve as the final biological opinion for the Willsource Gas Exploration Wells Number 1-17, 1-18 and 1-20.

Please refer to the “Drilling” section of the project description above for more detail on the project’s 0.75 acre-feet water depletion.

A Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin was initiated on January 22, 1988. The Recovery Program was intended to be the reasonable and prudent alternative for individual projects to avoid the likelihood of jeopardy to the endangered fishes from depletions from the Upper Colorado River Basin. In order to further define and clarify the process in the Recovery Program, a section 7 agreement was implemented

on October 15, 1993, by the Recovery Program participants. Incorporated into this agreement is a Recovery Implementation Program Recovery Action Plan (RIPRAP) that identifies actions currently believed to be required to recover the endangered fishes in the most expeditious manner.

On December 20, 1999, the Service issued a final 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. The Service has determined that projects that fit under the umbrella of the Colorado River PBO would avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletion impacts. The Colorado River PBO states that in order for actions to fall within the umbrella of the PBO and rely on the Recovery Implementation Program Recovery Action Plan to offset its depletion, the following criteria must be met.

1. A Recovery Agreement must be offered and signed prior to conclusion of section 7 consultation.
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3. Reinitiation stipulations will be included in all individual consultations under the umbrella of this programmatic.
4. The Service and project proponents will request that discretionary Federal control be retained for all consultations under this programmatic.

The Recovery Agreement was signed by the Service and the Water User. The depletions associated with this project are under 100 acre-feet/year, therefore, the project sponsor does not make a contribution to fund recovery actions. The WRNF has agreed to condition its approval documents to retain jurisdiction should section 7 consultation need to be reinitiated. Therefore, the Service concludes that the subject project meets the criteria to rely on the Recovery Implementation Program Recovery Action Plan to offset depletion impacts and is not likely to jeopardize the continued existence of the species and is not likely to destroy or adversely modify designated critical habitat.

Vail Valley Defensible Space Treatments

The project is located in and around the towns of Vail and Minturn and communities of Eagle-Vail and Intermountain. Fuels treatments projects are proposed around residential structures in various areas of the aforementioned communities. The proposed areas of work are in T. 5 S, R. 80 W., section 12; and T. 5 S., R. 81 W., sections 14, 18, 19, 22, and 35 in Eagle County, Colorado.

This project was initiated in response to concerns of citizens in the local communities about fire risks and the upcoming requirements by insurance companies to mitigate the fire risks around homes and buildings in wooded settings. During the last several years large catastrophic fires have burned several hundred homes in the western United States. In response, the Colorado State Forest (CSFS) and the Service has encouraged private homeowners thru the “Fire Wise” program to be proactive in creating defensible space around their property. Concerns about the high fire hazard in this area due to a mountain pine beetle epidemic that has prompted the communities, Fire Departments/Fire Districts in the Vail area and the USFS to develop a Wildland Urban Interface Defensible Space Plan.

The proposed project treatment guidelines are in a publication from Colorado State University (CSU) Cooperative Extension Natural Resource Series “Creating Wildfire-Defensible Zones” (publication no. 6.302). The guidelines suggest 3 zones of treatment. Zone 1 is within 15 feet of structures and would be cleared of all vegetation. Zone 2 would be out to 125 feet from the structure and would be thinned to a minimum distance 10 feet between crowns and all standing dead and down would be cleared. Low hanging branches and shrubs would also be pruned. Zone 3 would be beyond 125 from the structure and would be less thinning and pruning but would have dead trees and logs removed. The USFS lands affected by this project are in Zones 2 and 3, primarily Zone 3. The Defensible Space Plan calls for treatments within 200 feet of structures.

Various areas of the project on USFS lands will have different treatments that range from clearing down and standing dead to thinning of green trees to pruning lower branches.

The wildlife recommendations in the WRNF Plan Revision (2002) to retain snags and downed woody debris will be recommended in Zone 3. Those areas on the forest edge or on the edge of a

larger block of forest will not be required to implement these recommendations if it is determined that it would compromise the effectiveness of the defensible zone.

Spring Creek Salvage Harvest

The proposed project is located in Garfield County, approximately seven miles north of New Castle, Colorado. The legal description is T. 4 S., R. 90 W., sections 4, 9, 16, 17, 19, and 20. The project area encompasses 1,830 acres of USFS and Service land at elevations of 9000 to 10,000 feet. The USFS proposes to implement forest management activities in response to the Spring Creek Fire of 2002 on the Rifle Ranger District of the White River National Forest. Those activities are; salvage harvest approximately 665 acres of fire killed, beetle killed, and beetle infested Engelmann spruce and Douglas fir trees in nine individual cutting units in the Clinetop Area. In addition, the USFS will reforest approximately 170 acres of the burned area by hand planting Engelmann spruce trees.

Salvage harvesting would be done by ground-based equipment: either fully mechanized feller bunchers or manual chainsaw felling, with removal by tire or tracked skidders. Logging

activities (i.e., cutting, felling, yarding, temporary road construction, road reconstruction, road decommissioning, and road maintenance) would be carried out over the course of one to two field seasons from June 21 to December 1.

To access the timber, no new system roads would be constructed. However, other types of roadwork would be needed.

List of Proposed Action

Action	Units
Total acres salvage harvested	665
Total timber volume harvested (Million Board Feet)	1.1
Miles of new system road constructed	0
Miles of temporary road constructed & decommissioned	1.3
Miles of existing non-system roads utilized as temporary roads & decommissioned	1.9
Miles of existing system roads utilized as temporary roads & decommissioned	0.2
Miles of existing system roads reconstructed	1.4
Miles of existing system roads decommissioned after reconstruction	0.7
Miles of existing system roads realigned	0.2
Miles of by-passed roads (due to realignment) decommissioned	0.2
Miles of existing system road maintenance (FSR 603 & FSR 651)	12.5
Estimated number of loaded log truck trips	180
Total acres planted with Engelmann spruce seedlings	170

Temporary Road: A road not intended for permanent use. The road is closed through decommissioning, locking, and/or slashing closed when road is no longer needed.

System Road: A vehicle travel-way more than 50 inches wide. A road constructed and maintained for long-term highway vehicle use.

Non-System Road: A road that is not constructed, maintained, or intended for long term highway vehicle use, such as roads built for temporary access and other remnants of past short-term use roads associated with fire suppression, timber harvest, and oil and gas or mineral activities, as well as travel-ways resulting from off-road vehicle use.

Approximately 1.3 miles of temporary road would be constructed, 1.9 miles of existing non-system roads would be utilized as temporary roads, and 0.2 miles of existing system roads would be utilized as temporary roads. After harvest operations all these roads would be rehabilitated as practical. Approximately 1.4 miles of existing system roads would be reconstructed with 0.7 miles decommissioned after harvesting. A segment of the 1.4 miles of reconstruction would involve 0.2 miles of realignment followed by decommissioning of the by-passed segment. Road maintenance work (i.e., blading of the road, road ditch cleaning, and culvert cleaning) would be performed on 11.3 miles of the Clinetop Road (FSR 603) and 1.2 miles of FSR 651.

The log truck haul route from the project area would follow the Clinetop Road (FSR 603) southwest for 14.5 miles to the Main Elk Creek Bridge, then south on the Main Elk Creek Road (City. Rd. 243) for five miles, then southeast on County Rd. 245 for 2.9 miles to the town of New Castle, and then east on Castle Valley Boulevard for 2.3 miles to exit 105 of US Interstate 70.

Grand Mesa Travel Management

The Grand Valley Ranger District, of the Grand Mesa, Uncompahgre and Gunnison National Forests (GMUG), is conducting an analysis of the potential opening of 102 miles of existing non-motorized routes and 47 miles of motorized routes currently closed to off-highway-vehicle (OHV) use. This is being done as a result of a 1994 “Grand Mesa Travel Management Settlement Agreement” signed by the Forest Supervisor and appellants. The BA documents the analysis conducted to determine whether the preferred alternative of opening up 11.60 miles of non-motorized routes and 22.07 miles of full size vehicle routes to OHV use will affect any proposed, candidate, threatened, or endangered plant or animal species. The environmental assessment considered 102 miles of non-motorized routes and 47 miles of additional routes already open to full-sized vehicles.

The 14 routes analyzed in this BO are in forested stands currently providing suitable habitat for lynx. These routes have a combined total of 33.67 miles. Twenty-two miles of these routes that would be opened to OHVs are already opened to full-sized vehicles. To comply with the LCAS guidelines, lynx analysis units (LAU) with motorized route densities greater than 2-miles per square mile could be identified for seasonal restrictions or reclamation of routes. No areas on the Grand Mesa National Forest affected by this decision have been identified as having road densities greater than 2 miles of road per square mile. The 14 routes proposed for opening are described below;

1. #04- Point Creek- This route does not lie within any LAU's.
2. #110 Dirty George- This route is within the Island Lake LAU but does not traverse suitable lynx habitat.
3. #25 –Trout Lake (0.258 mile), #63 Granby (1.32 miles), and #115.1B Granby Res. (0.46 mile) will increase the open road density within the Island Lake LAU from 1.9 to 2 miles per section which is within the recommended allowable as outlined in the Lynx Conservation Assessment and Strategy (LCAS).
4. #27-Carpenter Lake (0.68 mile) and #31 Youngs Creek Ditch (1.25 miles) routes will increase the open road density in the Cottonwood Lakes LAU from 1.36 to 1.38 miles of open road per section.
5. #30- Bonita Lake (0.64 Mile) will increase the open road density in the Green Mountain

LAU from 1.26 to 1.27 miles per square mile.

6. #70 Lower Burn will increase the open road density in the Ruth Mountain LAU from 1.39 to 1.45 miles of open road per square mile.
7. #121 Trickle Park, #125 Surface Creek, #126 Leon Lake, and #129 Hay Park routes are currently open to full-sized vehicles and will not increase the miles of open road per section in any of these areas.
8. #268 Owens (0.25 mile) will not change the open road density in the Ruth Mountain LAU.

There are 5 routes proposed for opening that are currently closed to “motorized vehicles” (i.e., trucks and motorcycles) that are within lynx habitat; #25 Trout Lake (0.26 miles), #27 Carpenter Lake (0.68 miles), #30 Bonita Lake (0.64 mile), #63 Granby (1.32 mile), and #115.1 B Granby Reservoir (0.46 miles).

It is important to note that “motorized vehicles” does not include snowmobiles. Currently, the entire GMNF is open to snowmobile use. In the past, these five trails have consistently received periodic winter use by snowmobilers. The Amended Land and Resource Management Plan of 1991 [(0154) 7A] states “prohibit motorized vehicle use off USFS roads and trails (except snowmobiles operating on snow) in alpine and other ecosystems, where needed to protect soils, vegetation, or specific wildlife habitat. Dispersed winter recreation opportunities should provide for increased cross country ski and snowmobile trails, trailheads, sanitation facilities, and information signing”.

The Decision Notice and Finding of No Significant Impact for the Grand Mesa Forest Travel Plan Revision, December 1994 states that Motorized travel on the Grand Mesa National Forest will be restricted to designated roads and trails except for following instances;

1. Where developed parking sites are not provided (for camping, trailheads, fuelwood gathering) off road travel to suitable parking sites within 300 feet of the roadway is allowed, unless expressly prohibited.
2. Approximately 87,100 acres will continue to be closed yearlong to all motorized vehicles (Includes the Alkali, Kannah Creek, Whitewater Basin. These watersheds are Grand Junction’s water supply.
3. Snowmobile travel on snow will not be restricted over most of the Forest, with the following exceptions. Note: all exceptions are outside the area of these roads considered in the Biological Assessment. At the present time the Forest Plan allows winter use throughout the Grand Mesa except on the areas mentioned.

Listed below are the 5 routes that may affect lynx and that were addressed in the biological assessment;

The **#25 Trout Lake**- .26 mile and **#30 Bonita Lake**-0.64 mile Routes lie within Recreation Compartment #2 Sunlight to Powderhorn. This area includes lands within the Sunlight to Powderhorn Snowmobile Trail Corridor on the GMNF. Also included are Forest System lands south of the S-P corridor and between the Old Grand Mesa Road (#123) and the Surface Creek Road (Rd #125). The Recreation Allocation for this area has a maximum of 2,582 service days that are available for additional authorization within this compartment.

#27 Carpenter Lake- This 0.68 mile Route lies within Recreation Compartment #4 Collbran. This area includes GMNF lands located on the north side of the Grand Mesa between the Cottonwood Lakes Area and the Grand Mesa /White River National Forest Boundary. The Recreation Allocation for this area has a maximum of 842 service days that are available for additional authorization within this compartment.

#63 Granby- 1.32 mile and **#115.1 B Granby Reservoir- 0.46 mile**. These routes lay within Recreation Compartment #1 Lands End. This area includes Forest System Lands West of Hwy 65 including the Granby Lake Area, Flowing Park Area and the Lands End Area between Kannah Creek Basin and the north rim of the Grand Mesa. The Recreation Allocation for this area has a maximum of 1,403 service days that are available for additional authorization within this compartment.

Present road density with their respective LAU.

Road Considered	LAU Name	Total Miles	Miles in Lynx Denning Habitat	Miles in Foraging Habitat	Miles in Other Lynx Habitat	Miles in Unsuitable Lynx Habitat	Net miles of roads in lynx habitat
#04 Point Creek		2.26	0	0	0	2.26	0
#25 Trout Lake (121.4B)	Island Lake	0.258	0.258	0	0	0	0.258
#27 Carpenter Lake (279.1H1)	Cottonwood Lakes	0.68	0.15	.293	0	0.25	0.43
#30 Bonita Lake (719.2A)	Green Mtn.	0.64	0.175	0	0	0.465	0.175
#31 Youngs Ditch (279.1A)	Flat Tops	1.25	.607	0	.07	0.573	0.677
#110 Dirty George	Island Lake	1.14	0	0	0	0	0

#63 Granby (115A)	Island Lake	1.32	.575	.506	0	0.195	1.125
#70 Lower Burn (265.3A)	Ruth Mtn.	3.59	3.0	.259	0	0	3.59
#115.1B Granby Res	Island Lake	0.46	0.265	0	0	0.197	0.263
#121 Trickle Park	Island Lk. & Green Mtn.	12.3	8.61	0	0	3.69	0
#125 Surface Cr.	Green Mtn.	5.0	0.3 (est.)	0.2 (est.)	0	4.5 (est.)	0
#126 Leon Lake	Green Mtn	2.28	0.03	1.0	0.10	1.68	0
#129 Hay Park	Island Lk. & Green Mtn.	2.24	1.8 (est.)	0	0	0.44 (est.)	0
#268 Owens	Ruth Mountain	0.25	0	0.08 (east.)	0	0.17 (est.)	0
TOTALS	All LAU's	33.67	15.74	2.34	0.17	12.16	6.51

Snow compaction

The LCAS Standard for snow compaction states that there should be “*no net increase in designated or groomed over-the-snow routes*”. Designated over-the-snow routes and designated snowmobile play areas: This term applies to over-the-snow routes (i.e., trails) and snowmobile play areas that are “designated”. Meaning, these routes and/or play areas are specifically marked on a map, described in the resource or forest plan, described in the travel plan, or a signed action. As stated by the GMNF in the Addendum to the 100 Mile BA, this action will not *designate* or *groom* those routes that lie within lynx winter forage habitat. However, designation of these routes for winter use may be considered in future USFS actions (e.g., Winter Use Management Plan).

Ward Lake Vegetation Management Plan

The USFS is proposing two vegetation management projects in the Tongue-Currant watershed on the Grand Mesa National Forest. The Ward Lake Fuels Reduction Project (fuels treatment) will involve approximately 414 acres of piling and burning and thinning from below to reduce down woody material and ladder fuels. The Skinned Horse Timber Sale (timber sale) will involve approximately 646 acres of spruce/fir timber harvest. Collectively these two projects are referred to as the Ward Lakes Vegetation Management Projects.

The analysis area occupies approximately 17,959 acres and is dominated by high elevation Engelmann spruce/subalpine fir forests with inclusions of grass meadows and aspen stands. The spruce/fir forest occupies approximately 7,433 acres and is dominated by mature to over-mature stands (7,169 acres) that are characterized as densely stocked, large trees that form dense, closed canopies. In the analysis area, elevation ranges between approximately 8,200 and 11,200 feet.

Many lakes and reservoirs occur within the analysis area and are drained by several streams including Young's Creek, Kiser Creek, and Ward Creek.

Fuels Treatment

Under the proposed action, 414 acres of fuel reduction treatments will occur. The silvicultural prescription in this area is to thin the understories and treat the slash by chipping, lopping and scattering, or piling and burning. The fuels treatment will be focused near private land boundaries and any public facility located on National Forest System land. Because of this focus, the level of treatment varies across each treatment unit. Those parts of each unit that are closer to private land boundaries and facilities will receive more intense treatment than those parts of each unit that are more remote. The result will be a gradient of decreasingly intense treatment farther from private land boundaries and facilities, to the point that at the remote edge of each treatment unit, there will be no discernable difference between the treatment unit and the adjacent untreated area. Individual treatment units will range in size from 6 to 132 acres and will include:

1. Chipping, lopping and scattering, or piling and burning dead and down woody material.
2. Cutting (thinning from below) of dead, dying, and suppressed understory trees (less than eight inches in diameter) that create ladder fuels into upper forest canopies. These trees will be disposed of by chipping, lopping and scattering, piling and burning, or removal off site. At this time, it is not anticipated there will be a wood product market to salvage this small woody material, but it is possible that some of the material may be disposed of through commercial-use or personal-use permits for firewood, Christmas tree boughs, or posts and poles.
3. Removal of lower dead and live branches that also create ladder fuels into the tree crowns.

Timber Harvest

Under the proposed action, spruce/fir timber harvest is proposed on approximately 646 acres of Forest land classified as suitable for timber management by the Grand Mesa, Uncompahgre and Gunnison Forest Plan (1991). Anticipated timber volume harvested by this sale will be approximately 2.9 million-board-feet (MMBF). Individual harvest units will range in size from 4 to 102 acres. To accomplish the objectives of this project, both even-aged and uneven-aged silvicultural systems are proposed.

The even-aged silvicultural system is a combination of actions that result in the creation of a stand in which trees of about the same age grow together. Shelterwood cutting, which is the even-aged system proposed for use in most of the Skinned Horse area, is specifically designed to provide both seed and a sheltered microclimate to naturally regenerate spruce/fir. There are

generally three steps to this method: preparatory cut, seed cut, and removal cut. Due to the densities of trees in the spruce/fir stands, the current even-aged structure of these stands, and concerns with windthrow, a shelterwood preparatory cut is proposed for 425 acres of spruce/fir within the Skinned Horse area. Specifically this cut is designed to develop and test windfirmness, develop or maintain good quality seed-bearing trees that will be retained as a seed source, and decrease the insect and disease susceptibility before the next entry. A maximum of 30 percent of the basal area in each stand will be removed in areas where the existing basal area is greater than 120 square feet per acre. The minimum residual basal area in all treated stands will be 120 square feet per acre. Trees designated for harvest will generally be in the smaller diameter classes, will exhibit insect and/or disease problems, or will have poor growth characteristics. The seed cut and removal cut are not part of the proposed project.

Another type of an even-aged system is salvage/sanitation, which is proposed for 30 acres around the Grand Mesa Christian Church Camp. This harvest will remove damaged, dead, suppressed, diseased, and insect infested trees that pose a hazard to buildings and individuals within the camp.

The uneven-aged silvicultural system is a combination of actions that will simultaneously maintain continuous high forest canopy cover, regenerate desired species, and provide for the orderly growth and development of trees through a range of diameter and age classes. Group selection is distinguished by the removal of groups of trees that may vary in size from a fraction of an acre up to two acres. Each created opening will be regenerated with a new age class of trees. Group selection is prescribed for 191 acres of spruce/fir stands because the current stand structure has multiple distinct age classes and maintenance of this vertical structure is desired. Created openings will be no larger than two tree heights across (about one acre) and will be dispersed across 25 percent of the stand area. This will minimize windthrow risk and provide a sheltered microclimate. Site preparation will follow group selection harvest if there is inadequate disturbance from logging operations. Adequate disturbance results in exposure of 40 percent of the ground to bare mineral soil. Site preparation could include piling slash and moving logging debris to expose the soil. Group selection harvests may also need thinning of understories from below to reduce post-treatment tree densities to the desired level. A maximum of 30 percent of the basal area in each stand will be removed.

Under the shelterwood treatment, logging slash will be lopped and scattered to a depth of no more than 24 inches after the harvest operation. Green cull logs and topwood that exceeds eight inches in diameter will be bucked into sections not to exceed four feet for bark beetle prevention. Sites used as log deck landings may accumulate a larger amount of fuel than the surrounding sale areas. This material and slash generated in the group selection and sanitation/salvage units will be piled and burned or chipped as appropriate. The timber sale area will be opened as a fuelwood gathering site once the logging activity has ceased. This activity will target wood debris in the 3- to 9 inch fuel category, which contributes a high percentage of the overall fuel load.

The normal operating season will be from July 1 to October 31 of each year for up to five years.

Purchaser operations may continue beyond the normal operating season subject to contract provisions BT6.6 and BT6.66 (Erosion Prevention and Control and Current Operating Areas). Harvest of the Skinned Horse project is targeting to begin in the fall of 2004.

Road Construction and Reconstruction

The primary access to the Ward Lake Fuels Reduction Project will be from existing roads including State Highway 65 and NFSR 121. No existing roads associated with this project will require reconstruction and no new roads will be constructed.

Primary access to the Skinned Horse Timber Sale will be from State Highway 65 and National Forest Service Road(s) (NFSR) 122 and 123. The main log haul route will be across NFSR 122 east to NFSR 123 and then south on 123 to State Highway 65. NFSRs 122, 122.1A, and 121.1D2 will need approximately 3.2 miles of reconstruction to accommodate log haul. Approximately 0.9 miles of specified road and 1.8 miles of temporary road will also be constructed to access proposed harvest units. These new roads will be closed and obliterated by the purchaser after the project is complete.

Missionary Ridge Wildfire Suppression and Burned Area Emergency Rehabilitation Projects

The most common wildland fire suppression actions that occurred as part of the Missionary Ridge and Valley Fire’s included construction of fireline (handline and larger lines completed with heavy machinery such as dozers), construction of safety zones, falling of hazard trees, and drafting and collecting water from various sources (reservoirs, lakes, ponds, rivers, streams, and creeks). These actions have the potential to affect wildlife and habitat. A total of 120 miles of dozer line, and 39 miles of handline were constructed as part of the suppression efforts for the Missionary Ridge and Valley Fire’s. The Valley Fire burned approximately 360 acres of ponderosa pine/Gambel oak habitat, primarily on private lands west of the Missionary Ridge Fire and US Highway 550. Burned Area Emergency Rehabilitation (BAER) treatments implemented and ongoing for the Missionary Ridge Fire and Valley Fire’s are listed in the table below.

BAER Treatments for the Missionary Ridge and Valley Fire’s.

Type of BAER Treatment	Unit of Measure	# of Units
BAER Evaluation:		
BAER Team analysis and plan preparation		
Engineering assessments of slumps and spillway at Lemon Reservoir	Hours	200
Site risk assessments		
Native American consultation		
Channel Treatments:		
Engineering design and treatment to protect East Animas Bunkhouse from potential flooding and debris flows	Each	1
Land Treatments:		
Aerial seeding	Acres	23,644

Archeological site damage assessment and treatment		
Early warning system installation	Each	12
Log erosion barriers	acres	4,626
Non-native invasive plant control	acres	22,540
Sandbag erosion barriers	sandbags	168
Straw mulching	acres	60
Road and Trail Treatments:		
Culvert and ditch cleaning	miles	58
Culvert replacement in ephemeral and intermittent drainages	culverts	40
Culvert replacement in perennial streams	culverts	6
Grade dips	each	12
Hazard tree removal	miles	58
Replace/improve drainage structures	miles	54
Road and trail sign installation and repair for safety	each	93
Monitoring:		
Campground/campsite safety assessment		
Helicopter monitoring of debris jams	each	6
Trail safety assessment and monitoring		
Treatment effectiveness monitoring		

Missionary Ridge Fire Fence Rehabilitation and Installation Projects

The Missionary Ridge fire occurred in the summer of 2003 and burned approximately 70,000 acres. The fire burned fences and altered vegetation that served as a barrier to cattle. The proposed action consists of two parts; the construction of approximately 1.4 miles of new lay-down fence and the repair of 25 miles of burned fences. Both actions are within the burn area of the Missionary Ridge Fire perimeter.

Lay-down fence is a four-strand barbed-wire fence attached to four-foot high metal posts spaced approximately every fifty feet. The top wire is 42 inches above ground; the lowest is 12 to 14 inches from the ground with the two middle wires approximately 12 inches apart. At every 0.25 miles of fence a wooden brace, consisting of two posts spaced 8 feet apart, support the four strands of barbed wire, are incorporated into the fence. This type of fence is designed to literally lay-down when heavy snow loads are placed upon it and return to its upright position during snow-free periods of the year.

Construction of the new lay-down fence would require the clearing of an approximately 8 foot wide path of burnt trees and debris. Additionally, a 60 foot area on each side of the fence-line would be cleared of any dead trees less than 16 inches dbh (diameter at breast height) that would appear likely to fall on the fence. Occasionally a green tree that appears to be a hazard to the fence may be felled. Two new sections of fence are to be constructed over the next three years, a 0.5 mile section from the end of the existing Shearer/Elkhorn fence to a point on the Wallace

Lake road and a section 0.9 miles in length that generally parallels USFS road 595. These segments span burned areas of low, medium, and high intensity with some unburned stands. Trees felled will be left on site but may be pushed or bucked and then moved out of the fence-line with heavy earth-moving equipment. A farm-type tractor with an implement to install posts will be used in the construction of the new fence. Other than the fence line, no new trails or roads will be constructed. The total amount of acres affected by the new fence installation is 21 acres. The legal description of these sites are township 37 N., 8 W., sections 14 and 15 and 36 N., range 8 W., sections 4 and 9.

The project would also repair approximately 25 miles of existing standard and lay-down fences, including posts, metal or wooden, as well as damaged wire. In order to accomplish this, a D-4 dozer may be required to remove debris from on top of the fence. Chainsaws will be used to cut any burned trees that are equal to or less than 16 inches dbh and are within one tree length of the fences, assumed to be 60 feet. An occasional green tree that appears to be a hazard to the fence may be felled. A farm-type tractor with an implement to drive wooden posts will be used to repair some sections of fence. Any sections of standard fence damaged in the fire will be replaced by lay-down fence. The total number of acres affected by the fence repair is 363 acres. This project will use existing roads and trails to access fences. No new roads will be constructed. The project may occur from June 1, through September 30, of any calendar year and is expected to take 3 years to complete.

The project area straddles 72,964 acres of USFS and private lands that lie generally east of Colorado State Highway 550 and north of La Plata County Road 240. A total of 61,618 acres within the burn perimeter are located on land managed by the SJNF.

Dutton Ditch Pipeline

To meet its long-term domestic water demand in Pagosa Springs and vicinity, the Pagosa Area Water and Sanitation District (PAWSD) has proposed to replace the existing Dutton Ditch, a source of raw water supply to Stevens and Hatcher Reservoirs, with an underground pipeline.

Dutton Ditch receives its main water supply from the Four Mile Creek at a diversion approximately nine miles north of the town of Pagosa Springs. This ditch carries water approximately 5 miles to the Dutton Creek drainage that is tributary to Stevens Reservoir. Due to accumulation of sediment and difficulty in stabilizing the ditch at two locations within unstable hillsides, the capacity of Dutton Ditch has declined from ± 14 c.f.s. (cubic feet per second) to ± 4 c.f.s. within the last 15 years. A pipeline extension of the Dutton Ditch is currently being used to carry a portion of the Dutton Ditch flow to Hatcher Reservoir.

The pipeline construction would include the installation of a 24 to 30 inch diameter pipeline along USFS access roads for a distance of 27,500 linear feet. Installed adjacent to Four Mile and McCabe Plumtaw roads, this pipeline will connect with the existing pipeline extension delivering water to Hatcher Reservoir. The new pipeline would extend beyond this bifurcation point another 3,500 linear feet (l.f.) to a point near Dutton Creek at the National Forest boundary. This 31,000 l.f. of pipeline would deliver 35

c.f.s. of Dutton Ditch water, an increase of 14.85 c.f.s.. Once this pipeline is in place and functioning, Dutton Ditch will be abandoned and the area allowed to naturally regenerate.

As required by the District's water court decree for sidewater, two pipeline turnout structures will release water into the Four Mile and McCabe Creek drainage basins. The returning of water to these stream systems has been decreed by the District's water court to the Colorado Division of Water Resources Division Engineer.

STATUS OF THE SPECIES /CRITICAL HABITAT DESCRIPTION

Species/Critical Habitat Description

The lynx is a medium-sized cat with long legs; large, well-furred paws; long tufts on the ears; and a short, black-tipped tail (McCord and Cardoza 1982). The winter pelage of the lynx is dense and has a grizzled appearance with grayish-brown mixed with buff or pale brown fur on the back, and grayish-white or buff-white fur on the belly, legs and feet. Summer pelage of the lynx is more reddish to gray-brown (Koehler and Aubry 1994). Adult males average 10 kilograms (22 pounds) in weight and 85 centimeters (33.5 inches) in length (head to tail), and females average 8.5 kilograms (19 pounds) and 82 centimeters (32 inches) (Quinn and Parker 1987). The lynx's long legs and large feet make it highly adapted for hunting in deep snow.

Classification of the Canada lynx (also called the North American lynx) has been subject to revision. In accordance with Wilson and Reeder (1993), the lynx in North America is *Lynx canadensis*. Previously the scientific name *L. lynx canadensis* was used for lynx (Jones et al.

1992; S. Williams, Texas Tech University, pers. comm. 1994). Other scientific names still in use include *Felis lynx* or *F. lynx canadensis* (Jones et al. 1986; Tumlison 1987).

In 1998, the lynx was proposed for listing as a threatened species under the Act (63 FR, July 8, 1998). The lynx in the contiguous United States was listed as threatened effective April 23, 2000 (65 FR 16052, March 24, 2000). The Service identified one distinct population segment in the lower 48 states. No critical habitat has been designated for the threatened population of Canada lynx in the contiguous United States. As explained in the final rule (65 FR 16052, March 24, 2000), designation of critical habitat would be prudent, but has been deferred until other higher priority work can be completed within the Services's current budget.

Life History

Home range and dispersal - Lynx home range size varies by the animal's gender, abundance of prey, season and the density of lynx populations (Hatler 1988; Koehler 1990; Poole 1994; Slough and Mowat 1996; Aubry et al. 2000; Mowat et al. 2000). Documented home ranges vary from 8 to 800 square kilometers (3 to 300 square miles) (Saunders 1963; Brand et al. 1976; Mech 1980; Parker et al. 1983; Koehler and Aubry 1994; Apps 2000; Mowat et al. 2000; Squires and Laurion 2000). Preliminary research supports the hypothesis that lynx home ranges at the

southern extent of the species' range are generally large compared to those in the core of the range in Canada (Koehler and Aubry 1994; Apps 2000; Squires and Laurion 2000).

Lynx are capable of dispersing extremely long distances (Mech 1977; Washington Department of Wildlife 1993); for example, a male was documented traveling 616 kilometers (370 miles) (Brainerd 1985). Lynx disperse primarily when snowshoe hare (*Lepus americanus*) populations decline (Ward and Krebs 1985; Koehler and Aubry 1994; O'Donoghue et al. 1997; Poole 1997). Subadult lynx disperse even when prey is abundant (Poole 1997), presumably as an innate response to establish home ranges.

During the early 1960s and 1970s, there were numerous occurrences of lynx documented in atypical habitat, such as in North Dakota. In those years, harvest returns indicated unprecedented cyclic lynx highs for the 20th century in Canada (Adams 1963; Harger 1965; Mech 1973; Gunderson 1978; Thiel 1987; McKelvey et al. 2000b). Many of these unusual observations were probably dispersing animals that either were lost from the population or later returned to suitable habitat.

Diet - Snowshoe hares (*Lepus americanus*) are the primary prey of lynx, comprising 35-97percent of the diet throughout the range of the lynx (Koehler and Aubry 1994). Other prey species include red squirrel (*Tamiasciurus hudsonicus*), grouse (*Bonasa umbellus*, *Dendragapus* spp., *Lagopus* spp.), flying squirrel (*Glaucomys sabrinus*), ground squirrel (*Spermophilus parryii*, *S. richardsonii*), porcupine (*Erethizon dorsatum*), beaver (*Castor canadensis*), mice (*Peromyscus* spp.), voles (*Microtus* spp.), shrews (*Sorex* spp.), fish, and ungulates as carrion or occasionally as prey (Saunders 1963; Van Zyll de Jong 1966; Nellis et al. 1972; Brand et al. 1976; Brand and Keith 1979; Koehler 1990; Staples 1995; O'Donoghue et al. 1998).

Most research has focused on the winter diet. Summer diets are poorly understood throughout the range of lynx. Mowat et al. (2000) reported through their review of the literature that summer diets have less snowshoe hare and more alternate prey species, possibly because of a greater availability of other species. During the cycle when hares become scarce, the proportion and importance of other prey species, especially red squirrel, increases in the diet (Brand et al. 1976; O'Donoghue et al. 1998; Apps 2000; Mowat et al. 2000). However, Koehler (1990) suggested that a diet of red squirrels alone might not be adequate to ensure lynx reproduction and survival of kittens.

There has been little research on lynx diet specific to the southern portion of its range except in Washington (Koehler et al. 1979; Koehler 1990). Southern populations of lynx may prey on a wider diversity of species than northern populations because of lower average hare densities and differences in small mammal communities. In areas characterized by patchy distribution of lynx habitat, lynx may prey opportunistically on other species that occur in adjacent habitats, potentially including white-tailed jackrabbit (*Lepus townsendii*), black-tailed jackrabbit (*Lepus californicus*), sage grouse (*Centrocercus urophasianus*), and Columbian sharp-tailed grouse (*Tympanuchus phasianellus*) (Quinn and Parker 1987; Lewis and Wenger 1998).

In northern regions, when hare densities decline, the lower quality diet causes sudden decreases in the productivity of adult female lynx and decreased survival of kittens, which causes the numbers of breeding lynx to level off or decrease (Nellis *et al.* 1972; Brand *et al.* 1976; Brand and Keith 1979; Poole 1994; Slough and Mowat 1996; O'Donoghue *et al.* 1997). Relative densities of snowshoe hares at southern latitudes are generally lower than those in the north, and differing interpretations of the population dynamics of southern populations of snowshoe hare have been proposed (Hodges 2000b).

Snowshoe hares have evolved to survive in areas that receive deep snow (Bittner and Rongstad 1982). Primary forest types that support snowshoe hare are subalpine fir (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmannii*), Douglas-fir (*Pseudotsuga menziesii*), and lodgepole pine (*Pinus contorta*) in the western United States, and spruce/fir, pine, and deciduous forests in the eastern United States (Hodges 2000b). Within these habitat types, snowshoe hares prefer stands of conifers with shrub understories that provide forage, cover to escape predators, and protection during extreme weather (Wolfe *et al.* 1982; Monthey 1986; Koehler and Aubrey 1994). Hares' use of habitat is correlated with understory cover (Hodges 2000a). Early successional forest stages generally have greater understory structure than do mature forests and therefore support higher hare densities (Hodges 2000a, b). However, mature forests can also provide snowshoe hare habitat as openings are created in the canopy when trees succumb to disease, fire, wind, ice, or insects, and the understory develops (Buskirk *et al.* 2000b).

Lynx seem to prefer to move through continuous forest, using the highest terrain available such as ridges and saddles (Koehler 1990; Staples 1995). Cover is important to lynx when searching for food (Brand *et al.* 1976) but lynx often hunt along edges (Mowat *et al.* 2000). Kesterson (1988) and Staples (1995) reported that lynx hunted along the edges of mature stands within a burned forest matrix and Major (1989) found that lynx hunted along the edge of dense riparian willow stands. Lynx have been observed (via snow tracking) to avoid large openings (Koehler 1990; Staples 1995) during daily movements within the home range.

Den site selection - Lynx use large woody debris, such as downed logs, root wads and windfalls, to provide denning sites with security and thermal cover for kittens (McCord and Cardoza 1982; Koehler 1990; Koehler and Brittell 1990; Mowat *et al.* 2000; Squires and Laurion 2000). During the first few months of life, kittens are left alone at these sites when the female lynx hunts. Downed logs and overhead cover provide protection of kittens from predators, such as owls, hawks and other carnivores during this period.

The age of the forest stand does not seem as important for denning habitat as the amount of downed, woody debris available (Mowat *et al.* 2000). Den sites may be located within older regenerating stands (e.g., greater than 20 years since disturbance) or in mature conifer or mixed conifer-deciduous (i.e., spruce/fir or spruce/birch) forests. In Washington, lynx used lodgepole pine, spruce (*Picea spp.*), and subalpine fir (*Abies lasiocarpa*) forests older than 200 years with an abundance of downed woody debris for denning (Koehler 1990). A den site in Wyoming was located in a mature subalpine fir/lodgepole pine forest with abundant downed logs and a high amount of horizontal cover (Squires and Laurion 2000). A lynx den site found in Maine in 1999

was located in a forest stand in red spruce (*Picea rubra*) cover type that was logged in 1930 and again in the 1980s and is regenerating into hardwoods (Organ 1999). The site had a dense understory and an abundance of dead and downed wood.

Denning habitat must be in or near foraging habitat to be functional. The hunting range of females is restricted at the time of parturition, and their need to feed kittens requires an abundance of prey. Lynx, like other carnivores, frequently move their kittens until they are old enough to hunt with their mother. Multiple nursery sites are needed that provide kittens with overhead cover and protection from predators and the elements. Downed logs and overhead cover must also be available throughout the home range to provide security when lynx kittens are old enough to travel (Bailey 1974).

Recruitment - Breeding occurs through March and April in the north (Quinn and Parker 1987). Kittens are born in May to June in south-central Yukon (Slough and Mowat 1996). The male lynx does not help with rearing young (Eisenberg 1986). Slough and Mowat (1996) reported yearling females giving birth during periods when hares were abundant; male lynx may be incapable of breeding during their first year (McCord and Cardoza 1982).

In northern study areas during the low phase of the hare cycle, few, if any, live kittens are born and few yearling females conceive (Brand and Keith 1979; Poole 1994; Slough and Mowat 1996). However, Mowat et al. (2000) suggested that in the far north, some lynx recruitment occurs when hares are scarce and this may be important in lynx population maintenance during hare lows. During periods of hare abundance in the northern taiga, litter size of adult females averages 4 to 5 kittens (Mowat et al. 1996). Koehler (1990) suggested that the low number of kittens produced in north-central Washington was comparable to northern populations during periods of low snowshoe hare abundance. In his study area, 2 radio-collared females had litters of 3 and 4 kittens in 1986 and 1 kitten in 1987 (the actual litter size of one of the females in 1987 was not determined) (Koehler 1990). Of the known-size litters in Washington, one kitten survived the first winter.

In Montana, Squires and Laurion (2000) reported that one marked female produced two kittens in 1998. In 1999, two of three females produced litters of two kittens each. In Wyoming (Squires and Laurion 2000), one female produced 4 kittens in 1998, but snow tracking indicated that the kittens were not with the female in November and were presumed dead. The same female produced 2 kittens in 1999.

Mortality - Reported causes of lynx mortality vary between studies. The most commonly reported causes include starvation of kittens (Quinn and Parker 1987; Koehler 1990), and human-caused mortality, mostly fur trapping (Ward and Krebs 1985; Bailey et al. 1986). Significant lynx mortality due to starvation has been demonstrated in cyclic populations of the northern taiga, during the first two years of hare scarcity (Poole 1994; Slough and Mowat 1996). Various studies have shown that, during periods of low snowshoe hare numbers, starvation can account for up to two-thirds of all natural lynx deaths. Trapping mortality may be additive rather than compensatory during the low period of the snowshoe hare cycle (Brand and Keith 1979).

Hunger-related stress, which induces dispersal, may increase the exposure of lynx to other forms of mortality such as trapping and highway collisions (Brand and Keith 1979; Carbon and Patriquin 1983; Ward and Krebs 1985; Bailey et al. 1986).

Paved roads have been a mortality factor in lynx translocation efforts within historical lynx range. In New York, 18 translocated lynx were killed on highways (Brocke et al. 1990). It has been suggested by Brocke et al. (1990) that translocated animals may be more vulnerable to highway mortality than resident lynx. Six lynx were killed on 2 and 4-lane Colorado highways following their release as part of a reintroduction effort (CDOW 2003).

Other than translocated animals, there have been documented occurrences of highway mortality of lynx in Wisconsin (Theil 1987), Minnesota (DonCarlos 1997; J. Cochrane, USFWS, pers. comm. 2003), and Montana (G. Joslin, Montana Department of Fish, Wildlife and Parks, pers. comm. 2003).

Predation on lynx by mountain lion (*Felis concolor*), coyote (*Canis latrans*), wolverine (*Gulo gulo*), gray wolf (*Canis lupus*), fisher (*Martes pennanti*) and other lynx has been confirmed (Berrie 1974; Koehler et al. 1979; Poole 1994; Slough and Mowat 1996; O'Donoghue et al. 1997; Apps 2000; Vashon et al. 2003; Squires and Laurion 2000). Squires and Laurion (2000) reported 2 of 6 mortalities of radio-collared lynx in Montana were due to mountain lion predation. Observations of such events are rare, and the significance of predation on lynx populations is unknown.

Interspecific relationships with other carnivores - Buskirk et al. (2000a) described the two major competition impacts to lynx as exploitation (competition for food) and interference (avoidance). Of several predators examined (birds of prey, coyote, gray wolf, mountain lion, bobcat (*Lynx rufus*), and wolverine), coyotes were deemed to most likely pose local or regionally important exploitation impacts to lynx, and coyotes and bobcats were deemed to possibly impart important interference competition effects on lynx. Mountain lions were described as interference competitors, possibly impacting lynx during summer and in areas lacking deep snow in winter, or when high elevation snow packs develop crust in the spring.

Exploitation competition may contribute to lynx starvation and reduced recruitment. During periods of low snowshoe hare numbers, starvation accounted for up to two-thirds of all natural lynx deaths in the Northwest Territories of Canada (Poole 1994). Major predators of snowshoe hare include lynx, northern goshawk (*Accipiter gentilis*), great horned owl (*Bubo virginianus*), bobcat, coyote, red fox (*Vulpes vulpes*), fisher, and mountain lion. In southern portions of snowshoe hare range, predators may limit hare populations to lower densities than in the taiga (Dolbeer and Clark 1975; Wolff 1980; Koehler and Aubry 1994).

Based on only anecdotal evidence, Parker et al. (1983) discussed competition between bobcats and lynx on Cape Breton Island. Lynx were found to be common over much of the island prior to bobcat colonization. Concurrent with the colonization of the island by bobcats, lynx densities declined and their presence on the island became restricted to the highlands, the one area where bobcats did not become established.

Population Dynamics

In Canada and Alaska, lynx populations undergo extreme fluctuations in response to snowshoe hare population cycles, enlarging or dispersing from their home ranges and ceasing the recruitment of young into the population after hare populations decline (Mowat et al. 2000). In the southern portion of the range in the contiguous United States, lynx populations appear to be naturally limited by the availability of snowshoe hares, as suggested by large home range size, high kitten mortality due to starvation, and greater reliance on alternate prey. These characteristics appear to be similar to those exhibited by lynx populations in the taiga during the low phase of the population cycle (Quinn and Parker 1987, Koehler 1990, Aubry et al. 2000). This is likely due to the inherently patchy distribution of lynx and hare habitat in the contiguous United States and corresponding lower densities of hares.

A lack of accurate data limits our understanding of lynx population dynamics in the contiguous United States and precludes drawing definitive conclusions about lynx population trends. Formal surveys designed specifically to detect lynx have rarely been conducted. Many reports of lynx (i.e., visual observations, snow tracks) have been collected incidentally to other activities, but cannot be used to infer population trends. Long-term trapping data have been used to estimate population trends for various species. However, trapping returns are strongly influenced by trapper effort, which varies between years, and therefore may not accurately reflect population trends. Another important problem is that trapping records of many States did not differentiate between bobcats and lynx, referring to both as “lynxcats”. Overall, the available data are too incomplete to infer much beyond simple occurrence and distribution of lynx in the contiguous United States (McKelvey et al. 2000b)

Lynx populations in the contiguous United States occur at the southern periphery of a metapopulation whose core is located in the northern boreal forest of central Canada (McCord and Cardoza 1982; Quinn and Parker 1987; McKelvey et al. 2000a). Lynx population dynamics may emanate from the core to the periphery, as evidenced by a lagged correlation of lynx trap records and observations (McKelvey et al. 2000b; Mowat et al. 2000). In the Great Lakes Geographic Area, population dynamics in recent decades appear to be strongly driven by immigration from Canada (McKelvey et al. 2000b). In other areas and time periods, however, it is not known to what extent the correlation is due to immigration from Canada, population responses to the same factors controlling northern populations, or a combination of the two.

We suspect that some areas in the contiguous United States naturally act as sources of lynx (recruitment is greater than mortality) that are able to disperse and potentially colonize other patches (McKelvey et al. 2000a). Other areas may function as sinks, where lynx mortality is greater than recruitment and lynx are lost from the overall population. Sink habitats are most likely those places on the periphery of the southern boreal forest where habitat becomes more fragmented and more distant from larger lynx populations. Fluctuations in prey populations may cause some habitat patches to change from being sinks to sources, and vice versa. The ability of naturally dynamic habitat to support lynx populations may change as the habitat undergoes

natural succession following natural or manmade disturbances (i.e., wildland fire and clearcutting).

Status and Distribution

The lynx in the contiguous United States was listed as threatened effective April 23, 2000 (65 FR 16052, March 24, 2000). At least one of five listing factors must be met for listing under ESA. These factors include: present or threatened destruction of habitat or range, over-utilization, disease or predation, inadequacy of existing regulatory mechanisms or other natural or human-made causes. The sole factor for listing the Canada lynx as threatened was inadequacy of existing regulatory mechanisms, specifically the lack of Forest Land and Resource Management Plans guidance to address the needs of lynx.

The following discussion of the status and distribution of lynx is largely excerpted from the Service's final rule (65 FR 16052, March 24, 2000). The historical and present range of the lynx north of the contiguous United States includes Alaska and that part of Canada that extends from the Yukon and Northwest Territories south across the United States border and east to New Brunswick and Nova Scotia. In the contiguous United States, lynx historically occurred in the Cascades Range of Washington and Oregon; the Rocky Mountain Range in Montana, Wyoming, Idaho, eastern Washington, eastern Oregon, northern Utah, and Colorado; the western Great Lakes Region; and the northeastern United States region from Maine southwest to New York (McCord and Cardoza 1982; Quinn and Parker 1987).

The distribution of lynx in North America is closely associated with the distribution of North American boreal forest (Agee 2000). In Canada and Alaska, lynx inhabit the classic boreal forest ecosystem known as the taiga (McCord and Cardoza 1982; Quinn and Parker 1987; Agee 2000; McKelvey et al. 2000b). The range of lynx extends south from the classic boreal forest zone into the subalpine forest of the western United States, and the boreal/hardwood forest ecotone in the eastern United States (Agee 2000; McKelvey et al. 2000b). Forests with boreal features (Agee 2000) extend south into the contiguous United States along the Cascade and Rocky Mountain Ranges in the west, the western Great Lakes Region, and along the Appalachian Mountain Range of the northeastern United States. Within these general forest types, lynx are most likely to persist in areas that receive deep snow, to which the lynx is highly adapted (Ruggiero et al. 2000). Lynx are rare or absent from the wet coastal forests of Alaska and Canada (Mowat et al. 2000).

At its southern margins in the contiguous United States, forests with boreal features, or southern boreal forests, become naturally fragmented as they transition into other vegetation types. Southern boreal forest habitat patches are small relative to the extensive northern boreal forest of Canada and Alaska, which constitutes the majority of lynx range. Many southern boreal forest habitat patches within the contiguous United States cannot support resident populations of lynx and their primary prey species.

The complexities of lynx life-history and population dynamics, combined with a general lack of

reliable population data for the contiguous United States, make it difficult to ascertain the past or present population status of lynx in the contiguous United States. It is impossible to determine with certainty whether reports of lynx in many States were: 1) animals dispersing from northern populations that were effectively lost because they did not join or establish resident populations, (2) animals that were a part of a resident population that persisted for many generations, or (3) a mixture of both resident and dispersing animals.

The final rule (65 FR 16052, March 24, 2000) determining threatened status for the lynx in the contiguous United States summarized lynx status and distribution across four regions that are separated from each other by ecological barriers consisting of unsuitable lynx habitat. These distinct regions are the Northeast, the Great Lakes, the Northern Rocky Mountains/Cascades, and the Southern Rocky Mountains. While these regions are ecologically unique and discrete, the lynx is associated with southern boreal forest in each and, with the exception of the Southern Rocky Mountain Region, each area is geographically connected to the much larger population of lynx in Canada.

Northeast Region (Maine, New Hampshire, Vermont, New York) - Based on an analysis of cover types and elevation zones containing most of the lynx occurrences, McKelvey et al. (2000b) determined that, at the broad scale, most lynx occurrence records in the Northeast were found within the “Mixed Forest-Coniferous Forest-Tundra” cover type at elevations ranging from 250 to 750 meters (820 to 2,460 feet). This habitat type in the northeast United States occurs along the northern Appalachian Mountain range from southeastern Quebec, western New Brunswick, and western Maine, south through northern New Hampshire. This habitat type becomes naturally more fragmented and begins to diminish to the south and west, with a disjunct segment running north-south through Vermont, a patch of habitat in the Adirondacks of northern New York, and with a few more distant and isolated patches in Pennsylvania (McKelvey et al. 2000b).

In the Northeast, primarily in Maine, a boreal forest continues to exist and support a reproducing population of lynx. Maine’s lynx population is currently much larger than what the Service knew at the time of the final listing rule in 2000 and habitat is directly connected to substantive lynx populations and habitat in southeastern Quebec and New Brunswick. The potential exists for lynx to occur in New Hampshire because of its direct connectivity with Maine. Lynx in Vermont have always existed solely as dispersers. Lynx occurring in New York since 1900 have been dispersers. Detailed information on the status and distribution of lynx in this region is found in the Final Rule (65 FR 16052; March 24, 2000) and the Clarification of the Final Rule (68 FR 40076; July 3, 2003).

Great Lakes Region (Minnesota, Wisconsin, Michigan) - The majority of lynx occurrence records in the Great Lakes Region are associated with the “mixed deciduous-coniferous forest” type (McKelvey *et al.* 2000b). Within this general forest type, the highest frequency of lynx occurrences were in the sugar maple (*Acer saccharum*), basswood (*Tilia* spp.), jack pine (*Pinus banksiana*), white pine (*P. strobus*), and red pine (*P. resinosa*) forest types (McKelvey *et al.* 2000b). These types are found primarily in northeastern Minnesota, northern Wisconsin, and the

western portion of Michigan's Upper Peninsula.

We conclude that northeastern Minnesota has historically supported and currently supports a resident lynx population, based on the number of lynx records, evidence of reproduction, and the presence of boreal forest contiguous with occupied habitat in Ontario. We conclude records of lynx in Wisconsin and Michigan constitute dispersing animals, rather than individuals from resident populations, based on the lack of evidence of reproduction, lack of connectivity with suitable habitat, and limited amount of habitat. Detailed information on the status and distribution of lynx in this region is found in the Final Rule (65 FR 16052; March 24, 2000) and the Clarification of the Final Rule (68 FR 40076; July 3, 2003).

Northern Rocky Mountains/Cascades Region (Washington, Oregon, Idaho, Wyoming, Utah, Montana) - In this region, the majority of lynx occurrences are associated at a broad scale with the "Rocky Mountain Conifer Forest"; within this type, most of the occurrences are in moist Douglas-fir and western spruce/fir forests (McKelvey et al. 2000b). Most of the lynx occurrences are in the 1,500-2,000 meters (4,920-6,560 feet) elevation class (McKelvey et al. 2000b). These habitats are found in the Rocky Mountains of Montana, Idaho, eastern Washington, and Utah, the Wallowa Mountains and Blue Mountains of southeast Washington and northeastern Oregon, and the Cascade Mountains in Washington and Oregon. The majority of verified lynx occurrences in the United States and the confirmed presence of resident populations are from this region. The boreal forest of Washington, Montana, and Idaho is contiguous with that in adjacent British Columbia and Alberta, Canada.

We conclude that the Northern Rocky Mountains/Cascades Region continues to support resident lynx populations in north-central and northeastern Washington, western Montana and likely northern Idaho based on current evidence of reproduction in Washington and Montana and the presence of habitat able to support resident populations. We conclude that lynx have always occurred as dispersers in Oregon and Utah because habitat capable of supporting lynx is limited and there are relatively few historic records of lynx in these states. In northern Wyoming it appears habitat is less suitable to support resident populations and, therefore, we conclude animals in this area are most likely dispersers. Detailed information on the status and distribution of lynx in this region is found in the Final Rule (65 FR 16052; March 24, 2000) and the Clarification of the Final Rule (68 FR 40076; July 3, 2003).

Southern Rocky Mountains Region (Colorado, SE Wyoming) - Colorado represents the extreme southern edge of the range of the lynx. A majority of the lynx occurrence records in Colorado and southeastern Wyoming are associated with the "Rocky Mountain Conifer Forest" type. In the Southern Rocky Mountains, occurrences of lynx are generally in higher elevations (4,100 to 12,300 feet) than other occurrences in the west (McKelvey et al. 2000b). The southern boreal forest of Colorado and southeastern Wyoming is isolated from boreal forest in Utah and northwestern Wyoming by the Green River Valley and the Wyoming basin (Findley and Anderson 1956). These areas are likely to reduce the opportunity for immigration from the Northern Rocky Mountains/Cascades Region and Canada (Halfpenny et al. 1982; Koehler and Aubry 1994).

There are relatively few historic lynx records from this region (McKelvey et al. 2000b). We are uncertain whether the Southern Rocky Mountain supported a small resident population historically or whether such records were of dispersers that arrived during extremely high population cycles. If these historic records represent resident populations rather than dispersing animals that emigrated from the Northern Rocky Mountains, Cascades or Canada, then we believe a viable native resident lynx population no longer exists in the Southern Rocky Mountains. Although habitats in the Southern Rockies are far from source populations and more isolated, it is still possible that dispersers could arrive in the Southern Rocky Mountains during extreme highs in the population cycle. Detailed information on the status and distribution of lynx in this region is found in the Final Rule (65 FR 16052; March 24, 2000) and the Clarification of the Final Rule (68 FR 40076; July 3, 2003).

Reports from other locations - Lynx have been documented in habitats that are unable to support them long-term. Such occurrences are associated with cyclic population highs when lynx tend to disperse long distances. These unpredictable and temporary occurrences are not included within either the historic or current range of lynx because they are well outside of lynx habitat (65 FR 16052, March 24, 2000; 68 FR 40076, July 3, 2003). This includes records from Nevada, North Dakota, South Dakota, Iowa, Nebraska, Indiana, Ohio, and Virginia (Hall and Kelson 1959; Burt 1954; Gunderson 1978; Mech 1980; McKelvey et al. 2000b; Johnson 1994; Jones 1994; South Dakota Natural Heritage Program 1994; Jobman 1997; Smithsonian Institute 1998).

Status In the Southern Rockies - Canada lynx occur primarily in spruce-fir and lodgepole pine forests, at elevations between 8,000 and 12,000 feet (Ruggiero et al. 1999). Quaking aspen (*Populus tremuloides*) stands and forest edges, as well as open grass meadows and forest ecotones, may also support high numbers of hares and Canada lynx. On a landscape scale, Canada lynx habitat includes a mosaic of early seral stages that support snowshoe hare populations and late seral stages of dense old growth forest that provide ideal denning and security habitat. Connectivity between Canada lynx populations is critical: dispersal corridors should be several miles wide with only narrow gaps. Large tracts of continuous coniferous forest are the most desirable for Canada lynx travel and dispersal (Tanimoto 1998).

Records of lynx occurrence are available from throughout most of the Southern Rocky Mountains. The last specimens of lynx taken in the Southern Rocky Mountains were from the late 1960s and early 1970s. In 1969, three lynx specimens were taken in adjacent counties in the central core of the Southern Rocky Mountains. One was shot along the Fryingpan River in Pitkin County, another on Vail Mountain (Eagle County), and a third was trapped south of Leadville in Lake County (G. Byrne, pers. comm. 1999). In 1971, the State of Colorado closed the season on lynx, making it illegal to take this species. Since then, only a few specimens have been obtained. In 1972, a lynx was trapped on Guanella Pass and another caught in a snow slide east of Bakerville, Colorado, both in Clear Creek County. During the winter of 1973 to 1974, a pair of lynx was illegally trapped within Vail Ski Area boundaries (Thompson and Halfpenny 1989). No lynx specimens are available since those last illegal takes.

Despite the resulting lack of recent specimens, strong evidence of lynx persistence continued to surface. A Statewide lynx verification program conducted from 1978 to 1980 by the Colorado Division of Wildlife (CDOW) concluded that viable, low-density lynx populations persisted in Eagle, Pitkin, Lake, and Clear Creek counties (Halfpenny and Miller 1981). Because Summit County is positioned between three of those counties, it is likely that lynx existed there as well. In addition, the program provided evidence of lynx occurrence in Grand and Park counties. Lack of evidence from other portions of the State was as likely a consequence of survey effort as lack of lynx.

Thompson and Halfpenny (1989) confirmed lynx in the vicinity of Vail Ski Area during the winter of 1988-89 as part of studies conducted by Vail Associates for the Category III expansion. They stated in their report, "there is no question that lynx exist at Vail Ski Area and in the surrounding mountains." Follow-up work by the CDOW in 1990 and 1991 led to the discovery of additional lynx tracks in the area. In 1991, Thompson and Halfpenny also confirmed two sets of lynx tracks at a proposed ski area site south of Wolf Creek Pass in the eastern San Juan Mountains (Andrews 1992). They believed the pair was probably a female and its kitten.

Occasional credible sighting reports and track evidence continue to be received from various parts of the State, providing additional evidence that native lynx likely still persist in low numbers in the Southern Rocky Mountains. Since the 1991 track discoveries near Vail and in the San Juan Mountains, the CDOW has recorded seven lynx sightings or track locations between 1992 and 1998 that they rate as probable lynx. Three of those were by CDOW biologists. Carney (1993) reported lynx tracks from the east side of the Gore Range in Summit County. Tom Beck, a carnivore researcher with CDOW, found a set of lynx tracks in the Dolores River drainage in the west San Juan Mountains, Montezuma County in 1993. A CDOW Area Wildlife Manager observed a lynx in the southern Sangre de Cristos of Costilla County, also in 1993. Two sightings and one set of tracks were reported from Eagle County and another set of tracks was located in Larimer County north of Rocky Mountain National Park.

In 1997, photographs were taken of tracks believed to be those of lynx in the Tennessee Creek drainage on the border of Lake and Eagle counties. This is an area where possible lynx tracks were located just a few years earlier. Among the most recent credible sighting reports include one from Boreas Pass on the border of Summit and Park Counties in 1995, another from the Vail vicinity in January 1998, one from a USFS biologist in July 1998 on the Flattops in northwestern Colorado, and from a Park Ranger in Rocky Mountain National Park (Larimer County) in December 1998. During the winter of 1998 to 1999, CDOW biologists followed a radio-collared lynx into the San Juan Mountains and located a several day-old lynx trails they believed may be that of a native lynx (Byrne and Tanya Shenk, CDOW, 2002, pers. comm.). This location was in the same general area where Thompson and Halfpenny located lynx tracks in 1991. Lynx were confirmed in Eagle County as late as 1991 and in Summit County (Gore Range) as late as 1993. Evidence has continued to indicate lynx occupancy of the central and, possibly, northern mountains through the 1990s. This evidence includes a sighting by a USFS biologist in July 1998 in the Flattops in northwestern Colorado, and tracks in Larimer County north of Rocky

Mountain National Park. The Colorado Division of Wildlife found evidence of lynx in Eagle County and in Grand County. Radio tracking in 2000 of lynx translocated to Colorado indicated that a few individuals spent time in the Gore Range. In July 2001, CDOW reported a collared lynx in the Flattops Wilderness Area (Tanya Shenk, CDOW, pers. comm., 2002). It is conceivable that native lynx may yet occupy the high mountain landscapes in Colorado.

The Canada lynx has been classified by the State of Colorado as a State endangered species since 1976. In 2000, the Service classified the lynx as a federally threatened species. Since 1978, there have been 14 investigations into naturally occurring lynx presence in Colorado conducted by the CDOW and other private and public conservation groups. Definitive evidence has not been found to document the presence of lynx from these studies though tracks attributed to lynx were found on a number of occasions.

The CDOW initiated a Canada lynx recovery program in February 1999. The program augmented any existing population with transplants from Canada and Alaska, with the intent of reestablishing viable, self-sustaining populations in primary blocks of suitable habitat throughout the Southern Rocky Mountains. Ninety-six lynx were released into the San Juan Mountains during the winter/spring periods of 1999 and 2000 by the CDOW. In 2003, thirty-three additional lynx were released into south-central Colorado as part of the States recovery program. Additional lynx are to be released to further the goal of establishing a viable lynx population in Colorado. In May and June of 2003, the State of Colorado confirmed the birth of 16 lynx kittens. Evidence of reproduction and multiple individuals within each litter suggests that there is an adequate local supply of prey. Some of the lynx initially released by the CDOW appear to have established home ranges, as demonstrated by radio telemetry (Tanya Shenk, CDOW, pers comm., 2003). Many of the released lynx have displayed fidelity to areas away from the release areas suggesting that they have sought these areas out, and sufficient prey exists to support them.

After the first year of the program, there was evidence suggesting that there was insufficient prey availability in the Southern Rocky Mountains. Diet analysis conducted by the CDOW showed that only 67 percent of the diet consisted on snowshoe hare. At this time however, 89 percent of the diet of the released lynx population consists of snowshoe hare (Tanya Shenk, CDOW, pers comm., 2003). This suggests that after release, lynx were seeking out areas within the ecosystem that supported high numbers of prey, and, in the mean time relied on other prey to sustain them. Most of these lynx are currently known to occupy the San Juan Mountains. A number of lynx have made and continue to make exploratory movements throughout the Southern Rockies. Several animals have taken up residence for extended periods in the central and northern mountains. Currently, lynx may exist in most major portions of the Southern Rocky Mountain Ecosystem.

Most lynx that are currently being monitored continue to use terrain within the core research area: New Mexico north to Gunnison, west as far as Taylor Mesa and east to Monarch Pass. There are some lynx north of Gunnison up to the I-70 corridor and in the Taylor Park area.

The State is currently tracking 62 of the 84 lynx still possibly alive. Telemetry signals have not been detected for 20 lynx since at least May 24, 2002. One of these missing lynx was hit and killed by a truck in New Mexico. A number of these lynx are missing because their collar batteries have died and are no longer transmitting a radio signal. Some of the missing lynx may still have functioning collars but are outside the research area. Expanded flights outside the research area during the summer and fall months may yield the location of these lynx. In addition, the CDOW believes that 2 of the lynx released in 2000 probably slipped their collars and one male lynx released in 2003 has died from unknown circumstances.

ENVIRONMENTAL BASELINE

Crooked and Lincoln Creek Large Wood Habitat Placement Project

The 2002 Forest Plan Revision (USFS 2002c) identified LAUs for the WRNF following guidance provided by the LCAS (Ruediger et al. 2000) recommending project planning evaluate the effects to lynx habitat within designated LAU exceeding 25,000 acres in the southern Rocky Mountain Geographic Area. LAUs are intended to provide the smallest scale at which the effects of management actions on lynx habitat are quantitatively evaluated. To be consistent with the LCAS, two LAUs, Independence Pass and Fryingpan North will be analyzed separately as project impacts two streams that occur in the different LAUs.

Status of Lynx Habitat in the Project Area

The tables below describe the amount and percentage of lynx habitat within each LAU, as estimated from lynx habitat mapping. According to the BA, the mapped acres include the Forest Plan 2002 baseline plus any changes in habitat due to projects that have had ESA section 7 consultation since the baseline was established and current state, private, and federal actions are accounted for. Both LAUs are approximately 95 percent USFS lands.

Environmental baseline status of lynx habitat acres by LAU.		
Habitat Description	Acres of habitat within LAU	
	Independence Pass LAU	Fryingpan North LAU
Total Acres	97,115	108,146
Federal (NFS) Acres	92,744	101,544
Total Lynx Habitat	48,903	57,754
Denning Habitat	16,701	23,982
Winter Foraging*	26,919	33,573
Other Foraging*	5,198	0
Currently Unsuitable	85	199

Percent of Lynx Habitat on USFS Lands In Various Habitat Criteria By LAU.	
	Percent of habitat within LAU

Habitat Description	Independence Pass LAU	Fryingpan North LAU
Denning	34.1	41.5
Winter Foraging	55.0	58.1
Currently Unsuitable	0.2	0.3

The LCAS requires maintaining greater than 30 percent of the LAU in suitable condition and at least 10 percent as denning habitat. Both LAU values are consistent with the management thresholds recommended by the LCAS to help preserve lynx habitat viability. The project areas are not within lynx landscape linkages although there is a linkage near the project area on the south east side of Lime Park facilitates animal movement between the Holy Cross and the Hunter-Fryingpan Wilderness areas.

Both of the project areas are located in ¼ to ½ mile wide alpine meadow valleys containing the following vegetation habitats types: 1) aspen, 2) lodgepole pine, 3) Engelmann spruce/subalpine fir, 4) willow riparian/willow carrs, and 5) upland grass meadows. Trees to be used for instream structures are along the edge of Aspen/conifer and Engelmann spruce/subalpine fir stands that are either lynx denning and/or winter habitat or adjacent to this habitat. Instream wood placement sites are located in willow-dominate riparian zones.

Existing conditions in the project areas have been affected by past timber harvests, dispersed and developed recreation, travel management, grazing, and permitted outfitter/guiding. Recreation developments, including campgrounds, picnic areas, and trailheads are found along Lincoln Creek and in the vicinity of Crooked Creek. A number of cabins provide recreation opportunities nearby Crooked Creek. Both areas have a Forest Development Road parallel to the creeks that are heavily used during summer and provide over-snow travel during winter

Status of lynx within the project area

There are no detailed data available on the population status of lynx in either LAU. Historically lynx occurred in the vicinity of the Crooked Creek project area. There was a documented lynx killed in 1969 on the Fryingpan River and a report of tracks by CDOW in 1979 (Dwyer 1996b). Several lynx that were reintroduced in 1999 and 2001 by the CDOW in the southwestern part of the state have relocated in Pitkin and Eagle County (Shenk 2001). The locations of transplanted lynx up to December 2001 are thought to represent transient individuals as no lynx were documented as occurring in Eagle and Pitkin County at the end of 2001. Shenk (2002 and 2003) reported that there were some lynx north of Gunnison to the I-70 corridor, so there is a possibility that lynx may occur within the project areas.

Keystone Ski Resort's Little Bowl and Erickson Bowl Snowcoach Tours

The LCAS (Ruediger et al. 2000) suggests project planning evaluate effects to lynx habitat within a designated LAU exceeding 25,000 acres in the southern Rocky Mountain Geographic Area. LAUs are intended to provide the smallest scale at which the effects of management actions on lynx habitat are quantitatively evaluated. To be consistent with the LCAS, the 75,743

acre Snake River LAU mapped as part of the Forest’s 2002 Plan Revision will be used to analyze project impacts.

Status of lynx and habitat within the Snake River LAU

The project area is located within the 75,743 acre Snake River LAU of which 64,640 acres (85.3 percent) is in Federal ownership. The LAU is made up of the Snake River Watershed, bounded on the east and north by the Continental Divide, I-70 on the north and west, and the Snake River-Swan River on the south. Environmental baseline statistics of lynx habitat is summarized in table below. Current mapping of the LAU breaks down lynx habitat as follows: 6,609 acres of denning habitat, 17,714 of winter foraging habitat, 14,195 acres of other foraging habitat, and 2,244 acres of currently unsuitable lynx habitat.

The LCAS requires maintaining greater than 30 percent of the LAU in suitable condition and at least 10 percent remains as denning habitat. The Snake River LAU mapped values of 5.5 percent of unsuitable and 16.2 percent as denning are consistent with the LCAS management thresholds.

Keystone Ski Resort Snowcoach Tours

Snake River LAU	Baseline before action (acres)	Number of acres affected (action)	Net change (acres)	Percent of Habitat change
Denning Habitat (acres)	6,609	0	0	0
Winter Forage (acres)	17,714	0	0	0
Other lynx Habitat (acres)	14,195	0	0	0
Total LAU (acres) including non-habitat	40,762	0	0	0

The project area occurs within the upper montane, subalpine and alpine life zones of Keystone Mountain at elevations between approximately 9,400 and 11,600 feet. Treeline occurs around 11,520 feet in east-northeast-facing Little Bowl and 11,440 feet in southwest-facing Erickson Bowl. Alpine areas are dominated by climax (i.e., *Kobresia* sp.) mountain grassland. Both bowls are windward facing and do not develop persistent snowfields that support mesic vegetative communities (i.e., willows), except along drainage bottoms below treeline.

Factors Affecting Lynx

Several radio-collared lynx have been located in Summit County. From October 3, 1999 through October 22, 1999, a lynx moved through Keystone Ski Area, to the Montezuma area, to the north side of I-70, northeast of Dillon (Thompson 2003). That may have been the same lynx that, between Montezuma and I-70, crossed through A Basin Ski Area (G. Patton, USFWS; T. Kroening, G. Byrne, CDOW; B. Mitchell, KSA, pers. comm.).

A Yukon male used both sides of Fremont Pass over the 1999/2000 and 2000/2001 winters. Another lynx moved from south of Rifle to Guanella Pass (south of Georgetown), presumably through Summit County. In mid-May 2000, a mountain biker on the old railroad grade east of Copper Mountain observed a lynx with a collar. That animal was relocated by the CDOW east of Silverthorne on the north side of I-70. The cat appears to have gone through Tenmile Canyon and crossed I-70, but the exact routes and crossing points are unknown (T. Kroening, CDOW, pers. comm., June 5, 00). Another lynx used the area between Stafford Gulch (west of Copper Mountain Ski Area) and the east side of Highway 91 for approximately one week in February 2001; crossing Highway 91 several times during that period. Lynx would be able to cross through Copper Mountain Ski Area at night undisturbed, since night skiing is not permitted (Thompson 2002).

No evidence of lynx has been detected in the landscape area despite extensive winter tracking surveys conducted since 1984. Winter tracking surveys within the project area and in Jones Gulch did not find indication of lynx presence. Summer surveys conducted along the west boundary of the KSA twice each year for the purpose of monitoring compatibility of skiing with big game use of the area have not found evidence of lynx. The BA has detailed information on surveys.

The undeveloped forest stands below the bowls were historically logged and are now dominated by mature conifer forest. The forest below Little Bowl is largely spruce-fir, with a stand on a southwest-facing ridge, and a few, small willow dominated meadows on the north-facing slope. The forest below Erickson Bowl is almost entirely mature; open-canopy spruce-fir stands. Drainage bottoms through the forest below both bowls that are now used as de facto egress trails support willow-dominated riparian communities. The drainage bottom out of Little Bowl is narrow, incised, and generally supports a conifer overstory, while the drainage bottom out of Erickson Bowl is broader and open. Both forest patches are largely unused by existing skiers and what use does occur is light and occasional. A primitive road to the historic Erickson Mine bisects the forest patch below Erickson Bowl. This road, which dead-ends at the mine, is open to the public in summer when the Keystone Gulch Road is open.

Lynx landscape linkage

Due to the patchy, discontinuous distribution of lynx habitat in Colorado, landscape-level habitat connectivity is paramount to maintaining a viable lynx population. Any continuously forested corridor between mountain ranges supporting lynx habitat that is relatively free of human development has the potential to be an important landscape linkage. Southern Summit County, which includes the project area, is relatively well connected with forested habitats in adjacent mountain ranges. Lynx released in the SJNF have already used these forested areas into Summit County.

The Snake Rive LAU contains segments of a designated lynx landscape linkage which is a continuous, mostly forested area extending northeast below the west side of the Divide, then north through The Outback and North Peak portions of Keystone Ski Area, down Jones Gulch, across Montezuma Road and Highway 6, then northwest through the Tenderfoot Mountain habitat. The importance of this linkage to the proposed project is that Jones Gulch, a steep incised spruce-fir

forest is located on the west side of the LAU. Access to Jones Gulch is possible from the KSA.

Past and present State, local, and private actions in the action area include (in approximate decreasing order of impact significance and relevance to the proposed action) development of KSA and its base area, ongoing secondary resort development (municipal and residential) in Summit and adjacent counties as a result of the development, operation, and upgrading of Breckenridge, Copper Mountain, Vail, Beaver Creek, Arapahoe Basin, Loveland, and Ski Cooper Ski Areas, Dillon Reservoir, I-70 and Highways 6 and 9 effects, and dispersed summer and winter recreation (e.g., hunting, fishing, camping, hiking, Nordic skiing, snowmobiling, four-wheel driving, sightseeing, etc.). Obviously, collective impact areas affecting lynx habitat in the present Keystone analysis overlap those of other resort developments where impacts are less clearly attributable to KR.

Past historic mining of the late 1880's and early 1900's produced the most widespread and profound habitat changes that established the successional trend to present conditions. The original town of Dillon is the site of the present day Dillon Reservoir that began filling in 1963. During the 1970's, I-70 was expanded to its present form including the construction of Eisenhower Tunnel which allowed traffic to avoid Loveland Pass and therefore contributing to the interstate becoming a major transportation corridor. KSA began operating in 1972. With increased transportation access from Denver and the concomitant development of Summit and Eagle County ski areas, local towns began their evolution into four-season, day and destination resort communities.

Ski area

KR supports a fully developed base area with facilities common to a four-season resort. Most base area facilities operate year-round, although some may close during the "shoulder seasons". Resort facilities are interspersed within the town of Keystone, which extends along the bottom of Snake River Valley, from the Ski Tip area on the east to Summit Cove Subdivision and the Snake River Arm of Dillon Reservoir on the west. This narrow valley bottom formerly supported a continuous, riparian corridor along the Snake River with adjacent lodgepole pine and aspen stands interspersed with big sagebrush meadows. Much of this bottomland has been developed as a result of secondary developments associated with KR. Land ownership patterns generally confine private ownership to the valley bottom with mostly forested mid- and upper elevations in public ownership, managed by the USFS.

KSA is one of Colorado's major, year-round destination resorts that began development in 1971 and opened to the public in 1972. The ski area contains 116 trails and 1,861 skiable acres on portions of three mountains (from north to south: Keystone, North Peak, and The Outback) that are served by 21 lifts, including 2 gondolas. Total lift capacity is 33,564 people per hour. The ski season normally opens to the public in mid-November and closes in mid-April (5 mos.).

Keystone Ski Patrol personnel (J. Bussey, pers. comm., 1999) indicated that both bowls are now "skied hard" by hike-to skiers on fresh powder days, a level of use that amounts to as much as 2 to 4 dozen skier runs per day when conditions are optimal.

Crooked Creek Complex Timber Sale

The 2002 Forest Plan Revision identified LAUs for the WRNF following guidance provided by the LCAS (Ruediger et al. 2000). The project area overlaps two LAUs, Brush Creek and Fryingpan North. The tables below describe the current amount of lynx habitat types in each LAU and the expected changes these areas will receive from project actions. The current mapped acres include the Forest Plan 2002 baseline plus any changes in habitat due to projects that have had section 7 consultation since the baseline was established. No lynx landscape linkage areas have been identified within the project area.

Status of lynx habitat in the project area

Brush Creek LAU	Baseline before action (acres)	Number of acres affected (action)	Net change (acres)	Percent of Habitat change
Denning Habitat	21,113	25.6	21,087	<0.12%
Winter Forage	12,933	10.4	12,923	<0.08%
Other lynx Habitat	14,988	27	15,015	>0.18%
Total LAU acres including non-habitat	97,864	0	97,864	0

Fryingpan North LAU	Baseline before action (acres)	Number of acres affected (action)	Net change (acres)	Percent of Habitat change
Denning Habitat	23,982	332.1	23,650	<1.38%
Winter Forage	16,691	75.4	16,766	>0.45%
Other lynx Habitat	16,882	59.8	16,942	>0.35%
Total LAU acres including non-habitat	108,146	0	108,146	0

Within the project area there are about 6,720 acres of forested vegetation. The percentages of the project area by the vegetation cover types forest cover type by successional stage is given in the tables below.

Estimated percentage of Crooked Creek project area by dominant vegetation types

Lodgepole Pine	23%
Engelmann Spruce/Subalpine fir	33%
Aspen	24%

Douglas-Fir	0.5%
Willow riparian	9.8%
Grassland/forb	8.3 %
Other	1.0%

Crooked Creek project area cover types by structural stages

	Early	Mid	Late
	Structural Stage	Structural Stage	Structural Stage
Lodgepole pine	14 %	17 %	69 %
Spruce/fir	16 %	12 %	72 %
Aspen	11 %	55 %	34 %
Douglas-Fir	0 %	0 %	100 %

Results of random snowshoe hare pellet plots conducted within the project area in 2002 are described in detail in Doerr (2003) and are summarized here since snowshoe hares are the principle food item for lynx. The 2002 survey suggested a density of about 0.19 (\pm 0.05) hares/ha in forest habitat within the project area. Ruggiero et al. (2000) have proposed that a minimum density of 0.5 hares/ha are needed to support lynx populations in northwestern Canada. The 2002 hare data suggest that the Crooked Creek Timber Sale project area is well below that density.

Roads

There are approximately 32 individual travelways totaling 27.0 miles within the project area. Approximately 7.8 miles are classified as arterial roads, 4.9 miles are classified as collector roads, 9.8 miles are classified as local roads, 2.2 miles are designated as unclassified roads, 0.2 miles are private roads and 2.1 miles are classified as motorized trail. Approximately 25.6 miles of these travelways are designated as open. The current open travelway density of the Forested Flora and Fauna Habitats Management Area is 1.35 miles per square mile.

Forest Road 400 is the connecting road between the towns of Eagle and Thomasville and receives substantial vehicle traffic during the summer and fall. In the winter, the project area has no open roads, but receives a high amount of snowmobile use.

Status of lynx within the Project Area

Historically, lynx occurred in the project area. There was a documented lynx killed in 1969 on the Fryingpan River and a report of tracks by CDOW in 1979 (Dwyer 1996b). Several lynx that were reintroduced in 1999 and 2001 by the Colorado Division of Wildlife in the southwestern part of the state have been relocated in Eagle County (Shenk 2001). Relocations of transplanted lynx up to the end of December 2001 are thought to represent transient individuals as no lynx were documented as occurring in Eagle County at the end of 2001. However, Shenk (2002 and 2003) reported that there were some lynx “north of Gunnison up to the I-70 corridor” so there is

a possibly that lynx currently occur within the project area at least on occasions.

Lodgepole Pine Rollerchopped Thinning Project

The project will be located within the Bonanza-Cochetopa LAU and the North Pass Linkage area. The Bonanza-Cochetopa LAU is 155,283 acres in size and contains 100,443 acres of lynx habitat. This habitat is further divided into approximately 24 percent denning, 37 percent winter foraging, 33 percent summer foraging and 6 percent capable but currently unsuitable habitat. The North Pass Linkage Area contains 33,211 acres. It is assumed that the conditions in this linkage area are adequate and functioning to provide a travel corridor for the lynx. Because the proposed action may affect the quality and amount of habitat available to the lynx, the entire Bonanza-Cochetopa LAU and the North Pass Linkage Area are considered to be within the project area.

Lynx Linage Areas may contribute to the persistence of lynx populations on a regional scale depending on their position and ecological role in the landscape. To be functional, these areas must be several miles wide with only narrow gaps and contain sufficient cover and foraging habitat to sustain a dispersing adult lynx for several weeks. Human activity on a local level can affect the larger landscape dynamics such as creating barriers to travel for wide ranging species (i.e., lynx). Therefore, the entire North Pass linkage is considered the project area.

Currently the project area is covered with young lodgepole pine, but many are infected with gall rust which may spread and cause large tracts of dead and dying trees. A majority of these trees still maintain good numbers of ground level green boughs. However, crowding is beginning to occur and extensive self-pruning is expected to follow shortly, decreasing the value of the area to the snowshoe hare and the lynx.

To date, there have been no reported observations of lynx in the project area nor have surveys of the project area produced any lynx sightings or track observations. However, the linkage area is a known travel corridor and lynx are suspected to move through the project area.

Pre and post-treatment breakdown of habitat components within the Bonanza-Cochetopa LAU

Total USFS acres in LAU	Acres of lynx habitat	Acres of non-habitat	Acres of currently unsuitable habitat	Acres of denning	Acres of winter forage	Acres of "other" habitat	Acres and percent affected by project	Total acres and percent currently unsuitable habitat
155,283	100,370	n/a	5,853 4%	23,973 24%	37,008 37%	33,546 33%	221	6,074 6%

Million Fire Salvage Timber Sale

The project will take place entirely within the Trout-Handkerchief LAU. This LAU will serve as

the baseline unit from which long-term trends in landscape change can be tracked. In concept, LAUs are intended to reflect an average female lynx home range in size and landscape. Because the action may affect the habitat within the LAU and thereby affect any lynx that may be in the area, the entire LAU will be considered to be the project area.

The Trout-Handkerchief LAU is one of the largest LAUs on the Forest and is over 176,000 acres. This LAU is best characterized as being moderately to heavily roaded and contains ponderosa pine in lower elevations, which changes into a mixed conifer and aspen forested type with increased elevation. North slopes are characterized by Engelmann spruce and Douglas fir forests. Beaver Creek Reservoir, Poage Lake and Alberta Reservoir are located within the LAU.

The Million Fire occurred entirely within the Trout-Handkerchief LAU. Post-fire habitat conditions include Federal and private lands within the burn perimeter. It should be noted that improved mapping of the fire perimeter, since the BAER BA was submitted to the Service, has shown that less lynx habitat was burned than was reported in the BAER BA. This difference in acres (less than 250 acres total of all habitats) has been corrected and is reflected in the following table.

Description	*Post-fire conditions with 100% conversion to non-suitable habitat
Total acres within LAU	176,750
Total acres of lynx habitat within LAU	134,216 (75.9%)
Denning habitat	51,786 (39%)
Winter Foraging habitat	14,390 (11%)
Other habitat	42,135 (31%)
Unsuitable habitat	25,906 (19%)

*Included in the baseline are two small timber sales that have received concurrence from the Service prior to the Kessler decision. These projects were screened on July 7, 2002 and May 14, 2002, respectfully. The Beaver Creek II sale will convert 27 acres of denning habitat to winter foraging habitat and 70 acres of winter foraging habitat into other habitat. The Shaw Divide Aspen sale will convert 5 acres of winter foraging habitat into other habitat.

This particular LAU also has the highest percentage of unsuitable acres of lynx habitat on the forest. The LCAS limits the amount of unsuitable habitat within an LAU to no more than 30 percent. The Million Fire burned within lynx habitat including denning, winter and summer foraging habitat. A complete ground-truthing of the fire's impacts upon lynx habitat will occur next field season but preliminary surveys are strongly suggesting that 100 percent of the suitable lynx habitat within the burn was converted into unsuitable habitat. The table above shows that if 100 percent of the lynx habitat within the fire was converted into unsuitable habitat, the LAU will continue to meet the Standards and Guidelines of the LCAS.

While it is unknown if there are lynx currently in the action area, for the purposes of this opinion, all appropriate habitat is assumed to be occupied.

Avalanche Snowmobile Tours

The action area is the Williams Fork LAU. No linkage areas will be affected by this action.

Breakdown of lynx habitat components within the Williams Fork LAU

Total USFS acres in LAU	Acres of lynx habitat	Acres of non-habitat	Acres of currently unsuitable habitat	Acres of denning	Acres of winter forage	Acres of "other" habitat	Acres and percent affected by project	Total acres and percent currently unsuitable habitat
117,570	89,959	n/a	5,110 6%	39,084 43%	37,962 42%	7,803 9%	0	5,110 6%

While no individual lynx are known to occur within the project area, for the purposes of this opinion, all lynx habitat within the action area is considered to be occupied.

White River Plateau Sheep Allotment

For the purpose of this document, the analysis area encompasses approximately 257,800 acres, and is comprised of five LAUs (Bar HL, Clinetop, Coffeepot, Quartzite, and South Fork White River) that overlap the proposed sheep allotments and adjacent WRNF lands. The 2002 LRMP Revision (USFS 2002a) has identified LAUs for the WRNF following guidance provided by Ruediger et al (2000).

The analysis area is within the southeastern end of the White River Plateau, also referred to as the Flattops. It encompasses WRNF lands in Garfield and western Eagle County, Colorado, from Triangle Park to just west of Derby Mesa, and south to the Forest boundary. Elevation within the analysis area ranges from 8,000 to 11,400 feet. The Plateau has diverse geomorphology contributing to a variety of vegetation types in the project area. Vegetation in the allotments is comprised primarily of subalpine grass and forb communities, Engelmann spruce-subalpine fir, and aspen forests in a range of seral stages. Other vegetation types including mountain shrubs, riparian willows, and sagebrush (See BA Table 3)

The tables below show the composition of lynx denning, winter forage, and unsuitable habitat on the WRNF lands within each LAU, as estimated from lynx habitat mapping. The LCAS requires maintaining greater than 30 percent of the LAU in suitable condition and that at least 10 percent remains as denning habitat. The project’s LAU values are consistent with the management thresholds recommended by the LCAS to help preserve lynx habitat viability.

Acres of lynx habitat among LAUs that overlap the sheep allotment analysis area.	
	LAU Name

LAU Variable	Bar HL	Clinetop	Coffeepot	Quartzite	S FORK WHITE RIVER
Total Acres	99,373	86,154	84,580	97,120	105,392
Federal (NF) Area	95,828	85,515	82,129	96,392	104,939
Total Lynx Habitat	35,338	34,166	35,028	35,936	61,398
Denning Habitat	15,157	16,506	22,282	13,690	45,708
Winter Foraging	14,935	6,979	4,519	8,423	4,540
Other Habitat	5,137	7,323	8,083	13,540	11,082
Currently Unsuitable	109	3,358	144	283	68

Composition of lynx habitat on LAUs that overlap the allotment analysis area..					
% Composition	LAU Name				
	Bar HL	Clinetop	Coffeepot	Quartzite	S Fork White River
Denning	43	48	64	38	74
Winter Foraging	42	20	13	12	7
Currently Unsuitable	0.3	9.8	0.4	0.8	0.1

Canada lynx

CDOW records indicate four historic occurrences of lynx on the White River Plateau, all from the early 1900's (Byrne 1995). A 1997, aerial survey conducted by the Division detected one possible set of tracks that appeared to be a lynx at the head of East Elk Creek (Byrne and Copeland 1997), which is in or very close to the Clinetop LAU. These tracks were not ground verified for positive identification. There are currently no documented Canada lynx on the White River Plateau or the analysis area.

Reintroduction of lynx by the State of Colorado has increased the possibility of lynx occurring in the project area. In 2003, researchers confirmed successful reproduction among reintroduced lynx (Shenk 2003) in the southern portion of the State. At least one of the year 2000 transplanted lynx from southwestern Colorado was located several times in the general vicinity of Derby Mesa and also north of the project area along the Garfield/Routt County line (Shenk 2001). However, currently there are no known transplanted lynx anywhere north of I-70 in the vicinity of the Flattops area (Shenk 2002).

Forest activities affecting lynx

Management activities in the analysis area include grazing, timber harvest, dispersed and developed recreation, travel management, wilderness, and outfitter/guiding permits. Forest system roads provide access to visitors throughout the analysis area, although natural breaks and canyons make east-west travel discontinuous. Big game hunting during the fall is an important recreation activity that occurs within the analysis area.

Recreational activities across the White River Plateau have generally impacted riparian vegetation. Developed recreation sites, including camping units, picnic areas, hiking trails, and

access points associated within riparian ecosystems zones have contributed to soil compaction, degraded stream channels and sedimentation.

The Cow Camp timber sale, a regeneration harvest of spruce-fir, lodgepole and aspen stands, will change 76 acres of winter forage habitat to (currently) unsuitable lynx habitat for approximately 15 to 20 years in the Clinetop LAU. The acres are included in currently unsuitable lynx habitat as part of the environmental baseline for lynx.

State and private actions contributing to the environmental baseline are minimal as there is no State-managed land within the analysis area and the amount of private land is limited. Private land within the LAUs (7,816 acres, 2 percent) is along county and Forest-system roads at lower elevations and on the periphery of the area found in large blocks located outside of lynx habitat on the periphery of LAUs.

Fire

In June and July 2002, three lightning-caused fires occurred within the analysis area. The Spring Creek Fire, which burned 13,493 acres in the Clinetop Mesa area. The Coal Seam Fire burned 12,229 acres northwest of Glenwood Springs. The Meadow Lake Fire burned less than 100 acres. Fires occurred in spruce-fir, spruce-fir mixed forests, and mountain shrub vegetation types. Fires are included in the environmental baseline.

Grazing

In late summer of 2002, field assessments on allotment habitat conditions analyzed effects of sheep grazing on wildlife (except fishes) and plants. The overall effects from grazing appear to be minimal. Active allotments were in general good health, with Clark Ridge/Deep Creek allotment having the highest degree of grazing effects from sheep. Surveys revealed that most of the effects were evident along stock driveways, near watering holes, or areas of good forage. Effects appeared to be concentrated in certain areas, rather than spread out all over a specified allotment. Inactive allotments showed little evidence that sheep had used them.

Corral allotment contains a “dual use area” managed for cattle and sheep. Reconnaissance documented heavy to excessive utilization of riparian habitat by cattle. Mitigation and monitoring has been identified to bring the area up to LRMP standards for riparian and aquatic resources.

Beaver Creek Trail

The project area is located on the periphery of the Battlement LAU adjacent to private land and lynx non-habitat. The LAU contains about 55,926 acres according to January 29, 2002, mapping updates. Of the total LAU acreage, 15,591 acres is considered lynx habitat. It is estimated that about 56 percent of the total lynx habitat on National Forest lands in the LAU is suitable for lynx denning and about 24 percent is currently unsuitable.

The LCAS requires maintaining greater than 30 percent of lynx habitat within the LAU to be in suitable condition and that at least 10 percent remains as denning habitat. The Battlement LAU

values are consistent and well above the management thresholds recommended by the LCAS to help preserve lynx habitat viability. The table below summarizes the effects the proposed project on Battlement LAU lynx habitat. There are no identified linkage areas for lynx within the Project Area or the LAU.

Breakdown of lynx habitat components within the Battlement LAU

Battlement LAU	Baseline before action (acres)	Number of acres affected (action)	Net change (acres)	Percent of Habitat change
Denning Habitat	8,771	0.2	8,770.8	Negligible
Winter Forage	4,391	0	4,391	No change
Other Foraging lynx Habitat	2,404	0.13	2,403.9	Negligible
Total LAU	55,926	0.33	55,925.7	Negligible

The following habitats occur in the project area: lodgepole pine (*Pinus contorta*), aspen (*Populus tremuloides*), upland grass meadows, mixed conifer forests, and Engelmann spruce (*Picea engelmannii*)/ subalpine fir (*Abies lasiocarpa*). There is suitable lynx denning habitat within this project area. The denning area that is located within the project area consists of spruce-fir with young fir mixed with large amount of dead and down.

The Battlement Mesa area is a popular recreation area used for hunting, hiking, and dispersed recreation camping. Motorized use is limited to east or west ends of the Mesa. Private lands in Teepee Park are comprised of spruce-fir and aspen which are currently being logged. A project plan for logging operations was submitted to Mesa County by the landowner. The harvest operations are scheduled to end by fall of 2003. Lynx habitat was not mapped on private lands but reconnaissance of the project area revealed the portion of private land through which the trail lays is primarily aspen that has been clearcut, with some spruce-fir/aspen mixed stands that have been selectively logged. Some residual canopy vegetation remains, particularly in proximity to Beaver Creek and other riparian areas

Buffalo Mountain Trail Project

The action area is within Blue River LAU and consists of the Blue River watershed downstream of the Dillon Reservoir. The LCAS recommends that project planning should evaluate the effects to lynx habitat within designated LAUs exceeding 25,000 acres in the southern Rocky Mountain Geographic Area. The LAUs are intended to provide the smallest scale at which the effects of management actions on lynx habitat are quantitatively evaluated. To be consistent with the LCAS, the Blue River LAU will be the unit size for analysis. Project impacts occur on 1.5 acres and all within the Blue River LAU and effects do not extend into other LAUs. Therefore, the analysis will incorporate only the Blue River LAU.

The LCAS requires a standard of no more than 30 percent of the lynx habitat within an LAU can be in an unsuitable condition and that at least 10 percent remains as denning habitat. The Blue

River LAU values are consistent and well above the management thresholds recommended by the LCAS to help preserve lynx habitat viability with unsuitable habitat comprising less than one percent and denning habitat above 27 percent. The project does not affect denning habitat. The table below summarizes the effects the proposed project on the Blue River LAU.

Blue River LAU	Baseline in acres	Acres affected	Net change in acres	% of Habitat change
Denning Habitat (acres)	18,956	0	0	
Winter Forage	16,132	0.5	16,131.5	Negligible
Other lynx Habitat	34,483	0	0	0
Total LAU including non-habitat	158,651	158,650	0	Negligible

The project area consists of winter forage habitat, as well as non-habitat. There is mapped denning habitat a few hundred yards to the east and northeast (downhill). Snowshoe hares are present in the project area, however, their abundance is not known. The project area does not include a travel corridor. The Officer's Gulch lynx linkage is approximately three miles to the south along I-70. The corridor links two areas of suitable habitat, the Tenmile and Gore Mountain Ranges.

Approximately 20 percent of the LAU is in private ownership. Much of this private property is already heavily developed, especially on the southeast side. Interstate 70 crosses the extreme southeast corner of the LAU and acts as a partially effective barrier between this LAU and those to the south. Within this LAU, there are no suitable wildlife crossings along I-70.

The town of Silverthorne also serves as an effective wildlife barrier and lies at the intersection of State Highway 9 North, U.S. Highway 6 and I-70. Silverthorne is developed commercial zone. Residential areas generally occur uphill from Highway 9 and the Blue River. There are two golf courses in one of the residential areas on the northwest side of town.

The Blue River LAU is bisected lengthwise by Highway 9 and the Blue River. Traffic is high with commuters from North Summit County and Grand County into the commercial areas. The highway is currently being improved between Silverthorne and Ute Pass Road, which will result in increased traffic speed and perhaps volume. In addition, 2 wildlife crossing culverts have been installed underneath the roadway. Ranches, ranchettes, and houses occupy most of the valley floor between Silverthorne and Green Mountain Reservoir, but there are some public parcels adjacent to the highway or river that could provide cover for a dispersing lynx.

Green Mountain Reservoir and the community of Heeney sit at the north end of the LAU. This reservoir serves as a barrier to lynx travel. There is extensive juniper/sagebrush habitat on the east side of the highway between the reservoir and Ute Pass Road. It is possible that a lynx

could still cross the highway in some places and utilize the various riparian areas to reach timber in the Williams Fork Mountains.

The Buffalo Mountain trail is used mostly summer day hiking. Limited horse travel and overnight camping probably occurs, but is not a large percentage of use. The trailhead is at the upper end of the Wilderness residential subdivision, therefore, the trail at or below the project area also gets much use by residents/locals.

Recently a beneficial action by the Summit County Open Space Department resulted in acquisition of 892 acres of the Sudan ranch north of Green Mt. reservoir. The land will protect a potential lynx travel corridor around Green Mt. itself and sagebrush communities northeast of the reservoir. Those sagebrush communities have riparian corridors generally running east-west between Highway 9 and the Williams Fork Mountains. A large part of the potential corridor to the west of Green Mountain is still private; however it is forested and lightly developed along Deep Creek and Martin Creek.

Hummer Tours for the D&L Ranches

The project area is located within the Eagle Valley and Sheephorn LAUs, which contain about 97,650 and 90,740 total acres, respectively, of public lands (USFS 2002, as updated January 29, 2002). Because the action may affect the habitat or conditions within the LAUs and thereby affect any lynx that may be in the area, both LAUs will be considered to be the action area. The habitat types within the LAUs are described below.

Breakdown of lynx habitat components within the Eagle Valley LAU

Total USFS acres in LAU	Acres of lynx habitat	Acres of non-habitat	Acres of currently unsuitable habitat	Acres of denning	Acres of winter forage	Acres of "other" habitat	Acres and percent affected by project	Total acres and percent currently unsuitable habitat
n/a	55,614	n/a	4,939 9%	14,245 26%	18,895 34%	17,535 32%	0	4,939 9%

Breakdown of lynx habitat components within the Sheephorn LAU

Total USFS acres in LAU	Acres of lynx habitat	Acres of non-habitat	Acres of currently unsuitable habitat	Acres of denning	Acres of winter forage	Acres of "other" habitat	Acres and percent affected by project	Total acres and percent currently unsuitable habitat
n/a	49,837	n/a	1,129 2%	19,784 40%	14,543 29%	14,381 29%	0	1,129 2%

The habitat as mapped was assessed in a 1 mile wide corridor along USFS Road 700. About 5.8 miles of the road goes through currently mapped lynx habitat. The entire mile wide corridor is estimated at about 50 percent winter foraging habitat, 2 percent denning habitat, 15 percent other habitat, 28 percent nonhabitat and 5 percent unrated private lands.

The Vail area has accounted for a comparatively large number of sightings of native lynx in Colorado in the past 35 years (USFWS 1999). In 1969, a lynx was shot on the south side of Vail Mountain. In the winter of 1973-74, two lynx were illegally trapped in the Vail Ski Area near the bottom of Northeast Bowl about one mile east of the project area. These were the last two native lynx officially documented in Colorado. From 1988 to 1992, there were a number of lynx tracks reported by biologists as either “confirmed”, “probable”, or “possible” in the Mill Creek drainage, the Two Elks drainage, and on Vail Mountain (op. cit.). A lynx sighting near the Dowd Junction underpass (about 4 miles southwest of the project area) on January 1998 was deemed “credible” by the Service (op. cit.).

In 1999 and 2000, the State of Colorado released a number of lynx in southwestern Colorado in order to reestablish a viable lynx population within the state. Several of these animals have been either confirmed or reported in the general vicinity of Vail. In the summer of 1999, a radio-collared lynx was killed along I-70 near Vail Pass, about 8 miles southeast of the project area (Bill Andree, CDOW, pers. comm.). On May 30, 2000, a collared lynx was reported by a Vail Associates employee near the intersection of the Cold Feet and Lions Way Ski Runs on the north side of Vail Mountain (Doerr 2001). This sighting is considered “probable”. In June 2000, a collared lynx was seen by a CDOW biologist in the Camp Hale area about 16 miles south of the project area (Bill Andree, CDOW, pers. comm.). In February 2001, a collared lynx was documented in the area between Vail Mountain and Copper Mountain for about 10 days based on telemetry locations (op. cit.). This last area is roughly 18 miles southeast of the project area. None of these sightings have occurred north of I-70.

Winter track surveys and lynx hair snare surveys conducted in the Vail area by the USFS part of the CATIII BO monitoring have not produced any evidence of lynx in the area to date (USFS 2000b; unpublished data, Holy Cross Ranger District, wildlife files).

The local snowmobile association grooms the trails (roads) in this area during the winter. The trails are part of the current baseline of compacted trails and snow play areas on the WRNF (USFS unpublished data). The current winter capacity study shows a maximum capacity of 6,200 service days available in this area for permitted winter recreation. The current operating permits in this area allow a total of 4,000 service-days of snowmobiling on all or parts of FS Roads 700, 719, 786, 410, 734, 701, and 433 and the Lost Lake Trail and in the three small snow play areas, one at the junction of Roads 734 and 787, one at the switchback in Road 701 west of Indian Creek (boundary of Sec. 23 and 26) and area near Red Spring (Sec. 28/29).

The H&H Ranches dba Piney River Ranch is currently permitted use during the winter season. They currently lease Hummers to transport guests to the Ranch for lunch and conduct snowmobile tours. The Hummers are used only on USFS Road 700 and the snowmobile tours are permitted on other designated trails, roads and snow play areas in the project area. Both

operations are under the current permit that allows up to a total use of 4,000 service days. The current permit restricts their winter use to daylight hours only. The trail system as a whole does not have any restrictions for general public use.

During the 2001/2002 winter season an electronic eye counter was set up on USFS Road 700 to gather some basic information on existing use. The counter records both date and time each time the beam is broken. It does not differentiate between humans, vehicles or animals as the counter counts each break in the beam thus the numbers recorded represent maximum total use. A total of 96 days of counts were taken between December 21 and March 31. These counts are all assumed to be snowmobile traffic for the purposes of this analysis since during this period there were no known uses other than winter recreation by snowmobiles, skiers, and snowshoers.

The data from this counter shows very limited use from 6 p.m. to 6 a.m. throughout the season. A total of 30 days recorded 0 counts during the time period of 6 p.m. to 6 a.m.. These days were fairly well distributed though out the sample period with several multiple days in a row with 0 counts. Some of the days that had 1 or 2 counts were also early morning and very likely could have been counts of the trail grooming operation.

Analyzing the time frame that the proposed night time use would likely occur (6 pm to 10 pm) shows 38 days with 0 counts, 31 days with 1 count, 10 days with 2 counts, 8 days with 3 counts, 4 days with 4 counts and 2 days with more than 4 counts. This averages out to 1.1 counts per day for the time period of 6 pm to 10 pm.

Grand Adventure Snowmobile Tours

The proposed action may affect individual lynx and/or its habitat. The project area is considered the LAU (e.g., Fraser LAU) in which the project affects.

Breakdown of lynx habitat components within the Fraser LAU

Total USFS acres in LAU	Acres of lynx habitat	Acres of non-habitat	Acres of currently unsuitable habitat	Acres of denning	Acres of winter forage	Acres of "other" habitat	Acres and percent affected by project	Total acres and percent currently unsuitable habitat
113,581	78,259 69%	n/a	3,086 4%	45,697 58%	26,522 34%	2,972 4%	365	3,086 4%

The project area falls between 2 identified linkage corridors: Berthoud Pass, approximately 5 miles south of the project area; and the Fraser linkage, immediately north and east of the project area (see attached maps). Because the Fraser linkage was identified to protect a potential north-south bottleneck to lynx movement, the juxtaposition of the project area is of concern. The closest permitted route to the Fraser linkage is at the north end where permitted and public

snowmobiles are allowed at the upper end of Devil’s Thumb Park. This location is in an open meadow, about 1 mile northwest of, and 800 feet lower than, the north end of the linkage. A permitted route also parallels the western boundary of this linkage on private land. This route is about 1.5 miles west and 500 feet lower in elevation than the linkage; and the route follows a road that is also open for public use. Forested private property separates this route from the western boundary of the linkage.

The southern end of the project area is 5 miles north of the Berthoud Pass linkage. Jim, Parry, Flora and Eva Creeks separate the project area from the linkage area. A continuous forest habitat of lodgepole pine, spruce-fir and aspen exists between the project area and the linkage. While no individual lynx are known to occur within the project area all lynx habitat within the action area is considered to be occupied.

Hoop Creek Rehabilitation Project

The project area is identified as foraging habitat for the lynx within the Clear Creek LAU. Based on ARNF lynx habitat mapping, 41 percent of the Clear Creek LAU is lynx habitat. Lynx foraging habitat comprises 27 percent of the lynx habitat in the LAU.

Breakdown of lynx habitat components within the Clear Creek LAU

Total USFS acres in LAU	Acres of lynx habitat	Acres of non-habitat	Acres of currently unsuitable habitat	Acres of denning	Acres of winter forage	Acres of “other” habitat	Acres and percent affected by project	Total acres and percent currently unsuitable habitat
94,884	41,749 43%	n/a	2,052 5%	10,008 24%	26,222 63%	3,466 8%	3 <0.01%	2,052 5%

The project area is also within the boundaries of a lynx linkage area called the Berthoud Pass linkage zone. Lynx linkage zones are unique areas that have been identified as key connections to allow lynx to move between suitable habitats in areas that may be surrounded by non-lynx habitat. In the case of Berthoud Pass, the linkage zone is the forested habitat that goes across the pass, a narrow swath of hiding cover between the alpine/tundra habitat on each side. There are other three lynx linkage zones which also cross the Continental Divide in the Clear Creek LAU. These are Herman Gulch, Loveland Pass and Guanella Pass. Because this project may degrade current lynx habitat within the Clear Creek LAU and the Berthoud Pass linkage zone, the entire LAU and linkage zone combined would be the appropriate project area for this analysis.

Trailblazer Snowmobile Tours

While no individual lynx are known to occur within the action area, for the purposes of this opinion, all lynx habitat within the action area is considered to be occupied. The areas affected

by this action are the Williams Fork and the Fraser LAUs. No linkage areas are expected to be affected.

Breakdown of the lynx habitat components within the Williams Fork LAU

Total USFS acres in LAU	Acres of lynx habitat	Acres of non-habitat	Acres of currently unsuitable habitat	Acres of denning	Acres of winter forage	Acres of "other" habitat	Acres and percent affected by project	Total acres and percent currently unsuitable habitat
117,570	89,959	n/a	5,110 5.6%	39,084 43.4%	37,962 42.2%	7,803 8.7%	0	5,110 5.6%

Breakdown of the lynx habitat components within the Fraser LAU

Total USFS acres in LAU	Acres of lynx habitat	Acres of non-habitat	Acres of currently unsuitable habitat	Acres of denning	Acres of winter forage	Acres of "other" habitat	Acres and percent affected by project	Total acres and percent currently unsuitable habitat
113,581	78,259	n/a	3,086 3.9%	45,697 58.4%	26,522 33.9%	2,972 3.8%	0	3,086 3.9%

Mann Land Exchange

The LCAS has set forth Standards and Guidelines that the USFS has agreed to meet in order to assist in the recovery of the lynx. Current conditions of the Lower Elk River LAU are meeting the following Standards and Guidelines (see table below); no more than 30 percent of the LAU should be in a currently unsuitable condition, at least 10 percent of the LAU is denning habitat, no permanent loss of winter forage habitat, and no net increase in groomed or designated over the snow routes. Although there are other Standards and Guidelines in the LCAS, these are the only ones applicable to this action.

Breakdown of lynx habitat components within the Elk River LAU

Total USFS acres in LAU	Acres of lynx habitat	Acres of non-habitat	Acres of currently unsuitable habitat	Acres of denning	Acres of winter forage	Acres of win/den habitat*	Acres of "other" habitat	Acres and percent affected by project	Total acres and percent currently unsuitable habitat
77,566	69,106	8,460	2,755 4%	16,113 23%	19,068	11,772	35,492	80 <0.01%	2,755 4%

* Win/den habitat represents double counted acres on Forest Service lands (i.e. lands that are considered both denning and winter foraging habitats). On private, State or BLM lands, winter foraging and denning habitats were not defined independently and thus win/den habitat identifies the total estimated acres in winter foraging and denning habitat on those lands.

Road Operations and Maintenance Activities on the Rio Grande National Forest

Road operations and maintenance activities being evaluated potentially affect 18 LAUs over 1,814,471 acres across the RGNF. The RGNF LAUs include non-forested alpine; and subalpine and montane conifer forests with inclusions of deciduous forest, sagebrush, riparian, wetlands, water bodies, grass meadows and shrublands. The LAU mapping is derived from Forest Plan Revision–Common Vegetation Unit mapping efforts and Regional data assumptions. Since the

proposed action will affect a large area and many individual LAUs, the action area is the entire RGNF.

Existing modeled lynx habitat figures are displayed in Lynx Habitat Analysis- Rio Grande National Forest (January 2002). These percentages include existing man-made or other non-habitat features. For all LAUs, 39 percent to 69 percent of each LAU (with an average of 54 percent) are modeled as suitable lynx habitat with 61 percent to 31 percent of each LAU modeled as non-suitable. Denning habitat is modeled between 31 percent and 54 percent of each LAU of the modeled suitable habitat, thus all LAUs are well beyond the LCAS goals (maintaining 10 percent) for denning habitat. Winter foraging habitats are modeled between 12 percent and 40 percent of each LAU of modeled suitable habitat. Overall, 7.5 percent of all LAUs model as "currently unsuitable" lynx habitat range from less than 1 percent to 14.9 percent of any one LAU, thus, consistent with LCAS goals of maintaining 'currently unsuitable lynx habitat' at less than 30 percent. Denning and year-round habitats overlap and together, in light of the relative small degree of 'currently unsuitable habitat' and natural patchiness, reflect potentially suitable habitats being relatively high quality, persisting (low fire interval) conifer (spruce-fir) habitats.

The RGNF LAUs are areas located east of the Continental Divide or west of the Sangre de Cristo Divide, thus, all LAUs are connected to respective adjacent National Forests (NF) and linkage areas have been identified between the RGNF, SJNF, GMUG NFs and PISI NFs. The RGNF LAUs are somewhat segregated by the San Luis Valley, but are relatively connected near the Poncha Pass vicinity. The upper elevation borders of the LAUs are the alpine habitats of the

Continental or Sangre de Cristo Divides, which do not provide forage or denning habitats for lynx, but they are available for lynx movement. Similarly, the lower elevation borders of the LAUs are woodland, non-forested or developed areas, which also do not provide forage or denning habitats for lynx, but likely have some cover for lynx movement.

Forested habitat connectivity between all LAUs appears to exist, in that vegetation mapping has considered past forest treatments and non-lynx habitats. There are no major Interstate highways or extensive human developments bisecting any one LAU once one leaves the San Luis, South Fork Rio Grande or Saguache Creek valley floors. State Highways 17, 114, 149 and 160 bisect their respective LAUs. All the roads are judged to be negotiable by lynx to cross, especially once traffic reduces at night, even though re-introduced lynx have been killed by vehicle collisions (Shenk 2001). Forest connectivity is subject to natural patterns of various forest types and conditions with varying degrees of habitat gap, which lynx regionally and elsewhere have been able to negotiate. Four linkage areas have been delineated at Wolf Creek Pass, Slumgullion Pass, Poncha Pass and North Pass.

Soil, Watershed and Fisheries Conservation treatments on the Rio Grande National Forest and the San Luis Resource Area

The proposed actions are located across the RGNF, which includes approximately 1,852,000 acres of National Forest System (NFS) lands. These NFS lands are located in Township 25 South through Township 29 South; Range 72 West and 73 West of the Sixth Principle Meridian; Alamosa, Costilla and Saguache, Colorado; and Township 48 North through Township 32 North; Range 12 East through Range 6 West, New Mexico Principal Meridians; Alamosa, Conejos, Costilla, Mineral, Rio Grande, Saguache, Hinsdale, Custer, San Juan and Archuleta counties, Colorado. The proposed actions are also located across the San Luis Resource Area, which includes approximately 530,000 acres of BLM land.

Soil, watershed and fisheries conservation treatments being evaluated potentially affect 18 LAUs over 1,814,471 acres across the RGNF. RGNF LAUs include non-forested alpine, subalpine and montane conifer forests with inclusions of deciduous forest, sagebrush, riparian, wetlands, water bodies, grass meadows and shrublands. The LAU mapping is derived from Forest Plan Revision Common Vegetation Unit mapping efforts and Regional data assumptions. Since the proposed action will affect the management of the entire Forest and BLM resource area, which, in turn, will affect several LAUs, an area including both areas (RGNF and SLRA) would be the appropriate analysis area.

RGNF LAUs are areas located east of the Continental Divide or west of the Sangre de Cristo Divide, thus, all LAUs are connected to respective adjacent NFs. The RGNF LAUs are somewhat segregated by the San Luis Valley, but are relatively connected near the Poncha Pass vicinity. The upper elevation borders of the LAUs are the alpine habitats of the Continental or Sangre de Cristo Divides, which do not provide forage or denning habitats for lynx, but they are available for lynx movement. Similarly, the lower elevation borders of the LAUs are woodland, non-forested or developed areas, which also do not provide forage or denning habitats for lynx,

but likely have some cover for lynx movement.

Forested habitat connectivity between all LAUs appears to exist, in that, vegetation mapping has considered past forest treatments and non-lynx habitats. There are no major interstate highways or extensive human developments bisecting any one LAU outside the San Luis Valley, South Fork Rio Grande or Saguache Creek valley floors. State Highways 17, 114, 149 and 160 bisect their respective LAUs. All the roads are judged to be negotiable by lynx to cross, especially once traffic reduces at night, even though re-introduced lynx have been killed by vehicle collisions (Shenk 2001). Forest connectivity is subject to natural patterns of various forest types and conditions with varying degrees of habitat gap, which lynx regionally and elsewhere have been able to negotiate. There are 4 linkage areas on the RGNF and additional data is provided in the Updated BA for the Revised Rio Grande Forest Plan (USDA-FS 2003).

SLRA-Bureau of Land Management (BLM) lands are mapped for Canada lynx habitat through statewide efforts and are in many cases extensions of National Forest LAUs. The highest suitability occurs where land parcels are at or near 9,000 feet in elevation.

Canada lynx habitats are modeled on the RGNF under the specific assumptions common to Forests in Colorado. Total modeled lands of the RGNF include 1,814,471 acres. Of that, 984,184 acres or 54 percent of the RGNF is modeled as potentially suitable for Canada lynx. Habitats are well dispersed; however, habitat tends to be rather naturally patchy in this portion of the Southern Rocky Mountains.

Existing modeled lynx habitat figures are displayed in Lynx Habitat Analysis- RGNF (January 2002). These percentages include existing man-made or other non-habitat features. Thirty-nine to 69 percent of each LAU (with an average of 54 percent) are modeled as suitable lynx habitat with 61 percent to 31 percent of each LAU modeled as non-suitable. Potential suitable denning habitat is modeled between 31 percent and 54 percent of each LAU of the modeled suitable habitat, thus all LAUs are well beyond the LCAS goals (maintaining 10 percent) for denning habitat. Potential winter foraging habitats are modeled between 12 percent and 40 percent of each LAU of modeled suitable habitat. Overall, 7.5 percent of all LAUs model as 'currently unsuitable lynx habitat', ranging from less than one percent to 14.99 percent of any one LAU, thus, consistent with LCAS goals of maintaining 'currently unsuitable lynx habitat' at less than 30 percent. Denning and year-round habitats overlap and together, in light of the relative small degree of 'currently unsuitable habitat' and natural patchiness, reflect potentially suitable habitats being relatively high quality, persisting (low fire interval) conifer (spruce-fir) habitats.

The relative trend of lynx populations in Colorado is estimated considering the presumed, few existing wild individuals, the 96 individuals that were released in 1999 and 2000, and the current release of 32 individuals in 2003. Breeding activities have been observed, and successful reproduction was documented in 2003. Although kittens have been documented, the existing population of lynx is not considered established or stable, and thus, not viable. It still cannot be assumed to be an established, self-sustaining population in Colorado at this time.

Canada lynx occurrence on the RGNF before 1998 was largely unknown. Sightings were few and historical records never considered lynx to be ‘plentiful’. Tracks of lynx were recorded in the 1980’s in the East Fork of the San Juan River drainage. In 1999, private lands within the RGNF were selected by the CDOW as sites for release. To augment the natural lynx population, 96 lynx were released between 1999 and 2000. Further augmentation of 150 individual lynx are planned for 2003 and the following three years.

The CDOW has taken jurisdiction of surveys and studies of Canada lynx under specific guidance from the Service and the ESA. No specific USFS survey has been accomplished associated with this action primarily due to the CDOW efforts, as well as, the nature of the existing on-going activities being management direction verses an on-the-ground project.

Lost Basin Ditch Renovation Project

There are no reliable data available on the population status of lynx in the vicinity of the project area. Resident lynx have persisted in the general vicinity of the project area at least into the 1990’s (Halfpenny et al. 1982; Thompson and Halfpenny 1989; Andrews 1992; B. Andree, CDOW, pers. comm.; Ruediger et al. 2000). In addition, some transplanted lynx from southwestern Colorado have moved through the general area containing the project area (Kurt Broderdorp, USFWS; Tanya Shenk, CDOW, pers. comm.).

All ongoing Federal activities in the Crystal East LAU have been consulted on in 2000 as part of a regional “lynx screening” process (USFWS 2000a, b). All of these activities have been accounted for in the baseline conditions.

The Crystal East LAU totals 98,600 acres, of which 89,578 acres are USFS and 9,022 are non-USFS. Total lynx habitat within the LAU totals 33,348 acres. The break down of lynx habitat follows: 11,759 (35 percent) acres of denning, 10,642 (32 percent) of winter foraging and 10,941 (33 percent) of other habitat. Only 6 acres (less than 0.01 percent) of lynx habitat is unsuitable at this time. Summary of these values are listed in the table below.

The LCAS requires maintaining greater than 30 percent of the LAU in suitable condition and that at least 10 percent remains as denning habitat. Crystal East LAU values are consistent with the management thresholds recommended by the LCAS to help preserve lynx habitat viability.

Breakdown of lynx habitat components within the Crystal East LAU

Total acres in LAU	Acres of lynx habitat	Acres of “non-habitat”	Acres of “currently unsuitable” habitat	Acres of denning	Acres of winter forage	Acres of “other” habitat	Acres and percent affected by project	Total acres and percent “currently unsuitable” habitat
98,600	33,348	65,352	6	11,759	10,642	10,941	2.1 <0.01%	8.1 <0.01%

Landscape

Most of the alpine and subalpine habitats of this range have been preserved intact and are managed as the Maroon Bells - Snowmass Wilderness. Steep mountain gradients reduce optimal lynx habitat to relatively narrow bands around this mountain range. Potential linkage zones occur around the north and west flanks of Mt. Sopris.

The project area is dominated by mature aspen and mixed-conifer vegetation type. The forest structure is a result of historic timber harvest. The habitat within the ROW supports snowshoe hares and red squirrels and, as such, represent potential foraging habitat and may also facilitate lynx movements and effective diurnal security habitat.

Using current lynx habitat parameters (USFS 2002a), the 1.7 acres of WRNF lands in the project area contain 0.56 acres of denning habitat, 1.09 acres of winter foraging habitat, 0.07 acres of other habitat, and 0.53 acres of non-habitat. Private lands have 0.43 acres in the project area that contain 0.07 acres of “other habitat” and 0.36 acres of non-habitat. Field reconnaissance of the denning habitat revealed existing vegetation structure did not provide the necessary denning criteria and is thus considered ineffective denning habitat.

San Juan-Rio Grande National Forests Wilderness Management Direction Amendments

All proposed management directions affecting USFS lands are generally above 7,750 feet and just below 14,000 feet in elevation on the SJNF and the RGNF. These areas are generally dominated by forested and alpine ecosystems. Terrestrial habitats likely affected include alpine tundra, aspen forest, ponderosa pine forest, Douglas-fir forest, lodgepole pine forest, spruce-fir forest, pinyon-juniper woodlands, sagebrush, and oakbrush. Aquatic-oriented habitats potentially affected include rivers, streams, lakes, and riparian/wetlands. Non-forested habitats are generally dominant above 11,800 feet elevation; otherwise the habitats are inclusions (patches) within the forested landscapes.

All habitats are primarily affected by existing trail infrastructure.

Weminuche Wilderness

This is the largest wilderness in Colorado at 499,771 acres (334,776 acres on the SJNF and 164,995 acres on the RGNF). Stretching across the Continental Divide from Stony Pass on the north to Wolf Creek Pass on the south, the Weminuche contains three summits more than 14,000 feet in elevation and many more over 13,000 feet. The Weminuche is one of the most visited Wilderness areas in Colorado and is popular with both hiking and horseback visitors. There are more than 490 miles of trail, and access to two trailheads is via the Durango and Silverton Narrow Gauge Railroad, which offers an entry to the wilderness.

South San Juan Wilderness

Located in south-central Colorado this wilderness encompasses the eastern extent of the San Juan Mountain range including, a segment of the Continental Divide. The South San Juan contains 164,563 acres (75,640 acres on the SJNF and 88,923 on the RGNF). The South San Juan includes a variety of bottomlands, canyons, and glaciated uplands. Trademarks of the area are high, open parks and remote landscapes. Visitor use is higher on the Rio Grande portion of the Wilderness, but is lower overall than in other nearby Wilderness.

Piedra Area

While not officially designated as Wilderness, the Piedra Area is a congressionally designated area to be managed so as to retain its existing wilderness character and potential for inclusion in the National Wilderness Preservation System. The Piedra Area is 60,387 acres. It is lower in elevation than Wilderness areas on either Forest and encompasses large tracts of ponderosa pine communities, which are not as common in higher elevation Wilderness areas on either Forest.

Because the proposed action will affect the management of three large tracts of land within two NFs (e.g., SJNF and RGNF), both Forests are considered the project area.

Canada lynx occurrence on the SJNF and the RGNF before 1998 was largely unknown. Sightings were few and historical records never considered lynx to be 'plentiful'. Tracks of lynx were recorded in the 1980's in the East Fork of the San Juan River drainage. The private lands within the RGNF were selected by the CDOW in 1999 as sites for release of individual lynx from Canada where 96 lynx were released between 1999 and 2000. Similar, further augmentation was re-initiated in 2003 and is proposed to continue for the next three years to reintroduce up to another 150 individuals.

Canada lynx habitat components are modeled on the SJNF and the RGNF under the specific assumptions common to Forests in Colorado. The SJNF and RGNF LAUs are landscapes and ecosystems that include non-forested alpine; and subalpine and montane conifer forests with inclusions of deciduous forest, sagebrush, riparian, wetlands, water bodies, grass meadows and shrublands. The LAU mapping is derived from Common Vegetation Unit mapping efforts and Regional data assumptions consistent with the LCAS (Ruediger et. al 2000). Overall, 973,174 acres or 69 percent of the SJNF is modeled as potentially suitable for Canada lynx. Total modeled lands of the SJNF include 1,418,959 acres. Overall, 984,184 acres or 54 percent of the RGNF is modeled as potentially suitable for Canada lynx. Total modeled lands of the RGNF include 1,814,471 acres. Habitats are well dispersed; however, habitat tends to be rather naturally patchy in this portion of the Southern Rocky Mountains.

The Weminuche Wilderness is within 5 RGNF LAUs and 8 SJNF LAUs. The South San Juan Wilderness is encompassed by 6 LAUs. The Piedra Area is within 2 LAUs.

WillSource Gas Exploration Project

The project area, for the purposes of this consultation, is the Divide Creek LAU.

Rationale for identifying entire LAU as the action area

Human activity can affect the larger landscape dynamics for wide ranging species such as the lynx. At this time, LAUs provide the best level of analysis according to the LCAS.

The Willsource project area habitat is in an ecotone, or a vegetation transition zone, between montane and shrubland habitat. These areas form a mosaic of secondary lynx habitat that is vital to lynx in the Southern Rockies as they provide prey species and cover for lynx during exploratory movements. To maintain functionality of contiguous lynx habitat types, it is necessary to view project effects at a landscape scale.

Lynx Status in Divide Creek LAU

The LAU is composed of a 90,432-acre watershed, of which 96 percent is under WRNF administration. The table below describes the various lynx habitat components within the Divide Creek LAU.

Habitat description	Acres of habitat within LAU	Percent of lynx habitat within LAU
Total Acres	90,382	n/a
Federal (NF) Area	86,350	n/a
Total Lynx Habitat	30,361	n/a
Denning Habitat	11,326	37%
Winter Foraging	11,930	39.2%
Other Habitat	6,102	20%
Currently Unsuitable	1,003	3.3%

Landscape Area

The LAU is comprised largely of aspen and mountain brush vegetation in the northwestern portion with spruce-fir vegetation within drainages and on north-facing slopes of mountains and promontories. At higher elevations in the east and west side of the LAU, large a contiguous block of high-quality habitat (winter forage and denning) adjoins similar habitat in the adjacent Crystal West and East LAUs in vicinity of Mt. Sopris and Assignment Ridge.

Project Area

The project is located on the periphery of the LAU, bordering private lands at elevations ranging from 8,209 to 8,568 feet. The area overlaps the transition zone between montane forest and mountain shrubland. The area is approximately three miles west of the large block of high-quality habitat as discussed above and the two areas are separated by aspen stands in the Quaker Mesa area. There are no wetlands or riparian areas at any of the proposed well sites, but they border existing access roads at several locations near streams.

All three proposed well sites are located in areas classified as non-habitat and portions of the roads and pipeline segment G are in non-habitat. Winter foraging habitat is present near wells Number 1-17 and 1-18 and the access road to these wells is on the border of this habitat. North-

facing slopes along West Divide Creek and Little Rock Creek provide possible lynx denning habitat, but these sites are fairly narrow and isolated from larger stands of suitable habitat elsewhere within the LAU.

Travel Corridors

There are no identified linkage areas for lynx within the West Divide Creek LAU. Lynx movement along the riparian habitat of West Divide Creek, Little Rock Creek, and other unnamed tributaries is possible.

Vail Valley Defensible Space Treatments

The project area is located within the Eagle Valley LAU, which contain about 97,650 total acres of public lands (USFS 2002, as updated January 29, 2002). The environmental baseline of lynx habitat prior to and after defensible space treatments are shown below.

Pre and post-project breakdown of lynx habitat components in the Eagle Valley LAU

Total acres in LAU	Acres of lynx habitat	Acres of "non-habitat"	Acres of "currently unsuitable" habitat	Acres of denning	Acres of winter forage	Acres of "other" habitat	Acres and percent affected by project	Total acres and percent "currently unsuitable" habitat
97,650	55,614	n/a	4,939 8.8%	14,245 25.6%	18,895 34%	17,535 31.5%	25.1 0.1%	4,964.1 8.9%

The project area may currently provide for east-west movement of lynx to the south of I-70 and the towns of Vail Minturn Eagle-Vail and Avon. Lynx traveling in this direction would have to cross through ski areas that receive very high recreational use and approach urbanized areas along I-70. Limited evidence presented in the national lynx conservation reports indicates that such areas are not complete barriers to lynx movement, particularly at night when human activities are at a minimum (Ruediger et al. 2000).

The Vail area has had a large number of lynx sightings over the past 35 years (USFWS 1999). In 1969, a lynx was shot on the south side of Vail Mountain. In the winter of 1973-74, two lynx were illegally trapped in the Vail Ski Area near the bottom of Northeast Bowl about one mile east of the project area. These were the last two native lynx officially documented in Colorado. A lynx was sighted near the Dowd Junction underpass (about 2.5 miles west of the project area) on January 1998 and was deemed "a credible sighting" by the Service.

In 1999 and 2000, the State of Colorado released a number of lynx in southwestern Colorado in order to reestablish a viable lynx population within the state. Several of these animals have been either confirmed or reported in the general vicinity of Vail. In the summer of 1999, a radio-collared lynx was killed along I-70 near Vail Pass, about 8 miles southeast of the project area. On May 30, 2000, a collared lynx was reported by a Vail Associates employee near the intersection of the Cold Feet and Lions Way Ski Runs, about 150 feet uphill of the south

boundary of the project area (Doerr 2001). This sighting is considered “probable” and, if true, supports the contention that lynx can move across the front side of the Vail Ski Area, at least during the non-skiing season. In June 2000, a collared lynx was seen by a CDOW biologist in the Camp Hale area about 14 miles south of the project area (Bill Andree, CDOW, pers. comm., 2003). In February 2001, a collared lynx was documented in the area between Vail Mountain and Copper Mountain for about 10 days based on telemetry locations

Winter track surveys conducted in the Vail area by the USFS as part of the CATIII BO monitoring have not produced any evidence of lynx in the area in either the winters of 1999 to 2000 or 2000 to 2001 (USFS 2000a). These surveys are not sufficient to determine the absence of lynx in the area. However, the lack of lynx tracks seen during fieldwork in the winter of 2000-2001 and 2001-2002 interestingly contrasts with the substantial number of lynx tracks reported in the Vail Ski Area during fieldwork in the winter of 1988 to 89 (USFWS 1999).

Lynx hair snare surveys have been conducted in the area bounded by Interstate 70, Highway 24, and Turkey Creek Road (FDR 709) as part of the CATIII BO monitoring (USFS 2000b). The survey area covers roughly 63 square miles in size and includes the project area on Vail Mountain. No lynx sign was detected in the fall of 1999 and in late summer and fall of 2000. The lack of positive results suggest that there were no resident lynx in the Vail Ski Area during those time periods and that the lynx reported above in May 2000, if confirmed, was likely a transient. This assumption is based on the fact that the national lynx detection protocol resulted in a high detection rate (45 percent of 5-station line transects had “hits”) when field tested in known lynx habitat over a 2 to 4 week period (McKelvey et al. N. d.), and the Vail Area 2000 surveys were conducted for an 8-week period with no “hits” during that time interval.

Spring Creek Salvage Harvest

Survey information is very scant and most information about lynx presence on the White River Plateau is a result of trapping records or incidental observations reports. No designed systematic surveys have been conducted to verify the presence or absence of lynx on the White River Plateau. In 1997, an aerial survey that was conducted by the CDOW detected one possible set of tracks that appeared to be a lynx, at the head of East Elk Creek (Byrne and Copeland 1997), which would be in or very close to the Clinetop LAU. These possible tracks were never ground verified and therefore never verified as truly being from a lynx. The CDOW’s records only indicate four historic occurrences of Canada lynx on the White River Plateau, all from the early 1900’s (Byrne 1995). There are currently no documented Canada lynx on the White River Plateau or the Action Area.

Project Area

The proposed Spring Creek salvage harvest project area is located on the White River Plateau, 7 miles north of New Castle, CO in Garfield County. The Project Area encompasses 1,830 acres of NF System lands within the Clinetop LAU, which is the action area.

On June 22, 2002 a lightning strike ignited a fire in the steep walled canyon of the East Elk Creek drainage on the WRNF, seven miles north of the town of New Castle Colorado. This wildfire called the Spring Creek Fire grew to a total of 13,493 acres. It moved into the Clinetop area and on June 29, 2002 and continued to burn through the month of July.

Breakdown of Lynx Habitat Components within the Clinetop LAU

Total LAU Acres	Lynx Habitat in acres	Currently Unsuitable lynx habitat acres and %	Denning and Winter Foraging Habitat Acres and %	Winter Foraging (Only)	Other Foraging Acres	Acres and percent affected by project	Total acres and percent "currently unsuitable" habitat
86,154 a	34,166	3,282 9.6%	16,506 48%	7,055	7,323	*1,079 3%	3,282 9.6%

*The acres affected by this project are currently unsuitable and therefore, will not increase the amount of unsuitable habitat.

The current conditions in the LAU are the result of a recent wildfire, the Spring Creek Fire, which occurred in the Clinetop area in June and July, 2002. Prior to this fire, less than 1 percent of the lynx habitat was in "currently unsuitable" condition. The fire area includes foothill, montane and subalpine life zones. Elevations within the fire area range from approximately 5,800 to 10,500 feet. Drainages that flow from the fire area include Spring Creek, Main and East Elk Creek, and Boiler Creek. There is very little private land within the Clinetop LAU, and that is along the County Road along Main Elk Creek, outside of lynx habitat. There is no state land within the Clinetop LAU.

The project area, located on the Clinetop Mesa at 9400 feet elevation, encompasses approximately 1,800 NF System acres, of which forested stands are 63 percent subalpine fir, 30 percent Engelmann spruce, 2 percent Douglas fir, and 5 percent aspen. The southern portion of the project area is comprised largely of spruce-fir and aspen stands that were moderately to severely burned. The northern portion of the project area is comprised of open grassland parks that are interspersed with moderately burned stands. The project area is bounded to the east by East Elk Creek and to the west by Hadley Gulch and Main Elk Creek.

The burned areas within the project area are currently unsuitable habitat for lynx. Burned areas amount to 1,079 acres out of the 1,830 within the project area, or 59 percent. Within the harvest units, 593 of the 664 acres are burned and are considered to be currently unsuitable lynx habitat.

The forest stand conditions have been modified to the extent that stands contain open ground, little horizontal understory cover, and little or no vertical overhead cover, except for standing snags. Coarse woody debris and vegetative cover have been severely altered, to the point that denning structures have been eliminated. Likewise, burned areas no longer provide habitat for snowshoe hare, and thus no foraging habitat for lynx. In some areas, regeneration of aspen began vigorously following the fire, which could provide some foraging habitat if adjacent to some of the unburned areas. All salvage harvest proposed is within currently unsuitable lynx habitat.

Gravel Mesa Travel Management

Road density

The LCAS does not recommend any Standards or Guidelines for road density within lynx habitat *components* (i.e., winter forage, denning). However, the LCAS does recommend a Guideline for road density within lynx habitat. This Guideline recommends not exceeding 2 miles of roads per square mile within lynx habitat. The table shown below illustrates that road density will not exceed the LCAS Guideline of no more than 2 miles per square mile. Only the Island Lake LAU has reached its recommended capacity of road density (2.0 miles per square mile).

Roads density within each LAU, before and after implementation of proposed action

LAU NAME	Lynx habitat acres (sq. mi.)	Total miles of roads	Miles of non-motorized	Miles of motorized roads	Miles/sq. mi.	Net Change of miles of road	New miles/sq /mi.
Cottonwood Lakes	9,856 ac.	43.324	11.66	31.7		.25	**
Cottonwood Lakes	24,137ac (37.7) D,O,W	55.5	15.0	40.6	1.08	.43	1.09
Total	33,987 ac (53)	99	26.7	72.3	1.36	.68	1.38
Crater Lake	11,262	2.135		2.1			**
Crater Lake	35,137 ac. D,O,W	3.2	2.1	1.4			**
Total	46,399 ac						**
Green Mountain	21,329 ac.	69.487	17.05	52.4		.47	**
Green Mountain	17,676 ac. (27.6) D,O,W	30.9	5.5	24.7	.89	.175	0.90
Total	39,005 ac. (61)	100.4	22.6	77.4	1.26	.64	1.27
Huntsman Mountain	12,337 ac.	0.912	0.91	0.9			**
	20,220 ac.						**
Total	32,557 ac.						**
Island Lake	15,453 ac.	71.5	19.01	52.5		.39	**
Island Lake	10,189 ac. (15.9) D,O,W	43.1	18.4	24.9	1.57	2.79	1.74
Total	25,642 ac. (40)	114.6	37.4	77.4	1.93	3.18	2.00
Kannah Creek	6,023 ac.	50.31	15.29	35.0			**
Kannah Creek	18,017 ac, D,O,W	30.5	11.5	19.0			**
Total	24,040 ac. (37.5)	80.8	26.79	54.0	1.44		1.44*
Mesa Lakes	6,308 ac.	26.630	9.56	17.1			**
Mesa Lakes	16,916 ac.(26.4) D,O,W	42.9	18.4	24.5	.93		0.93*
Total	23,244 (36.3)	69.5	27.9	41.6	1.15		1.15
Mule Park	11,223 ac.	2.203	0.38	1.8			**
Mule Park	25,845 ac. D,O,W	1.4	0.38	1.0			**
Total	37,068 ac. (57.9)						**
Ruth Mountain	13,414	74.44	14.71	59.7			**
Ruth Mountain	21,120 ac.(33)	23.3	7.9	15.4	.47	3.59	0.58

	D,O,W						
Total	34,534 ac. (54)	97.7	22.6	75.1	1.39	3.59	1.45
South Mamm Peak	15,808 ac.	51.61	15.09	36.5			**
South Mamm Peak	5,523 ac.(8.6) D,O,W	9.5	3.3	6.2	.72		0.72*
Total	21,331 ac. (33.3)	61.1	18.4	42.7	1.28		1.28*
The Flat Tops	21,119ac.	62.141	16.68	45.5		.573	**
The Flat Tops	22,014 ac (34.4) .D,O,W	20.4	4.4	16.0	.47	.677	0.48
The Flat Tops -Total	43,113 ac. (67.4)	82.5	21.1	61.5	.91	1.25	0.93

* No change in road density. D=Denning, O=Other lynx habitat, W=Winter forage

** LAU is adjacent to a route that is within another LAU

Ward Lake Vegetation Management Projects

The GMUG and Service cooperatively identified and mapped Canada lynx analysis units in 2000. The analysis area occurs in the Island LAU. The LCAS recommended that project planning should evaluate the effects of management actions to lynx and lynx habitat. Lynx habitat types and vegetative features were evaluated within the LAU. The following table summarizes lynx habitat acres within the Island Lake LAU and within the treatment units for each project.

Summary of Lynx Habitats within the Island Lake LAU and Treatment Units

Habitat Type	Island Lake LAU		Fuels Treatment		Timber Harvest	
	Acres	% of Habitat	Acres	% of Habitat	Acres	% of Habitat
Denning	8,548	79	307	4	544	6
Winter	154	1	0	0	0	0
Other	2,147	20	16	<1	80	4
Currently unsuitable	0	0	0	0	0	0
Total habitat	10,849	42 % of LAU	323	3	624	6
Non-habitat	14,796	58 % of LAU	91	<1	22	<1
LAU Total	25,645		414	2 %	646	3 %

Missionary Ridge Wildfire Suppression and Burned Area Emergency Rehabilitation Projects

In cooperative effort with the Bureau of Land Management, Service, and the CDOW, the SJNF has mapped lynx denning, winter forage, “other” habitat and currently unsuitable lynx habitat across the SJNF. In conjunction with mapping habitat, LAUs have been identified and are used as the primary analysis units for assessing impacts to lynx habitat conditions.

A post-disturbance lynx habitat assessment was conducted on the area burned by the Missionary Ridge Wildfire. The fire was modeled on the SJNF’s Geographic Information Systems (GIS) to predict lynx habitat under currently existing, post-fire conditions. Post-fire lynx habitat was

calculated by merging the CVU and fire intensity layers from the SJNF’s GIS and modifying these based on regenerating habitat components observed in the field. Severely burned acreage, by cover type, was converted into grass/forb or shrubs, depending on the regeneration apparent during field review. Sites converting to shrubs would still provide other lynx habitat, including travel habitat.

Spruce-fir, cool moist mixed conifer, and warm dry moist mixed conifer was converted to dense aspen regeneration or grass/forb. Severely burned warm dry mixed conifer and ponderosa habitat types were converted to Gambel oak.

It must be noted that these stages are predicted to be current as of the 2003 growing season. Ecological succession is a dynamic process. Lynx habitat components will change rapidly as the succession proceeds, as trees fall, and as the remaining forest recovers and begins the process of recovery.

Field reconnaissance demonstrates that lynx denning habitat was actually improved in many cases in areas that burned with low to moderate intensity, as snags and downfall were created throughout the otherwise intact forest canopy. Snags will likely fall to create more coarse structure near the ground to provide denning opportunity.

The landscape within the burn perimeter has been subject to numerous human-induced impacts over the past century and a half of Anglo inhabitation. Historic timber harvest and livestock grazing have altered patterns of vegetation growth and wildlife distribution. Road construction associated with timber harvest has increased accessibility of much of the analysis area to humans, especially during hunting season, but also during winter and summer months. Many of these effects were, however, eclipsed to a large degree by the effects of the fire.

The Missionary Ridge Wildfire affected habitat in five LAU’s, including the Animas, Bear Creek, Upper Florida River, Upper Los Pinos River, and Vallecito Creek LAU’s (see table below). The currently existing, post-fire acreage of lynx habitat within each LAU, along with the percent of habitat deemed unsuitable, is presented in the table. The amount of habitat displayed accounts for changes in habitat conditions as a result of high, moderate, and low burn intensities, and the activities associated with the Missionary Ridge Burned Area Timber Salvage Project mentioned in the consultation history section.

Lynx Habitat within the Missionary Ridge Wildfire Burned Area

LAU	Total Acreage (ac)	Denning (ac)	Winter Forage (ac)	Other (ac)	Non Habitat (ac)	Currently Unsuitable (ac)	Percent Unsuitable Habitat Within the LAU
Animas	69,929	14,443	7,044	17,768	27,108	1,956	8
Bear Creek	47,827	8,564	6,149	13,695	17,116	1,557	8
Upper Florida River	29,416	10,112	1,464	6,809	10,169	337	4
Upper Los Pinos River	84,652	35,211	4,918	23,809	20,649	65	1

Vallecito Creek	60,034	13,747	5,137	16,659	23,081	1,411	1
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Missionary Ridge Fire Fence Rehabilitation and Installation Project

The table below gives a breakdown of the various components of lynx habitat within the LAU affected by this project.

Current Amounts of Lynx Habitat Components within the Project Area (acres)							
LAU	Total	Denning	Winter Forage	Other	Non Habitat	Currently Unsuitable	Percent Unsuitable Habitat Within the LAU
Animas	69,929	14,443	7,044	17,768	27,108	1,956	8
Bear Creek	47,827	8,564	6,149	13,695	17,116	1,557	8
Upper Florida	29,416	10,112	1,464	6,809	10,169	337	4

Sixty-seven acres of denning habitat exists in the project area. The felling of dead trees in the project area will result in more woody debris on the forest floor than is likely to occur in a short period of time by natural means. These dead standing trees are not contributing to the foraging component of denning habitat, but once felled, may provide additional cover and denning opportunities. Therefore, the project is not anticipated to change the character of denning habitat.

Other lynx habitat in the project area does not provide winter foraging or denning habitat. These stands provide some marginal use for lynx, since they may provide habitat for snowshoe hare during the summer months or serve as travel routes to denning and winter foraging habitat. Approximately 123 acres of other lynx habitat is available across the project area. The activities planned for this project will not move this habitat type into unsuitable since only dead trees less than 16 inches d.b.h are being removed.

Dutton Ditch Pipeline Project

The proposed project lies within the San Juan LAU (SJLAU). Lynx habitat within the SJLAU is located on USFS and private lands. The table below describes existing modeled lynx habitat within the SJLAU. In addition, this table includes reflects all activities on public lands that have changed lynx habitat.

Modeled lynx habitat within the SJLAU, all ownerships included.

Habitat Description	Acres of Habitat within LAU	Percent of all Lynx Habitat within LAU
Winter Forage	5,950	19.92 %
Denning	8,556	28.64 %
Other	14,465	48.42 %
Currently Unsuitable	904	3.03 %
Total Lynx Habitat	29,875	100.01 %

Total Non Habitat	16,021	
LAU Total	45,896	

About 90 percent of the pipeline alignment is within the Dutton Timber Sale Analysis Area. The Dutton Timber Sale was analyzed for threatened and endangered species in 2002.

From 1965 to 1992, approximately 32,900 Federal acres (of 45,896 in the entire SJLAU) received some type of vegetation activity in the entire SJLAU. Most of this was in the form of timber regeneration prescriptions including: shelterwood, seed tree, individual tree, group selection, and commercial thinning. Other timber harvest has included sanitation salvage and mortality salvage. To a lesser extent non-harvest activities include permanent land clearings (i.e. campgrounds or trailheads), reforestation by planting, and prescribed fire.

About one-third of the SJLAU is the designated Weminuche Wilderness Area. Since wilderness designation, major management activities have been concentrated in the southern two-thirds of the LAU. Most of the 904 acres identified as currently unsuitable habitat are harvest treatments,

which occurred in the 1960's and 1970's. Ground verification of map (CVU) designation has occurred in portions of both proposed sale areas (Dutton and Jackson Mountain) in the SJLAU.

Road construction is almost always associated with timber harvest. Portions of these roads remain open to public use while others are closed for resource benefit. There are four arterial roads that provide seasonal (summer) access into three major drainages; USFS road 634 (Plumtaw), FS road 645 (Fourmile Trailhead), FS road 037 (Jackson Mountain), and USFS road 647 (Turkey Creek). Each of these 'drainage' roads have closed arterial roads branching off of them. However, recreational snowmobiling and cross-country skiing occurs on these closed roads during the winter.

EFFECTS OF THE ACTION - Direct and Indirect Effects

Crooked and Lincoln Creek Large Wood Habitat Placement Project

Activities associated with the construction of the habitat structures may displace a lynx or affect their activity due to possible high noise levels from construction equipment. Disturbance effects would end with the cessation of the construction activity. It is likely the effect would be insignificant due to the fact the noise disturbance would be temporary in nature and is not likely to prevent lynx from using or traveling through the project areas as lynx are generally tolerant of humans and human disturbance (Mowat 2000; Aubry 2000).

Some individual tree loss in low quality lynx habitat will occur, but the proposed action will not affect year-round foraging or denning habitat. The loss of approximately 25 trees in suitable lynx habitat would be insignificant and discountable considering the size of either LAU. Further, the proposed action will adhere to all 2002 Forest Plan Revision Canada lynx conservation measures including terms and conditions, reasonable and prudent measures, standards, and guidelines which refer to the LCAS for guidance.

Bald Eagles

Potential summer and winter bald eagle habitat may exist in both project areas. However, no nest or roost trees would be removed according to the conservation measures listed above and the project will not occur during a period when migrating or wintering bald eagles would likely be in the vicinity (September to early October is before bald eagles typically arrive in lower elevations near the forest). If bald eagles are present, the disturbances associated with removing approximately 25 trees along each stream reach would be short-term and the eagles could fly to another area along the reach.

The original determination for the proposed action was “no effect”. However, after discussing this determination with Mark Lacey (WRNF, West Zone Fisheries Biologist) on September 12, 2003, we concurrently concluded that this project “may affect, but is not likely to adversely affect” bald eagle. The Service believes the potential effect of disturbance from this project would be negligible and concurs with the WRNF that the proposed action “may affect, but would not likely adversely affect” bald eagle.

Keystone Ski Resort’s Little Bowl and Erickson Bowl Snowcoach Tours

Snowcoach transport of skiers between the Summit House and Little and Erickson Bowls would occur along an existing maintenance corridor and Nordic trail that include forested areas and would result in annual, increased winter recreational use along the route. The corridor is now kept packed by snowcat, as required for maintenance access (i.e., snowmobile) and also for hike-to skiers to access the two cirques. The additional usage would not further degrade any lynx habitat values.

Skier use of the alpine portions of Little and Erickson Bowls would have no effect on lynx habitat use because these areas are not lynx habitat and adjacent areas of lynx habitat are already affected by the same types of winter recreational and maintenance uses.

It is possible that up to 36 additional skiers (three daily transports of 12 people each) per day would ski below the alpine bowls to continue on to developed ski terrain instead of returning by the snowcoach. These clients would have to travel through the lynx diurnal security habitat to reach their destination increasing compaction and disturbance. However, this area is already regularly used by hike-to skiers. Due to the steep and difficult terrain, it is likely that not all snowcoach guests would ski the forest section in and those that do would be a small subset of what is now skied by hike-to skiers. Furthermore, due to the schedule of the snowcoach, guests would ski down through the forest several hours after the first hike-to skiers. As such, existing hike-to ski use would have already degraded the security habitat values in the forest patches below the cirques and any additional snowcoach skiers that might ski through the same forest patch would add insignificant impact to diurnal security values.

The proposal could lead to increased out-of bounds use in Jones Gulch (extreme skiing of avalanche chutes that are adjacent to the snowcoach route along the Jones Gulch), which

supports important, intact lynx habitat values. Signage and enforcement is to be implemented as part of the proposed action to prevent out-of-bounds skiing into Jones Gulch along the northeastern edge of the revised administrative boundary. The USFS Snow Ranger or authorized representative, will survey the eastern periphery of the KSA-Jones Gulch area to determine access points and relative level of non-compliance. Such an approach would not contribute to potential disturbances in Jones Gulch as a result of monitoring. In addition, snowcoach guests will be transported to and from the bowls and dropped off well below the ridgeline to Jones Gulch and not be permitted by the snowcat operator and/or guide to hike up and ski into Jones Gulch. Clients would not be inclined, or have an opportunity, to ski into this area. Snowcoach trips would also increase the opportunity to detect and enforce existing levels of backcountry skiing in Jones Gulch.

Although impacts to lynx habitat concerning the possibility of out-of bounds skiers in Jones Gulch exists, enforcement of maintaining a boundary at the entry to Jones Gulch and monitoring for out-of bounds skiing or other recreational activity in Jones Gulch as outlined in

the conservation measures should prevent any impacts to lynx habitat in the critical lynx linkage area.

The lynx consistency analysis with the Forest Plan is part of the project's administrative record on file at the Dillon Ranger District. The proposed project would be consistent with all applicable, lynx-related provisions of the WRNF revised 2002 Forest Plan which refers to the LCAS for lynx management guidance.

Crooked Creek Complex Timber Sale

The project would harvest 36 and 518.4 acres of timber in the Brush Creek and the Fryingpan North LAU, respectively. In addition there would be about 1.0 acre of forest removed for temporary roads (0.5 miles in spruce/fir and lodgepole pine with 10 to 16 feet clearing width) in the Fryingpan North LAU. A specific prescription was developed to maintain snowshoe hare and lynx foraging habitat for 218.1 acres of the timber harvest. The prescription would maintain forage and hiding cover for hares during deep snow conditions, buffer areas around large squirrel middens and buffer areas around large piles of woody debris. These measures would maintain the habitat in a suitable condition for lynx post-harvest.

The proposed treatments would increase the percent of unsuitable habitat from 11.53 percent to 11.54 percent in the Brush Creek LAU (an addition of 9 acres of currently unsuitable habitat) and from 0.3 percent to 0.7 percent in the Fryingpan North LAU (an addition of 196.9 acres of currently unsuitable habitat). Both these percentages are below the LAU threshold levels of 15 percent for a ten-year period and 30 percent overall.

Loss of suitable lynx habitat would total about 22, 109, and 75 acres in aspen, lodgepole pine, and spruce/fir, respectively. A portion of the harvest would occur in mature stands that have low understory and low hare use. The main effects to suitable lynx habitat would be loss of hiding

cover, loss of understory cover that would support snowshoe hare and loss of overstory conifers that would provide habitat for red squirrels. The affected stands would return to suitable habitat in about 3-5 years in areas where aspen regenerates and in about 20 years in areas where conifers regenerate. The proposed temporary conversions of these habitats to an unsuitable condition is not viewed as a significant consequence to lynx due to the current poor quality of the affected habitat and the future increase in lynx winter foraging habitat as a result of the treatments.

Habitat that has much higher understory conifer cover and generally much higher snowshoe hare use (161.3 acres) would be converted to unsuitable habitat with the proposed treatments. A result in temporary decrease in snowshoe hare prey within the project area is expected but would have an insignificant and discountable effect on lynx, due to their large home range size (Ruggiero et. al. 2000) and the overall amount of habitat available at the LAU level.

Denning

There would be a total of about 332 and 25.5 acres, of timber harvest in lynx denning habitat in the Fryingpan North and Brush Creek LAUs, respectively. In the Fryingpan North LAU, this would include 24.2 acres of clearcutting, 125.8 acres of group shelterwood harvest, and 182.1 acres of individual tree mark designed to maintain lynx foraging habitat. In the Brush Creek LAU, all harvesting in denning habitat would be group shelterwood. There would be about 0.01 miles of temporary roads constructed in mapped lynx denning habitat the Fryingpan North LAU and about 0.04 miles of mapped denning habitat removed by road realignment in the Brush Creek LAU. The latter habitat is alongside an existing open road and is probably not suitable for denning due to the level of human activity on the road.

The main impacts to denning habitat from timber harvest would be loss of forest cover, loss of future large woody debris that would provide den sites, reduction in prey items for lynx, and short-term disturbances to habitat due to logging operations and skid trails that would temporarily improve human access in the stand. Clearcutting would have long-term impacts on denning habitat as there would be little or no opportunities for the natural creation of large piles of downed logs until the stand regenerated into a mature forest with dead and decadent trees. Other harvest methods would have shorter-term impacts on denning habitat as some overstory trees would be maintained that could provide future denning material if they fell to the ground. This is especially true for the individual tree marking to maintain lynx habitat. It is assumed that those units would return to potential lynx denning habitat within 10 years of treatments when exiting skid trails have revegetated.

The proposed treatments would decrease the percentage of denning habitat from 38.1 to 38.05 percent in the Brush Creek LAU and from 41.5 to 40.9 percent in the Fryingpan North LAU. The percentages of denning habitat that would remain post-treatment would be well above the minimum 10 percent standard in both LAUs, therefore effects are considered insignificant and discountable.

Some winter logging may occur. Over-snow timber harvest routes would be limited to those designated by the WRNF. Skid trails for timber harvest activities would be closed following

use. Due to the nature of the terrain and vegetation in the proposed units, it is anticipated that most physical closures will be effective. There will be no new permanent roads and only one mile of temporary roads would be constructed. The locations of the temporary roads would not be along forest stringers or on ridgetops, saddles, and other areas identified as important for lynx habitat connectivity. All temporary roads and two unclassified roads, totaling 0.2 miles, would be decommissioned at the end of the sale. Decommissioning would involve scarification, seeding, water barring, and covering the travelway with logging slash. Summer access would change little within the project area from the existing condition after implementation of the project and would have an insignificant and discountable effect on the ability of lynx to move within the project area.

The project would construct about 1 mile of temporary roads and create logging skid trails on about 554 acres of commercially harvested forest. The temporary roads would be decommissioned and the skid trails and harvested units would be allowed to regenerate naturally. The temporary roads and skid trails, plus the openings created by timber harvest, would facilitate snowmobile use in the short-term, particularly in the area south of Crooked Creek Pass. However, none of the affected areas would connect to any large natural opening, such as alpine areas, that are not already being used by snowmobilers. Thus no major new snowmobile play areas will be created. The limited harvesting north of Crooked Creek Pass would be immediately adjacent to existing roads. South of Crooked Creek Pass, the harvest units are close to existing roads and already within a large snowmobile play area. Therefore winter access and net snow compaction within the project area would be expected to only slightly increase.

There would be a small loss of diurnal security habitat in portions of the harvest units away from existing roads and trails. Lynx resting in those areas during the day would be at a greater risk of being disturbed, particularly by snowmobiles. This increased risk would persist for about 20 years or so until sapling-size conifers reestablished in the units and trails. If disturbed, lynx would retreat to denser cover away from areas of human activity. Effects of this potential increased disturbance are thought to be insignificant and discountable due to the current level of human activity in the area and the relatively small area affected by proposed timber harvest treatments that is not already in close proximity to winter play areas.

The proposed action is not expected to result in direct mortality of any individual lynx or prevent lynx from traveling through or using the project area. Some reduction in denning, winter foraging, and suitable habitats would occur due to the proposed vegetation treatments. However, the alternatives adhere to all Forest Plan and LCAS Standards and Guidelines, therefore the effects of this proposed action are considered insignificant and discountable.

Bald Eagle

This project “may affect, but is not likely to adversely affect” bald eagles. The Crooked Creek Complex Timber Sale Transportation Report indicates traffic increases would be insignificant and would not result in any adverse impacts to bald eagles, and are not expected to prevent eagles from using the area. The Service believes this would have a negligible effect and concurs with the WRNF that the project “may affect, but is not likely to adversely affect” bald eagle.

Lodgepole Pine Rollerchopped Thinning Project

Direct effects to lynx will be an insignificant increase (less than 0.01 percent) in the amount of unsuitable habitat. In addition, human activities (i.e., mechanical and hand thinning operations) may temporarily displace individual lynx. However, due to the small size and scattered distribution of project units, displaced lynx would only be temporarily affected. Work will be conducted during summer months and therefore will not disturb lynx winter foraging activities. Snowshoe hares are expected to disperse during thinning operations but are expected to return to their territories as soon as project activities are completed.

No changes in the lynx's ability to disperse throughout the linkage area are expected to result from this project, as the function of the linkage area will not be impaired. There is adequate habitat within the linkage area that will not be disturbed to permit continued lynx use while avoiding human disturbance in the treatment units. Project activities will not convert any habitat types although some degradation may occur as a result of the removal of ground and snow level branches. The project will create openings within the dense lodgepole stands that may be beneficial to lynx by promoting the presence of prey species. The project site will continue to function as winter foraging habitat and should have a discountable effect on the lynx.

Actual thinning of the stands may increase predation rates of hares for a few years following treatments, but no losses are expected as a direct result of thinning operations. A majority of the stands currently have interspersed vegetation within them. This vegetation is expected to increase within 1 to 5 years after treatment and spread to available space following tree removals. Post project conditions are expected to improve winter foraging habitat within the treatment sites, while maintaining the integrity of the area's dispersal function.

Project activities are expected to have a beneficial effect on snowshoe hare populations for the next twenty years or more while improving lynx foraging conditions over this same time period. Increased understory vegetation growth and density is also expected to improve habitat for many other prey species too. The presence of these additional species would also be expected to increase foraging value for lynx.

There will be no roads created and no additional snow compaction will occur as a result of this action which would increase the competition for food in the winter.

Million Fire Salvage Timber Sale

Removal of trees from the area will not further impact the percentage of unsuitable lynx habitat within the LAU, as the area has already been converted to unsuitable condition as a result of the Million Fire, and is expected to remain in this condition for 1 to 10 years. There will be no habitat for red squirrels and other prey items including snowshoe hares and grouse. It is doubtful that lynx will move through the area but instead will move around the burn area in the short term. The area will continue to be classified as unsuitable after the sale. Harvest activities

including hauling logs along the road (summer and winter) could result in displacing lynx from the general area in the short term. However, because lynx would be expected to avoid this area due to its condition, this action would be insignificant to the normal behavior of the lynx. The proposed haul routes are groomed snowmobile routes in the winter and will not result in increasing the amount of groomed trails in the LAU. There will be no additional competition by other carnivores in the winter as a result of this action.

In the longer term (10 to 20 years), the area should start to be more productive and beneficial to the lynx. Some of the expected processes would include an increase in habitat for those species requiring early successional habitats including snowshoe hare. Red squirrels should be found along the edge of the burn next to existing forested stands but will not be found within the heart of the burn. The burn area will eventually move out of unsuitable lynx habitat and into summer foraging habitat.

The proposed sales will result in less woody debris being available on the forest floor in the future for both lynx denning opportunities and in less structure for lynx prey but this removal should be insignificant given the amount of debris and snags that will be left remaining in the units and the small percentage of the burn area being proposed for treatment (less than 10 percent). It is also doubtful that much of this material will be remaining on the ground and will be available to serve as lynx habitat given the amount of time it will take the area to once again provide habitat for lynx.

Based on the following facts; that there will be no conversion of habitat types in the LAU as a result of this project, no new roads will be constructed which would further fragment the habitat, no additional snow compaction, and no denning or winter foraging habitat will be degraded we believe that this action will have a discountable affect on lynx.

Avalanche Snowmobile Tours

The proposed action occurs within habitat that is considered suitable for lynx denning and/or foraging, but will not convert any suitable lynx habitat to unsuitable condition and will not allow snowmobile play areas or other off-trail uses within patches of seedlings unless snow deposition covers all seedlings with at least one foot of snow. Although night grooming will be conducted, AST does not offer nighttime tours.

Snowmobile activity in these areas may affect the lynx by causing a temporary disturbance to their normal activity by avoiding the area or remaining stationary until the snowmobiles pass. The snowmobiles may also affect the presence or behavior of any snowshoe hares or secondary prey species in the area. Disturbances such as these may prevent the lynx from foraging successfully thereby lowering its chances of surviving. Based on the history of snowmobiling in the area and the temporary nature of the disturbance, any lynx within the area would have become habituated to snowmobile activities. The continuation of the operation of snowmobiles in the area will have a discountable effect on the lynx.

No habitat is expected to be degraded or converted into lesser quality habitat as a result of this action. Because of this, there will be a discountable change in the type or quality of habitat available to the lynx. In addition, the USFS will not allow snowmobiles in areas where regenerating trees could be damaged so there will be a discountable effect on the winter foraging habitat to the lynx.

Since the proposed action is currently part of the Sulphur District snow compaction baseline, the proposed action will have no net increase in snow compaction. Therefore, there will be a discountable affect to lynx as a result of this action.

This action is not expected to affect any key linkage areas.

White River Plateau Sheep Allotment

The presence of humans and herding dogs may potentially disturb lynx and cause them to leave the area. However, this effect would likely be insignificant as lynx are generally tolerant of daily human use and presence in an area (Mowat 2000; Aubry 2000). In addition, activities would occur in summer and mostly in low quality habitat or outside lynx habitat and in an area isolated from other large blocks of lynx habitat or landscape linkages.

Ungulates browsing and grazing in lynx habitat can cause indirect effects to lynx by altering prey species foraging habitat. Foraging by domestic or wild ungulates change the structure and/or composition of native plant communities, thus reducing habitat necessary to support lynx prey. The loss of the understory of a forest can also cause the loss of lynx diurnal security habitat. Domestic livestock grazing has been recognized as a factor influencing the decline or loss of aspen as a seral species in subalpine forests. Particularly in riparian areas within lynx habitat, heavy ungulate foraging may result in competition to snowshoe hare and therefore indirectly impact lynx productivity (Ruediger et al. 2000).

The effects of sheep grazing to lynx should be insignificant for the following reasons:

1. Sheep tend to graze in open grassy areas and herds are kept moving through an area according to LRMP standards. These factors should keep effects minimal at most lynx denning and winter foraging habitat in the project area (BA Table 7).
2. Due to the logistics of allotments, impacts would be primarily in lynx summer foraging habitat. Adherence to conservation measures set up in the LRMP would keep impacts moderate and within LCAS threshold levels. Analysis by the WRNF biologists suggests that sheep grazing should not lead to long-term conversion of suitable lynx habitat to unsuitable. BA Table 7).

Project impacts will not change the current LCAS threshold levels for the five LAUs affected by the action. The project will stay consistent with the LCAS standards and guidelines and WRNF LRMP and will likely not result in any additional loss or modification of lynx habitat and therefore would have only insignificant and discountable effects.

Beaver Creek Trail

Human presence and the associated construction activities of the trail may temporarily affect lynx within the project area. After construction, there would be no disturbance to lynx that may be using this habitat, other than from hikers or horse-back riders. Disturbance from these types of activities in summer is believed to have an insignificant effect to lynx. This belief is based on the fact that lynx can be tolerant to human presence (Ruediger et al. 2000).

The proposed construction involves modifying 0.2 acres of lynx denning and 0.13 acres of other suitable habitat by removing some vegetation for the trail. Effects to security cover would occur on the periphery of the habitat. The project is designed to avoid cutting standing timber or modifying understory to help minimize reduction of cover. The focus will be to buck up trees that are down and to leave all standing snags. In addition, the trail would not separate denning habitat from other lynx habitat because the vegetation east of the denning habitat is mapped as lynx non-habitat. The amount of thermal denning structure will be insignificantly modified. After construction, maintenance activity would not modify overstory vegetation.

Although the total proposed clearing may potentially approach or slightly exceed 2.18 acres (approximately 6 feet x 3 miles), the weaving nature of the trail to avoid impacts to vegetation structure will likely reduce this number. The northern one third of the trail will traverse through relatively open stands of aspen with a mixed shrub understory on approximately 20 to 35 percent slopes. The southern two-thirds of the trail will weave through mature Engelmann spruce and subalpine fir habitat types on slopes ranging from about 40 to 60 percent.

The project will decrease the amount of denning and other habitat by less than 1 percent. No winter forage habitat will be affected by the trail corridor construction. Relative to the amount of denning and other lynx habitat within the Battlement LAU, this amount of habitat affected is insignificant.

Unauthorized use by snowmobiles would compact snow but the activity is expected to be infrequent. Snow travelers (snowshoes and skies) will have access to the trail and may add to some compaction. However, even these combined activities are expected to be insignificant as the proposed trail will not be groomed during the winter and would be closed to motorized use. Maintenance standards for the trail and its location through private land should further discourage over snow travel.

Buffalo Mountain Trail Project

Rerouting the hiking trail will likely convert less than 0.01 percent of the winter forage habitat in the Blue River LAU to unsuitable. This amount is insignificant when compared to the total available LAU winter foraging habitat and is within the LCAS Standards and Guidelines. The minor degradation may degrade cover for winter foraging and diurnal security but the change would not significantly alter the structure or functionality of the LAU. In addition, most of the

trail will pass through existing openings in the ground cover and on rock or duff and thereby will reduce the need to remove vegetative cover.

Recreational use may increase slightly since access should be easier and safer than the existing route. The WRNF expects an increase in human presence in the project area to perhaps dozens of people per day, spread out throughout the day. The presence of humans, horses and dogs on the trail, and the trail construction itself, may potentially disturb lynx and cause them to leave the area, thus making that portion of the forest unsuitable for lynx. However, this effect would likely be insignificant as lynx are generally tolerant of daily human use and presence in an area (Mowat 2000; Aubry 2000). In addition, the project occurs within a wilderness area and dogs are required to be leashed and mechanized travel, such as mountain bikes and snowmobiles, is not allowed. The trail may be used for skiing or snowshoeing but this sort of use is intermittent and not expected to significantly increase snow compaction.

Hummer Tours for the D&L Ranches

The data indicates that the proposed use would be a substantial increase in use during the time period proposed and would be a change over current use. Even though there will be nighttime use, the amount and duration of the effects of the Hummers would be short at any given point along the travel route, which will be restricted to FR 700. Any lynx that might encounter the Hummers would either remain still or find cover in the vicinity. After the Hummers have passed, the lynx should be able to resume normal activity. Other than a very brief interruption of their normal routine, the effects to the lynx would be insignificant.

This project will not result in additional snow compaction, landscape alteration or connectivity between LAUs, therefore the overall impacts are insignificant and discountable.

Grand Adventure Snowmobile Tours

Lynx have successfully moved through the linkage area from 1999 and 2000 releases in southwestern Colorado (Kurt Broderdorp, USFWS, pers. comm., 2003). Since the existing level and locations of the GAST permit use will not change, the Fraser LAU and adjacent linkage areas will not be adversely affected.

The proposed action occurs within habitat that is considered suitable for lynx denning and/or foraging. With the exception of meadow habitat in Devil's Thumb Park, all permitted routes pass through winter foraging habitat. Snowmobile activity in these areas may affect the lynx by causing a temporary disturbance to their normal activity by avoiding the area or remaining stationary until the snowmobiles pass. The snowmobiles may also affect the presence or behavior of any snowshoe hares in the area. However, due to the temporary nature of the disturbance and the fact that lynx are tolerant to human disturbances ((Ruediger et al. 2000), the effects to lynx would be discountable. Additional lynx habitat will not be degraded or converted into lesser quality as a result of this action. Play-areas will not occur in regenerating forest areas where snowmobile use and compaction could damage the tops of young trees. The effects of this

action will not result in a change to the Fraser LAU environmental baseline or the type or quality of habitat available to the lynx. The continuation of the snowmobile outfitters in the area will have a discountable effect on the lynx.

Hoop Creek Rehabilitation Project

The proposed Hoop Creek rehabilitation work and the replacement of the pipeline will take place primarily in the parking lot during the summer and fall months during daylight hours for two years or less. This project may temporarily prevent lynx from using the project area while construction activities are occurring. However, these activities would occur in an area where there is already a large human presence. Since lynx are tolerant to human activities (Ruediger et al. 2000), they would continue to move through and use the project area for foraging. Any temporary displacement would have an insignificant effect on the otherwise normal behavior of the lynx.

Use of the project area as part of the lynx linkage zone would remain the same during the winter and spring months with or without the rehabilitation of Hoop Creek. The rehabilitation of Hoop Creek may benefit lynx by stabilizing cut slopes and steep banks, rehabilitating riparian habitat, improving cover and foraging habitat for lynx prey species, and by preventing further degradation of the drainage. The proposed replacement of the buried pipeline in the Berthoud Pass parking lot would not impact lynx habitat and would have a discountable effect on lynx.

As a result of this project, an insignificant amount, 3 acres or less than 0.01 percent of lynx habitat (e.g., winter forage habitat), would be temporarily converted to an unsuitable condition through the removal of shrubs and trees necessary for the bank stabilization and the heavy equipment access to the site. This conversion of habitat would result in 2,055 acres of unsuitable habitat in the LAU, or 5 percent of lynx habitat, well within the LCAS Standard of “no greater than 30 percent of a LAU should be in an unsuitable condition”.

The linkage area will continue to properly function. This project will not reduce cover or forage to the degree that a lynx would no longer be able to travel through the area. In addition, this project will be in accordance with the LCAS Standards and Guidelines.

Trailblazer Snowmobile Tours

The proposed action will occur in habitat that is considered suitable for lynx denning and/or foraging. With the exception of meadow complexes in the Church Park area, the majority of permitted routes pass through winter foraging habitat. Smaller patches of denning habitat are interspersed throughout the project area with the largest, most contiguous blocks well away from permitted snowmobile activity (Fraser Experimental Forest, upper Vasquez, upper Williams Fork and Upper Kinney areas). Snowmobile activity in these areas may affect the lynx by causing a temporary disturbance to their normal activity by avoiding the area or remaining stationary until the snowmobiles pass. The snowmobiles may also affect the presence or behavior of any snowshoe hares in the area. However, lynx are tolerant to human activities (Ruediger et al. 2000), and therefore the effects of this project would be insignificant and

discountable.

No habitat is expected to be degraded or converted into lesser quality habitat as a result of this action. Because of this, there will be a discountable change in the type or quality of habitat available to the lynx.

TST will not allow snowmobiles in areas where regenerating trees could be damaged so there will be a discountable effect on the winter foraging habitat to the lynx.

This action is not expected to affect any key linkage areas.

Mann Land Exchange

This land exchange will have a beneficial and insignificant effect to lynx. The increase of 20 acres of winter forage habitat will have a beneficial effect to lynx. The net loss of 20 acres of other lynx habitat would be an insignificant decrease (less than 0.01 percent) in the amount of other lynx habitat within the Lower Elk River LAU. Indirect effects would be beneficial by reducing the potential development of winter forage habitat.

Road Operations and Maintenance Activities on the Rio Grande National Forest

Much of the RGNF facilities and infrastructure are within the general habitats for Canada lynx. There are 2,154 miles of open-to-the-public roads across the 1,852,000 acres of the RGNF. There are 676 miles of closed roads on the RGNF.

As actions are confined to existing roads and bridges, the effects that result from rock and slide removal, signing, repair or maintenance of drainage structures, restoring road surface, crown, and clearing - removing dead or green trees leaning over roads and limbs that obstruct driver vision; repairing or replace gates, cattle guards, bridges, fences; and use of explosives, would be limited to temporary disturbances to individuals should they be present at the time of operations. Actions are limited to existing infrastructure that is non-habitat itself, but may be inclusions within larger lynx habitat types; however actions would not convert habitats, nor impair the functionality of the habitat type.

Brushing along roadsides is confined to road ditches and the adjoining cutbank of roads that are suitable for passenger cars for safety purposes. While there are approximately 800 miles of this type of road on the Forest, only about 2 miles of road may be treated annually and treatment sites are selected based on public safety concerns. Treatment is spotty along the length of a road, where needed to provide a clear line of sight, so there are no large strips of vegetation removal. Several individual regenerating aspens (less than or equal to 2 inch diameter) may be removed manually from a site, and cumulatively across the RGNF during one year of maintenance, may result in less than 5 acres of aspen removed annually. On average, these sites will be retreated in 10+ year intervals (Frink, pers. comm. 2003). The extent of this activity is so small as to be discountable as to its impacts on adjacent lynx habitat.

One potential direct effect of maintenance activities to wildlife includes potential encounters with individuals, which might result in temporarily disturbing an individual, but would not result in long-term displacement. The likelihood of such encounters resulting in mortality is predicted to be relatively low or nonexistent due to the rarity of individuals or their individual habituation around humans.

Use of explosives could have an intense startling effect, but would be very brief in duration and infrequent in use. Conceptually, use of explosives, especially during the denning period in suitable denning habitat, could cause a lynx to move kittens to a less secure scenario. It is extremely unlikely that a lynx would be denning close to open roads, unless there were topographic features (i.e., ridgeline) in the vicinity that provided a sense of security to the individual. Such topographic features might provide an audio-buffer to reduce the intense noise associated with explosives.

The activities proposed are not anticipated to affect individual lynx beyond a potential temporary disturbance. Lynx would probably avoid roads during maintenance activities and there is sufficient habitat to allow movement around and away from these activities.

Studies outside of Colorado (Roe et. al. 1999) specifically evaluated and discussed Canada lynx responses, behavior, and relative resiliency to humans on the Lake Louise Ski Area in Banff National Park, Alberta, Canada, and other ski areas in Canada. Their study indicated “studies and anecdotal encounters with lynx are almost uniform in describing the mild if not indifferent reaction of individual lynx to human presence.” Mowat (Ruggerio et. al. 2000) discusses Canada lynx’s relative acceptable tolerances of humans, and found through his studies in Canada that they could not detect changes in lynx movement patterns or home range despite their constant, repetitive and daily traveling through the study area to check traps and locate animals [lynx].”

All road operations and maintenance activities occur on established infrastructure and will be confined to road prisms or a short distance (25 feet) beyond the road edge. While roads may be inclusions within lynx habitats, there is sufficient surrounding habitat to provide movement around and away from sites where maintenance activities are occurring. Overall, lynx habitat would be insignificantly affected by road operations and maintenance activities, as no habitat conversions would occur. Lynx are expected to avoid operations and resume their normal activities as soon as the operations are completed, showing insignificant effects of the action.

Future activities will be subject to a Checklist to ensure that the activity is within criteria of assumptions associated with this opinion and the effects to the lynx have been analyzed.

Soil, Watershed and Fisheries Conservation treatments on the Rio Grande National Forest and the San Luis Resource Area

One potential direct effect of soil, watershed and fisheries conservation treatments to wildlife includes possible encounters with individuals, which might result in disturbing an individual.

Because of the size, duration and type of treatments proposed, it would be expected that any lynx in the area may be temporarily displaced by the human activity. However, this displacement would have an insignificant effect on the otherwise normal behavior of the lynx. The long term effect would be a general improvement in the existing habitat which may prove to be beneficial to the lynx. There would be no conversion of lynx habitat types or additional snow compaction as a result of the action.

Lost Basin Ditch Renovation Project

Factors

1. Vegetation Modification – Temporary removal of vegetation along the ROW would temporarily reduce the amount winter forage habitat, inhibit the ability of lynx to move through the action area, and a temporary loss diurnal security.
2. Disturbance - Disturbance from noise associated with project activities and human presence could cause lynx to leave the area temporarily.

Vegetation Modification

The proposed action would result in the temporary loss and disturbance of vegetation (aspen and mixed conifer) in the project area where removal of vegetation in the ROW is required. There will not be any permanent loss of lynx habitat. The movement of construction equipment within the 7,653-foot forested ROW will result in crushed vegetation. These impacts would cause a loss of foraging, cover and movement values to the LAU. However, considering the linear configuration of the disturbance area through the relatively large home ranges of primary and secondary prey species, it is unlikely that the disturbance would reduce the local prey base. Disturbance to lynx habitat would not measurably change the structural characteristics of the forest and therefore impacts to lynx foraging, diurnal security, and travel values would be insignificant and discountable and in accordance with the LCAS Standards and Guidelines.

Human disturbance

Activities associated with the pipeline repair may displace a lynx or affect their activity due to possible high noise levels from construction equipment. Disturbance effects would end with the cessation of the construction activity. It is likely the effect would be insignificant because the noise disturbance would be temporary in nature and the fact that lynx are generally tolerant of humans and human disturbance (Mowat 2000; Aubry 2000).

San Juan/Rio Grande National Forests Wilderness Management Direction Amendments

No alteration, change or conversion of lynx habitat types is expected as a result of this action. The effects of this action to lynx habitat would be insignificant.

By taking actions to reduce use in the areas when 20 percent or more of use-days sampled are exceeded rather than the previous guideline of 10 percent, a higher density of humans in key

habitats and at key times may be increased. This increase in human presence may result in an increase in encounters with lynx which may disrupt normal foraging, breeding, and travel behaviors of the lynx.

Studies outside of Colorado (Roe et. al.1999) specifically evaluated and discussed Canada lynx responses, behavior, and relative resiliency to humans on the Lake Louise Ski Area in Banff National Park, Alberta, Canada, and other ski areas in Canada. Their study indicated that studies and anecdotal encounters with lynx are almost uniform in describing the mild if not indifferent reaction of individual lynx to human presence. Mowat (*in* Ruggerio et. al. 2000) discussed the tolerance of Canada lynx to humans and human activities, and found through his studies that they could not detect changes in lynx movement patterns or home range despite their constant, repetitive and daily traveling through the study area to check traps and locate animals (e.g., lynx).

Because there is a current level of human visitation to these wilderness areas and the assumed reaction by the lynx, an increase in activity at this level should have a discountable effect on the lynx.

One key potential direct effect of wilderness use by dispersing public and special-use activities to lynx includes potential encounters with individuals, which might result in mortality of an individual, as shown by shooting of Canada lynx (CDOW 2001) or domestic dog(s) chasing lynx. Winter encounters may occur with Canada lynx. The likelihood of dog/lynx encounters resulting in mortality is predicted to be relatively low due to the rarity of individuals and the limited mobility that a dog has in deep snow. The current mitigation set forth in the Wilderness Management Direction concerning the leashing of dogs or the possible prohibition of dogs within the areas would be beneficial to lynx and would decrease the likelihood of a lynx/dog encounter significantly.

The most probable potential indirect effects to lynx are adversities to their suitable habitats (especially prey habitat) by some timber harvest and natural or prescribed fire, or maturing of some conifer types (i.e., lodgepole pine) and deciduous (i.e., aspen) types. Dispersing public and special-use permittees in wilderness utilize existing trails and some historical campsites, which would not be suitable habitat in themselves for lynx. However they are sometimes inclusions within surrounding suitable habitats. The most significant potential change that would occur in wilderness areas would include the gathering of incidental down woody material for camp firewood near chosen campsites. However, due to the small relative size of dispersed campsites, the impact to the lynx would be discountable.

Other indirect effects to lynx associated with dispersing public and special-use permittees in wilderness include the potential occupation of non-habitat within or immediately adjacent to suitable habitats by humans for prolonged periods of time, especially key seasonal habitat components such as lynx spring denning or summer rearing habitat. Based on the relatively large amount of suitable habitat (i.e., denning) available for lynx and the fact that this project is

within the Standards and Guidelines of the LCAS, the effects of this action will be insignificant and discountable.

Snow compaction

Since there will be no net increase in groomed and/or designated over the snow routes, this project will be in accordance with the LCAS Standards and Guidelines.

WillSource Gas Exploration Project

Factors:

1. Vegetation Modification – Changes to vegetation structure would reduce lynx habitat base for foraging, movements, security, and denning.
2. Disturbance - Disturbance from noise associated with project activities such as increased road traffic and human presence could cause lynx to leave the area temporarily.

Well pads

Activities associated with gas well drilling and production near wells Number 1-17 and 1-18, may displace a lynx or affect their activity most likely during the initial phase of the project when noise levels may be high. The effect from disturbance would likely be negligible as lynx are generally tolerant to humans and human disturbance, including moderate snowmobile traffic and daily human use and presence in an area (Mowat et al. 2000; Aubry et al. 2000.)

Access Roads

Lynx movement patterns are not affected by forest roads alone, but may be affected by widening or paving that lead to increased speeds or traffic volume (Ruggiero et al.2000). Minimal road maintenance includes some widening and drainage improvements. However, the road improvements are not expected to increase traffic volumes or traffic speeds. In addition, travel routes for well access are established roads and are already open to the public. No new roads will be constructed for this project.

The clearing of approximately 5 feet of vegetation on sides of the existing routes would result in habitat disturbance to about 0.9 acres of lynx habitat along the 5,700 feet of access road. This includes a potential disturbance of about 0.4 acres of lynx winter foraging habitat, 0.3 acres of other lynx habitat, and 0.2 acres of lynx denning habitat. Disturbance to lynx habitat caused by vegetation treatments would insignificantly modify lynx winter foraging, denning, and other habitats. Proposed road improvements would not introduce new barriers or impediments to the ability of lynx to travel through the area.

Pipelines

It is estimated that vegetation disturbances in lynx habitat of about 2.5 feet in width would occur through a 3,000-foot section where pipeline installation would occur. A temporary disturbance to understory vegetation communities that provide foraging habitat for lynx along Segment G

would impact about 800 feet of winter foraging habitat, 900 feet of denning habitat, and 750 feet of other habitat. The impact to winter foraging habitat would be about 0.5 acres; the impact to denning habitat about 0.5 acres, and the impact to other lynx habitat would be about 0.7 acres. Installation of surface pipelines would result in temporary small disturbances to the understory in lynx denning, winter forage and other habitats. This disturbance would result in an insignificant temporary change to the Divide Creek LAU; and is in accordance with the LCAS Standards and Guidelines.

Snow compaction

Winter access by foot or snowmobile could occur along the Segment G pipeline route, should freezing or other problems require pipeline repair. The need for access is likely to be infrequent and unpredictable, and therefore would result in short-term, periodic snow compaction along portions of the pipeline route. No regular compaction is scheduled, but would be as needed to address pipeline problems.

If wells are developable, the estimated duration of production is between 10 and 15 years. During this time, maintenance crews will need to access the well sites at least three times a week and year-round. This year-round maintenance will increase snow-compaction in “other” lynx habitat, as well as, in winter forage habitat along the 1.48 miles of road used for maintenance access. However, the increase in snow-compaction within the 0.88 miles “other” lynx habitat has been determined by the lynx biology team to have a discountable effect (Kurt Broderdorp, USFWS, pers. comm. 2003). The increase in snow-compaction on the 0.6 miles of winter forage habitat is negligible, since this section of road is part of the WRNF snow compaction baseline. In accordance with the LCAS, there will be no increase in groomed or designated over the snow routes associated with this action. The increase in snow compaction resulting from this project will be insignificant and will have a discountable effect on lynx.

In conclusion, we believe that the effects of this project will be insignificant and discountable; and is in accordance with the LCAS Standards and Guidelines.

Vail Valley Defensible Space Treatments

The evaluation of the effects of the project on lynx is tiered to the conservation measures recommended in the LCAS (Ruediger et al. 2000). This project is assessed with respect to relevant project standards for maintaining suitable foraging and denning habitat and providing for movement and dispersal. It is also evaluated with regard to changes in snow compaction and providing for diurnal security areas.

1) If more than 30 percent of lynx habitat within a LAU is currently in unsuitable conditions, no further reduction of suitable conditions shall occur as a result of vegetation management activities by federal agencies

Based on the most recent lynx habitat mapping on the WRNF, it is estimated that about 47 percent of the Eagle Valley LAU is lynx habitat and 9 percent is currently unsuitable. All of the

proposed treatments will be in mature lodgepole pine or mature lodgepole/aspen forests with no appreciable understory cover. Some treatments will affect small areas of Douglas fir and Spruce/fir. About 6.3 acres of winter foraging habitat would be converted to other lynx habitat. All of the affected habitat is on the edge of the blocks of habitat and thus may not be as important for foraging as the habitat within the interior of the block. The proposed action will reduce the amount of suitable foraging habitat for lynx within the LAU by 6.3 acres or 0.0003 percent so the project is consistent with this Standard in that it will not increase the unsuitable habitat to more than 30 percent of the LAU.

The proposed action would remove dead and dying trees, conduct overstory thinning, and prune some lower branches. These potential changes in understory cover will have a negligible effect on lynx food supply. We consider this a negligible effect when considering the amount of human activity that occurs in the treatment areas and the overall amount of winter forage within the Eagle Valley LAU (18,895 acres).

2) Where less than 10 percent denning habitat is currently present within a LAU, defer any management actions that would delay development of denning habitat structure.

Based on the most recent lynx habitat mapping on the WRNF, it is estimated that about 26 percent of the forested lynx habitat in the Eagle Valley LAU is suitable lynx denning habitat. The project area does not contain suitable lynx denning habitat because inadequate coarse woody debris exists in the treatment areas. Additionally, the project area receives high daily influence from human uses, which would likely prevent lynx from denning in the area. There will be no loss of suitable denning habitat as a result of this project. The project is therefore consistent with the LCAS standard with regard to maintaining denning habitat.

3) Maintain habitat connectivity within and between LAUs.

The proposed action will not create any barriers to lynx movement. Wildlife recommendations to limit work operations to the hours from sunrise to sunset have been incorporated into this proposal. The removal of overstory cover as a result of cutting dead and dying trees and selective thinning will make the units more open than if the dead trees were left standing and no thinning was performed. During the daytime there is so much activity in the area presently that it seems unlikely that a lynx could enter the treatment area without encountering people or human activities. This possibility is not deemed to have a significant effect on lynx travel through the project area because the project area borders an urban center and is on the edge of the habitat blocks. Any lynx that currently would travel through the project area would encounter these openings as well as traffic and other noises from Interstate 70, Vail, Eagle-Vail and Minturn. The few stands of more open forests that would result from the proposed action would not be a major change to the landscape. More reclusive areas for east-west movement across the LAU would remain to the south of the project area. Therefore, the project is consistent with the LCAS for maintaining habitat connectivity.

4) Maintain diurnal security areas

As outlined in the environmental baseline, none of the treatment areas currently provide diurnal security areas for lynx. Adequate and more functional diurnal security habitat is available in the area to the south of the treatment areas. The proposed action therefore will not affect potential diurnal security areas.

5) *No net increase in snow compaction*

The treatment areas are not in areas that would have regular snow compaction and the treatments would not increase snow compaction so the proposed action is consistent with this standard.

Direct effects and some indirect effects of the proposed action have been evaluated above. One additional indirect effect of the proposed action is the reduced risk to catastrophic fire. By treating the areas around these dwellings we may be not only protecting the structures from wildfire but we may also be protecting the adjacent habitat from fire originating from the urban area. How effectively these risks will be reduced by the proposed action is difficult to evaluate because of the high degree of unpredictability associated with catastrophic fires.

Wildland fire can have beneficial effects to lynx habitat (Ruediger et al. 2000). However, because the area is immediately adjacent to Vail, Eagle-Vail and Minturn and to permanently occupied dwellings, large-scale mortality of trees from fire within the project area would not necessarily improve habitat for lynx. This is because the loss of cover that would follow a large fire would create additional areas where lynx moving at dawn or dusk may be detected by people living or working in the area. Consequently, a controlled removal of dead, infected, and “high-risk” trees next to an urban center has some merit for lynx by attempting to limit the extent of overstory removal compared to an uncontrolled fire started from near the dwellings.

Since the proposed project will adhere to the Standards and Guidelines of the LCAS, will only slightly affect foraging habitat of questionable quality, will not affect suitable denning habitat or diurnal security areas, and will not change the overall snow compaction, the Service has determined that this project will have a discountable effect on individual lynx and/or its habitat.

Spring Creek Salvage Harvest

Since all activities will be in currently unsuitable lynx habitat, no direct effects to suitable lynx habitat will occur as a result of this project. There are intermittent “pockets” of suitable habitat, located within the action area. However, these areas are so small that they are unable to support lynx.

The proposed action may indirectly affect future denning habitat from the removal of dead or dying standing trees. Since 48 percent (16,506 acres) of the Clinetop LAU is denning habitat, the salvage harvesting of 670 acres of trees will have an insignificant affect on the future amount of denning habitat (0.04 percent).

Denning Habitat

No studies have been done in Colorado to describe the specific components of lynx denning habitat, but it is thought to consist of late succession coniferous forests with large amounts of woody debris, such as snags, downed logs and windfalls. Denning habitat is located in areas that provide for minimal disturbance by humans and protection from predators, and in or very close proximity to foraging habitat. Approximately 84,000 acres of standing dead and down material remain on the White River Plateau following an insect outbreak that occurred in the 1940's. Denning habitat was recently modeled on the White River Plateau. Approximately 25 percent of the lynx habitat on the Plateau is classified as denning habitat. This denning habitat is well distributed across the higher elevations of the Plateau, except on the western portions where the habitats are primarily aspen and grassland types. Within the project area (i.e., Clinetop LAU), denning habitat has been modeled on 16,500 acres, which is approximately 48 percent of the lynx habitat.

Under the proposed action, removal of most of the spruce and Douglas fir snags on 664 acres would reduce the number of future downed logs that could provide for denning structures long term. However, only the spruce and Douglas fir snags would be harvested, all the sub-alpine fir and aspen snags would be retained, as well as some of the unmerchantable spruce snags. Also, the harvest units were designed to leave unharvested areas between each harvest unit, in which all the snags would be retained. Riparian buffers were also delineated, and these will be areas in which all snags will be retained. These unharvested areas will provide a well-distributed pattern of snags/future downed logs, which could provide for denning structures in the long-term. As 48 percent of the lynx habitat within the LAU is currently considered denning habitat, this indirect effect to future denning habitat would have very minimal impacts long term to lynx denning habitat.

Foraging Habitat

There are 23,561 acres of winter foraging habitat within the Clinetop LAU, which is 69 percent of lynx habitat. In addition, 7,323 acres are considered to be "other" habitat. Of the total lynx habitat, approximately 10 percent of the LAU is "currently unsuitable", most of which is due to the Spring Creek Fire. It may take 20 to 25 years (or more) for these areas to regenerate enough to be considered suitable for lynx foraging habitat. Generally, snowshoe hare need cover and forage at the 6-8 foot level to be able to survive during winter conditions. Forage for snowshoe hare in the winter can be conifer needles and aspen or willow stems. Young, regenerating aspen and lodgepole pine provide excellent snowshoe hare habitat if it is in proximity to dense cover.

There would be no harvest of existing foraging habitat from the proposed action. Indirect effects could occur in the small remaining pockets of live forested patches from the human activity associated with the road and harvest activity. This could displace any lynx potentially using the area, but it is very unlikely that a lynx would use these small patches of unburned habitat, when there is a large amount of unburned foraging habitat within the LAU. Indirect effects to potential lynx using the area from human activity would be very minimal.

Connectivity/Disturbances

The Clinetop area has an approximate road density of 2 miles/square mile, with most of the roads

being in a primitive, rough, 4 wheel drive condition, which somewhat limits the human use of the area. No new permanent roads would be constructed for this project, and all temporary roads would be decommissioned (i.e., closed and rehabilitated). In addition, approximately 2 miles of currently existing “non-system” roads would be used for harvest purposes, and then decommissioned. This would result in an overall reduction of the road density in the project area, which may benefit lynx by providing additional security areas.

Since no aspect of this project will be conducted during the winter and there will be no net increase in designated or groomed over the snow routes, the issue of increased snow compaction will have “no effect”. In conclusion, the “no effect” from increased snow compaction and the temporary construction of logging roads within “currently unsuitable” lynx habitat will result in an insignificant and discountable effect to lynx.

There are no identified linkage areas for lynx within the project area.

Grand Mesa Travel Management

Snow compaction

Designated over-the snow routes and designated snowmobile play areas: This term applies to over-the-snow routes (i.e., trails) and snowmobile play areas that are “designated”, meaning, these routes and/or play areas are specifically marked on a map, described in the resource or forest plan, described in the travel plan, or a signed action. This definition does not apply to ski areas.

Historically, the routes proposed in this action have received periodic use by snowmobilers (Tom Holland, USFS, pers. comm., 2003). Although these routes are not designated, the USFS does not consider this to be an illegal activity (Clay Speas, USFS, pers. comm., 2003), based on the following facts: 1) these routes have been historically and legally used by snowmobilers; and 2) that this action will not increase the amount of designated or groomed over-the-snow routes and/or play areas; the Service believes that snow compaction, as associated with this action, will have “no effect” on lynx.

In accordance with the LCAS, the results of this action will not catalyze a net increase in groomed or designated over-the-snow routes and/or snowmobile play areas within the affected LAUs. At a later date, if the USFS does choose to designate these roads as “over-the-snow routes” in order to consolidate unregulated snowmobile use, the USFS should reinitiate consultation with the Service.

Road density

As previously stated in the environmental baseline, the opening of these roads to motorized summertime use will not increase the amount of snow compaction by designating or grooming over-the-snow routes and/or snowmobile play areas. The effects of this action will be the increase in human activities and disturbance to previously closed (to motorized vehicles) routes during summer, late spring and early fall.

Mowat et al. (2000) reported that building roads in and through lynx habitat may exert potentially negative influences on lynx by altering and modifying their habitats, and by direct disturbance through travel into occupied habitat. The LCAS recommends that in areas where high total road densities (greater than 2 miles per square mile) occur, roads should be at least seasonally closed or permanently closed and reclaimed. Research has identified a “concern that high levels of human disturbance, particularly near den sites, may be detrimental to lynx”. Conservation measures such as road closures and reclamation will minimize disturbance in lynx denning habitat. The Service believes by maintaining the road density guideline (as previously discussed) the increase in human disturbance, as associated with this proposed action, will be discountable.

The proposed action of opening 14 routes to OHV use will include 33.67 miles within lynx habitat. Of the 33.67 miles, 22 miles are already open to full-sized vehicles. The GMNF is complying with the LCAS Guideline of no greater than 2 miles per square mile within lynx habitat. Therefore, since none of the proposed routes will cause any of the LAUs to exceed the aforementioned road density guideline, the Service believes that this action will have a discountable effect on lynx.

Human disturbance

The most direct effect to lynx associated with this action will be the increase in human activities, primarily during the summer months. However, lynx are known to be tolerant of human activities (Ruediger et al.2000). Of the 33.67 miles that are being recommended for opening, 22 miles are already opened to full-sized vehicles and 6.51 miles are within lynx habitat. This increase in human activity (e.g., off-highway-vehicles) would not likely be so significant as to permanently deter use of the area by lynx and will have a negligible affect to lynx.

Ward Lake Vegetation Management Project

Under the proposed action, treatment units of both projects occur within 947 acres of suitable lynx habitats. Implementation of the proposed action will degrade approximately 947 acres of lynx habitat, or approximately nine percent of the lynx habitat in the Island Lake LAU. Although an insignificant amount of lynx denning and “other” habitats will be affected (see section on Environmental Baseline), winter forage habitat will not be affected. These projects will maintain the overall structural condition of mature forested stands and will not convert any lynx habitats to a permanently unsuitable condition. The effects from these treatments will be insignificant and discountable.

Although lynx are generally tolerant of human activity, direct mortality or injury to lynx will not occur because of their mobility that will allow them to avoid areas of disturbance or potential danger. It is assumed that all lynx that may occur in the analysis area, particularly females, are radio collared and therefore their position and movement can be monitored. Information from such monitoring will aid in the identification of potential active denning sites and, therefore,

reduce the likelihood of physical disturbance to active dens or direct effects to denning adults or young. The one lynx known to occur on the Grand Mesa is radio-collared and is currently being tracked.

Other effects to lynx may include visible and audible disturbances associated with human activities. These disturbances may deter lynx from suitable hunting, denning, or resting habitats. Avoidance of construction areas by lynx will be insignificant, because of the relatively small size

of the treatment areas compared to the large area of adjacent, suitable lynx habitat within the LAU.

The snowshoe hare is an important prey species of the lynx. Habitat preferred by the hare is typically early seral stage forests with relatively open canopies and higher proportions of woody shrubs. These habitats do not occur within the treatment units. Implementation of the proposed action will not reduce the availability or condition of suitable snowshoe hare habitat within the analysis area. Implementation of the proposed action may increase the amount of suitable snowshoe hare habitat by reducing canopy cover and increasing age class diversity and thus providing conditions favorable for the establishment and growth of forage and cover types beneficial to the hare.

Effects Specific to the Fuels Treatment

The fuels treatment project will degrade suitable lynx denning and other habitats by removing down woody debris, thinning trees from below, and removing lower limbs of some trees. No direct effects to individual lynx will occur due to species mobility and general avoidance of human activities. Effects to lynx habitats will be more intensive closer to private property and developed facilities on USFS lands in order to achieve the established fire protection goals of this project. Lynx habitat functionality will be degraded within these areas. Project activities will be less intensive farther from private land and facilities. In these areas, lynx habitats will be degraded, but not to the same extent as closer to private lands and facilities. Throughout the treatment units, mitigation measures will help reduce the effects of the project on lynx habitats.

The degree of functionality of post-project lynx habitats is difficult to quantify but will depend on current habitat conditions, intensity and distribution of activities within treatment units, and potential lynx responses to these impacts. The functional degradation of lynx denning habitat within the fuels treatment units will not result in substantial effects to the lynx, because it does not currently represent fully functional denning habitat. These habitats do not currently represent fully functional denning habitats because of their proximity to developed facilities and associated human disturbances. The extent of the degraded lynx habitats, within the treatment units in relation to the size and availability of suitable habitats within the LAU, but outside of the treatment units, also suggests that any lynx that may inhabit the LAU will utilize habitats farther from human disturbance. The potential effects to lynx denning habitats within the fuels treatment units will not be important to locally occurring lynx because denning functionality will not be completely lost. The remaining large tracts of unaffected denning habitat will maintain the 10 percent denning standard of the LCAS.

The fuels treatment project will not remove mature conifer trees, but will result in the loss of some down woody debris, potentially reducing the quality of the treatment units for red squirrel. Although there may be some loss of red squirrel habitat quality on the 414 acres that will be treated, populations of this species are not expected to be substantially affected because of the extent of unaffected habitats in the analysis area (6,762 acres) and because the treated areas will continue to provide some level of habitat for this species. As a result of this action, the effects to lynx will be insignificant and within the Standards and Guidelines of the LCAS.

Effects Specific to the Timber Harvest

The timber harvest project will degrade approximately 544 acres of lynx denning habitat and 80 acres of other habitat within the treatment units. The table below shows the extent of potential effects to lynx habitats from the timber harvest project. Implementation of the timber harvest project will degrade some suitable lynx denning and other habitats by disturbing existing large down woody debris and removing trees that provide important canopy cover. The primary objective of the timber harvest project is not related to the removal of down woody debris but rather the removal of up to 30 percent of the standing basal area. Any disturbance that may occur to the down woody debris component will be incidental and highly localized. Under this project, most down woody debris disturbance will likely be associated with skid trails. Skid trails will not account for more than 15 percent of the area within each treatment unit; therefore, down woody debris in the remaining 85 percent of each unit will not be altered.

Summary of Lynx Habitat Affected by the Timber Harvest

Habitat Type	Acres Converted to Unsuitable	Percent Converted to Unsuitable	Acres Affected	Percent Affected
Denning	0	0	544	6
Winter	0	0	0	0
Other	0	0	80	4
Total habitat	0	0	624	6
Non-habitat	n/a	n/a	22	<1
LAU Total	0	0	646	3

Implementation of the timber harvest project will alter lynx denning habitat within the treatment units. The functionality of these habitats will not be lost but will diminish in some unquantifiable degree. The extent of alteration will depend on: existing lynx habitat conditions, intensity and type of harvest activity, and potential lynx responses to these impacts. Vegetation within some units defined as other lynx habitats will be affected by the implementation of this project. Lynx denning and other habitats within the timber harvest treatment units will not be completely lost because some level of denning and hunting functionality will still exist, and because of the availability of large tracts of unaffected habitats adjacent to and connected with the treatment units.

The timber harvest project will result in the removal of up to 30 percent of the basal area of

mature conifers in the treatment units. Removing large live trees to reduce the basal area of a stand reduces red squirrel habitat, but does not eliminate it. While this removal may result in decreased conifer seed crops for the red squirrel, the improved health of the remaining stand may result in increased cone production on the remaining trees. Coarse woody debris will generally be retained, except where it is disturbed by skid trails or slash treatment. Although there may be some reduction in the conifer seed crop and disturbance of existing down woody debris in the treatment units (646 acres), populations of this species will not be substantially affected because of the extent of unaffected habitats in the analysis area (6,530 acres). In addition, the treated areas will continue to provide a substantial conifer seed crop and coarse woody debris in similar amount to the existing situation. As a result of this action, the effects to lynx will be insignificant and within the Standards and Guidelines of the LCAS.

Project activities may occur during the winter months, and roads in the analysis area may be plowed to allow winter access. In lynx habitats, deep snow conditions are a physical barrier that limits competition between lynx and other predators (e.g., coyotes, bobcats, and mountain lions). Plowing may allow these predators to enter lynx habitats that would not otherwise be accessible and result in increased competitive pressure. This increased competitive pressure may affect lynx fitness by reducing the availability of prey items (e.g., snowshoe hare or red squirrel). Competition can also occur when one species acts aggressively toward another. Coyotes, bobcats, and mountain lions can exhibit this type of competition with lynx. Documentation of coyotes killing lynx (Buskirk et al. 1999) and evidence that lynx populations tend to respond negatively to increases in coyote numbers support the theory of competition between these species. However, the LCAS has a provision for plowing winter logging routes in order to meet resource management objectives. Based on this LCAS provision, plowing these logging routes to obtain the resource management objective of this project will have a discountable effect to lynx.

Bald eagle

Implementation of the fuels treatment and timber harvest projects will not result in detrimental effects to individual bald eagles or potentially suitable bald eagle habitats. This statement is based on the absence of nesting or winter roosting bald eagles within the analysis area. Foraging eagles may use snags in the analysis area as hunting perches. The proposed action will result in the removal of some snags that occur near private lands or developed facilities on USFS lands. In areas farther from private lands and facilities in the fuels treatment units and in all of the timber sale units, large diameter snags will be preserved at a minimum density of 1 to 3 per acre. The potential removal of snags near private lands and facilities will not be important to foraging bald eagles because of the relative availability of snags within the treatment units following implementation and outside of the analysis area, and the limited occurrence of foraging bald eagles within the analysis area and Forest. In conclusion, the affects of this project to bald eagle will be discountable.

The Service concurs with the USFS determination that the proposed action “may affect, but will not likely adversely affect” bald eagle. This determination and concurrence is based upon the rare occurrence of bald eagles within the analysis area, the lack of suitable nesting and winter

roosting habitats, the maintenance of snags within the treatment units following implementation, and the general availability of snags throughout the Forest.

Missionary Ridge Wildfire Suppression and Burned Area Emergency Rehabilitation Projects

Wildland fire suppression actions were implemented in denning, winter forage, and other lynx habitat by various professional fire fighting crews (i.e., engine crews, hand crews, helitack crews, air tankers, etc.). Potential direct and indirect effects to lynx and lynx habitat from wildfire suppression are the result of the discretionary actions utilized to suppress the fires. These discretionary actions relate to the resources needed to contain, control, and extinguish the fire.

Direct effects to lynx and lynx habitat from suppression actions resulted in approximately 185 acres of suitable lynx habitat being impacted primarily from fireline and safety zone construction.

A total of 120 miles of dozer line were constructed during suppression efforts. Approximately half this amount was located in lynx habitat, totaling approximately 145 acres of suitable habitat affected. Approximately 39 miles of handline were constructed during suppression efforts. Approximately two thirds this amount was located in lynx habitat, totaling approximately 10 acres of suitable lynx habitat affected. Less than 30 acres of suitable lynx habitat was cleared to construct safety zones. Safety zones constructed usually averaged about 3 acres in size. Fireline and safety zones constructed via dozer had the largest impact to habitat by removing trees of all age classes and disturbing grass and forb vegetation that provides habitat for prey species (i.e., snowshoe hare, grouse, and red squirrels). Fireline constructed via handline had similar effects, but at a much lower level because of the smaller amounts of vegetation disturbed. Fireline and safety zone rehabilitation has occurred to help minimize soil and watershed concerns, and to help minimize the amount of illegal off road use in the area. In simple terms, material (i.e., boulders, logs, and vegetation) that were cleared were pulled back into the line. These temporary effects to lynx were insignificant, discountable and with in the Standards and Guidelines of the LCAS.

Direct effects to lynx and lynx habitat from BAER actions that have the potential to affect (positively and negatively) lynx and lynx habitat include aerial seeding, early warning system installation, log erosion barriers, non-native plant control, sandbag erosion barriers, and straw mulching. These land treatments have primarily occurred in highly impacted watersheds, in areas that provide minimal habitat value to lynx because of the degree of fire impacts to vegetation. Consequently, no impacts to lynx are expected in the highly burned areas. To a lesser extent, treatments are occurring in areas that received low to moderate impacts from the fire. These treatments are not expected to impact lynx habitat.

Temporary, indirect effects to lynx are most likely to be associated with human disturbance resulting from crews walking in the burn, vehicular use, and aircraft use. Since none of the monitored lynx had been reported in the area during the fire, effects from the fire suppression activities were likely to have been negligible. There has been at least one report of an individual

lynx in the burned area since the fire. The overall impacts to lynx from this project were insignificant and discountable.

Missionary Ridge Fire Fence Rehabilitation and Installation Projects

The clearing of fence-line for the new 1.4 miles of fence extending the Shearer/Elkhorn allotment fence, the fence along the Burnt Timber road, and the clearing along the existing fences may open up some areas to snowmobile use that otherwise would be inaccessible. Some fence sections cross roads currently open for winter travel. In those areas where fence is being repaired, it can be expected that the project will result in some sections of land being cleared. The USFS estimates 60 feet of land (123 acres) on either side of the fence will need to be cleared.

This project may increase the amount of human disturbance and intermittent snow compaction within the affected LAUs. Although the USFS will not be conducting maintenance while snow is on the ground, private snowmobile users may access the cleared area and intermittently compact the snow. The effects of intermittent snow compaction may increase competition to lynx from other predators (i.e., coyotes and bobcats). This increase in predator competition may lead to a decrease in the amount of prey available to lynx. However, the fence-line covers terrain of varying slope, ruggedness and goes through a mosaic of high, medium, and low intensity burns and live timber. In the low intensity and live timber areas, very little if any clearing will occur, making passage for a snowmobile unlikely, if not impossible.

Associated with the construction of new fence line and repairing of the burned fence line will be the clearing of dead standing trees, and possibly some live trees, that are 60 feet from the fence line. These trees are considered to pose a potential problem of falling onto the fence. Trees that are felled will not be removed from the site. The felling of these trees will not affect winter forage habitat, but may contribute to the denning component. The effects of this project will be insignificant and discountable.

Dutton Ditch Project

The alignment of this pipeline follows existing roads for about 80 percent of its length and will be buried under the existing roadbed or in the adjacent ditch with no vegetation disturbance. Along the existing ditch for about quarter-of-a-mile, the remaining 20 percent of pipeline will impact vegetation at the diversion point and directly below the diversion point. This disturbance is in cool moist mixed conifer habitat. It is expected that about 50 trees of various diameters will be removed over a 6 acre area. In addition, four heavy pieces of equipment will be used to supply materials for the project.

The 6 acres of winter foraging habitat that will be affected by this project (less than 0.01 percent) will have an insignificant effect on lynx and the SJLAU. In addition, this project will not measurably increase the amount of currently unsuitable habitat (less than 0.01). The effects from this project will be the temporary loss of some winter forage and some human disturbance associated with construction activities. The capability of the effected area to function as winter

forage for snowshoe hares will return as the area rehabilitates itself.

Although lynx are naturally reclusive, they will tolerate some human disturbance. Human disturbance may be in the form of human presence and the possible use of a helicopter at the diversion site to supply concrete (Art Holloman, PAWSD, 2003, pers. comm.). This temporary disturbance from human activities may deter transient or resident lynx from using the area during this period of time. The disturbance period is expected to last 30 to 120 days. The effects of this project will be insignificant and discountable.

EFFECTS OF INTERRELATED OR INTERDEPENDENT ACTIONS

Crooked and Lincoln Creek Large Wood Habitat Placement Project

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Keystone Ski Resort's Little Bowl and Erickson Bowl Snowcoach Tours

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Crooked Creek Complex Timber Sale

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Lodgepole Pine Rollerchopped Thinning Project

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Million Fire Salvage Timber Sale

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Avalanche Snowmobile Tours

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

White River Plateau Sheep Allotment

Direct impacts may occur by predator control activities associated with domestic grazing. The

Animal Damage Control of the Animal Plant Health Inspection Service-Wildlife Services (APHIS-WS) is allowed to manage livestock predation by coyote, red fox, black bear, mountain lion and that caused by federally designated “Threatened” species. Although predator control actions could possibly impact lynx, this type of action would require section 7 consultation. Part of that consultation process would include coordinating with the appropriate District Ranger, the Colorado Division of Wildlife and an APHIS representative before any actions could be taken.

Beaver Creek Trail

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Buffalo Mountain Trail Project

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Hummer Tours for the D&L Ranches

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Grand Adventure Snowmobile Tours

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Hoop Creek Rehabilitation Project

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Trailblazer Snowmobile Tours

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Mann Land Exchange

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Road Operations and Maintenance Activities on the Rio Grande National Forest

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Soil, Watershed and Fisheries Conservation treatments on the Rio Grande National Forest and the San Luis Resource Area

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Lost Basin Ditch Renovation Project

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

San Juan/Rio Grande National Forests Wilderness Management Direction Amendments

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

WillSource Gas Exploration Project

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Vail Valley Defensible Space Treatments

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Spring Creek Salvage Harvest

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Grand Mesa Travel Management

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Ward Lake Vegetation Management Projects

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Missionary Ridge Wildfire Suppression and Burned Area Emergency Rehabilitation Projects

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Missionary Ridge Fire Fence Rehabilitation and Installation Project

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

Dutton Ditch Pipeline

This pipeline will be a source of water for the expansion of Stevens Reservoir. The Stevens Dam and Reservoir expansion is a Pagosa Area Water and Sanitation District project that will have “no effect” on lynx.

CUMULATIVE EFFECTS

Cumulative effects are the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this BO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Crooked and Lincoln Creek Large Wood Habitat Placement Project

WRNF biologist review of public records resulted in finding very little planned activity within the Independence Pass and Fryingpan North LAUs. No new state or county actions are planned. Private actions include one single-family home to be built on a private land parcel located within the Fryingpan North LAU. The construction will occur approximately 5.5 miles south of the project area, on the North shore of Reudi Reservoir adjacent to the water and vegetation mapped largely as non-habitat, including aspen and mountain shrub. Vegetation along the North shore of Reudi Reservoir is primarily non-lynx habitat interspersed with corridors of suitable habitat.

Within the Independence Pass LAU, the majority of private land is on the west end of the LAU within 5 miles of Aspen. Foreseeable home building construction is in this area, on the outskirts of town, where 3 building permits have been filed with Pitkin County. Home sites are located on private land and are adjacent to other private parcels.

Effects associated with home building predominantly involve on-site habitat loss or alteration, and disturbance associated with human travel to and from the site. Because these effects occur primarily in habitats mapped as non-habitat or private, and in areas not associated with lynx foraging or denning activities, cumulative effects to the LAU from private home building would be very minor and would fall under the definitions of insignificant and discountable. The

amount of potential lynx habitat that would be affected by the cumulative impact of these anticipated actions is too small to be measured and would not have an overall affect on the use of the LAU by a resident lynx. The potential of any of the current or proposed development actions displacing a lynx, or creating a change in a movement pattern is very unlikely due to the low habitat value of the private lands.

Keystone Ski Resort's Little Bowl and Erickson Bowl Snowcoach Tours

In 1999, a residential community (located within the KSA base area) received approval from Summit County to construct 26 single-family lots and 66 multi-family units. The community is near build-out and will likely be completed in the near future.

Crooked Creek Complex Timber Sale

There are no other foreseeable future actions or effects or connected actions on state and private lands that would affect lynx habitat in the Brush Creek and Fryingpan North LAUs.

Lodgepole Pine Rollerchopped Thinning Project

Two parcels of private land are found in the lower reaches of the project area. These are both old mining claim properties and are no longer active. No knowledge of future activities exists for these mining claim properties and no changes in the condition of these properties are expected to occur. No state lands exist within the project area.

Million Fire Salvage Timber Sale

As identified in the environmental baseline, private actions include timber harvests in currently unsuitable habitat, but no further habitat conversions are expected to occur. There are no State or local actions known at this time. On private land, a timber harvest was initiated within the burn area following the Million Fire and continues to date. Harvest is ongoing within the burn area already converted to unsuitable habitat condition and is included in the baseline.

Avalanche Snowmobile Tours

Future non-Federal activities within the Williams Fork LAU that could contribute to Canada lynx cumulative effects includes: the mechanized removal of hundreds of acres of dead lodgepole pine on Henderson Molybdenum Mine property, and associated road and skid trail construction to remove dead trees.

Current conditions in these dead standing habitats are not favorable for lynx, nor snowshoe hare or alternate prey species. Likewise, large areas of lodgepole pine seedling habitat will not provide suitable habitat for lynx until cover and forage recovers enough to provide habitat for snowshoe hares.

White River Plateau Sheep Allotment

WRNF review of the Garfield County 2002 Comprehensive Plan Revision indicates a trend in private lands adjoining National Forest Lands within the analysis area to establish dude ranches, hunting retreats, and up-scale mini-resorts. This type of activity is currently proposed along the Colorado River main stem in Eagle County between Sweetwater and Burns. This area is primarily within non-lynx habitat at lower elevations. In addition, the Eagle County area below Sweetwater Lake is not within any of the LAUs affected by this proposed action.

Beaver Creek Trail

There are no private inholdings within the Battlement LAU and no foreseeable development of private parcels within WRNF. A review by the WRNF of the Garfield County 2002 Comprehensive Plan Revision indicated a trend north of the Battlement LAU towards the Colorado River for the development of residential homes on private lands adjoining National Forest Lands. This area is primarily within non-lynx habitat at lower elevations.

Buffalo Mountain Trail Project

Residential development on non-Federal land is expected to continue in the Blue River Valley. This development is occurring on the northeast side of Silverthorne, to Hamilton Creek. Improvements to Highway 9 will likely continue all the way to the Grand County line and will result in increased traffic speed and volume. The developments will continue to incrementally fragment lynx habitat and thereby decrease suitability and connectivity.

Hummer Tours for the D&L Ranches

There will be additional activity around the Ranch as a result of this action. The dinner guests would have access to ice skating on the lake and snowshoeing in the area immediately around the Ranch. Since the guests will arrive at the ranch close to sundown there would be limited impact outside of the immediate ranch area, which will have been previously impacted through use during the day. Any lynx in the area will be in a habit of avoiding the area during the day due to this activity. The continuation of activity until 9 p.m. will have an insignificant effect on the normal behavior of the lynx.

Grand Adventure Snowmobile Tours

Future non-Federal activities within the Fraser LAU that could contribute to Canada lynx cumulative effects include: infrastructure development at the base of the Winter Park-Mary Jane ski area including buildings, roads and parking lots; widening and re-alignment of sections of US Highway 40 from the ski area to the town of Winter Park; subdivision development on inholdings in the vicinity of the Winter Park base area (Lakota); subdivision and land exchange proposals for inholdings and adjacent public lands along the Rollins Pass Road and US Highway 40; timber harvest and subdivision development east of Fraser in a large inholding adjacent to

the Fraser linkage area (Diamond Bar T); town of Winter Park Townsite Act proposal for employee housing; and reservoir and open space development in the Vasquez Creek drainage.

All of these potential cumulative actions involve potential loss of lynx habitat. The US Highway 40 project could exacerbate an already dangerous highway crossing as lynx potentially move from south to north through eastern Grand County, via the Berthoud Pass linkage area. Of these cumulative effects, none are suspected to significantly alter the function of either LAU or connections between these and adjacent LAUs, save for potential subdivision of the Diamond Bar T parcel adjacent to the Fraser linkage area. Further loss of habitat in this habitat bottleneck could impair north-south lynx movement within eastern Grand County.

The Fraser LAU is also affected by extensive year-round recreation use; by Winter Park–Mary Jane Ski Area and Resort development; subdivision development on inholdings and adjacent private lands; Tri-State transmission lines from Fraser to Church Park; and Denver Water Department operation and maintenance of water collection facilities, roads, diversion structures and pipelines. Two other snowmobile outfitters operate in this LAU: Aspen Canyon and Trailblazers have reciprocal use of the groomed system from Fraser to Church Park and on into the Williams Fork LAU.

Hoop Creek Rehabilitation Project

Most of the private lands in and around the project area are historic mining claims that now support small homes with part time or full time residents. Some old claims have old cabins and buildings on them that are not currently being used by residents. The Henderson molybdenum mine is an active mining operation that is part of the private land acreage. The small town of Alice is also within the LAU private land total. The LAU is bisected by Interstate Highway 70. The other two major travel corridors within the LAU are U.S. Highway 40, which runs west and north from I-70 to Berthoud Pass, and the Guanella Pass Road, which runs south from I-70 at Georgetown.

While there are cumulative effects to the lynx within the Clear Creek LAU, most of the disturbances occur on and in the immediate vicinity of the established road systems and ski areas. Any lynx in the area would have arrived after the establishment of most of these facilities and therefore, they would have a discountable effect on their behavior.

Trailblazer Snowmobile Tours

Future non-federal activities within the Fraser LAU that could contribute to Canada lynx cumulative effects include;

1. Infrastructure development at the base of the Winter Park-Mary Jane ski area including buildings, roads and parking lots;
2. Widening and re-alignment of sections of US Highway 40 from the ski area to the

town of Winter Park;

3. Subdivision development on inholdings in the vicinity of the Winter Park base area (Lakota);
4. Subdivision and land exchange proposals for inholdings and adjacent public lands along the Rollins Pass Road and US Highway 40;
5. Timber harvest and subdivision development east of Fraser in a large inholding adjacent to the Fraser linkage area (Diamond Bar T);
6. Town of Winter Park Townsite Act proposal for employee housing, reservoir and open space development in the Vasquez Creek drainage.

All of these potential cumulative actions involve potential loss of lynx habitat. The US Highway 40 project could exacerbate an already dangerous highway crossing as lynx potentially move from south to north through eastern Grand County, via the Berthoud Pass linkage area.

Of these cumulative effects, none are suspected to significantly alter the function of the Fraser LAU or linkage areas to adjacent LAUs, except for the potential construction of a subdivision within the Diamond Bar T parcel adjacent to the Fraser linkage area. Further loss of habitat in this habitat bottleneck could impair north-south lynx movement within eastern Grand County.

Future non-Federal activities within the Williams Fork LAU that could contribute to Canada lynx cumulative effects include: the mechanized removal of hundreds of acres of dead lodgepole pine on Henderson molybdenum Mill property, and associated road and skid trail construction to remove dead trees.

The Fraser LAU is also affected by extensive year-round recreation used by Winter Park–Mary Jane Ski Area and Resort development; subdivision development on inholdings and adjacent private lands; Tri-State transmission lines from Fraser to Church Park; and Denver Water Department operation and maintenance of water collection facilities, roads, diversion structures and pipelines. Two other snowmobile outfitters operate in this LAU: Aspen Canyon and Grand Adventure have reciprocal use of the groomed system from Fraser to Church Park and into the Williams Fork LAU.

Mann Land Exchange

There are no current plans for the development of the Federal land that will transfer to private ownership. In addition, the USFS does not know of any local or private actions within the action area (e.g., Lower Elk River LAU). There are no Tribal lands within the Lower Elk River LAU.

Road Operations and Maintenance Activities on the Rio Grande National Forest

A total of 93 miles of non-Federal snow plowing does occur in certain areas of the Forest to access private dwellings in winter and to open roads for utility maintenance in the spring. These

activities were documented as part of the environmental baseline of snow compaction, relative to the LCAS.

State actions include highway development and/or improvement as well as maintenance on roads within the perimeter of the RGNF. Known large-scale actions that may modify lynx habitat include the Highway 160 upgrade through the Wolf Creek linkage area, which is being reviewed and consulted on separately.

There are routine county and private road use and maintenance activities that could include snow plowing, but these activities are ongoing and considered part of the environmental baseline and do not contribute to a net increase in over-the-snow compaction. There are no reasonably foreseeable changes to the level of these activities that would significantly alter the environmental baseline.

There are no reasonably foreseeable Tribal actions expected to occur within the analysis area.

Soil, Watershed and Fisheries Conservation treatments on the Rio Grande National Forest and the San Luis Resource Area

Within the Southern Rocky Mountains Geographic Area (SRMGA), there are large proportions of lynx habitat on non-federal lands where development and/or forestry practices could potentially impact the lynx by converting suitable habitat to unsuitable, reducing dispersal (connectivity) habitat, and increasing the disturbance to any lynx that may be using the areas or adjacent areas. Connectivity concerns with highways and development are especially relevant to the more fragmented nature of lynx habitat in the SRMGA. Expected cumulative effects from activities on non-federal lands generally are expected to be insignificant however, as both suitable and unsuitable lynx habitat acreages on non-Federal lands within most of the LAUs are less than 1 percent (USFS 2003).

Within the Wolf Creek linkage area, some non-Federal activities on in-holdings and adjacent non-federal lands may have localized cumulative impacts of significant scope. The Colorado Department of Transportation works directly with the Service to develop project mitigations such as highway underpasses for the Highway 160 improvement construction project, but coordinates with the Forest in the analysis of effects to facilitate project consultation.

There are no other known future State, Tribal, local or private actions, reasonably certain to occur, in the action area that would result in significant changes to the environmental baseline

Lost Basin Ditch Renovation Project

Approximately 9 percent of the LAU is on private lands, all at higher elevations. Reviews of Pitkin County and Town land use maps, planning and land use policies, and buildout analyses indicate that reasonably certain private development in the LAU (as defined by proposed subdivisions and building permits [2002 to date]) is almost entirely confined within existing

growth boundaries (e.g., towns and subdivisions) at lower elevations outside lynx habitat. Exceptions are unconnected, single-family residences within previously approved subdivisions throughout the county. No current development (2002 to date) is occurring, or is reasonably certain to occur, on private inholdings (including mining claims) within the WRNF and within the LAU. Pitkin County growth management policies will likely protect existing lynx habitat.

San Juan/Rio Grande National Forests Wilderness Management Direction Amendments

There are no reasonable foreseeable future or known State, Tribal, private or local actions within the action area, since there are no Tribal, State, local or private lands within the wilderness areas.

WillSource Gas Exploration Project

The Mesa County Planning and Building Departments did not indicate any new building or other activities on private lands within the LAU. There are no known oil and gas leases on private lands in the LAU that indicate future exploration activities on these properties. As a result, no cumulative effects were identified.

Vail Valley Defensible Space Treatments

Cumulative effects would include the work that is planned on community lands or on private property. There is not a breakdown of Town or community property and private property. Lynx habitat was not mapped on private lands so there is no data that will give the total lynx habitat that could be affected. Most of the acres would be on a hillside behind homes but in the case of Whiskey Hill, Intermountain, and Big Horn the homes are scattered through the trees at intervals of less than 200 feet. These areas are also more influenced by the human activity than the WRNF lands that are within the treatment areas.

Spring Creek Salvage Harvest

There are no known or reasonably certain activities that may occur on State, Tribal, local or private land within the Clinetop LAU.

Grand Mesa Travel Management

The only State Land near the GMNF is at Vega Reservoir. This area provides no habitat for the lynx or boreal toad but does provide spring and fall habitat for the bald eagle. These areas are generally below the elevation limits of lynx.

Ward Lake Vegetation Management Projects

No known future State, Tribal, or private actions are planned within the analysis area or the Island Lake LAU.

Missionary Ridge Wildfire Suppression and Burned Area Emergency Rehabilitation Projects

Fire rehabilitation activities (i.e., tree removal along travel routes and erosion control efforts) are being conducted on State and private lands. The rebuilding of homes and other structures destroyed in the Missionary Ridge and Valley Fires is occurring. There is no Tribal land within the action area.

Missionary Ridge Fire Fence Rehabilitation and Installation Project

At this time there are no reasonable foreseeable future or known State, Tribal, private or local actions within the action area.

Dutton Ditch Pipeline Project

There are no reasonably foreseeable activities planned on Tribal, State, private or local land within the action area.

CONCLUSION

After reviewing the current status of the Canada lynx, the environmental baseline for the action area, the effects of the action, and the cumulative effects, it is the Service's biological opinion that these 26 projects are not likely to jeopardize the continued existence of the Canada lynx. No critical habitat has been designated for this species; therefore, none will be affected.

Although this BO covers 26 projects, and those actions have been analyzed individually, the Service finds it appropriate to summarize the effects of all the actions on lynx and lynx habitat to the Southern Rocky Mountain Ecosystem. Most of the individual actions were located within a single LAU, with very few impacting more than one LAU. Those actions located within multiple LAUs were evaluated to ensure that movement capability between adjacent LAUs was maintained. All of the actions met the criteria, set forth in the lynx screen process, which was considered extremely conservative, compared to conservation standards and guidelines within the LCAS. The LCAS was evaluated on its ability to conserve lynx when used in concert with existing planning documents. The October 2000 BO concluded, that in general, actions that followed the standards and guidelines of the LCAS would only result in effects to lynx that were considered insignificant and/or discountable to lynx. Through individual and collective analysis these 26 actions were found to have insignificant and/or discountable effects to lynx.

Based on our evaluation and analysis of information received, we have concluded that these 26 actions are distributed relatively evenly across the Southern Rocky Mountain Ecosystem and will have an insignificant and/or discountable affect on lynx within the Southern Rocky Mountain Region. Although some actions have a higher level of negative effect than others, many of the large-scale vegetation management actions are very small when compared to the overall quantity of lynx habitat within the Southern Rocky Mountains. None of the proposed actions will cause habitat conditions in any LAU to individually exceed those recommended in the LCAS, or collectively exceed those recommended for the Southern Rocky Mountain Ecosystem.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Amount or Extent of Take

No incidental take is anticipated due to any of these actions.

Effect of the Take

Since no incidental take is anticipated, take will not affect lynx.

Reasonable and Prudent Measures

Since no incidental take is anticipated, no Reasonable and Prudent Measures are necessary.

Terms and Conditions

Since no incidental take is anticipated, no Terms and Conditions are necessary.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act requires Federal Agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- 1) The Service recommends that the USFS continue to implement the LCAS.

The Service recommends that the USFS finalize their Southern Rockies Lynx Amendments.

- 2) The Service recommends that the USFS develop a monitoring program to address the issue of snow compaction on the Grand Mesa National Forest.
- 3) The Service recommends that the USDA continue to cooperate with Wildlife Services to ensure predator control activities are conducted in accordance with any appropriate section 7 consultations for Wildlife Services activities.

REINITIATION NOTICE

This concludes consultation on the actions outlined in your July 15, 2003, correspondence requesting consultation for the 26 batched projects in Colorado. As provided in 50 CFR 402.16, reinitiation of formal consultation for any action is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Reinitiation requirements for specific projects include:

Ward Lake Vegetation Management Plan

If USFS does choose to designate these trails, reinitiation with the Service will be required.

Lost Basin Ditch Renovation Project and the WillSource Oil and Gas Exploration Project

This concludes formal consultation on the subject action. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and under the following conditions.

- a. The amount or extent of take specified in the incidental take statement for the Colorado River PBO is exceeded. The Service has determined that no incidental take, including harm, is anticipated to occur as a result of the depletions contemplated in this opinion because of the implementation of recovery actions. The implementation of the recovery actions contained in the Colorado River PBO will further decrease the likelihood of any take caused by depletion

impacts.

b. New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in the Colorado River PBO. In preparing the Colorado River PBO, the Service describes the positive and negative effects of the action it anticipates and considered in the section of the opinion entitled “Effects of the Action.” New information would include, but is not limited to, not achieving a “positive response” or a significant decline in population, as described in Appendix D of the Colorado River PBO. Significant decline shall mean a decline in excess of normal variations in population (Appendix D). The current population estimate of adult Colorado pikeminnow in the Colorado River is 600 individuals, with a confidence interval of ± 250 . Therefore, with the criteria established in Appendix D, a negative population response would trigger reinitiation if the population declined to 350 adults. The Recovery Program has developed recovery goals for the four endangered fishes. If a population meets or exceeds the numeric goal for that species, it will be considered to exhibit a positive response. The Service retains the authority to determine whether a significant decline in population has occurred, but will consult with the Recovery Program’s Biology Committee prior to making its determination. In the event of a significant population decline, the Service is to first rely on the Recovery Program to take actions to correct the decline. If nonflow recovery actions have not been implemented, the Service will assess the impacts of not completing these actions prior to reexamining any flow related issues.

New information would also include the lack of a positive population response by the year 2015 or when new depletions reach 50,000 acre-feet/year. According to the criteria outlined in Appendix D of the Colorado River PBO, a positive response would require the adult Colorado pikeminnow population estimate to be 1,100 individuals (± 250) in the Colorado River (Rifle, Colorado to the confluence with the Green River). When the population estimate increases above 1,100, a new population baseline is established at the higher population level.

c. The Recovery Action Plan actions listed as part of the proposed action in the Colorado River PBO are not implemented within the required time frames. This would be considered a change in the action subject to consultation; section 7 regulations (50 CFR 402.16 (c)) state that reinitiation of consultation is required if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion. The Recovery Action Plan is an adaptive management plan because additional information, changing priorities, and the development of the States’ entitlement may require modification of the Recovery Action Plan. Therefore, the Recovery Action Plan is reviewed annually and updated and changed when necessary and the required time frames include changes in timing approved by means of the normal procedures of the Recovery Program, as explained in the description of the proposed action. In 2003 and every 2 years thereafter, for the life of the Recovery Program, the Service and Recovery Program will review implementation of the Recovery Action Plan actions to determine timely compliance with applicable schedules.

d. The Service lists new species or designates new or additional critical habitat, where the level

or pattern of depletions covered under the Colorado River PBO may have an adverse impact on the newly listed species or habitat. If the species or habitat may be adversely affected by depletions, the Service will reinitiate consultation on the Colorado River PBO as required by its section 7 regulations. The Service will first determine whether the Recovery Program can avoid such impact or can be amended to avoid the likelihood of jeopardy and/or adverse modification of critical habitat for such depletion impacts. If the Recovery Program can avoid the likelihood of jeopardy and/or adverse modification of critical habitat no additional recovery actions for individual projects would be required, if the avoidance actions are already included in the Recovery Action Plan. If the Recovery Program is not likely to avoid the likelihood of jeopardy and/or adverse modification of critical habitat then the Service will reinitiate consultation and develop reasonable and prudent alternatives.

For purposes of any future reinitiation of consultation, depletions have been divided into two categories.

Category 1:

- a) existing depletions, both Federal and non-Federal as described in the project description, from the Upper Colorado River Basin above the confluence with the Gunnison River that had actually occurred on or before September 30, 1995 (average annual depletion of approximately 1 million acre-feet/year);
- b) depletions associated with the total 154,645 acre-feet/year volume of Green Mountain Reservoir, including power pool (which includes but is not limited to all of the 20,000 acre-feet contract pool and historic user's pool), the Colorado Big-Thompson replacement pool; and
- c) depletions associated with Ruedi Reservoir including Round I sales of 7,850 acre-feet, Round II sales of 6,135 acre-feet/year as discussed in the Service's biological opinion to Reclamation dated May 26, 1995, and as amended on January 6, 1999, and the Fryingpan Arkansas Project replacement pool as governed by the operating principles for Ruedi Reservoir but excluding 21,650 acre-feet of the marketable yield.

Category 1 depletions shall remain as Category 1 depletions regardless of any subsequent change, exchange, or abandonment of the water rights resulting in such depletions. Category 1 depletions associated with existing facilities may be transferred to other facilities and remain in Category 1 so long as there is no increase in the amount of total depletions attributable to existing depletions. However, section 7 consultation is still required for Category 1 depletion projects when a new Federal action occurs which may affect endangered species except as provided by the criteria established for individual consultation under the umbrella of the Colorado River PBO. Reinitiation of this consultation will be required if the water users fail to provide 10,825 acre-feet/year on a

permanent basis.

Category 2:

Category 2 is defined as all new depletions up to 120,000 acre-feet/year, this includes all depletions not included in Category 1 that occur after 1995 regardless of whether section 7 consultation has been completed. This category is further divided into two 60,000 acre-feet/year blocks of depletions.

The recovery actions are intended to avoid the likelihood of jeopardy and/or adverse modification of critical habitat and to result in a positive response as described in Appendix D of the Colorado River PBO for both 60,000 acre-feet blocks of depletions in Category 2. However, prior to depletions occurring in the second block, the Service will review the Recovery Program's progress and adequacy of the species response to the Recovery Action Plan actions. According to the criteria outlined in Appendix D, a positive response would require the adult Colorado pikeminnow population estimate to be maintained at approximately 1,100 individuals in the Colorado River (Rifle, Colorado to the confluence with the Green River), unless the criteria in Appendix D is changed because of new information. If the adult Colorado pikeminnow population is maintained at approximately 1,100 adults or whatever is determined to be the recovery goal in the Colorado River, a new population baseline would be established to determine a positive or negative population response.

When population estimates for wild adult humpback chub are finalized, they will also be used to determine population response. As outlined in Appendix D, Colorado pikeminnow and humpback chub population estimates will serve as surrogates for razorback sucker and bonytail to assess the status of their populations for 10 years. Recovery goals for all four species were completed August 1, 2002. If a population meets or exceeds the numeric goal for that species, it will be considered to exhibit a positive response. However, short of reaching a specific recovery goal, trends in certain population indices provide an interim assessment of a species' progress toward recovery. This review will begin when actual depletion levels from the first depletion block reach 50,000 acre-feet/year or the year 2015, whichever comes first.

Calculation of actual depletions is to be accomplished using Cameo gage records and State Division of Water Resources data (Appendix B of the Colorado River PBO). The review will include a determination if all the recovery actions have been satisfactorily completed, that all ongoing recovery actions are continuing, and the status of the endangered fish species. If it is determined that the recovery actions have all been completed and the status of all four endangered fish species has improved (based on criteria in Appendix D), then the Service intends that the Colorado River PBO would remain in effect for new depletions up to 120,000 acre-feet/year (total of both 60,000 acre-feet blocks of Category 2 depletions).

Monitoring, as explained in Appendix D, will be ongoing to determine if a population estimate of 1,100 (\pm one confidence interval) adult Colorado pikeminnow is maintained. If it is not maintained, this would be considered new information and section 7 would have to be

reinitiated. Population baselines will be adjusted as population estimates change. If the adult Colorado pikeminnow population estimates increase, a new population baseline will be established to determine a positive or negative population response. If the population estimate for Colorado pikeminnow in the year 2015 is greater than 1,100 adults, then the higher number will be used to establish a new population baseline. These numeric values may be revised as new information becomes available. Revisions will be made to Appendix D as needed.

If the 50,000 acre-foot or 2015 review indicates that either the recovery actions have not been completed or the status of all four fish species has not sufficiently improved, the Service intends to reinitiate consultation on the Recovery Program to specify additional measures to be taken by the Recovery Program to avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletions associated with the second 60,000 acre-feet/year block. Any additional measures will be evaluated every 5 years. If other measures are determined by the Service or the Recovery Program to be needed for recovery prior to the review, they can be added to the Recovery Action Plan according to standard procedures, outlined in that plan. If the Recovery Program is unable to complete those actions which the Service has determined to be required for the second 60,000 acre-feet/year, consultation on projects with a Federal nexus may be reinitiated in accordance with Endangered Species Act regulations and this opinion's reinitiation requirements. The Service may also reinitiate consultation on the Recovery Program if fish populations do not improve according to the criteria in Appendix D or if any positive response achieved prior to the 50,000 acre-foot or the year 2015 is not maintained. Once a positive response is achieved, failure to maintain it will be considered a negative response.

If the Service reinitiates consultation, it will first provide information on the status of the species and recommendations for improving population numbers to the Recovery Program. The Service will reinitiate consultation with individual projects only if the Recovery Program does not implement recovery actions to improve the status of the listed fish species. The Service will reinitiate consultation first on Category 2 projects and second on Category 1 projects. The Service will only reinitiate consultations on Category 1 depletions if Category 2 depletion impacts are offset to the full extent of the capability of the covered projects as determined by the Service and the likelihood of jeopardy to the listed fishes and/or adverse modification of critical habitat still cannot be avoided. The Service intends to reinitiate consultations simultaneously on all depletions within the applicable category.

If new information becomes available, if a new species becomes listed, if incidental take occurs, if the total average annual amount of water depleted by this project changes, or if any other project element changes which alters the operation of the project from that which is described in your correspondence and which may affect any endangered or threatened species in a manner or to an extent not considered in this biological opinion (see 50 CFR 402.16), formal section 7 consultation should be reinitiated. The Forest Service has agreed to condition its approval documents to retain jurisdiction should section 7 consultation need to be reinitiated.

Thank you for your continued interest in the conservation of endangered and threatened species. If you have any questions or comments, please contact John Kleopfer at the Service's Western

Colorado Field Office, (970) 245-3920, extension 39.

Sincerely,

Susan C. Linner
Colorado Field Supervisor

cc: CRRP
Western Colorado Field Office
R6 RO (section 7 coordinator)

LITERATURE CITED

- Adams, A.W. 1963. The lynx explosion. *North Dakota Outdoors* 26:20-24.
- Agee, J.K. 2000. Disturbance ecology of North American boreal forests and associated northern mixed/subalpine forests. Chapter 3 *in* Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, *et al.*, tech. eds. The scientific basis for lynx conservation in the contiguous United States. Gen. Tech. Rpt. RMRS-GTR-30. Ogden, UT: U.S. Dept. Agriculture, Forest Service, Rocky Mountain Research Station.
- Andrews, T. 1992. Colorado lynx survey: winter 1992. Unpublished Report. 59 pp.
- Apps, C.D. 2000. Space-use, diet, demographics, and topographic associations of lynx in the southern Canadian Rocky Mountains: a study. Chapter 12 *in* L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Aubry, K.B., G. Koehler, and J.R. Squires. 2000. Ecology of Canada lynx in southern boreal forests. Chapter 13 *in* L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Bailey, T.N. 1974. Social organization in a bobcat population. *J. Wildl. Manage.* 38:435-446.
- Bailey, T.N., E.E. Bangs, and M.F. Porter. 1986. An apparent overexploited lynx population on the Kenai peninsula, Alaska. *J. Wildl. Manage.* 50:279-290.
- Berrie, P.M. 1974. Ecology and status of the lynx in interior Alaska. Pages 4-41 *in* R.L. Eaton, ed. *The world's cats*. Volume 1. World Wildlife Safari, Winston, Oregon.
- Bittner, S.L., and O.J. Rongstad. 1982. Snowshoe hare and allies *in* J.A. Chapman and G.A. Feldhamer, eds. *Wild mammals of North America biology, management and economics*. Johns Hopkins University Press, Baltimore, Maryland.
- Brainerd, S.M. 1985. Reproductive ecology of bobcats and lynx in western Montana. M.S. Thesis, University of Montana, Missoula.
- Brand, C.J., and L.B. Kieth. 1979. Lynx demography during a snowshoe hare decline in

- Alberta. J. Wildl. Manage. 43:827-849.
- Brand, C.J., L.B. Kieth, and C.A. Fisher. 1976. Lynx responses to changing snowshoe hare densities in central Alberta. J. Wildl. Manage. 40:416-428.
- Brocke, R.H., K.A. Gustafson, and L.B. Fox. 1990. Restoration of the lynx in New York: biopolitical lessons. Transactions of the North American Wildlife and Natural Resources Conference 55:590-598.
- Burt, W.H. 1954. The mammals of Michigan. Univ. of Michigan Press, Ann Arbor.
- Buskirk, S.W., K.B. Aubry, and C.J. Krebs. 2000a. Habitat fragmentation and interspecific competition: implications for lynx conservation. Chapter 4 in L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Buskirk, S.W., L.F. Ruggiero, K.B. Aubry, D.E. Pearson, J.R. Squires, and K.S. McKelvey. 2000b. Comparative ecology of lynx in North America. Chapter 14 in L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Byrne, G. 1995. Fisher, lynx, and wolverine observation and records for Colorado. Glenwood Springs, CO. May 5, 1995.
- Byrne, G. and Copeland, J. 1997. An aerial survey for wolverine in Colorado. unpublished. Colorado Division of Wildlife.
- Carbon, L.N., and D. Patriquin. 1983. Observations on home range sizes, movements and social organization of lynx, *Lynx canadensis*, in Riding Mountain National Park, Manitoba. Canadian Field Naturalist 97:262-267.
- Carney, I.M. 1993. Colorado lynx study: Winter 1993. Colorado Division of Wildlife, Glenwood Springs. Unpublished Report.
- Colorado Division of Wildlife. 2002. Colorado Lynx Recovery Project – Lynx Update. Tanya Schenk. November 1, 2002 - Internet website.
<http://www.dnr.state.co.us/wildlife/T&E/lynx.asp>
- Colorado Division of Wildlife. 2003. Report providing information on lynx.

- Colorado Division of Wildlife. 2001a. Wildlife Occurrence Database for the San Luis Valley. Unpublished spreadsheet provided by the Rio Grande National Forest. 192p.
- Doerr, J. 2001. Checklist for monitoring the RPMs and terms and conditions of the U. S. Fish and Wildlife Biological Opinion for the Vail Ski Area Category III Expansion: Summary of November 2000 review meeting. Unpublished report dated 2/6/01, Holy Cross Ranger District project files, Minturn, CO.
- Doerr, J. 2003. 2002 snowshoe hare MIS monitoring report for the Crooked Creek timber sale project. Unp. report. Sopris Ranger District, Carbondale, CO. 9 pp.
- Dolbeer, R.A., and W.R. Clark. 1975. Population ecology of snowshoe hares in the central Rocky Mountains. *J. Wildl. Manage.* 39:535-549.
- DonCarlos, M.W. 1994. Fact sheet: Management of the lynx (*Felis lynx*) in Minnesota. Unpublished, Minnesota Department of Natural Resources, St. Paul, MN.
- Dwyer, L. E. 1996. Biological assessment for the Crooked Creek timber harvest. U. S. Forest Service project files, Sopris District, Carbondale, Colorado. N. p.
- Eisenberg, J.F. 1986. Life history strategy of the Felidae: variations on a common theme. Pages 293-303 *in* S.D. Miller and D.D. Everett. *Cats of the world: biology, conservation, and management.* National Wildlife Federation, Washington, D.C.
- Findley, J.S. and S. Anderson. 1956. Zoogeography of the montane mammals of Colorado. *Journal of Mammalogy* 37:80-82.
- Gibeau, M., and H. Heuer. 1996. Effects of transportation corridors on large carnivores in the Bow River Valley, Alberta. Pages 67-79 *in* Proceedings of the Florida Department of Transportation/Federal Highway Administration Transportation-Related Wildlife Mortality Seminar. Orlando, Florida.
- Gunderson, H.L. 1978. A mid-continent irruption of Canada lynx, 1962-1963. *Prairie Naturalist* 10:71-80.
- Halfpenny, J.C., S.J. Bissell, D.M. Nead. 1982. Status of the lynx (*Felis lynx* Felidae) in Colorado with comments on its distribution in the western United States. Unpublished manuscript, Institute of Arctic and Alpine Research, Boulder, CO.
- Hall, E.R., and K.R. Kelson. 1959. *The mammals of North America.* Vol. II. Ronald Press, New York.
- Harger, E.M. 1965. The status of the Canada lynx in Michigan. *Jack-pine Warbler.* 43:150-153.

- Hatler, D.F. 1988. A lynx management strategy for British Columbia. Wildlife Bulletin No. B-61. B.C. Ministry of the Environment, Wildlife Branch, Victoria, B.C.
- Hodges, K.E. 2000a. The ecology of snowshoe hares in southern boreal and montane forests. Chapter 7 in L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Hodges, K.E. 2000b. The ecology of snowshoe hares in northern boreal forests. Chapter 6 in L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Jobman, W. 1997. U.S. Fish and Wildlife USFWS memo.
- Johnson, S. 1994. Letter providing information on lynx. Indiana Department of Natural Resources.
- Jones, J.K., Jr., R.S. Hoffman, D.W. Rice, C. Jones, R.J. Baker, M.D. Engstrom. 1992. Revised checklist of North American mammals north of Mexico, 1991. Occas. Papers No. 146, Texas Tech University.
- Jones, J.K., D.C. Carter, H.H. Genoways, R.S. Hoffman, D.W. Rice, C. Jones. 1986. Revised checklist of North American mammals north of Mexico, 1986. Occas. Papers Mus. No. 107, Texas Tech University.
- Jones, P. 1994. Letter providing information on lynx. Ohio Department of Natural Resources.
- Joslin, G. 2003. Montana Department of Fish, Wildlife and Parks, pers. comm.
- Kesterson, B.A. 1988. Lynx home range and spatial organization in relation to population density and prey abundance. M.S. Thesis. University of Alaska, Fairbanks.
- Koehler, G.M. 1990. Population and habitat characteristics of lynx and snowshoe hares in northcentral Washington. Canadian Journal of Zoology 68:845-851.
- Koehler, G.M., and J.D. Brittell. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. Journal of Forestry 88:10-14.
- Koehler, G.M., and K.B. Aubry. 1994. Pages 74-98 in L.F. Ruggiero *et al.*, tech. eds. The

- scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station. General Technical Report RM-254. 184 pp.
- Koehler, G.M., M.G. Hornocker, and H.S. Hash. 1979. Lynx movements and habitat use in Montana. *Canadian Field Naturalist* 93:441-442.
- Lewis, L., and C.R. Wenger. 1998. Idaho's Canada lynx: pieces of the puzzle. Idaho Bureau of Land Management Technical Bulletin No. 98-11. 19 pp.
- Major, A.R. 1989. Lynx, *Lynx canadensis canadensis* (Kerr) predation patterns and habitat use in the Yukon Territory, Canada. M.S. Thesis, State University of New York, Syracuse.
- McKelvey, K.S., K.B. Aubry, and Y.K. Ortega. 2000a. History and distribution of lynx in the contiguous United States. Chapter 8 in L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder.
- McKelvey, K.S., S.W. Buskirk, C.J. Krebs. 2000b. Theoretical insights into the population viability of lynx. Chapter 2 in L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder.
- McKelvey, K. S., J. J. Claar, G. W. McDaniel, and G. Hanvey. (No date). National lynx detection protocol. U.S. Forest Service, Region 1, Missoula, MT.
- McCord, C.M., and J.E. Cardoza. 1982. Bobcat (*Felis rufus*) and lynx (*F. lynx*). Pages 728-766 in J.A. Chapman and G.A. Feldhamer, eds. Wild mammals of North America. Johns Hopkins University Press, Baltimore, Maryland.
- Mech, L.D. 1973. Canadian lynx invasion of Minnesota. *Biological Conservation*. 5:151-152.
- Mech, L.D. 1977. Record movement of a Canadian lynx. *Journal of Mammalogy* 58:676-677.
- Mech, L.D. 1980. Age, sex, reproduction, and spatial organization of lynxes colonizing northeastern Minnesota. *Journal of Mammalogy* 61:261-267.
- Monthey, R.W. 1986. Responses of snowshoe hares, *Lepus americanus*, to timber harvesting in Northern Maine. *Canadian Field-Naturalist* 100:568-570.

- Mowat, G., G. Slough, and S. Boutin. 1996. Lynx recruitment during a snowshoe hare population peak and decline in southwest Yukon. *Journal of Wildlife Management* 60:441-452.
- Mowat, G., K.G. Poole, and M. O'Donoghue. 2000. Ecology of lynx in northern Canada and Alaska. Chapter 9 in L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Nellis, C.H., S.P. Wetmore, and L.B. Kieth. 1972. Lynx-prey interactions in central Alberta. *Journal of Wildlife Management* 36:320-329.
- O'Donoghue, M., S. Boutin, C.J. Krebs, and E.J. Hofer. 1997. Numerical responses of coyotes and lynx to the snowshoe hare cycle. *Oikos* 74:115-121.
- O'Donoghue, M., S. Boutin, C.J. Krebs, G. Zuleta, D.L. Murrey, and E.J. Hofer. 1998. Functional responses of coyotes and lynx to the snowshoe hare cycle. *Ecology* 79(4):1193-1208.
- Organ, J. 1999. Memo regarding lynx den sites. U.S. Fish and Wildlife Service.
- Parker, G.R., J.W. Maxwell, and L.D. Morton. 1983. The ecology of lynx (*Lynx canadensis*) on Cape Breton Island. *Canadian Journal of Zoology* 61:770-786.
- Poole, K.G. 1994. Characteristics of an unharvested lynx population during a snowshoe hare decline. *Journal of Wildlife Management* 58:608-618.
- Poole, K.G. 1997. Dispersal patterns of lynx in the Northwest Territories. *Journal of Wildlife Management* 61(2):497-505.
- Quinn, N.W.S., and G. Parker. 1987. Lynx. Pages 683-694 in M. Novak, J. Baker, M. Obbard, eds. Wild furbearer management and conservation in North America. Ontario Ministry of Natural Resources, Toronto.
- Roe, A.N., K.G. Poole, and D.L. May. 1999. A Review of Lynx Behavior and Ecology and its Relation to Ski Area Planning and Management. Unpub. Rpt, IRIS Environmental Systems. Calgary, Alberta, Canada. 67pp.
- Ruediger, B.; J.Claar; S.Mighton; B.Naney; F.Wahl; N.Warren; D.Wenger; A.Williamson; L. Lewis; B.Holt; G.Patton; J.Trick; A.Vandehey; and S.Gniadek. 2000. Canada Lynx Conservation Assessment and Strategy. USDI, BLM, USDA FS, USDI NPS and USDI

- FWS. unpublished report, USDA-For. Serv., Region 1. Missoula, Montana. 120p.
- Ruggiero, L.F., K.B. Aubrey, S.W. Buskirk, *et al.* 2000. Tech. eds., Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Saunders, J.K. 1963. Food habits of the lynx in Newfoundland. *Journal of Wildlife Management* 27:384-390.
- Shenk, T.M. 2001. Post-Release Monitoring of Lynx Reintroduction to Colorado – Annual progress Report for the U.S. Fish and Wildlife Service – Interim Report Preliminary Results. CDOW. December 2001.33p
- Shenk, T. M...2002. Colorado Division of Wildlife lynx update, November 2002. <http://wildlife.state.co.us/t&e/lynx.asp>. Accessed 20 November 2002.
- Shenk, T. M. 2003. Colorado Division of Wildlife lynx update, February 26, 2003. <<http://wildlife.state.co.us/t&e/lynx.asp>>. Accessed March 19, 2003.
- Slough, B.G., and G. Mowat. 1996. Lynx population dynamics in an untrapped refugium. *Journal of Wildlife Management* 60:946-961.
- Smithsonian Institute. 1998. List of museum specimens.
- South Dakota Natural Heritage Program. 1994. Letter providing information on lynx.
- Squires, J.R., and T. Laurion. 2000. Lynx Home Range and Movements in Montana and Wyoming: Preliminary Results. Chapter 11 *in* L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, *et al.*, tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Staples, W.R. 1995. Lynx and coyote diet and habitat relationships during a low hare population on the Kenai Peninsula, Alaska. M.S. Thesis. University of Alaska, Fairbanks.
- Tanimoto, P.D. 1998. Lynx management assessment and comment to the U.S. Fish and Wildlife Service's proposal to list lynx under the Endangered Species Act of 1973. Unpublished report. Predator Project, Bozeman, Montana.
- Thiel, R.P. 1987. The status of Canada lynx in Wisconsin, 1865-1980. *Wisconsin Academy of Sciences, Arts and Letters* 75:90-96.

- Thompson, R.W., and J.C. Halfpenny. 1989. Canada lynx presence on the Vail ski area and proposed expansion areas. Unpublished report. Western Ecosystems, Lafayette, Colorado.
- Thompson, R.W. 2002. Biological assessment for the Kokomo Lift and teaching terrain improvements, Copper Mountain Ski Area, Dillon Ranger District, White River National Forest, Summit County, Colorado. Western Ecosystems, Inc. Boulder, CO. 49 pp.
- Thompson, R.W. 2003. Biological assessment for Keystone Resort's Ski Tip Lift and trail development Environmental Assessment, Summit County, Colorado. Western Ecosystems, Inc. Boulder, CO. 205 pp.
- Tumlison, R. 1987. *Felis lynx*. Mammalian Species 269:1-8.
- U.S. Fish and Wildlife Service. 1992. Letter of Concurrence for the 1992 Revised Land and Resource Management Plan for the San Juan National Forest. Ecological USFWSs, Region 6 Fish and Wildlife USFWS, Grand Junction, CO. XXXX 5, 1992. 2p.
- U.S. Fish and Wildlife Service. 1996. Letter of Concurrence for the 1996 Revised Land and Resource Management Plan for the Rio Grande National Forest. Ecological USFWSs, Region 6 Fish and Wildlife USFWS, Grand Junction, CO. XXXX 5, 1996. 2p.
- U.S. Fish and Wildlife Service. 1999. Vail Ski Area Category III Expansion Conference Opinion. Ecological Services, Colorado Field Office, Lakewood, CO.
- U.S. Fish and Wildlife Service. 2000a. Letter to Lyle Laverty, Regional Forester, Rocky Mountain Region, from Leroy W. Carlson, Field Supervisor, re: programmatic concurrence for projects with NLAA determinations that meet certain conditions and stipulations, dated 5/30/2000. Ecological Services, Colorado Field Office, Denver, Co. 3 pp.
- U.S. Fish and Wildlife Service. 2000b. Letter to Lyle Laverty, Regional Forester, Rocky Mountain Region, from Leroy W. Carlson, Field Supervisor, re: batched concurrence for priority projects with NLAA determinations that do not meet programmatic concurrence criteria, dated 5/31/2000. Ecological Services, Colorado Field Office, Denver, Co. 4 pp. plus attachments.
- U.S. Forest Service. 1992. Amended Land and Resource Management Plan, Final Environmental Impact Statement, and Appendices for the San Juan National Forest. April 1992. Durango, CO. USDA-Forest Service, Rocky Mtn. Region. 3 volumes.
- U.S. Forest Service. 1996. Letter regarding concurrence for the findings of "may affect, not likely to adversely affect" listed species in the Biological Assessment for the Rio Grande

- Forest Plan Revision. November 6, 1996. ES/CO: DOE/NREL, MS 65412, Colorado Field Office, Denver, CO.
- U.S. Forest Service. 1996. Revised Land and Resource Management Plan, Final Environmental Impact Statement, and Appendices for the Rio Grande National Forest. Monte Vista, CO. USDA-Forest Service, Rocky Mtn. Region. 3 volumes.
- U.S. Forest Service. 1998. Letter regarding clarification of mitigation associated with 1996 and 1997 biological assessment modifications for southwestern willow flycatcher (*Empidonax traillii extimus*). March 17, 1998. ES/CO: USFS Rocky Mtn. Region; MS 65412 GJ, Western Colorado Office, Grand Junction, CO.
- U.S. Forest Service. 2000a. Letter to Chance Gowan, Acting Holy Cross District Ranger, from Joseph Doerr, Wildlife Biologist, summarizing 1999-2000 winter track monitoring for lynx in Vail CATIII area, dated 12/10/2000. Holy Cross Ranger District, Minturn, CO.
- U.S. Forest Service. 2000b. Letter to Chance Gowan, Acting Holy Cross District Ranger, from Joseph Doerr, Wildlife Biologist, summarizing summer 2000 lynx hair snare monitoring in Vail CATIII area, dated 11/27/2000. Holy Cross Ranger District, Minturn, CO.
- U.S. Forest Service. 2002a. Land and resource management plan-2002 revision for the White River National Forest. Glenwood Springs. CO. N.p.
- U.S. Forest Service. 2003. Update to the Biological Assessment for the Revised Land and Resource Management Plan, Final Environmental Impact Statement, and Appendices for the Rio Grande National Forest. Monte Vista, CO. USDA-Forest Service, Rocky Mtn. Region. (In Consultation).
- Van Zyll de Jong, C.G. 1966. Food habits of the lynx in Alberta and the Mackenzie District, N.W.T. Canadian Field-Naturalist 80:18-23.
- Vashon, J., A. Vashon, and S. Crowley. 2003. Partnership for lynx conservation in Maine. December 2001 - December 2002, field report. Maine Dept. of Inland Fisheries and Wildlife, Bangor, Maine. 19 pp.
- Ward, R.M.P., and C.J. Krebs. 1985. Behavioral responses of lynx to declining snowshoe hare abundance. Canadian Journal of Zoology 63:2817-2824.
- Washington Department of Wildlife. 1993. Status of the North American lynx (*Lynx canadensis*) in Washington. Unpubl. rpt. Washington Department of Wildlife, Olympia.
- Wilson, D.E., and D.M. Reeder. 1993. Mammal species of the world. Smithsonian Institution

Press, Washington, DC.

Wolfe, M.L., N.V. Debyle, C.S. Winchell, and T.R. McCabe. 1982. Snowshoe hare cover relationships in northern Utah. *Journal of Wildlife Management* 46:662-670.

Wolff, J.O. 1980. The role of habitat patchiness in the population dynamics of snowshoe hares. *Ecol. Monog.* 50:111-130.