Chapter 2 Alternatives

Introduction

The NEPA regulation at 40 CFR 1502.14 state Chapter 2, which describes the alternatives, is the heart of the environmental impact statement. Based on the information and analysis presented in Chapter 3, the regulations state Chapter 2 should compare the environmental impacts of the proposal and the alternatives, sharply defining the issues and providing a clear basis for choice among options.

Chapter 2 describes Alternative B, the Proposed Action, developed in response to the Purpose and Need identified in Chapter 1. It also describes alternatives to the Proposed Action, including a no-action alternative (Alternative A), which is defined as no change from existing plans.

Three alternatives were developed by changing some of the standards and guidelines to respond to comments raised during the initial scoping period. These changes were used to create Alternatives C, D, and E. No changes were made to the goal or the objectives.

Alternative F was developed for the FEIS based on comments received from people and agencies who reviewed the DEIS. They suggested different objectives, standards, and guidelines, or different combinations of them, or they had concerns about the impacts the standards or guidelines might have (see Volume 2, *Response to Comments*). The FS considered these comments on the alternatives. These comments were used to revise and rearrange the standards and guidelines to create Alternative F. Along with the other alternatives, the effects of Alternative F are analyzed in full in Chapter 3 of the FEIS.

If an action alternative is chosen, the goal, objectives, standards, and guidelines of the chosen alternative would be incorporated into those existing plans under the 1982 planning regulations that currently do not have management direction for lynx consistent with the ESA. If a conflict exists between the management direction in the chosen alternative and an existing plan, the more restrictive direction would apply. The goal, objectives, standards, and guidelines for any alternative chosen would be applied to all future, site-specific projects.

Public participation

The public has been involved in this proposal from the time the FS first began trying to determine the scope of public interest in the project, on September 11, 2001, when a notice was published in the *Federal Register*, Vol. 66, No. 176, 47160-47163. The notice announced we were accepting public input on the lynx proposal.

Originally, the scoping period was scheduled to end on October 26, 2001, but it was extended to December 10, 2001. We gave people more time to comment, both in response to several requests for extensions, and because of the general disruption stemming from the September 11th terrorist attacks.

An official website was created at www.fs.fed.us/r1/planning/lynx.html, providing information about the proposal, including the information used to develop the Proposed Action.

Open-house meetings were held to provide a better understanding of the lynx proposal and to gain an understanding of public issues and concerns. Most newspapers in the planning area ran stories about the proposal and open-house meetings. Open houses were held in:

- Idaho at Bonners Ferry, Challis, Coeur d'Alene, Coolin, Grangeville, Idaho Falls, Orofino, and Salmon;
- Montana at Billings, Bozeman, Dillon, Great Falls, Hamilton, Helena, Kalispell, Libby, and Missoula; and
- Wyoming at Cody, Jackson Hole, Riverton, and Sheridan.

FS mailed out more than 6,000 letters about the proposal and upcoming meetings to their mailing lists of people interested in land management issues. Input was solicited from individuals and organizations, and from federal, state, and local government agencies interested in or affected by the Proposed Action, as well as from FS employees – see the *Scoping* section in the Project Record.

Tribes with aboriginal territories within the planning area were identified and individual letters written to each of them. The letters asked for their participation and identified local federal contacts.

The governor's office for each state was also contacted about their briefing needs. Discussions were held with the State of Idaho Office of Species Conservation and the Montana Departments of Natural Resources & Conservation and Fish, Wildlife & Parks. The State of Utah considered cooperating agency status, but they decided they would participate on the Lynx and Wolverine Steering Committee instead.

The 1,890 public responses to the scoping notice that were received by December 17, 2001, were evaluated and summarized in a report called *Summary of Public Comments* – see the *Scoping* section of the Project Record. Responses received after December 17, 2001, but before the release of this DEIS were also considered. A summary of these comments is also in the *Scoping* section of the Project Record.

The summary analyzes the public's concerns and thoughts, describing what people said as completely and directly as possible. The system used to analyze public input was designed to be objective, reliable, and easily tracked. Many letters were signed by more than one person, for a total of responses from 2,743 people – individuals, businesses, organizations and agencies. People provided input via letters, e-mail messages, on forms and faxes, and at meetings. More than half the people who responded submitted form letters. One petition was received.

In mid-May 2002, an eight-page update was mailed to the more than 2,000 addresses of the people who responded to the scoping notice.

On August 15, 2002, a Notice of Intent to prepare an Environmental Impact Statement was published in the *Federal Register,* Vol. 67, No. 158, pp. 53334-53335. There were five responses to the Notice of Intent, which also have been considered. The agencies decided to prepare an EIS because of the level of interest expressed during scoping.

The *Scoping* section of the Project Record includes a communication plan, written to make sure no one was overlooked, as well the public involvement documents.

On January 16, 2004, a Notice of Availability of the DEIS for the Northern Rockies Lynx Amendment was published in the *Federal Register*, Vol. 69, No. 11, p. 2619. This notice began a 90-day public comment period. At that time, the agencies also sent copies of the DEIS (either paper or CD versions), or the summary of the DEIS to 71 County Commissions, 31 other Federal Agencies, 16 State Agencies, 19 Tribal Governments, 15 US Representatives and Senators, and 266 organizations and businesses. Also, 100 copies of the DEIS and 1,350 summaries were mailed to individuals who had expressed interest. The documents were also available on the web site: www.fs.fed.us/r1/planning/lynx.html.

Open-house meetings were held to provide a better understanding of the DEIS and its alternatives. Over 380 people attended the open houses which were held in:

- Idaho at Boise, Challis, Coeur d'Alene, Grangeville, Idaho Falls, Orofino, Priest River, and Salmon;
- Montana at Billings, Bozeman, Dillon, Hamilton, Helena, Libby, and Missoula;
- Wyoming at Afton, Cody, Jackson, Kemmerer, Marbleton, Pinedale, Riverton, Rock Springs, and Sheridan; and
- Utah at Vernal.

Public comments were accepted on the DEIS either sent through the US Mail or via E-mail. The public comment period ended on April 15, 2004, with well over 5,000 comments having been received. Many of those comments were used to help formulate Alternative F, help clarify and add to the analysis, and to correct errors in the DEIS. The Interdisciplinary (ID) team reviewed and responded to all of the comments in Volume 2 and updated this FEIS based on those comments.

Issues & concerns addressed in alternatives

NEPA regulations at 40 CFR 1501.2(c) state federal agencies shall

> *"Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflict concerning alternative uses of available resources..."*

Accordingly, the scoping process was used to identify conflicts associated with the Proposed Action and to identify issues to use as a basis for developing alternatives. Statements about the effects of the Proposed Action were sorted into *primary issues,* which are discussed below.

Five primary issues were identified. They reflect conflicts between lynx conservation and alternative uses of natural resources. The primary issues were used to develop alternatives to the Proposed Action that meet the Purpose and Need.

Some scoping letters and comments on the DEIS suggested management direction, or other more general ideas, that would have created other alternatives. All comments were reviewed to determine whether or not they warranted further consideration. In the FEIS a section has been added which reviews the relevant risk factors, suggested management direction, management direction considered in detail and management direction not considered in detail. This section combines portions in Chapter 2 of the DEIS.

General criteria for dismissing management direction from detailed study included: (1) direction is not within the authority of FS; (2) direction is already contained in the plans; (3) there was no scientific evidence that indicated management direction is warranted; (4) direction would not meet the Purpose and Need: or (5) the direction is already reflected in an alternative.

While many comments opposed adding management direction to conserve lynx to the existing plans, an additional alternative was not developed to reflect that point of view because it is already reflected in the no-action alternative, Alternative A. Further, the responsible officials could decide to not adopt some of the direction proposed in the action alternatives, Alternatives B, C, D, E, or F.

The following describes the primary issues and indicators that can be used to compare how the action alternatives respond to them. More information can be found in the *Issues* section of the Project Record.

Primary issues

1. Over-the-snow recreation
Issue: What are the effects of limiting the growth of designated over-the-snow routes, on opportunities for over-the-snow recreation?

As discussed in the LCAS (Ruediger et al. 2000, p. 1-2), lynx have evolved a competitive advantage in places with deep, soft snow, where other predators tend to be excluded during mid-winter when prey is most scarce. Snow shoeing, cross-country skiing, and snowmobiling compact snow and may make it possible for competing predators to occupy lynx habitat during winter (LCAS, p. 2-8). On the other hand FWS stated in Federal Register, "… Because no evidence has been provided that packed snowtrails facilitate competition to a level that negatively affects lynx, we do not consider packed snowtrails to be a threat to lynx at this time" (Appendix P, p. 40098).

Standard HU S1 states there can be no net-increase in designated over-the-snow routes in an LAU, unless the increase consolidates use and improves lynx habitat.

Some people said the standard unfairly restricted special-use permits and agreements, because the public could continue to expand their use into areas that are not designated, but people operating under permits or agreements could not expand their use into the same areas.

Issue indicators
- Ability to expand groomed routes
- Ability to expand designated routes
- Effect on over-the-snow winter recreation opportunities

2. Wildland fire risk
Issue: What are the effects of management direction on the risks of wildland fire to communities?

Historically, natural disturbance processes such as fire created and maintained a mosaic of forest stages that provided habitat for both snowshoe hare and lynx (LCAS, p. 2-5).

In August 2000, the President directed the Secretaries of Agriculture and Interior to develop a response to severe wildland fires, to reduce fire impacts on rural communities and to ensure effective firefighting capacity. The result was the National Fire Plan. Congress later directed a 10-Year Comprehensive Strategy be developed to reduce wildland fire risk by improving fire prevention and suppression, reducing hazardous fuels, restoring fire-adapted ecosystems and promoting community assistance (USDA FS 2001a).

In August 2002, President Bush launched the *Healthy Forests Initiative* (HFI) with the intent to reduce the risks severe wildfires pose to people, communities, and the environment.

In December 2003 Congress passed and the President signed the *Healthy Forests Restoration Act (HFRA)*. HFRA provides improved statutory processes for hazardous fuel reduction projects on

certain types of at-risk National Forest System (NFS) and BLM lands and also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships.

Objective VEG O3 states fire should be used to restore ecological processes and maintain or improve lynx habitat. However, Standards VEG S1 through VEG S6 could limit or constrain fuel treatments, depending on the situation.

Some people thought the management direction might preclude fuel treatment, especially in the wildland urban interface (WUI).

Issue indicators

- Limits imposed on fuel treatments that reduce winter snowshoe hare habitat
- Limits on fuel treatment outside winter snowshoe hare habitat
- Amount of the 10-year fuel treatment program in lynx habitat that would be unconstrained (standards would not apply)
- Amount of the 10-year fuel treatment program in lynx habitat in the WUI that would be unconstrained (standards would not apply)
- Effect on wildland fire risk

3. Winter snowshoe hare habitat in multistoried forests

Issue: What is the effect on lynx of allowing projects in winter snowshoe hare habitat in multistoried forests?

Winter snowshoe hare habitat can be found in older forests with substantial undergrowth of shrubs and tree branches that snowshoe hares can reach during winter (LCAS, pp. 1-5 to 1-8).

The LCAS, considered the best scientific information available at the time it was written, recognized that older forests with substantial undergrowth were important to lynx, but recommended restricting only precommercial thinning.

The Proposed Action was based on the LCAS. Like the LCAS, it contains measures to protect winter snowshoe hare habitat, including measures restricting precommercial thinning (Standard VEG S6). Recent research in northwest Montana demonstrates that mature forests provide important winter snowshoe hare habitat and are more important than younger stands (J. Squires. pers. com. Oct. 30, 2006).

Other activities, such as prescribed burning, fuel treatment, and timber harvest can reduce foraging habitat in older, multistoried forests. These same activities also can create multistoried conditions or can be used to prolong winter snowshoe hare habitat.

Some people said the management direction should preclude <u>all</u> activities that reduce winter snowshoe hare habitat in multistory forest.

Issue indicators

- Activities allowed in multistoried forests that provide winter snowshoe hare habitat outside wilderness
- Effect on winter snowshoe hare habitat in multistoried forests outside wilderness

4. Precommercial thinning

Issue: What are the effects of limiting precommercial thinning, on restoring tree species and forest structures that are declining?

Dense sapling cover is a major component of winter snowshoe hare habitat – winter hare habitat is important to lynx because the hare is its primary prey (LCAS, p. 1-7). Winter habitat is the most limiting (Ruggiero et al. 2000a). Dense saplings are found:

- In the young regenerating forests that grow up after a major disturbance such as regeneration timber harvest or stand-replacing fire; and
- In older forests with substantial undergrowth of shrubs and short trees that snowshoe hares can reach during winter.

In the northern Rockies, western white pine, whitebark pine, ponderosa pine, quaking aspen, and western larch are all declining (USDA FS 1998). These species all require some level of disturbance to grow into mature trees; historically this disturbance has been fire. Otherwise they get over-topped or shaded from below and the sides, and are out-competed by faster-growing species that are more apt to be killed by fire. See the *Forests* section in Chapter 3 for descriptions of species status.

Lodgepole pine often regenerates densely. In the past, low-intensity fires thinned them out, encouraging some to develop into large, mature trees (Lotan et al. 1985). Forests of large lodgepole pine trees are used by many wildlife species, including goshawk (Shaw 2002).

Standards VEG S5 and VEG S6 put constraints on precommercial thinning in winter snowshoe hare habitat.

Some people said precommercial thinning should continue to be used to restore tree species that are declining or to encourage future large trees.

Issue indicators

- Acres available for precommercial thinning in young regenerating forests to maintain or restore tree species in decline
- Total acres available for precommercial thinning
- Precommercial thinning acres that are deferred by the lynx management direction during the next decade, based on historic average funding of about 34 percent of what is requested
- Effect on tree species in decline

5. FWS Remand Notice

Issue: What level of management direction should be applied to activities that the FWS remand notice found were not a threat to lynx populations?

On July 3, 2003, the FWS issued a *Notice of Remanded Determination of Status for the Contiguous United States Distinct Population Segment of the Canada Lynx* (Appendix P). The notice revisited the five factors used to determine whether lynx should be listed as threatened or endangered, and reassessed the magnitude of threats to lynx. The notice said lynx is not endangered throughout a significant portion of its

range, reaffirming the decision to list lynx as threatened.

The notice said that, for several risk factors identified in the LCAS, the FWS has no information to indicate they are a threat to lynx at this time. "The risks identified in the LCAS are based on effects on either individual lynx, populations, both, or lynx habitat. Therefore, not all of the risks identified in the LCAS threaten lynx populations in the United States" (p. 40096). The notice specifically discussed several of the risk factors addressed in the Proposed Action:

- "Mining and grazing were not specifically addressed because we have no information to indicate they pose threats to lynx." (p. 40083)
- "… lynx show no evidence of being displaced by or avoidance of unpaved forest roads. We find no information demonstrating that forest roads negatively impact lynx (Roe et al. 2001) and, therefore do not consider forest roads to be a threat to lynx." (p. 40097)
- "There continues to be no data on the role of competition between lynx and other species … At this time there is no evidence that, if competition exists between lynx and any of these species, it exerts a population-level impact on lynx; therefore we do not consider competition to be a threat to lynx." (p. 40097)
- "… Because no evidence has been provided that packed snowtrails facilitate competition to a level that negatively affects lynx, we do not consider packed snowtrails to be a threat to lynx at this time." (p. 40098)

The notice raises questions about whether the management direction should apply only to activities that threaten lynx populations.

Issue indicators

- Nature of management direction applied to grazing, minerals, roads, and over-the-snow recreation.

Range of alternatives

NEPA regulations at 40 CFR 1502.14(a) say an environmental impact statement must

> *…rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons …*

The courts have established that this does not mean every conceivable alternative must be considered, but that the selection and discussion of alternatives must permit a reasoned choice and foster informed public participation and decision-making.

Whether an alternative is *reasonable* is primarily determined by whether it meets the Purpose and Need and whether it represents a distinctly different approach in responding to issues.

The range of alternatives presented in this chapter was determined by evaluating the public letters sent during the scoping period, the comments on the DEIS, and the Purpose and Need. The level of scientific information available on lynx and lynx habitat, the Listing Decision (Appendix O), the Remand Notice (Appendix P), and ESA requirements were also considered.

Within these parameters, the alternatives developed display a reasonable range to guide future projects, respond to the issues, and to meet the Purpose and Need.

When the alternatives were being developed, suggested objectives, standards, and guidelines were considered if they addressed the primary issues or management concerns. These comments were screened to see if:

- They met the Purpose and Need, and, if so, whether
- They provided approaches different from those already included in other alternatives.

Those that did not meet both tests are discussed later in this chapter as *Management direction considered*. In the discussion the reasons why some comments with suggested direction were not developed further are explained. These comments with their partially developed management direction were reviewed and weighed by the deciding officials during the course of the process. Therefore, they contribute to the range of reasonable alternatives and a reasoned choice, even though they were eliminated from further consideration.

Alternatives developed in detail

Alternative A, no action

Analyzing a no-action alternative is a requirement of NEPA at 40 CFR 1508.14(d), and of FS planning procedures. In this case, no action means no change, no amendment to the already existing plans. This analysis considers the effects of the existing plans as they currently exist, including any previous amendments.

The no-action alternative does not include the conservation measures in the LCAS. While the FS has been following the Conservation Agreements we signed with the FWS and considering the LCAS when evaluating projects, the LCAS measures have not been incorporated as plan direction. A decision to adopt Alternative A would not adopt the measures of the LCAS, but also would not void the Conservation Agreements or the requirements of ESA.

The comparison of alternatives focuses on the changes in effects that result from adding lynx management direction to the plans. The proposed measures are considered individually, as well as collectively. They may be selected individually or not. A decision to not adopt some of the lynx management direction would be a decision to select part of Alternative A.

Alternative B, the Proposed Action

The Proposed Action was developed from conservation measures recommended in the LCAS. Appendix A is a crosswalk from the LCAS, to the proposal as written in the scoping letter, and the Proposed Action, Alternative B, found in the Draft and Final EISs.

Alternative B addresses activities on NFS lands that can affect lynx and their habitat. The exact language of the goal, objectives, standards, and guidelines for Alternative B and all the other action alternatives can be found in Table 2-1.

Timber and wildland fire management

Timber and wildland fire management both can affect the amount and quality of winter snowshoe hare and denning habitat (LCAS, pp. 2-2 to 2-6). Alternative B would add management direction to provide certain habitat conditions (see the *Lynx* section in Chapter 3 of this EIS for a more thorough description and explanation of stand conditions).

Objectives describe desired conditions.

- Objectives VEG O1 and VEG O3 focus on using fire and timber management to emulate historic processes.

- Objective VEG O2 says winter snowshoe hare habitat should be near denning habitat.
- Objectives VEG O3 and VEG O4 encourage using fire and timber management to develop winter snowshoe hare habitat.

Standards set sideboards for projects. The vegetation standards do not apply to fire suppression or to *wildland fire use*.

- Standard VEG S1 limits to 30 percent in an LAU, the amount of lynx habitat that can be in an unsuitable condition. *Unsuitable lynx habitat* is young regenerating forests where the trees are generally less than ten to 30 years old and the vegetation has not yet grown tall enough to support snowshoe hares during all seasons. It would grow into winter snowshoe hare habitat over time.

  Standard VEG S1 is meant to ensure lynx habitat is maintained at the scale of a lynx home range. Standard VEG S1 is based on general information about historic conditions (Brittel et al. 1989) and would not apply if a broadscale assessment substantiated different historical levels. The amount of lynx habitat in an unsuitable condition on private lands within the LAU is considered in this standard.

- Standard VEG S2 limits to 15 percent in ten years the amount of lynx habitat in an LAU that can be made unsuitable because of timber harvest. Timber harvest is not an exact ecological substitute for natural disturbance processes (LCAS, p. 2-2 to 2-3). Limiting the amount of timber harvest would let natural disturbance processes – fire and insect and diseases – play their historic roles producing unsuitable habitat, and later, foraging conditions.

- Standards VEG S3 and VEG S4 direct maintaining denning habitat and limiting salvage harvest that may remove potential denning sites.

- Standards VEG S5 and VEG S6 limit precommercial thinning so existing winter snowshoe hare habitat would be maintained. Thinning would be allowed for safety and protecting property.

Guidelines identify ways to meet the objectives.

- Guideline VEG G1 encourages managers to create winter snowshoe hare habitat where it is lacking.

- Guidelines VEG G2 and VEG G3 say providing denning habitat close to foraging habitat should be considered when designing timber and fire projects.

- Guideline VEG G4 says the result of prescribed fire or wildland fire use should not be new trails that lead to more snow compaction or

permanent firebreaks built on ridges and saddles.

- Guideline VEG G5 says habitat for red squirrels should be provided.

Livestock grazing

According to the LCAS (pp. 2-13 to 2-14), livestock grazing may reduce winter snowshoe hare habitat especially where young riparian forests or stands of aspen are regenerating. Livestock grazing also may reduce shrub-steppe habitat, which provides cover and prey for lynx when they are traveling. In the Remand Notice (Appendix P) the FWS stated they have no information to indicate grazing poses a threat to lynx.

- Objective GRAZ O1 says grazing should be managed in a way that maintains or improves lynx habitat.
- Standard GRAZ S1 says to make sure shrubs and trees can re-grow.
- Standard GRAZ S2 says to make sure aspen can survive.
- Standards GRAZ S3 and GRAZ S4 say livestock grazing is to be managed in a manner to emulate historic conditions in riparian areas and shrub-steppe habitats.

Human uses

Recreational use, forest backcountry roads and trails, and other human developments may reduce lynx habitat connectivity, or by compacting snow, provide a way for competing predators to move into lynx habitat (LCAS, pp. 2-6 to 2-13).

- Objective HU O1 and Guideline HU G4 say to discourage new snow-compacting activities in lynx habitat.
- Objectives HU O2, HU O4, and HU O5, and Guidelines HU G1, HU G2, HU G3, and HU G5 say to provide lynx habitat in association with human uses and developments.
- Objectives HU O2, HU O3, HU O4, HU O5, and HU O6, and Guidelines HU G2, HU G3, HU G6, HU G7, HU G8, and HU G9 say to maintain lynx habitat connectivity.
- Standard HU S1 would stop the agencies from encouraging snow-compacting recreation in new areas, but would not limit existing use.
- Standard HU S2 says ski area expansions shall provide diurnal security habitat.
- Standard HU S3 limits winter access for special uses other than recreation, and for mineral and energy exploration and development.

Highways and private land developments

Highways and private land developments may affect lynx mortality or habitat connectivity (LCAS, pp. 2-17 to 2-19). The following direction applies only to

the FS, but encourages cooperation with others.

- Objectives ALL O1 and LINK O1 say to provide lynx habitat connectivity.
- Objective LINK O1 says to work with other landowners.
- Standard ALL S1 says to make sure developments and vegetative management projects provide connectivity.
- Standard LINK S1 says to identify highway crossings.
- Standard LINK S2 says to manage shrub-steppe habitats to contribute to maintaining or achieving mid- or late-seral stages.
- Guideline ALL G1 says highway-crossing structures and fencing should be used to avoid or reduce effects on lynx.
- Guideline LINK G1 says NFS lands should be retained in public ownership.

Lynx Analysis Units

- Standard LAU S1 says LAU boundaries would not be adjusted except through agreement with the FWS, based on new information about lynx habitat.

Monitoring

- Map the location and amount of snow-compacting use that coincided with lynx habitat in LAUs during the 1998-2000 seasons for designated over-the-snow and groomed routes and areas, and areas of consistent snow compaction. Such activities include snowmobiling, snowshoeing, cross-country skiing, dog sledding, etc.

Alternative C

Alternative C was designed to respond to issues of over-the-snow recreation management and winter snowshoe hare habitat in multistoried forests, while providing a comparable level of protection to lynx as Alternative B, the Proposed Action.

Alternative C expands the area to consider several of the standards from an LAU to multiple LAUs and provides additional management direction for multistoried forests.

The **changes** from Alternative B are:

- Standard VEG S1 was changed to increase the scale at which it is applied. Alternative C would apply the 30 percent standard either to an LAU or to a fixed combination of adjacent LAUs, so disturbance processes such as fire could be factored in. Under Alternative C, the standard would not limit the use of prescribed fire.
- Standard VEG S2 was changed to a guideline (see VEG G6). While the agencies must comply with a standard, they may deviate from

a guideline. Analysis indicated that timber harvest has caused very few LAUs to exceed 15 percent unsuitable (Hillis et al. 2003). Some people thought timber harvest should not be singled out since unsuitable conditions can be created by prescribed fire as well.

- Standard VEG S4 was changed to allow salvage logging in disturbed areas smaller than five acres, when such areas are within 200 feet of dwellings and outbuildings. This would let commercial operators clear dead or dying trees to treat fuels.
- Standards VEG S5 and VEG S6 were changed to apply to all vegetation management, not just precommercial thinning, and to allow research projects and genetic tests. The LCAS did not say to limit all activities that could reduce winter snowshoe hare habitat in multistoried stands.
- Guideline VEG G1 was changed to give priority to managing vegetation in mid-aged or mature forests that have little understory or few dead trees. Analysis indicates an abundance of this kind of forest in the planning area, and it is of relatively low value to lynx.
- Guideline VEG G6 was a standard under Alternative B. The guideline states timber management project should not change more than 15 percent of the lynx habitat in an LAU into an unsuitable condition during a ten-year period.
- Standard HU S1 was changed to increase the scale at which it would be applied to consolidate use and improve lynx habitat. The no-net-increase standard for groomed or designated routes would be applied either to an LAU or to a fixed combination of immediately adjacent LAUs.

  Standard HU S1 also was changed to let groomed or designated trails expand into areas or routes where snow was already compacted, as identified in the baseline of 1998 through 2000. This would allow increased use where snow is already compacted.
- Standard HU S2 was changed to a guideline (see HU G10). Not all ski areas need to provide diurnal security habitat; it can be provided next to ski areas, not just inside them.
- Guideline HU G6 changed its emphasis from *avoiding* to *mitigating* upgrading roads, where upgrades would lead to substantial increases in traffic volumes or speeds. Some upgrades may be proposed to reduce dust or to ensure safety and reduce maintenance.

- Guideline HU G10 states when developing or expanding ski area and trails, access road and lift termini should be located to maintain and provide lynx diurnal security habitat.

Alternative D

Alternative D was designed to address the issues of managing over-the-snow recreation and multistoried forests, similar to Alternative C. Alternative D also addresses the issue about precommercial thinning by allowing some precommercial thinning in winter snowshoe hare habitat. The **changes** from Alternative B are:

- Standard ALL S2 was added which would allow any project to go forward if it deviates from a lynx standard with a "not likely to adversely affect" determination, subject to ESA requirements and to review by the FS Regional Forester.
- Standard VEG S1 was changed to further increase the scale at which it is applied. Alternative D would apply the 30 percent standard at the scale of a sub-basin or an isolated mountain range.
- Standard VEG S2 was dropped.
- Standard VEG S3, deferring vegetation management where less than ten percent denning habitat was available, was changed to allow projects if they leave enough standing trees and large down woody material for den sites.
- Standard VEG S4 was changed to Guideline VEG G7 that says salvage logging should be limited after a disturbance kills trees in areas of five acres or less. Leaving small dead patches should be considered if less than ten percent denning habitat is available in an LAU.
- Standards VEG S5 and VEG S6 were changed to apply to all vegetation management, not just precommercial thinning. Thinning would be allowed in the same cases as Alternative C, plus thinning could be done to favor certain tree species.

  In young regenerating forests, *daylight thinning* could take place around western larch, ponderosa pine and planted western white pine if 80 percent of the cover was retained. This would retain some of the value as snowshoe hare cover and forage, and give these disturbance-adapted species a better chance to grow into large mature trees. VEG S5 would let aspen restoration projects take place in young regenerating forests.

  Both standards would allow whitebark pine restoration projects, including thinning and prescribed burning. Both would allow thinning anywhere there is

already an abundance of snowshoe hare forage, and projects that would encourage lodgepole pine to develop old-growth characteristics.

Standard VEG S6 would permit some short-term reduction of foraging habitat in older stands, allowing logging or prescribed fire to create openings that would improve or maintain foraging habitat in the long term.

- Guideline VEG G1 was changed in Alternative D as it was in Alternative C. It gives priority to managing vegetation in mid-aged or mature forests that have little understory or few dead trees. Analysis indicates an abundance of this kind of forest in the planning area, and it is of relatively low value to lynx.
- Guideline VEG G2 was dropped as a separate item. It is included as part of Standard VEG S3.
- Guideline VEG G7 states after a disturbance kills trees in areas of five acres or smaller, which could contribute to lynx denning habitat, salvage harvest should not occur unless at least ten percent denning habitat in an LAU is retained and well distributed.
- Standard HU S1 was changed in Alternative D as it was in Alternative C, to increase the scale at which it would be applied to consolidate use and improve lynx habitat. The no-net-increase standard for groomed or designated routes would be applied either to an LAU or to a fixed combination of immediately adjacent LAUs.

  Standard HU S1 also was changed to let groomed or designated trails expand into areas or routes where snow was already compacted, as identified in the baseline of 1998 through 2000. This would allow increased use where snow is already compacted.
- Standard HU S2 was changed to a guideline (see HU G10). Not all ski areas need to provide diurnal security habitat; it can be provided next to ski areas, not just inside them.
- Guideline HU G6 was changed in Alternative D as it was changed in Alternative C. Guideline HU G6 changed its emphasis from *avoiding* to *mitigating* upgrading roads, where upgrades would lead to substantial increases in traffic volumes or speeds. Some upgrades may be proposed to reduce dust or to ensure safety and reduce maintenance.
- Guideline HU G10 states when developing or expanding ski area and trails, access road and lift termini should be located to maintain and provide lynx diurnal security habitat.

- Two monitoring items were added to Alternative D along with the monitoring that is found in Alternative B.

  They are: 1) Annually monitor the acres of vegetation management projects that occurred in lynx habitat and in winter snowshoe hare habitat during the previous fiscal year; and 2) Document and evaluate the conditions under which Standard ALL S2 is applied.

Alternative E

Alternative E addresses the issue of wildland fire risk. The vegetation standards would not apply to fuel treatment projects developed in a collaborative manner. Alternative E also responds to statements made in the Remand Notice (Appendix P) that FWS has no information to indicate that grazing or snow compaction is a threat to lynx at this time.

The **changes** from Alternative B are:

- As with Alternative D, Standard ALL S2 was added that would allow a project to go forward if it deviates from a lynx standard with a "not likely to adversely affect" determination, subject to ESA requirements. Under Alternative E, the standard would allow a project to go forward if it deviates from a lynx standard and results in short-term adverse effects, but has long-term beneficial effects on lynx. No higher level of review would be required.
- Standard VEG S1 was changed to increase the scale at which it is applied. As with Alternative C, Alternative E would apply the 30 percent standard either to an LAU or a fixed combination of adjacent LAUs. Under Alternative E, the standard does not apply to fuel treatments developed in a collaborative manner, as described in the *10-Year Comprehensive Strategy Implementation Plan* (USDA FS 2001a).
- Standard VEG S2 was dropped, the same as under Alternative D.
- Standard VEG S3 was changed, as in Alternative D, to allow projects where less than ten percent denning habitat is available if enough standing trees or large down woody material is left for den sites. Under Alternative E, the standard does not apply to fuel treatments developed in a collaborative manner, as described in the *10-Year Comprehensive Strategy Implementation Plan.*
- Standard VEG S4 was changed as in Alternative D, to Guideline VEG G7 that says salvage logging should be limited after a disturbance kills trees in areas of five acres or less. Leaving small dead patches should be considered if less than ten

percent denning habitat is available in an LAU.

- Standard VEG S5 would apply only to precommercial thinning, as in Alternative B. Under Alternative E, the standard would also allow fuel treatments projects that use precommercial thinning and were developed in a collaborative manner, as described in the *10-Year Comprehensive Strategy Implementation Plan.*
- Standard VEG S6 was dropped. The management direction was changed to Guideline VEG G8.
- Guideline VEG G1 was changed in Alternative E as it was in Alternative C. It gives priority to managing vegetation in mid-aged or mature forests that have little understory or few dead trees. Analysis indicates an abundance of this kind of forest in the planning area, and it is of relatively low value to lynx.
- Guideline VEG G2 was dropped as a separate item. It is included as part of Standard VEG S3.
- Guideline VEG G7 states after a disturbance kills trees in areas of five acres or smaller, which could contribute to lynx denning habitat, salvage harvest should not occur unless at least ten percent denning habitat in an LAU is retained and well distributed.
- Guideline VEG G8 states vegetation management projects should provide habitat conditions through time that maintain winter snowshoe hare habitat during the understory reinitiation or old-multistory structural stages. Vegetation management projects should be use to improve lynx habitat where dense understories are lacking.
- Standards GRAZ S1, S2, S3, and S4 were dropped and the management direction included in Guidelines GRAZ G1, G2, G3, and G4.
- Guideline GRAZ G1 says livestock grazing should be managed so that shrubs and trees can re-grow in openings.
- Guideline GRAZ G2 says livestock grazing should be managed to contribute to heath and sustainability of aspen stands.
- Guidelines GRAZ G3 and GRAZ G4 say livestock grazing should be managed in a manner to emulate historic conditions in riparian areas and shrub-steppe habitats.
- Standard HU S1 was dropped and the management direction included as Guideline HU G11.
- Standard HU S2 was dropped and the management direction included as Guideline HU G6.

- Standard HU S3 was dropped and the management direction included as Guideline HU G12.
- Guideline HU G6 changed its emphasis from *avoiding* to *mitigating* upgrading roads, where upgrades would lead to substantial increases in traffic volumes or speeds. Some upgrades may be proposed to reduce dust or to ensure safety and reduce maintenance.
- Guideline HU G10 states when developing or expanding ski area and trails, access road and lift termini should be located to maintain and provide lynx diurnal security habitat.
- Guideline HU G11 states designated over-the-snow routes or play areas should not expand outside baseline areas of consistent snow compaction by LAU or in a combination of immediately adjacent LAUs, unless designation serves to consolidate use and improve lynx habitat.
- Guideline HU G12 states winter access for non-recreation special uses, and mineral and energy exploration and development, should be limited to designated routes or designated over-the-snow routes.
- Standard LINK S2 was dropped and the management direction included in Guideline LINK G2.
- Guideline LINK G2 states livestock grazing in shrub-steppe habitats should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.
- Two monitoring items were added to Alternative E along with the monitoring that is found in Alternative B. They are: 1) Annually monitor the acres of vegetation management projects that occurred in lynx habitat and in winter snowshoe hare habitat during the previous fiscal year; and; 2) Document and evaluate the conditions under which Standard ALL S2 is applied.

Alternative F, FEIS Preferred Alternative

Appendix N identifies the management direction applicable to Alternative F, the FEIS Preferred Alternative.

Alternative F was developed from public comments on the DEIS and by pulling together parts of the other alternatives. Since it was developed from the other alternatives, the effects of Alternative F is within the scope of the effects of the alternatives analyzed in the DEIS.

Alternative F addresses comments about where to apply the management direction. Many comments suggested the management direction should only

be applied to occupied habitat. Therefore, Alternative F is evaluated under two scenarios: (1) management direction would be incorporated into all forest plans and would *apply to all mapped lynx habitat*, whether or not occupied; and (2) management direction would be incorporated into all forest plans but would only *apply to occupied habitat.* Under scenario 2, the direction would be "considered" for unoccupied units, but would not have to be followed until such time as lynx occupy the unit. The Nez Perce, Salmon-Challis, Beaverhead-Deerlodge, Bitterroot, Ashley and Bighorn NFs, and the disjunct mountain ranges on the Custer, Gallatin, Helena and Lewis and Clark NFs are unoccupied based on the best scientific information available at this time (USDA FS, USDI FWS 2006a).

Alternative F addresses many comments about problems and concerns with Alternatives E, the DEIS preferred alternative. In particular many people and FWS felt Alternative E would not meet the purpose and need because it did not provide the regulatory mechanisms to adequately address lynx needs.

Alternative F was designed to provide adequate regulatory mechanisms for those risk factors found to be a threat to lynx populations – specifically those factors related to the quantity and quality of lynx habitat as discussed in the section *Management direction considered*.

In addition, Alternative F addresses all the primary issues to some degree by:

- addressing over-the-snow recreation in a similar fashion as the other alternatives;
- providing additional protection to multistoried winter snowshoe hare habitat than what is described in Alternative B;
- allowing some fuel treatment projects to be unconstrained by the vegetation standards, but providing additional sideboards from Alternative E on where and to what degree;
- allowing a limited amount of precommercial thinning to restore tree species in decline; and
- responding to statements in the Remand Notice which indicated there is no information to indicate grazing or snow compaction are threats to lynx at this time.

For those risk factors found to be a threat to lynx populations' management direction is in the form of standards and would apply to individual LAUs. For risk factors found to be threat only to individuals, management direction is in the form of guidelines.

The **changes** from Alternative B are:

- Objectives VEG O1, O2 and O4 were modified for clarity.
- Objective VEG O1 states manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.
- Objective VEG O2 states provide a mosaic of habitat conditions through time that support dense horizontal cover, and high densities of snowshoe hare. Provide winter snowshoe hare habitat in both the stand initiation structural stage and in mature, multi-story conifer vegetation.
- Objective VEG O4 states focus vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover.
- Standard VEG S1 was modified to clarify the type of vegetation treatment it applies to (activities that regenerate) and clarify what is "unsuitable" habitat (habitat which is in the stand initiation structural stage that is too short to provide winter snowshoe hare habitat).
- In addition, Standard VEG S1 was modified so it would not apply to *fuel treatments projects within the WUI as defined by HFRA within sideboards*.
- Fuel treatment projects within the WUI that do not meet this standard can proceed, however a cumulative total of fuel treatment projects that do not meet VEG Standards S1, S2, S5, and S6 shall not exceed six percent of mapped lynx habitat on each Forest.

  Fuel treatment projects that create stand initiation structural stage would be included in the 30 percent calculation addressed here in VEG S1. This means if a fuel treatment project within the WUI creates more than 30 percent, then other projects that want to regenerate more would have to be modified or deferred until the standard can be met.
- Standard VEG S2 was modified to describe the type of timber harvest projects it applies to (regeneration harvest).

  In addition, it was modified so it would not apply to *fuel treatment projects within the WUI as defined by HFRA within sideboards.*

  Fuel treatment projects within the WUI that do not meet this standard can proceed, however a cumulative total of fuel treatment projects that do not meet VEG Standards S1, S2, S5, and S6 shall not exceed six percent of mapped lynx habitat on each Forest.

- Denning habitat direction found in Standards VEG S3, VEG S4 and Guidelines VEG G2 and VEG G3 were combined into one, Guideline VEG G11. It states denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees ("jack-strawed" piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles, or residual trees to provide denning habitat in the future.
- Standard VEG S5 would allow some precommercial thinning to occur for aspen and whitebark pine; for daylight thinning of planted rust-resistant white pine where 80 percent of the winter snowshoe hare habitat is retained and for research studies or genetic tree tests evaluating genetically improved reforestation stock. In addition Standard VEG S5 was modified to allow for incorporation of new information, it says:

  1. Based on new information that is peer reviewed and accepted by the regional level of the FS and state level of FWS, where a written determination states:

     a. that a project is not likely to adversely affect lynx; or

     b. that a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat.

- In addition Standard VEG S5 would not apply to fuel treatment projects that use precommercial thinning as a tool within the WUI as defined by HFRA. The cumulative total of fuel treatment projects that do not meet Standards VEG S1, S2, S5, and S6 shall not exceed 6 percent of mapped lynx habitat on each Forest.
- Standard VEG S6, management direction for multistoried forests, was modified to apply to all vegetation management projects. The standard also recognizes vegetation management can be used to improved habitat condition.

  Standard VEG S6 would not apply to fuel treatment projects within the WUI as defined by HFRA, within sideboards. Cumulative total of fuel treatment projects that do not meet Standards VEG S1, S2, S5, and S6 shall not exceed six percent of mapped lynx habitat on each Forest.
- Guideline VEG G1 was modified to clarify where it would be desirable treat vegetation and for what objective.

- Guideline VEG G4 states prescribed fire activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.
- Guideline VEG G10 states fuel treatment projects within the WUI as defined by HFRA should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation.
- Standards GRAZ S1, S2, S3, and S4 were dropped and similar management direction provided in the form of guidelines (Guidelines GRAZ G1, G2, G3, and G4).
- Objective HU O5 was reworded for clarity.
- Standard HU S1 was dropped and the management direction included as Guideline HU G11.
- Standard HU S2 was dropped and the management direction included as Guideline HU G10.
- Standard HU S3 was dropped and the management direction included as Guideline HU G12.
- Guideline HU G2 wording was changed from *nocturnal foraging* to *lynx foraging habitat.*
- Guideline HU G6 changed its emphasis from *avoiding* to *mitigating* upgrading roads, where upgrades would lead to substantial increases in traffic volumes or speeds. Some upgrades may be proposed to reduce dust or to ensure safety and reduce maintenance.
- Guideline HU G10 states when developing or expanding ski areas and trails, consider locating access roads and lift termini to maintain and provide lynx security habitat if it has been identified as a need.
- Guideline HU G11 states designated over-the-snow routes, or designated play areas, should not expand outside baseline areas of consistent snow compaction, unless designation serves to consolidate use and improve lynx habitat. This may be calculated on an LAU basis, or on a combination of immediately adjacent LAUs. Use the same analysis boundaries for all actions subject to this guideline.

  This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings, or to access regulated by Guideline HU G12.
- Guideline HU G12 states winter access for non-recreation special uses, and mineral and energy exploration and development, should be limited to designated routes or designated over-the-snow routes.

- Standard LINK S2 was dropped and the management direction included as Guideline LINK G2.
- Guideline LINK G2 states livestock grazing in shrub-steppe habitats should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.
- Standard ALL S1. Wording is added that makes it clear the standard applies only in an LAU or in a linkage area.
- Standard LAU S1 says changes in LAU boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.
- The original monitoring item from Alternative B was rephrased to say: Map the location and intensity of snow compacting activities, and designated and groomed routes that occurred inside LAUs during the period of 1998 to 2000. The mapping is to be completed within one year of this decision, and changes in activities and routes are to be monitored every five year after the decision.
- Two other monitoring items were added in Alternative F. They are:

1. Annually report the number of acres where any of the exemptions 1 through 6 listed in Standard VEG S5 were applied. Report the type of activity, the number of area, and the location (by unit and LAU); and
2. Report the acres of fuel treatment in lynx habitat within the WUI, as defined by HFRA, when the project decision is approved. Report whether or not the fuel treatment met the vegetation standards. If standard(s) are not met, report which standard(s) are not met, why they were not met, and how many acres were affected.

Table 2-1, starting on the following page, compares the five action alternatives, Alternatives B, C, D, E, and F so differences and similarities among their various objectives, standards, and guidelines can be readily compared. Alternative A is not included on Table 2-1 since there are no lynx goals, objectives, standards, or guidelines in the No-Action Alternative to compare to the other alternatives.

Table 2-1. Crosswalk between Alternative B (the Proposed Action) and the other action alternatives: C, D, E & F

Differences between the alternatives have been *italicized*.

If a conflict exists between this management direction and an existing plan, the more restrictive direction applies.

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Goal[14] Conserve Canada lynx.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
ALL MANAGEMENT PRACTICES AND ACTIVITIES (ALL). *The following objectives, standards, and guidelines apply to all management projects in lynx habitat in lynx analysis units (LAUs) and in linkage areas, subject to valid existing rights. They do not apply to wildfire suppression, or to wildland fire use. They do not apply to wildfire suppression, or to wildland fire use.*				
Objective[30] ALL O1 Maintain[26] or restore[40] lynx habitat[23] connectivity[16] in and between LAUs[21], and in linkage areas[22].	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
Standard[44] ALL S1 New or expanded permanent developments[33] and vegetation management[49] projects[36] must maintain[26] habitat connectivity[16].	Same as Alt B	Same as Alt B	Same as Alt B	Standard[44] ALL S1 New or expanded permanent developments[33] and vegetation management[49] projects[36] must maintain[26] habitat connectivity[16] *in an LAU[21] and/or linkage area[22].*
Standard ALL S2 None	None	A project[36] proposal that deviates from one or more lynx standards may proceed without amending the plan, subject to ESA requirements, if a written determination is made that the project is not likely to adversely affect lynx. The regional forester must approve any project proposed under this measure before the decision is made.	A project[36] proposal that deviates from one or more lynx standards may proceed without amending the plan, subject to ESA requirements, *either:* *1.* If a written determination is made that the project[36] is not likely to adversely affect lynx; or 2. *If it may result in short-term adverse effects on lynx but if long-term benefits to lynx and its habitat would result.*	*None*

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Guideline[15] ALL G1 Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways[18] or forest highways[12] across federal land. Methods could include fencing, underpasses, or overpasses.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
Standard[44] LAU S1 LAU[21] boundaries will not be adjusted except through agreement with the FWS, based on new information about lynx habitat[23].	Same as Alt B	Same as Alt B	Same as Alt B	Standard[44] LAU S1 *Changes in LAU[21] boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.*
VEGETATION MANAGEMENT ACTIVITIES AND PROJECTS (VEG): *The following objectives, standards, and guidelines apply to vegetation management projects in lynx habitat within lynx analysis units (LAUs). With the exception of Objective VEG O3 that specifically concerns wildland fire use, the objectives, standards, and guidelines do not apply to wildfire suppression, wildland fire use, or removal of vegetation for permanent developments such as mineral operations, ski runs, roads, and the like. None of the objectives, standards, or guidelines apply to linkage areas.*				
Objective[30] VEG O1 Manage vegetation to be more similar to historic succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.	Same as Alt B	Same as Alt B	Same as Alt B	Objective [30] VEG O1 Manage vegetation[49] to *mimic or approximate natural* succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.
Objective VEG O2 Maintain or improve lynx habitat[23], emphasizing high-quality winter snowshoe hare habitat[51] near denning habitat[6].	Same as Alt B	Same as Alt B	Same as Alt B	Objective VEG O2 *Provide a mosaic of habitat conditions through time that support dense horizontal cover[19], and high densities of snowshoe hare. Provide*

Table 2-1 Alternatives

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
				winter snowshoe hare habitat[51] in both the stand initiation structural stage and in mature, multi-story conifer vegetation.
Objective VEG O3 Conduct fire use[11] activities to restore[40] ecological processes and maintain or improve lynx habitat.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
Objective VEG O4 Design regeneration harvest[38], reforestation, and thinning to develop characteristics suitable for winter snowshoe hare habitat.	Same as Alt B	Same as Alt B	Same as Alt B	Objective VEG O4 *Focus vegetation management[49] in areas that have potential to improve winter snowshoe hare habitat[51] but presently have poorly developed understories that lack dense horizontal cover.*
Standard[44] VEG S1 Unless a broad scale assessment[2] has been completed that substantiates different historic levels of unsuitable habitat[24], limit disturbance in each LAU[21] as follows: If more than 30 percent of the lynx habitat[23] in an LAU is currently in unsuitable condition, no additional habitat may be made unsuitable by vegetation management[49] projects[36].	Standard VEG S1 Unless a broad scale assessment has been completed that substantiates different historic levels of unsuitable habitat, limit disturbance in each LAU *or in a combination of immediately adjacent LAUs* as follows: If more than 30 percent of the lynx habitat in an LAU *or a combination of immediately adjacent LAUs* is currently in unsuitable condition, no additional habitat may be made unsuitable by vegetation management projects[36].	Standard VEG S1 Unless a broad scale assessment has been completed that substantiates different historic levels of unsuitable habitat, limit disturbance in *each sub-basin or isolated mountain range[20]* as follows: If more than 30 percent of the lynx habitat *in a sub-basin or isolated mountain range* is currently in unsuitable condition, no additional habitat may be made unsuitable by vegetation management projects[36]. Use the same analysis	Standard VEG S1 Unless a broad scale assessment has been completed that substantiates different historic levels of unsuitable habitat, limit disturbance in each LAU *or in a combination of immediately adjacent LAUs* as follows: If more than 30 percent of the lynx habitat in an LAU *or a combination of immediately adjacent LAUs* is currently in unsuitable condition, no additional habitat may be made unsuitable by vegetation management	Standard[44] VEG S1 *Standard VEG S1 applies to all vegetation management[49] projects[36] that regenerate[38] forests, except for fuel treatment[13] projects[36] within the wildland urban interface (WUI) [50] as defined by HFRA[17], subject to the following limitation:* *Fuel treatment projects[36] within the WUI[50] that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent*

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
	This standard does not apply to prescribed fire[34]. *Use the same analysis boundaries for all vegetation management projects[36] subject to this standard.*	boundaries for all vegetation management projects[36] subject to this standard.	projects[36]. *This standard does not apply to fuel treatment[13] projects[36] identified through processes such as that described in A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan.* Use the same analysis boundaries for all vegetation management projects[36] subject to this standard.	*(cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects[36] within the WUI[50] see guideline VEG G10.* Unless a broad scale assessment has been completed that substantiates different historic levels of stand initiation structural stages[45] limit disturbance in each LAU as follows: If more than 30 percent of the lynx habitat in an LAU is currently in a *stand initiation structural stage that does not yet provide winter snowshoe hare habitat* no additional habitat may be *regenerated* by vegetation management projects[36].
Standard VEG S2 Timber management[47] projects[36] shall not change more than 15 percent of the lynx habitat on NFS lands in an LAU to an unsuitable condition in a ten-year period.	*This number is not included in Alt C. This item is included as part of Guideline VEG G6.*	*None*	None	Standard VEG S2 *Standard VEG S2 applies to all timber management[47] projects[36] that regenerate[38] forests, except for fuel treatment projects[36] within the wildland urban interface (WUI) [50] as defined by HFRA[17], subject to the following limitation:* *Fuel treatment projects[36]*

Table 2-1 Alternatives

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
				within the WUI[50] that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects[36] within the WUI[50] see guideline VEG G10. Timber management[47] projects[36] shall not regenerate more than 15 percent of lynx habitat on NFS lands within an LAU in a ten-year period.
Standard VEG S3 Maintain[26] at least ten percent of the lynx habitat in an LAU as denning habitat[6] in patches generally larger than five acres. Where less than ten percent denning habitat is present in an LAU, defer vegetation management projects[36] in stands that have the highest potential to develop denning habitat.	Same as Alt B	Standard VEG S3 Maintain at least ten percent of the lynx habitat in an LAU as denning habitat in patches generally larger than five acres. Where less than ten percent denning habitat is present in an LAU, *either:* *1.* Defer vegetation management projects[36] in stands that have the highest potential to develop denning habitat; *or* 2. *Move towards ten percent denning habitat by leaving enough standing trees and coarse woody debris to be similar to what would be there naturally.*	Standard VEG S3 Maintain at least ten percent of the lynx habitat in an LAU as denning habitat in patches generally larger than five acres. Where less than ten percent denning habitat is present in an LAU, either: 1. Defer vegetation management projects[36] in stands that have the highest potential to develop denning habitat; or 2. Move towards ten percent denning habitat by leaving enough standing trees and coarse	*This number is not included in Alt F. This item is included as part of Guideline VEG G11.*

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
			woody debris to be similar to what would be there naturally. *This standard does not apply to fuel treatment projects[36] identified through processes such as that described in A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan.*	
Standard VEG S4 After a disturbance kills trees in areas five acres or smaller that could contribute to lynx denning habitat, salvage harvest[42] may occur only in: 1. Developed recreation[9] sites, administrative sites, or authorized special use structures or improvements; or 2. Designated road or trail corridors where public safety or access has been or may be compromised; or 3. LAUs where denning habitat has been mapped and field-validated, provided at least ten percent is retained and well	Standard VEG S4 After a disturbance kills trees in areas five acres or smaller that could contribute to lynx denning habitat, salvage harvest may occur only in: 1. Developed recreation sites, administrative sites, or authorized special use structures or improvements; or 2. Designated road or trail corridors where public safety or access has been or may be compromised; or 3. LAUs where denning habitat has been mapped and field-validated, provided at least ten percent is retained and well distributed; or 4. *Within 200 feet of dwellings or*	*This number is not included in Alt D. This item is included as part of Guideline VEG G7.*	*This number is not included in Alt E. This item is included as part of Guideline VEG G7.*	*This number is not included in Alt F. This item is included as part of Guideline VEG G11.*

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
distributed.	*outbuildings.*			
Standard VEG S5 Precommercial thinning[35] projects[36] that reduce winter snowshoe hare habitat[51] during the stand initiation structural stage[45] may occur only: 1. Within 200 feet of administrative sites, dwellings or outbuildings. NOTE: Some thinning projects[36], such as white pine pruning or Christmas tree harvest, may occur if winter snowshoe hare habitat is not reduced.	Standard VEG S5 *Vegetation management* projects[36] that reduce winter snowshoe hare habitat during the stand initiation structural stage may occur only: 1. Within 200 feet of administrative sites, dwellings or outbuildings; or 2. *For research studies[39] or genetic tree tests evaluating genetically improved reforestation stock.* NOTE: Some vegetation management projects[36], such as white pine pruning or Christmas tree harvest, may occur if winter snowshoe hare habitat is not reduced.	Standard VEG S5 Vegetation management projects[36] that reduce winter snowshoe hare habitat during the stand initiation structural stage may occur only: 1. Within 200 feet of administrative sites, dwellings or outbuildings; or 2. For research studies or genetic tree tests evaluating genetically improved reforestation stock; or 3. *For daylight thinning[5] of planted rust-resistant white pine where 80 % of the winter snowshoe hare habitat is retained; or* 4. *To restore[40] whitebark pine; or* 5. *For daylight thinning to release larch or ponderosa pine where 80 % of the winter snowshoe hare habitat is retained; or* 6. *To develop future old growth[32] characteristics in lodgepole; or* 7. *When a broad scale assessment[2] determines that the amount winter snowshoe hare habitat in the stand initiation stage exceeds what would be expected under the normal range of historic conditions; or* 8. *For conifer removal in aspen or daylight thinning around*	Standard VEG S5 Precommercial thinning[35] projects[36] that reduce winter snowshoe hare habitat during the stand initiation structural stage may occur only: 1. Within 200 feet of administrative sites, dwellings or outbuildings; or 2. For research studies or genetic tree tests evaluating genetically improved reforestation stock; or 3. *For fuel treatment projects[36] identified through processes such as that described in A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan.*	Standard VEG S5 *Standard VEG S5 applies to all precommercial thinning[35] projects[36], except for fuel treatment projects[36] that use precommercial thinning as a tool within the wildland urban interface (WUI) [50] as defined by HFRA[17], subject to the following limitation: Fuel treatment projects[36] within the WUI[50] that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects[36] within the WUI[50] see guideline VEG G10.* Precommercial thinning projects[36] that reduce snowshoe hare habitat, *may occur from the stand initiation structural stage[45] until the stands no longer provide winter snowshoe hare habitat* only: 1. Within 200 feet of administrative sites, dwellings, or outbuildings; or 2. For research studies or

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
		individual aspen trees. NOTE: Appendix G includes examples of 3, 5, 6 and 7.		genetic tree tests evaluating genetically improved reforestation stock; or 3. *Based on new information that is peer reviewed and accepted by the regional level of the Forest Service, and state level of FWS, where a written determination states:* a. *that a project[36] is not likely to adversely affect lynx; or* b. *that a project[36] is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat.* 4. *For conifer removal in aspen, or daylight thinning[5] around individual aspen trees, where aspen is in decline; or* 5. *For daylight thinning of planted rust-resistant white pine where 80% of the winter snowshoe hare habitat[51] is retained; or* 6. *To restore whitebark pine.*

Table 2-1 Alternatives

Table 2-1 Alternatives

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Standard VEG S6 Precommercial thinning projects[36] that reduce winter snowshoe hare habitat during the understory-reinitiation[48] or old-multistory structural stages[31] may occur only: 1. Within 200 feet of administrative sites, dwellings or outbuildings.	Standard VEG S6 *Vegetation management[49] projects[36]* that reduce winter snowshoe hare habitat during the understory-reinitiation or old-multistory structural stages may occur only: 1. Within 200 feet of administrative sites, dwellings or outbuildings; or 2. For research studies[39].	Standard VEG S6 Vegetation management projects[36] that reduce winter snowshoe hare habitat during the understory-reinitiation or old-multistory structural stages may occur only: 1. Within 200 feet of administrative sites, dwellings or outbuildings; or 2. For research studies; or *3. To maintain planted rust-resistant white pine where 80 % of the winter snowshoe hare habitat is retained; or* *4. To restore whitebark pine; or* *5. To release larch or ponderosa pine where 80 % of the winter snowshoe hare habitat is retained; or* *6. To develop future old growth characteristics in lodgepole; or* *7. When a broad scale assessment[2] determines that the amount of winter snowshoe hare habitat in multistory structural stages exceeds what would be expected under the normal range of historic conditions.* 8. *When improving or maintaining winter snowshoe hare habitat in the long term.* NOTE: Appendix G includes examples of 3, 5 and 6.	*This number is not included in Alt E. This item is included as part of Guideline VEG G8.*	Standard VEG S6 *Standard VEG S6 applies to all vegetation management[49] projects[36],except for fuel treatment projects[36] within the wildland urban interface (WUI) [50] as defined by HFRA[17], subject to the following limitation:* *Fuel treatment projects[36] within the WUI[50] that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects[36] within the WUI[50] see guideline VEG G10.* *Vegetation management projects[36] that reduce snowshoe hare habitat in multi-story mature or late successional forests[29] may occur only:* *1. Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or*

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
				2. *For research studies or genetic tree tests evaluating genetically improved reforestation stock; or* 3. *For incidental removal during salvage harvest*[42] *(e.g. removal due to location of skid trails).* *(NOTE: Timber harvest is allowed in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover [e.g. uneven age management systems could be used to create openings where there is little understory so that new forage can grow]).*
Guideline[15] VEG G1 Vegetation management[49] projects[36] should be planned to recruit a high density of conifers, hardwoods and shrubs where such habitat is scarce or not available. Winter snowshoe hare habitat [51] should be near denning habitat[6]. Vegetation management projects[36] should be planned to extend the production of winter snowshoe hare habitat	Guideline VEG G1 Vegetation management[49] projects[36] should be planned to recruit a high density of conifers, hardwoods and shrubs where such habitat is scarce or not available. *Priority should be given to stem-exclusion, closed-canopy structural stage*[46]. Winter snowshoe hare habitat should be near denning habitat. Vegetation management projects[36] should be planned to extend the production of winter snowshoe hare habitat when forage quality and	Same as Alt C	Same as Alt C	Guideline VEG G1 Vegetation management[49] projects[36] should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority *for treatment* should be given to stem-exclusion, closed-canopy structural stage[46] *stands to enhance habitat conditions for lynx or their prey (e.g. mesic, monotypic lodgepole stands).* Winter snowshoe hare

Table 2-1 Alternatives

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
when forage quality and quantity is declining.	quantity is declining.			habitat[51] should be near denning habitat[6].
Guideline VEG G2 Where more denning habitat is desired, leave standing trees and coarse woody debris in amounts similar to what would be there naturally. Denning habitat should be near winter snowshoe hare habitat.	Same as Alt B	*This number is not included in Alt D. This item is included as part of Standard VEG S3.*	*This number is not included in Alt E. This item is included as part of Standard VEG S3.*	Guideline VEG G2 *This number is not included in Alt F. This item is included as part of Guideline VEG G11.*
Guideline VEG G3 Vegetation management projects[36] designed to retain or restore[40] denning habitat should be located where there is a low probability of stand-replacing fire.	Same as Alt B	Same as Alt B	Same as Alt B	Guideline VEG G3 *This number is not included in Alt F. This item is included as part of Guideline VEG G11.*
Guideline VEG G4 Fire use[11] activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.	Same as Alt B	Same as Alt B	Same as Alt B	Guideline VEG G4 *Prescribed fire*[34] activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.
Guideline VEG G5 Habitat for alternate prey species, primarily red squirrel[36], should be provided in each LAU.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
This number is not included in Alt B. This item is included as Standard VEG S2.	*Guideline VEG G6* *Timber management[47] projects[36] should not change more than 15 percent of the lynx habitat in an LAU into an unsuitable condition during a ten-year period.*	*This number is not included in Alt D.*	*This number is not included in Alt E.*	*This number is not included in Alt F. This item is included as Standard VEG S2.*
This number is not included in Alt B. This item is included as Standard VEG S4.	*This number is not included in Alt C. This item is included as Standard VEG S4.*	*Guideline VEG G7* *After a disturbance that kills trees in areas five acres or smaller which could contribute to lynx denning habitat, salvage harvest[42] should not occur unless at least ten percent denning habitat in an LAU is retained and well distributed.*	Same as Alt D.	*This number is not included in Alt F. This item is included as part of Guideline VEG G11.*
This number is not included in Alt B. This item is included as Standard VEG S6.	*This number is not included in Alt C. This item is included as Standard VEG S6.*	*This number is not included in Alt D. This item is included as Standard VEG S6.*	Guideline VEG G8 *Vegetation management[49] projects[36] should provide habitat conditions through time that maintain[26] winter snowshoe hare habitat[51] during the understory reinitiation[48] or old-multistory structural stages. Vegetation management projects[36] should be used to improve lynx habitat where dense understories are lacking.*	*This number is not included in Alt F. This item is included as Standard VEG S6.*
This number is not included in Alt B.	*This number is not included in Alt C.*	*This number is not included in Alt D.*	*This number is not included in Alt E.*	Guideline VEG G10 *Fuel treatment projects[36] within the WUI[50] as defined by HFRA[17] should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation.*

Table 2-1 Alternatives

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
This number is not included in Alt B.	*This number is not included in Alt C.*	*This number is not included in Alt D.*	*This number is not included in Alt E.*	*Guideline VEG G11* *Denning habitat[6] should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees ("jack-strawed" piles). If denning habitat appears to be lacking in the LAU, then projects[36] should be designed to retain some coarse woody debris[4], piles, or residual trees to provide denning habitat[6] in the future.*
LIVESTOCK MANAGEMENT (GRAZ): *The following objectives, standards, and guidelines apply to grazing projects in lynx habitat in lynx analysis units (LAUs). They do not apply to linkage areas.*				
Objective[30] GRAZ O1 Manage livestock grazing to be compatible with improving or maintaining[26] lynx habitat[23].	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
Standard[44] GRAZ S1 In fire- and harvest-created openings, manage livestock grazing to make sure impacts do not prevent shrubs and trees from regenerating.	Same as Alt B	Same as Alt B	*This number is not included in Alt E. This item is included as Guideline GRAZ G1.*	*This number is not included in Alt F. This item is included as Guideline GRAZ G1.*
Standard GRAZ S2 In aspen stands, manage livestock grazing to contrib-ute to their long-term health and sustainability.	Same as Alt B	Same as Alt B	*This number is not included in Alt E. This item is included as Guideline GRAZ G2.*	*This number is not included in Alt F. This item is included as* Guideline GRAZ G2.

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Standard GRAZ S3 In riparian areas[41] and willow carrs[3], manage livestock grazing to contribute to maintaining or achieving a preponderance of mid- or late-seral stages[28], similar to conditions that would have occurred under historic disturbance regimes.	Same as Alt B	Same as Alt B	*This number is not included in Alt E. This item is included as Guideline GRAZ G3.*	*This number is not included in Alt F. This item is included as Guideline GRAZ G3.*
Standard GRAZ S4 In shrub-steppe habitats[43], manage livestock grazing in the elevation ranges of forested lynx habitat[23] in LAUs[21], to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.	Same as Alt B	Same as Alt B	*This number is not included in Alt E. This item is included as Guideline GRAZ G4.*	*This number is not included in Alt F. This item is included as Guideline GRAZ G4.*
This number is not included in Alt B. This item is included as Standard GRAZ S1.	Same as Alt B	Same as Alt B	Guideline[15] GRAZ G1 *In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating.*	Same as Alt E
This number is not included in Alt B. This item is included as Standard GRAZ S2.	Same as Alt B	Same as Alt B	Guideline GRAZ G2 *In aspen stands, livestock grazing should be managed to contribute to their long-term health and sustainability.*	Guideline GRAZ G2 *In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen.*

Table 2-1 Alternatives

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
This number is not included in Alt B. This item is included as Standard GRAZ S3.	Same as Alt B	Same as Alt B	Guideline GRAZ G3 *In riparian areas[41] and willow carrs[3], livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages[28], similar to conditions that would have occurred under historic disturbance regimes.*	Same as Alt E
This number is not included in Alt B. This item is included as Standard GRAZ S4.	Same as Alt B	Same as Alt B	Guideline GRAZ G4 *In shrub-steppe habitats[43], livestock grazing should be managed in the elevation ranges of forested lynx habitat in LAUs[21], to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.*	Same as Alt E
HUMAN USE PROJECTS (HU): The following objectives, standards, and guidelines apply to *human use projects, such as special uses (other than grazing), recreation management, roads, highways, and mineral and energy development, in lynx habitat in lynx analysis units (LAUs),* subject to valid existing rights. *They do not apply to vegetation management projects or grazing projects directly. They do not apply to linkage areas.*				
Objective[30] HU O1 Maintain[26] the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat[23].	Same as Alt B.	Same as Alt B.	Same as Alt B.	Same as Alt B.

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Objective HU O2 Manage recreational activities to maintain lynx habitat and connectivity[16].	Same as Alt B.	Same as Alt B.	Same as Alt B.	Same as Alt B.
Objective HU O3 Concentrate activities in existing developed areas, rather than developing new areas in lynx habitat.	Same as Alt B.	Same as Alt B.	Same as Alt B.	Same as Alt B.
Objective HU O4 Provide for lynx habitat needs and connectivity when developing new or expanding existing developed recreation[9] sites or ski areas.	Same as Alt B.	Same as Alt B.	Same as Alt B.	Same as Alt B.
Objective HU O5 Manage human activities – such as exploring and developing minerals and oil and gas, placing utility corridors and permitting special uses – to reduce impacts on lynx and lynx habitat.	Same as Alt B.	Same as Alt B.	Same as Alt B.	Objective HU O5 Manage human activities, *such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors*, to reduce impacts on lynx and lynx habitat.
Objective HU O6 Reduce adverse highway[18] effects on lynx by working cooperatively with other agencies to provide for lynx movement and habitat connectivity[16], and to reduce the potential of lynx mortality.	Same as Alt B.	Same as Alt B.	Same as Alt B.	Same as Alt B.

Table 2-1 Alternatives

Table 2-1 Alternatives

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Standard[44] HU S1 Allow no net increase in designated over-the-snow routes[7] or play areas by LAU[21], unless designation serves to consolidate use and improve lynx habitat[23]. This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings or where regulated by HU S3.	Standard HU S1 Allow no net increase in designated over-the-snow routes or play areas *outside baseline areas of consistent snow compaction*[1] by LAU *or in a combination of immediately adjacent LAUs*, unless designation serves to consolidate use and improve lynx habitat. This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings or to access regulated by HU S3. *Use the same analysis boundaries for all actions subject to this standard.*	Same as Alt C	*This number is not included in Alt E. This item is included as Guideline HU G11.*	*This number is not included in Alt F. This item is included as Guideline HU G11.*
Standard HU S2 When developing or expanding ski areas, locate trails, access roads and lift termini to maintain[26] and provide lynx diurnal security habitat[10] if it's been identified as a need.	*This number is not included in Alt C. This item is included as Guideline HU G10.*	*This number is not included in Alt D. This item is included as Guideline HU G10.*	*This number is not included in Alt E. This item is included as Guideline HU G10.*	*This number is not included in Alt F. This item is included as Guideline HU G10.*
Standard HU S3 Winter access for non-recreation special uses and mineral and energy exploration and development, shall be limited to designated routes[8] or designated over-	Same as Alt B	Same as Alt B	*This number is not included in Alt E. This item is included as Guideline HU G12.*	*This number is not included in Alt F. This item is included as Guideline HU G12.*

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
the-snow routes[7].				
Guideline[15] HU G1 When developing or expanding ski areas, provisions should be made for adequately sized inter-trail islands that include coarse woody debris[4], so winter snowshoe hare habitat[51] is maintained.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
Guideline HU G2 When developing or expanding ski areas, nocturnal foraging should be provided consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes.	Same as Alt B	Same as Alt B	Same as Alt B	Guideline HU G2 When developing or expanding ski areas, *lynx* foraging *habitat* should be provided consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes.
Guideline HU G3 Recreation developments and operations should be planned in ways that both provide for lynx movement and maintain the effective-ness of lynx habitat[23].	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
Guideline HU G4 For mineral and energy development sites and facilities, remote monitoring should be encouraged to reduce snow compaction.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B

Table 2-1 Alternatives

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Guideline HU G5 For mineral and energy development sites and facilities that are closed, a reclamation plan that restores[40] lynx habitat should be developed.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
Guideline HU G6 Upgrading unpaved roads to maintenance levels[27] 4 and 5 should be avoided in lynx habitat, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development.	Guideline HU G6 *Methods to avoid or reduce effects on lynx should be used in lynx habitat*[23] *when* upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development.	Same as Alt C	Same as Alt C	Same as Alt C
Guideline HU G7 New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity[16]. New permanent roads and trails should be situated away from forested stringers.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
Guideline HU G8 Cutting brush along low-speed[25], low-traffic-volume roads should be done to the minimum level necessary to provide for public safety.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Guideline HU G9 On new roads built for projects[36], public motorized use should be restricted. Effective closures should be provided in road designs. When the project[36] is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
This number is not included in Alt E. This item is included as Standard HU S2.	*Guideline HU G10* *When developing or expanding ski areas and trails, access roads and lift termini should be located to maintain and provide lynx diurnal security[10] habitat if it has been identified as a need.*	Same as Alt C	Same as Alt C	*Guideline HU G10* *When developing or expanding ski areas and trails, consider locating access roads and lift termini to maintain and provide lynx security[10] habitat if it has been identified as a need.*
This number is not included in Alt B. This item is included as Standard HU S1.	Same as Alt B	Same as Alt B	Guideline HU G11 *Designated over-the-snow routes[7] or play areas should not expand outside baseline areas of consistent snow compaction[1] by LAU or in a combination of immediately adjacent LAUs, unless designation serves to consolidate use and improve lynx habitat.* *This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings or*	Guideline HU G11 *Designated over-the-snow routes, or designated play areas, should not expand outside baseline areas of consistent snow compaction[1], unless designation serves to consolidate use and improve lynx habitat. This may be calculated on an LAU basis, or on a combination of immediately adjacent LAUs.* *This does not apply inside permitted ski area boundaries, to winter logging,*

Table 2-1 Alternatives

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
			where regulated by HU G12. *Use the same analysis boundaries for all actions subject to this guideline.*	*to rerouting trails for public safety, to accessing private inholdings, or to access regulated by Guideline HU G12.* *Use the same analysis boundaries for all actions subject to this guideline.*
This number is not included in Alt B. This item is included as Standard HU S3.	Same as Alt B	Same as Alt B	Guideline HU G12 *Winter access for non-recreation special uses, and mineral and energy exploration and development, should be limited to designated routes[8] or designated over-the-snow routes[7].*	Same as Alt E
LINKAGE AREAS (LINK): The following objective, standards, and guidelines apply to *all projects within linkage areas,* subject to valid existing rights.				
Objective[30] LINK O1 In areas of intermingled land ownership, work with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
Standard[44] LINK S1 When highway[18] or forest highway[12] construction or reconstruction is proposed in linkage areas[22], identify potential highway crossings.	Same	Same	Same	Same

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Standard LINK S2 Manage livestock grazing in shrub- steppe habitats[43] to contribute to maintaining[26] or achieving a preponderance of mid- or late-seral stages[28], similar to conditions that would have occurred under historic disturbance regimes.	Same as Alt B	Same as Alt B	*This number is not included in Alt E.. This item is included as Guideline LINK G2.*	*This number is not included in Alt E.. This item is included as* Guideline LINK G2.
Guideline[15] LINK G1 NFS lands should be retained in public ownership.	Same as Alt B	Same as Alt B	Same as Alt B	Same as Alt B
This number is not included in Alt B.. This item is included as Standard LINK S2.	Same as Alt B	Same as Alt B	Guideline LINK G2 *Livestock grazing in shrub-steppe habitats[43] should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages[28], similar to conditions that would have occurred under historic disturbance regimes.*	Guideline LINK G2 Same as Alt E
REQUIRED MONITORING				
Map the location and amount of snow-compacting use that coincided with lynx habitat[23] in LAUs[21] during the 1998-2000 seasons for designated over-the-snow[7] and groomed routes and areas, and areas of	Same as Alt B	Same as Alt B	Same as Alt B	*Map the location and intensity of snow compacting activities, and designated and groomed routes that occurred inside LAUs during the period of 1998 to 2000. The mapping is to be completed within one year of this decision, and changes in*

Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
consistent snow compaction[1]. Such activities include snowmobiling, snowshoeing, cross-country skiing, dog sledding, etc.				*activities and routes are to be monitored every five year after the decision.*
None	None	*Annually monitor the acres of vegetation management[49] projects[36] that occurred in lynx habitat and in winter snowshoe hare habitat[51] during the previous fiscal year.*	Same as Alt D	*Annually report the number of acres where any of the exemptions 1 through 6 listed in Standard VEG S5 were applied. Report the type of activity, the number of acres, and the location (by unit and LAU[21]).*
None	None	*Document and evaluate the conditions under which Standard All S2 is applied.*	Same as Alt D	None
None	None	None	None	*Report the acres of fuel treatment[13] in lynx habitat within the wildland urban interface[50], as defined by HFRA[17] when the project[36] decision is approved. Report whether or not the fuel treatment met the vegetation standards. If standard(s) are not met, report which standard(s) are not met, why they were not met, and how many acres were affected.*

Glossary

[1] *Areas of consistent snow compaction* – An area of consistent snow compaction is an area of land or water that during winter is generally covered with snow and gets enough human use that individual tracks are indistinguishable. In such places, compacted snow is evident most of the time, except immediately after (within 48 hours) snowfall. These can be areas or linear routes, and are generally found in or near snowmobile or cross-country ski routes, in adjacent openings, parks and meadows, near ski huts or plowed roads, or in winter parking areas. Areas of consistent snow compaction will be determined based on the acreage or miles used during the period 1998 to 2000.

[2] *Broad scale assessment* – A broad scale assessment is a synthesis of current scientific knowledge, including a description of uncertainties and assumptions, to provide an understanding of past and present conditions and future trends, and a characterization of the ecological, social, and economic components of an area. (LCAS)

[3] *Carr* – Deciduous woodland or shrub land occurring on permanently wet, organic soil. (LCAS)

[4] *Course woody debris* – Any piece(s) of dead woody material, e.g., dead boles, limbs, and large root masses on the ground or in streams. (LCAS)

[5] *Daylight thinning* – Daylight thinning is a form of precommercial thinning that removes the trees and brush inside a given radius around a tree.

[6] *Denning habitat (lynx)* – Denning habitat is the environment lynx use when giving birth and rearing kittens until they are mobile. The most common component is large amounts of coarse woody debris to provide escape and thermal cover for kittens. Denning habitat must be within daily travel distance of winter snowshoe hare habitat – the typical maximum daily distance for females is about three to six miles. Denning habitat includes mature and old growth forests with plenty of coarse woody debris. It can also include young regenerating forests with piles of coarse woody debris, or areas where down trees are jack-strawed.

[7] *Designated over-the-snow routes* – Designated over-the-snow routes are routes managed under permit or agreement or by the agency, where use is encouraged, either by on-the-ground marking or by publication in brochures, recreation opportunity guides or maps (other than travel maps), or in electronic media produced or approved by the agency. The routes identified in outfitter and guide permits are designated by definition; groomed routes also are designated by definition. The determination of baseline snow compaction will be based on the miles of designated over-the-snow routes authorized, promoted or encouraged during the period 1998 to 2000.

[8] *Designated route* – A designated route is a road or trail that has been identified as open for specified travel use.

[9] *Developed recreation* – Developed recreation requires facilities that result in concentrated use. For example, skiing requires lifts, parking lots, buildings and roads; campgrounds require roads, picnic tables, and toilet facilities.

[10] *Security habitat (lynx)* – Security habitat amounts to places in lynx habitat that provide secure winter bedding sites for lynx in highly disturbed landscapes like ski areas. Security habitat gives lynx the ability to retreat from human disturbance. Forest structures that make human access difficult generally discourage human activity in security habitats. Security habitats are most effective if big enough to provide visual and acoustic insulation and to let lynx easily move away from any intrusion. They must be close to winter snowshoe hare habitat. (modified from LCAS)

[11] *Fire use* – Fire use is the combination of wildland fire use and using prescribed fire to meet resource objectives. (NIFC) Wildland fire use is the management of naturally ignited wildland fires to accomplish resource management objectives in areas that have a fire management plan. The use of the term wildland fire use replaces the term prescribed natural fire. (Wildland and Prescribed Fire Management Policy, August 1998)

[12] *Forest highway* – A forest highway is a forest road under the jurisdiction of, and maintained by, a public authority and open to public travel (USC: Title 23, Section 101(a)), designated by an agreement with the FS, state transportation agency, and Federal Highway Administration.

[13] *Fuel treatment* – A fuel treatment is a type of vegetation management action that reduces the threat of ignition, fire intensity, or rate of spread, or is used to restore fire-adapted ecosystems.

[14] *Goal* – A goal is a broad description of what an agency is trying to achieve, found in a land management plan. (LCAS)

[15] *Guideline* – A guideline is a particular management action that should be used to meet an objective found in a land management plan. The rationale for deviations may be documented, but amending the plan is not required. (LCAS modified)

[16] *Habitat connectivity (lynx)* – Habitat connectivity consists of an adequate amount of vegetation cover arranged in a way that allows lynx to move around. Narrow forested mountain ridges or shrub-steppe plateaus may serve as a link between more extensive areas of lynx habitat; wooded riparian areas may provide travel cover across open valley floors. (LCAS)

[17] *HFRA (Healthy Forests Restoration Act)* - Public Law 108-148, passed in December 2003. The HFRA provides statutory processes for hazardous fuel reduction projects on certain types of at-risk NFS and Bureau of Land Management lands. It also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships. (Modified from Forest Service HFRA web site.)

[18] *Highway* – The word highway includes all roads that are part of the National Highway System. (23 CFR 470.107(b))

[19] *Horizontal cover* – Horizontal cover is the visual obscurity or cover provided by habitat structures that extend to the ground or snow surface primarily provided by tree stems and tree boughs, but also includes herbaceous vegetation, snow, and landscape topography.

[20] *Isolated mountain range* – Isolated mountain ranges are small mountains cut off from other mountains and surrounded by flatlands. On the east side of the Rockies, they are used for analysis instead of sub-basins. Examples are the Little Belts in Montana and the Bighorns in Wyoming.

[21] *LAU (Lynx Analysis Unit)* – An LAU is an area of at least the size used by an individual female lynx, from about 25 to 50 square miles (LCAS). An LAU is a unit for which the effects of a project would be analyzed; its boundaries should remain constant.

[22] *Linkage area* – A linkage area provides connectivity between blocks of lynx habitat. Linkage areas occur both within and between geographic areas, where basins, valleys, or agricultural lands separate blocks of lynx habitat, or where lynx habitat naturally narrows between blocks. (LCAS updated definition approved by the Steering Committee 10/23/01)

[23] *Lynx habitat* – Lynx habitat occurs in mesic coniferous forest that experience cold, snowy winters and provide a prey base of snowshoe hare. In the northern Rockies, lynx habitat generally occurs between 3,500 and 8,000 feet of elevation, and primarily consists of lodgepole pine, subalpine fir, and Engelmann spruce. It may consist of cedar-hemlock in extreme northern Idaho, northeastern Washington and northwestern Montana, or of Douglas-fir on moist sites at higher elevations in central Idaho. It may also consist of cool, moist Douglas-fir, grand fir, western larch and aspen when interspersed in subalpine forests. Dry forests do not provide lynx habitat. (LCAS)

[24] *Lynx habitat in an unsuitable condition* –Lynx habitat in an unsuitable condition consists of lynx habitat in the stand initiation structural stage where the trees are generally less than ten to 30 years old and have not grown tall enough to protrude above the snow during winter. Stand replacing fire or certain vegetation management projects can create unsuitable conditions. Vegetation management projects that can result in unsuitable habitat include clearcuts and seed tree harvest, and sometimes shelterwood cuts and commercial thinning depending on the resulting stand composition and structure. (LCAS)

[25] *Low-speed, low-traffic-volume road* – Low speed is less than 20 miles per hour; low volume is a seasonal average daily traffic load of less than 100 vehicles per day.

[26] *Maintain* – In the context of this proposal, maintain means to provide enough lynx habitat to conserve lynx. It does not mean to keep the status quo.

[27] *Maintenance level* – Maintenance levels define the level of service provided by and maintenance required for a road. (FSH 7709.58, Sec 12.3) Maintenance level 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most level 4 roads are double lane and have an aggregate surface. Some may be single lane; some may be paved or

have dust abated. Maintenance level 5 is assigned to roads that provide a high degree of user comfort and convenience. Normally, level 5 roads are double lane and are paved, but some may be aggregate surfaced with the dust abated.

[28] *Mid-seral or later* – Mid-seral is the successional stage in a plant community that is the midpoint as it moves from bare ground to climax. For riparian areas, it means willows or other shrubs have become established. For shrub-steppe areas, it means shrubs associated with climax are present and increasing in density.

[29] *Multi-story mature or late successional forest* – This stage is similar to the *old multistory structural* stage (see below). However, trees are generally not as old, and decaying trees may be somewhat less abundant.

[30] *Objective* – An objective is a statement in a land management plan describing desired resource conditions and intended to promote achieving programmatic goals. (LCAS)

[31] *Old multistory structural stage* – Many age classes and vegetation layers mark the old forest, multistoried stage. It usually contains large old trees. Decaying fallen trees may be present that leave a discontinuous overstory canopy. On cold or moist sites without frequent fires or other disturbance, multi-layer stands with large trees in the uppermost layer develop. (Oliver and Larson, 1996)

[32] *Old growth* – Old growth forests generally contain trees that are large for their species and the site, and are sometimes decadent with broken tops. Old growth often contains a variety of tree sizes, large snags, and logs, and a developed and often patchy understory.

[33] *Permanent development* – A permanent development is any development that results in a loss of lynx habitat for at least 15 years. Ski trails, parking lots, new permanent roads, structures, campgrounds, and many special use developments would be considered permanent developments.

[34] *Prescribed fire* – A prescribed fire is any fire ignited as a management action to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements met, before ignition. The term prescribed fire replaces the term management ignited prescribed fire. (NWCG)

[35] *Precommercial thinning* – Precommercial thinning is mechanically removing trees to reduce stocking and concentrate growth on the remaining trees, and not resulting in immediate financial return. (Dictionary of Forestry)

[36] *Project* - All, or any part or number of the various activities analyzed in an Environmental Impact Statement, Environmental Analysis, or Decision Memo. For example, the vegetation management in some units or stands analyzed in an EIS could be for fuel reduction, and therefore those units or stands would fall within the term *fuel treatment project* even if the remainder of the activities in the EIS are being conducted for other purposes, and the remainder of those units or stands have other activities prescribed in them. All units in an analysis do not necessarily need to be for fuel reduction purposes for certain units to be considered a *fuel reduction project*.

[37]*Red squirrel habitat* – Red squirrel habitat consists of coniferous forests of seed and cone-producing age that usually contain snags and downed woody debris, generally associated with mature or older forests.

[38] *Regeneration harvest* – The cutting of trees and creating an entire new age class; an even-age harvest. The major methods are clearcutting, seed tree, shelterwood, and group selective cuts. (Helms, 1998)

[39] *Research* – Research consists of studies conducted to increase scientific knowledge or technology. For the purposes of Standards VEG S5 and VEG S6, research applies to studies financed from the forest research budget (FSM 4040) and administrative studies financed from the NF budget.

[40]*Restore, restoration* – To restore is to return or re-establish ecosystems or habitats to their original structure and species composition. (Dictionary of Forestry)

[41] *Riparian area* – An area with distinctive soil and vegetation between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation. (LCAS)

[42] *Salvage harvest* – Salvage harvest is a commercial timber sale of dead, damaged, or dying trees. It recovers economic value that would otherwise be lost. Collecting firewood for personal use is not considered salvage harvest.

[43] *Shrub steppe habitat* – Shrub steppe habitat consists of dry sites with shrubs and grasslands intermingled.

[44] *Standard* – A standard is a required action in a land management plan specifying how to achieve an objective or under what circumstances to refrain from taking action. A plan must be amended to deviate from a standard.

[45] *Stand initiation structural stage* – The stand initiation stage generally develops after a stand-replacing disturbance by fire or regeneration timber harvest. A new single-story layer of shrubs, tree seedlings, and saplings establish and develop, reoccupying the site. Trees that need full sun are likely to dominate these even-aged stands. (Oliver and Larson, 1996)

[46] *Stem exclusion structural stage (Closed canopy structural stage)* – In the stem exclusion stage, trees initially grow fast and quickly occupy all of the growing space, creating a closed canopy. Because the trees are tall, little light reaches the forest floor so understory plants (including smaller trees) are shaded and grow more slowly. Species that need full sunlight usually die; shrubs and herbs may become dormant. New trees are precluded by a lack of sunlight or moisture. (Oliver and Larson, 1996)

[47] *Timber management* – Timber management consists of growing, tending, commercially harvesting, and regenerating crops of trees.

[48] *Understory re-initiation structural stage* – In the understory re-initiation stage, a new age class of trees gets established after overstory trees begin to die, are removed, or no longer fully occupy their growing space after tall trees abrade each other in the wind. Understory seedlings then re-grow and the trees begin to stratify into vertical layers. A low to moderately dense uneven-aged overstory develops, with some small shade-tolerant trees in the understory. (Oliver and Larson, 1996)

[49] *Vegetation management* – Vegetation management changes the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. For the purposes of this proposal, the term does not include removing vegetation for permanent developments like mineral operations, ski runs, roads and the like, and does not apply to fire suppression or to wildland fire use.

[50] *Wildland urban interface (WUI)* - Use the definition of WUI found in the Healthy Forests Restoration Act. The full text can be found at HFRA § 101. Basically, the WUI is the area adjacent to an at-risk community that is identified in the community wildfire protection plan. If there is no community wildfire protection plan in place, the WUI is the area 0.5 mile from the boundary of an at-risk community; or within 1.5 miles of the boundary of an at-risk community if the terrain is steep, or there is a nearby road or ridgetop that could be incorporated into a fuel break, or the land is in condition class 3, or the area contains an emergency exit route needed for safe evacuations. (Condensed from HFRA. For full text see HFRA § 101.)

[51] *Winter snowshoe hare habitat* – Winter snowshoe hare habitat consists of places where young trees or shrubs grow densely – thousands of woody stems per acre – and tall enough to protrude above the snow during winter, so snowshoe hare can browse on the bark and small twigs (LCAS). Winter snowshoe hare habitat develops primarily in the stand initiation, understory reinitiation and old forest multistoried structural stages.

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Management direction considered

This section replaces the section in the DEIS labeled "Management direction considered, but not in detail". This section now describes the following:

- what management direction is needed;
- management direction included in Alternative B;
- what comments were received regarding Alternative B;
- how Alternatives C, D, and E addressed those comments;
- what comments were received on Alternative E in the DEIS, including those from FWS; and
- how those comments were considered in development of the FEIS, Alternative F.

Management direction related to habitat elements

Lynx require certain habitat elements to persist in a given area. Lynx productivity is highly dependent on the quantity and quality of winter snowshoe hare habitat. Lynx use a variety of forest ages and structural stages. They use young regenerating forests and multistoried forests that provide habitat for snowshoe hares. Certain activities, such as timber harvest, can affect the amount and distribution of these habitat elements, which can in turn affect lynx productivity.

Standards and guidelines relating to quantity of winter snowshoe hare habitat

Standards VEG S1 and S2 were developed to address the quantity of winter snowshoe hare habitat by providing a distribution of age classes across an area.

In Alternative B, Standard VEG S1 says if more than 30 percent of the lynx habitat in an LAU is in an *unsuitable condition*, then vegetation management projects cannot make more habitat unsuitable. *Unsuitable lynx habitat* consists of young regenerating forests where the trees and brush are generally less than 10 to 30 years old and have not yet grown tall enough to protrude above the snow in winter. If a broad-scale assessment is completed, the standard can be modified to take local conditions into account.

The standard tries to make sure blocks of quality lynx habitat are maintained in each LAU, to sustain a good distribution of lynx habitat at the scale of a lynx home range.

Unsuitable habitat may grow into foraging condition over time. Providing a distribution of forest ages is important; so large parts of each LAU are always winter snowshoe hare habitat.

Some people said 30 percent was "one-size-fits-all" direction that does not take into account local conditions or natural disturbances. Others said allowing 30

percent unsuitable was no real improvement. People said the proposal should make a decision about whether 30 percent unsuitable (or any amount) was too high for lynx to recover, and whether stricter standards were needed.

The 30 percent criterion of unsuitable habitat is based on a model to maintain lynx habitat over time (Brittel et al. 1989).

Fire is the most common disturbance process in lynx habitat. Generally, large stand-replacing fires burn every 40 to 200 years and smaller low intensity fires burn in the intervals between the stand replacing fires (Fisher and Bradley 1987; Smith and Fisher 1997). Based on this historic fire pattern in the northern Rockies, it is likely wildfires would often create more than 30 percent unsuitable habitat in an LAU.

The ID team considered this comment and determined the 30 percent criterion was appropriate to provide a mosaic of habitat conditions. A higher percentage would not provide the desired mosaic (more habitat could be in young regenerating forests) and a lower percentage is not warranted based on fire disturbance processes in lynx habitat.

Some people said that if management actions were supposed to emulate natural processes, especially with prescribed burns, then some scale larger than one LAU should be used to apply the 30 percent standard. Some people felt that combining the LAUs during analysis would be one way to do this.

In Alternative B standard VEG S1 applies *to each LAU*. Based on comments and analysis of wildfire processes, the application was modified in Alternatives C, D, and E. In Alternatives C and E (DEIS preferred alternative) this standard would apply to *"each LAU or a combination of immediately adjacent LAUs."* In Alternative D the standard would apply to *"each sub-basin or isolated maintain range."*

The FWS commented on the DEIS preferred Alternative E and recommended that VEG S1 be applied to a single LAU. They said application of conservation measures at the LAU scale requires blocks of quality habitat to be maintained within each LAU, maintaining a good distribution of lynx habitat at the scale of a lynx home range, thereby maintaining a good distribution of lynx habitat conditions across the range of lynx. They were concerned that if the standard were applied at a larger scale than an LAU, it could result in large contiguous areas devoid of providing the variety of habitat elements needed by lynx. In addition, they said the broad-scale assessment allowed for in Standard VEG S1 allows for deviation based local analysis.

Alternative F applies the management direction to a single LAU to ensure a variety of successional stages are provided within a home range.

Some people commented that the term "unsuitable habitat" was confusing and was a mis-application of the word. In addition, some people wanted to clarify what type of

vegetation management projects create "unsuitable habitat".

"Unsuitable habitat" refers to those forests in the early stand initiation structural stage which are too short to provide for winter snowshoe hare habitat (the trees have not grown above the snow line). This habitat is created by stand replacing fires or regeneration harvest (clearcut, seed tree, shelterwood). The habitat *may be* suitable for lynx and lynx prey in seasons other than winter if they provide good *horizontal cover*.

Standard VEG S1 in Alternative F was modified to be more explicit, so it now reads: "If more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat no additional habitat may be regenerated by vegetation management projects."

A few people felt Standard VEG S1 should ensure an even distribution of lynx habitat, but it does not do so.

It would not be possible to meet a standard for even distribution of lynx habitat elements in every LAU. Lynx habitat is found at mid to upper elevations, and the geology that forms those elevations is not evenly distributed. Lynx habitat is characterized by abundant moisture; this too, is not evenly distributed. In addition, some LAUs include private land, but the management direction would only apply to federal lands. However, the 30 percent takes private land into account if that private land is within an LAU.

Lynx use a variety of forest ages, types, and structural stages. It would be very difficult to produce an even distribution of these habitats in every section on the publicly owned land, much less on the private land. Natural disturbances, such as fire, can change large areas of habitat in a matter of days, frustrating attempts at producing an even distribution. A lynx home range can be from 25 to 50 square miles, or more. With home ranges of that size it is unnecessary to have an even distribution of lynx habitat in every square mile section of ground in order to conserve Canada lynx. For these reasons the ID team did not consider this request in detail.

In addition, lynx can travel long distances easily, so they can find the habitat components they seek over a large landscape.

In Alternative B, Standard VEG S2 says timber management projects shall not change more than 15 percent of lynx habitat in an LAU to an unsuitable condition in a 10-year period.

Some people said Standard VEG S2 should not single out a specific management practice, when other practices and wildland fires can have the same result. Others questioned whether or not this was a relevant sideboard since very few LAUs exceed this standard due to timber harvest.

The ID team explored why this standard singles out timber management projects. The purpose of the standard was to limit

the rate of management induced change in lynx habitat within an LAU to ensure sufficient habitat for lynx through time and reduce the likelihood that LAUs would be rendered incapable of supporting lynx by an action or several actions over a short period of time. Timber harvest (regeneration harvest) and wildfires are the predominate events that create "unsuitable habitat" or young regenerating forests. Prescribed fire, can in some cases, create unsuitable habitat if the fires are stand replacing.

Standard VEG S1 incorporates habitat changes created by all events (wildland fire, prescribed fire and regeneration harvest) that create the stand initiation structural stage. Standard VEG S2 constrains the amount of timber harvest over a 10 year period in order to regulate the amount of management induced change that occurs in a short period of time. Since timber harvest—specifically regeneration harvest—is the primary management activity that results in "unsuitable habitat" (stand initiation structural stage)—it is the activity which is the focus of this standard.

In 2003, the ID team analyzed the effect that timber harvest has historically had on creating "unsuitable habitat" on Forest Service lands in Region 1 (Hillis et al. 2003). The analysis was based on the amount of regeneration harvest occurring between 1986 and 2001, by 4th code hydrologic unit (HUC). The analysis found that only 2.5 percent of the HUCs exceeded the 15 percent criterion due to timber harvest on federal lands (13 percent if federal and non-federal lands are considered together). Fire was determined to be the dominate action that created stand initiation structural stages.

In the DEIS, Standard VEG S2 was changed to Guideline VEG G6 in Alternative C, and dropped as a standard or guideline in Alternatives D and E. Management direction was lessened in these alternatives primarily because very few LAUs exceeded the 15 percent criterion (Hillis et al. 2003).

FWS comments on the DEIS say that dropping Standard VEG S2 could allow potentially negative effects to lynx to accumulate. Removal of the standard could result in reducing the amount of lynx habitat over a short period of time. Based on these comments Standard VEG S2 was included in Alternative F. In addition, the standard was modified to clarify that it only applies to timber management practices that regenerate a stand.

In Alternative B Guideline VEG G1 recommends creating forage where it is lacking. The intent is to create forage habitat where it is lacking in a manner that result in dense horizontal cover once the trees grow up.

Some people said more guidance was needed about what stand conditions should be targeted to create forage. Others said we should rely on natural disturbances to provide hare habitat, or that we need to consider connectivity of hare habitat.

Timber harvest can be beneficial, benign, or detrimental depending on the harvest method, the spatial and temporal occurrence on the landscape, and the inherent vegetation potential of the site (Appendix P). An option to have the guideline only apply to natural disturbances was considered but dismissed because the focus of the guideline is the "intent" not the tool. The method to achieve the intent should not be limited, especially since it has been found that timber harvest can be done in a manner that results in good winter snowshoe hare habitat over time.

In Alternatives C, D, and E the guideline adds that "*priority should be given to stem-exclusion, closed-canopy structural stage.*" Alternative F adds that "*priority for treatment should be given to stem-exclusion, closed-canopy structural stage stands to enhance habitat conditions for lynx and their prey (e.g. mesic, monotypic lodgepole stands).*"

Include a standard to limit type conversions

Forest management can result in changing the dominant vegetation from one species to another, called a "type conversion." Silvicultural prescriptions can be designed, for instance, to change the species composition from lodgepole pine to western larch, which would reduce winter snowshoe hare habitat. Some people said a standard should be considered to limit type conversions to tree species that are of less value to lynx.

On page 34 of the 2000 Biological Opinion (USDI FWS 2000a), FWS discusses habitat conversions and identifies the conservation measures in the LCAS that relate to this concern. The action alternatives include measures that promote management toward historic conditions and restrict moving away from them (see Objective VEG O1; Standards GRAZ S3 and S4, and LINK S2; and Guidelines GRAZ G3 and G4, and LINK G2).

The ID team reviewed the measures in the action alternatives and decided another standard that restricts type conversions was not necessary because:

- The alternatives include objectives that describe the desired condition of lynx habitat;
- Vegetative management projects should be designed to meet or move toward meeting the objectives; and
- Such language was not included in the LCAS and no new information has been found to indicate such direction is necessary.

Limit the size of clearcuts and other regeneration harvest units

Some people wanted an alternative to limit the size of clearcuts to 40 acres. They wanted regeneration timber harvest limited to irregularly shaped cutting units no more than 300 feet wide. They wanted a standard that would make sure lynx travel corridors would be wider than 330 feet and that cutting units would be designed to preserve travel corridors, especially along ridges, saddles, and riparian areas.

Standards ALL S1 and VEG S2, and Objectives VEG O1 and VEG O4 indirectly respond to concerns about unit size and travel corridors. Openings created by even-aged harvest are normally 40 acres or less. Creating

larger openings requires 60-day public review and Regional Forester approval, with some exceptions (R1 Supplement Forest Service Handbook 2400-2001-2; R2 Supplement 2400-99-2).

Koehler (1990) speculated that openings created by regeneration harvest, where the distance-to-cover was greater than 325 feet, might restrict lynx movement and use patterns until the forest re-grows. While it is assumed lynx would prefer to travel where there is forested cover, the literature contains many examples of lynx crossing unforested openings (Roe et al. 2000).

Lynx evolved with disturbance. In the northern Rockies, the most common disturbance is fire. The LCAS and Alternative B recognize that fact. Fires come in many sizes. Most are small. Generally, a few, very large fires burn most of the acres. Recent burns provide herbaceous summer foods; older burns provide woody winter browse (Fox 1978).

The LCAS says landscapes with trees of various heights that support dense understory vegetation may be more likely to support high snowshoe hare populations (Poole et al. 1996). Trees in a distribution of ages may provide a greater range of available browse as snow depths vary throughout the winter.

Larger openings can often more closely resemble vegetative patterns similar to natural disturbance events (e.g. fire, windthrow, and insect outbreaks) (Appendix P). A disturbance pattern characterized by a few large blocks may be desirable if large areas of forested habitat are a management goal, or if the predation and competition that occur at the edges between vegetation types is a problem (Ruggiero et al. 2000a, p. 431).

While it is true lynx may not use large openings initially, once they have re-grown and can provide cover, generally after ten to 30 years, such areas may be important to lynx (Appendix P, p. 40092).

The action alternatives already contain direction to consider natural disturbances and maintain habitat connectivity. Based on the management direction in the alternatives, and evaluating the information in the *Ecology and Conservation of Lynx in the United States* (Ruggiero et al. 2000a) and the LCAS, the ID team decided that a standard limiting the size of openings was unlikely to improve lynx conservation.

Standards and guidelines relating to quality of winter snowshoe hare habitat

Snowshoe hares are the primary prey for lynx. Snowshoe hare habitat consists of forests where young trees or shrubs grow densely. During winter, hare forage is limited to twigs and stems that protrude above the snow and the hares can reach. Winter snowshoe hare habitat is a limiting factor for lynx persistence. It can be found in young regenerating forests which are dense; or in multistory forests that have trees whose limbs come down to snow depth and have an abundance of trees in the understory. Two standards were

developed to address management actions: (1) Standard VEG S5 addresses actions occurring in young regenerating forests; and (2) Standard VEG S6 addresses actions occurring in multistory forests.

In Alternative B, Standard VEG S5 does not allow precommercial thinning that reduces winter snowshoe hare habitat in the stand initiation structural stage except for within 200 feet of administrative sites, dwellings or outbuildings.

Some people said this standard should apply to all vegetation management projects, not just precommercial thinning.

Precommercial thinning is the primary activity that occurs in young regenerating forests. On occasion, other activities such as fuel treatments or prescribe burning, could occur. Alternatives C and D were expanded to apply to all vegetation management projects. Alternative E, the DEIS preferred alternative, only applied to precommercial thinning projects.

Only a few comments were received on the DEIS saying the standard should apply to all type of projects. FWS did not comment on the more narrow application of the standard.

Alternative F only applies to precommercial thinning because it is the predominate activity in young regenerating forests and it is has been identified as the risk factor for reducing winter snowshoe hare habitat (LCAS, Ruggiero et al. 2000a, USDA FS and USDI BLM 2000a, USDI FWS 2000a, 2000b, USDI FWS 2003).

As noted earlier in the issues section some people said that precommercial thinning should be allowed to restore tree species in decline or to encourage future large trees.

Alternative D addresses this issue by allowing precommercial thinning of planted western white pine, whitebark pine, aspen, and larch, ponderosa pine and lodgepole pine in certain situations. Alternative E, the DEIS preferred alternative only allowed precommercial thinning adjacent to structures, for research or genetic tests, or for fuel treatment projects identified in a collaborative manner.

Several comments on the DEIS said that the allowances for precommercial thinning in Alternative D should be incorporated into the final alternative. Several comments said that some allowance for adaptive management should be incorporated and that thinning should be allowed where it could be done to promote or prolong winter snowshoe hare habitat.

FWS said that thinning adjacent to administrative sites, dwellings, or outbuildings and for research and genetic tests would have little effect on lynx or their habitat. In addition, they said the following thinning activities would have cumulatively little effect upon lynx habitat and, in some cases, advance natural ecological conditions. These include: (1) daylight thinning of planted rust-resistant white pine where 80 percent of winter snowshoe hare habitat is maintained; (2) thinning within whitebark pine stands; (3) white

pine pruning and (4) thinning for Christmas trees.

The ID team evaluated the comments and incorporated the following elements into Alternative F.

- Since Standard VEG S5 is concerned with reduction of winter snowshoe hare habitat, white pine pruning and thinning for Christmas trees can occur if winter snowshoe hare habitat is not reduced. Generally these activities are done on an individual tree basis and do not change the characteristics of the habitat.
- Precommercial thinning can be done adjacent to administrative sites, dwellings, or outbuildings and for research and genetic tests since these would have benign effects on lynx.
- Precommercial thinning can be done for planted rust-resistant white pine, whitebark pine, and aspen. Thinning to enhance whitebark pine and aspen would benefit other wildlife species and effects only limited acres in lynx habitat. Daylight thinning of white pine may reduce some habitat effectiveness, but since this tree species has declined 95 percent across its range, the ID team determined it was important to allow a limited amount of thinning to retain the species on the landscape.

The ID team considered allowing precommercial thinning in vast areas of young regenerating forests where precommercial thinning could be done to prolong winter snowshoe hare habitat. The team also considered precommercial thinning in young regenerating forests composed primarily of western larch with more than 10,000 trees per acre – where larch would be removed to favor other species that provide better winter snowshoe hare habitat. In both these situations the general belief is that these activities may be beneficial to lynx in the long term, but information is not available at this time to support that hypothesis. So, the standard was modified to provide an avenue to consider new information that may in the future prove or disprove these hypotheses. The criterion provide in Alternative F states:

Based on new information that is peer reviewed and accepted by the regional level of the Forest Service and the state level of FWS, where a written determination states:

a. that a project is not likely to adversely affect lynx; or
b. that a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat.

In addition, under Alternative F Standard VEG S5 would not apply to fuel treatment projects that use precommercial thinning as a tool within the WUI (see discussion regarding fuel treatments in the next section).

In Alternative B, Standard VEG S6 does not allow precommercial thinning that reduces winter snowshoe hare habitat in multistory forests except for within 200

feet of administrative sites, dwellings or outbuildings.

As noted in Issue #3 some people said the management direction should preclude all activities that reduce winter snowshoe hare habitat in multistory forest.

Alternatives C, D, and F would apply the management direction to all vegetation management activities in multistory forests that provide winter snowshoe hare habitat. Each alternative has different allowances for vegetation management. Alternative E, the DEIS preferred alternative changed the management direction from a standard to Guideline VEG G8. The intent of the guideline was to direct vegetation projects to provide winter snowshoe hare habitat through time.

Multistory forest structures can develop from natural processes, such as insects and diseases and fire, or management actions like timber harvest that create small openings where trees and shrubs can grow.

Comments on the DEIS suggested that management direction for multistory forests should be in the form of a standard. FWS suggested the agencies review the latest information or research on lynx use of forests in multistoried structural stages prior to developing a final preferred alternative.

The ID team reviewed the latest research and discussed lynx use in multistory forests with lynx researchers, the Lynx Biology Team, and FWS. Based on the review and discussions, the ID team retained Standard VEG S6 in Alternative F, which limits vegetation management activities that reduce winter snowshoe hare habitat in multistory forests. Minor reductions in winter snowshoe hare habitat were allowed for activities within 200 feet of structures, research or genetic tests, and for incidental removal during salvage harvest (associated with skid trails) in Alternative F. The standard also says that timber harvest is allowed in areas that have the potential to improve winter snowshoe hare habitat but presently have poorly developed understories. The standard would not apply to fuel treatments within the WUI (see discussion regarding fuel treatments in the next section).

Denning habitat

Woody debris – piles of wind-thrown trees, root wads, or large down trees – provides lynx denning sites. Large woody debris gives kittens an escape route from predators, as well as cover from the elements. During the first few months of life, when kittens are left alone while the mother hunts, denning habitat must be available throughout the home range (Bailey 1974). It is necessary for lynx survival. The proposed action included two standards and two guidelines which provided management direction for denning habitat.

In Alternative B Standard VEG S3 defers vegetation management projects in places with the potential to develop into denning habitat if an LAU contains less than ten percent denning habitat. ***Standard VEG S4*** limits salvage harvest

in some situations. ***Guideline VEG G2*** says when more denning habitat is desired to leave standing trees and coarse woody debris. ***Guideline VEG G3*** says to locate denning habitat where there is a low probability of stand-replacing fire.

Development of alternatives for the DEIS

Some people said that den sites can be found in old regenerating forests and the agency should be allowed the flexibility to create denning habitat in regeneration units, especially since denning habitat should be located in or adjacent to forage. In Maine 17 den sites were located in a variety of stand types, including 10-20 year old clearcuts adjacent to residual stands (Appendix P).

After reviewing the literature, the ID team determined it was reasonable to have an alternative that allows for flexibility to mitigate or create denning habitat, especially when there is less than 10 percent denning habitat. Alternatives D and E modify Standard VEG S3 to say where there is less than 10 percent denning habitat either: 1) defer management, or 2) move towards 10 percent by leaving standing dead trees or piles of coarse woody debris. This combined the guidance in Alternative B, Guideline VEG G2 with the Standard VEG S3.

Some people said salvage harvest should not be singled out because it is not the only management action that removes denning habitat. Standard VEG S4 limits salvage harvest after a disturbance kills trees in areas five acres or smaller – if there is less than 10 percent denning habitat.

The ID team evaluated whether other management actions, such as prescribed burning, chipping, piling and burning, etc. should be precluded. Salvage harvest is the primary management action that removes denning habitat because it removes dead and down timber; therefore the team determined that other actions did not need to be constrained. However, the team determined that Standard VEG S4 should be a guideline in Alternatives D and E. The guideline says that when there is less than 10 percent denning habitat, then units should consider retaining small areas of dead trees. As noted in Alternatives D and E, Standard VEG S3, units can mitigate when there is less than 10 percent denning habitat. It is possible to create denning habitat or retain pockets, but units should be allowed to evaluate denning needs on a site specific basis.

The intent of Alternatives D and E, is where denning habitat is lacking, units should recognize it, retain large and small patches and/or mitigate, especially if it denning habitat can be created in or near new forage areas. In most areas denning habitat is likely not limiting because it is found in such a variety of stand conditions and ages.

Considerations for alternatives in the FEIS

Some people said there was no basis for retaining ten percent denning habitat – they wanted the standard dropped altogether.

Others wanted more denning habitat required.

Some people asked for an alternative to prohibit harvest in old growth or mature timber to protect denning habitat. Some people said that all old growth should be protected by management direction because some administrative units do not meet old growth standards.

Some people said allowing salvage logging in disturbed areas smaller than five acres lacked a scientific basis and that all salvage harvest should be deferred.

Most comments on the DEIS said that management direction for denning habitat should be in the form of standards and salvage logging should be prohibited.

FWS supported Standard VEG S3, including conditions 1 and 2 in Alternative E, and was concerned about changing Standard VEG S4 into Guideline VEG G7. FWS recommended development of a standard that: 1) maintains ten percent denning habitat within an individual LAU; 2) is randomly/evenly distributed across the LAU; and 3) ensures recruitment of future denning habitat.

Based on these comments, the ID team reconsidered the management direction for denning habitat. The team held discussions with the researchers, lynx biology team and FWS to further explore denning habitat – where it is found, how to measure it, and how to ensure plans provide the appropriate level of management direction.

Where denning habitat is found: Since 1989 researchers have discovered that lynx denning habitat is found in a variety of structural stages from young regenerating forests to old forests. The integral component of lynx den sites appears to be the amount of downed, woody debris, not the age of the forest stand (Mowat, et al. 2000). Research by Squires (pers. com. Oct. 30, 2006) has found that of 40 den sites in northwest Montana most were located under large logs but "jack-strawed" small diameter wind thrown trees, root wads, slash piles and rock piles were also used. These structural components of lynx den sites can often be found in managed (logged) and unmanaged (e.g. insect damaged, wind-throw) stands.

How to measure denning habitat: Retaining ten percent denning habitat is based on maintaining lynx habitat over time (Brittel et al. 1989). Brittel recommended a balance of conditions – 30 percent forage, 30 percent unsuitable that would grow into forage, 30 percent travel, and ten percent denning.

The ID team evaluated how to measure 10 percent denning based on where the habitat can be found. The team evaluated using mature and over-mature forests as a first approximation of denning habitat. Generally mature and over-mature forests contain a component of dead and down trees which lynx use. If these two components were used then all units would show much more than ten percent denning habitat as all forests have at least twenty percent of their forest in mature stand structures. In addition, these stand structures do not

account for all the stand conditions where denning habitat can be found because denning habitat can be found in young forests with slash piles, lodgepole forests with insect and disease outbreaks, areas recently burned in wildfires, as well as variety of other forest conditions. Based on these discussions, the ID team, with agreement from FWS, determined that using stand structures as a proxy would show an overabundance of denning habitat; therefore the requirement to retain ten percent was found not to be a useful measure.

How to provide for denning habitat:

The ID team considered restricting harvest in mature forests and old growth. The important component for all lynx den sites appears to be the amount of down woody debris present, not the age of the forest (Mowat et al. 2000, Appendix P). Old growth and mature forests can provide denning habitat, but based on review of research a variety of forest structures also provide denning habitat. The ID team considered prohibiting timber harvest in old growth but dismissed this from detailed consideration because denning habitat is found in a variety of forest structures.

The ID team considered restricting salvage harvest. Standard VEG S4 in Alternatives B and C limits salvage harvest after a disturbance kills trees in areas five acres or smaller – if there is less than 10 percent denning habitat. The standard was changed to a guideline in Alternatives D and F. The guideline says that when there is less than 10 percent denning habitat, then units should consider retaining small areas of dead trees.

Salvage harvest can remove denning habitat. However, den sites can be found in areas with large logs, "jack-strawed" small diameter wind thrown trees, root wads, slash piles, and rock piles. These need not be extensive – they are small areas that provide hiding cover for lynx.

The team reevaluated whether or not denning habitat is a limiting factor for lynx. Based on discussions with research, the team reaffirmed that denning habitat is found in a variety of forest conditions and these habitat elements are generally found across broad landscape, and lynx denning sites are not believed to be a limiting factor (J. Squires, pers. com. Oct. 30, 2006). In addition, management actions can create denning habitat by strategically leaving piles of woody debris, or leaving residual trees where denning habitat is lacking.

Therefore the ID team determined that restricting salvage harvest was not necessary, but that projects should consider the abundance and distribution of denning habitat in their project design.

The ID team considered management direction in the form of standards vs. guidelines. The ID team determined management direction for denning habitat should be incorporated into one set of management direction. Incorporating all the direction into one standard or guideline reduces the

potential for conflicts between directions, focusing on the important components of denning habitat.

The ID team determined a guideline would be best suited for this management direction because denning habitat can be found in a variety of forest structures and is not a limiting factor for lynx. The management direction would provide design features for projects. Therefore the ID team developed Guideline VEG G11 in Alternative F. The guidance is to: 1) have denning habitat distributed across an LAU (in the form of pockets of large woody debris, either down logs or root wads, or large piles of jack-strawed trees); and 2) if denning habitat is lacking, projects should be designed to retain coarse woody debris – by leaving piles or retaining residual trees that can become denning habitat later.

Fuel treatments

Most lynx habitat consists of high-elevation spruce/fir and lodgepole pine forests, but some lynx habitat may be found in mixed conifer forests. Generally, forests in lynx habitat are close to historic conditions, meaning the long fire return interval has not been affected by more recent fire suppression as is the case in dryer forests with short fire return intervals. However, some stand conditions are conducive to extreme fire behavior because of insect and disease mortality or the amount of tree limbs that provide ladder fuels. Fuel treatments designed to reduce ladder fuels or reduce the potential size and severity of wildland fires may be proposed in lynx habitat.

Some people thought the management direction might preclude fuel treatment, especially in the WUI.

In Alternative A, there would be no change in existing plan direction on the treatment of fuels.

Alternative B would allow fuel treatments to go forward if they:

- Meet the 10 percent denning standard (Standard VEG S3 and S4)
- Meet 30 percent unsuitable habitat standard (Standard VEG S1) or 15 percent unsuitable habitat created by timber harvest standard (Standard VEG S2)
- Use methods other than precommercial thinning in winter snowshoe hare habitat (Standards VEG S5 and VEG S6)

Alternatives C and D would not allow any type of fuel reduction project that reduced winter snowshoe hare habitat – except within 200 feet of structures.

Alternative E was designed to address the issue regarding fuel treatments, while contributing to the conservation of lynx. None of the vegetation standards (Standards VEG S1, S3 and S5) would apply to fuel treatments developed in a collaborative manner, as described in the *10-Year Comprehensive Strategy Implementation Plan* (USDA FS 2001b). This exception was used because a multi-party Memorandum of Understanding was signed in 2003 by the FS, BLM, and FWS (USDA FS et al. 2003.

The ID team considered limiting fuel treatments to just the WUI in the design of Alternative E. However, the National Fire Plan and Comprehensive Strategy both identify the potential need to treat fuels outside the WUI, particularly those forests in Condition Classes 2 and 3. Most of the forests in lynx habitat are likely to be in Condition Class 1; however a few may be in Condition Class 2 or 3.

Many comments were received on the DEIS regarding fuel treatments. Some people suggested there be no exemptions for fuel treatments. Several environmental groups suggested that only fuel treatments within 500 yards of human residences and other structures be allowed because these areas are generally not appropriate to restore lynx anyway. Others felt the exemptions should only apply to the WUI and that the agencies should define the WUI. Others liked the exemptions as they were written in Alternative E.

FWS cautioned against exempting a broad range and unknown number of actions from plan direction. They felt, as currently worded in Alternative E, the exemption was sufficiently vague that it did not allow an adequate analysis of potential effects upon lynx or lynx habitat.

FWS suggested Standard VEG S5 be modified to restrict precommercial thinning to within one mile of structures. They did not believe any exemptions were needed for Standards VEG S1 or S2 since so very few LAUs were near the thresholds identified in these standards. They felt very few proposals would be constrained by the standards. They also questioned why Condition Class 1 forests were not specifically excluded from the exemptions. Condition Class 1 forests include areas where fires have burned as often as they did historically; the risk of loosing key ecosystem components is low; and vegetation composition and structure is intact and functioning. The FWS went on to say they recommended that processes, actions, or types that would be exempt be clearly identified.

The ID team and Responsible Officials reviewed and discussed the comments with FWS and decided to modify the fuel treatment exemption for Alternative F. The team and FWS thoroughly discussed the issue of how to allow for fuel treatments to reduce the hazard to communities – while providing for the conservation and recovery of lynx. The following summarizes the outcome of the discussions.

1) Outcome: The vegetation standards would not apply to fuel treatment projects within the WUI.

   Discussion: Under Standards VEG S1 and S2 it is likely very few projects would exceed the 30 percent and 15 percent criteria because many fuel treatment projects are not regeneration harvest. If regeneration harvest is applied it is likely to be done to create a fuel break adjacent to communities or to break up the continuity of fuels. The ID team did not want to limit the ability create fuel breaks where they are needed.

2) Outcome: Treatment in all condition classes would be allowed.

   Discussion: Many forests in lynx habitat are in Condition Class 1, meaning these forests have not missed a fire cycle because fire only occurs every 100 to 200 years. However, some of these Condition Class 1 forests can still be a threat to communities. An example is lodgepole pine forests which are at the age of being susceptible to mountain pine beetle outbreaks. Regenerating lodgepole pine, adjacent to a community, may be needed to reduce the severity and size of a wildland fire. Fire is a natural process in these ecosystems; but there is a need to balance the natural process with the risk of fire destroying homes.

3) Outcome: The standards would not apply to fuel treatments within the WUI as defined by HFRA.

   Discussion: The team evaluated various options regarding where the standards should be applied and they used a variety of criteria to evaluate which option to carry forward for detailed consideration. The criteria included: 1) is there a defined area; 2) can effects be meaningfully evaluated; 3) would it provide for community protection; and 4) does it meet the purpose and need. (For further detail see Alternative development section – alternatives considered from July 29, 2004 through February 24, 2005 in the project file). The following summarizes the options and considerations:

a. *Not applying the vegetation standards to fuel treatment projects within ¼ mile of communities.* This option provides a defined area which could be meaningfully evaluated and it meets the purpose and need. However, in some cases it may not provide for community protection because this option would not fulfill the need to break up the continuity of fuels and or to reduce fire spread by creating fuel breaks (USDI USDA 2006).

b. *Not applying the vegetation standards to fuel treatment projects within ½ mile of an at-risk community.* This option provides a defined area which could be meaningfully evaluated and it meets the purpose and need. However, in some cases it may not provide for community protection because this option would not fulfill the need to break up the continuity of fuels and or to reduce fire spread by creating fuel breaks.

c. *Not applying the vegetation standards to fuel treatment projects within completed Community Wildfire Protection plans.* Each Community Wildfire Protection plans defines the WUI area for their area. However, not all communities have completed their plans. This option was dismissed because it did not have a defined area – or one that could be easily mapped; therefore it would be difficult to evaluate effects. In addition, fuel treatment projects would not be exempted for those communities who had not

completed a Community Wildfire Protection plan; therefore it would not meet criterion number 3.

d. *Not applying the vegetation standards to fuel treatment projects within 1 mile of a boundary of an at-risk community, interface community or intermix community.* This option meets all the criteria because it contains a defined area where effects can be meaningfully evaluated. In most cases it would allow fuel treatments to reduce fuels around communities and it would meet the purpose and need. This option was dismissed from detailed consideration because instead it was combined with option (e) below.

e. *Not applying the vegetation standards to the WUI as defined by HFRA - with a limit not exempting projects on more that 6 percent of lynx habitat and add Guideline VEG G10.* The team discussed how to define WUI and decided to use the definition established by Congress in the HFRA as it established a *national procedure* for determining the extent of the WUI (USDI, USDA FS 2006). The team used the analysis from option (d) to limit the amount of fuels treatment projects which could be exempted. (In the Northern Rockies six percent of lynx habitat is within one mile of the boundary of an at-risk community, interface community or intermix community). This option addresses all the criteria: (1) it has a defined area (WUI as defined by HFRA); (2) it can be meaningfully evaluated (limits exemption to six percent of lynx habitat; (3) provides for community protection; and (4) meets the purpose and need by incorporating management direction into plans to address the quantity and quality of lynx habitat although it would allow for adverse effects to occur on up to six percent of lynx habitat.

Guideline VEG G10 is only found in Alternative F. It recommends that fuel treatment projects within the wildland-urban interface should be designed *considering* Standards VEG S1, S2, S5, and S6. The intent in adding this guideline is that although the vegetation standards do not apply to fuel treatment projects within the WUI as defined by HFRA, these projects should still consider the standards in the development of the proposal. In many cases projects can be designed to reduce hazardous fuels while providing for lynx needs. This guideline ensures lynx are considered in the project design – but allows for the flexibility of not meeting the standards in situations where meeting the standards would prevent the project from reducing the hazardous fuels.

Grazing

Livestock grazing may reduce or eliminate foraging habitat in areas that grow quaking aspen and willow in riparian areas (LCAS). These localized changes in habitat may affect individual lynx; however, no information indicates that grazing poses a threat to overall lynx populations (Appendix P, p. 40083). Grazing was not mentioned in

the original listing decision as a threat to lynx, nor is it discussed in *the Ecology and Conservation of Lynx in the United States* (Ruggiero et al. 2000a).

In ***Alternative B, Standards GRAZ S1, GRAZ S2, GRAZ S3, and GRAZ S4*** provide management direction for grazing in fire and harvest created openings, aspen stands, riparian areas and willow carrs, and shrub-steppe habitat. Alternatives C and D retain the management direction as standards. Alternative E changes the management direction to Guidelines GRAZ G1, GRAZ G2, GRAZ G3, and GRAZ G4 because neither the Remand Notice nor the *Ecology of Conservation of Lynx in the United States* recognized grazing as a threat to lynx.

Many people commented on Alternative E, the preferred alternative in the DEIS, and said the guidelines should be standards in the final alternative. Others said grazing should not be allowed at all, while two said the grazing guidelines should be retained. The FWS did not comment on the level of grazing management direction in Alternative E.

All the action alternatives address the LCAS grazing risk factors in Standards GRAZ S1 through GRAZ S4 or Guidelines GRAZ G1 through GRAZ G4. They provide management direction for livestock grazing that would retain winter snowshoe hare habitat, including aspen, willow, riparian areas, and shrub-steppe. Since the LCAS risk factors were addressed in all action alternatives, the ID team decided an alternative that prohibited grazing was not necessary. Prohibiting grazing also would not meet the Purpose and Need of maintaining the overall multiple-use direction in existing plans.

The ID team reevaluated whether or not the management direction in the final alternative should be in the form of standards or guidelines. No new information surfaced which indicates grazing is a threat to lynx populations; therefore Alternative F retains the management direction for grazing as guidelines. The guidelines ensure projects consider lynx habitat needs in their design and only when warranted may they deviate.

Add standards and guidelines to direct when and where wildland fire should be allowed to burn

The 1999 BA found suppressing wildfire might limit its role in creating winter snowshoe hare habitat, thus contributing to the risk of adverse effects on lynx (Hickenbottom et al. 1999, p. 69-70). Some people said none of the standards addressed fire suppression. They said the analysis should recognize the vital role of natural fire, which should be allowed to burn when it occurs.

All the action alternatives encourage using fire where winter snowshoe hare habitat is limited. Objective VEG O3 says to conduct fire use activities to restore ecological processes and maintain or improve lynx habitat. Guideline VEG G1 says vegetation management near denning habitat should be planned to recruit and

maintain winter snowshoe hare habitat where it is scarce, unavailable, or declining.

Where fire suppression does occur in lynx habitat, it can reduce the quality of habitat by reducing the amount of young forests or by changing species composition and structure of forests (LCAS, p. 2-6; Appendix P, p. 40094).

Many existing plans allow using wildland fire in *non-developmental allocations* – places where natural disturbance processes predominate, such as wilderness and roadless areas (Hickenbottom et al. 1999, p. 67). Most direct aggressive fire suppression in *developmental land allocations*, places where campgrounds and active management like timber sales are allowed (Hickenbottom et al. 1999, p. 69).

Changing plans to allow natural fires would require evaluating each area to see where, when, and under what conditions natural fires should be allowed. This would expand the scope of the Purpose and Need, Proposed Action, and alternatives.

The ID team decided the decision about where to let natural fires burn would be best evaluated at the local level, so local conditions could be considered. The existing alternatives encourage using natural fire, but leave the decision about when and where to the responsible local officials.

Climate Change

Some people said we should consider the effects of climate change on lynx habitat and whether or not additional management direction should be developed to address this concern.

Vegetation dynamics, disturbance, climate, and their interactions are key elements in predicting the future condition of ecosystems and landscapes and the vulnerability of species and populations to climatic change. Climatic factors such as temperature, precipitation, and wind patterns are among the many factors that influence vegetative structure and composition, fire behavior, and wildlife habitat, including lynx habitat. Lynx have a competitive advantage in deep snow habitats that are common throughout the northern Rockies. Climate change, therefore, has potential to affect factors that influence lynx and their habitat in the northern Rockies.

The paper *Climate change science – An analysis of some key questions* (Cicerone et al. 2001) elaborated on the topic of global warming. There is little scientific disagreement that global warming is occurring at an accelerating rate and that human activities (greenhouse gas emission increases, etc.) have contributed to this phenomenon. Some uncertainty exists as to the magnitude of these effects in relation to natural variation and the precise effects of how feedback mechanisms (increased water vapor, reduced snow cover) influence the extent and magnitude of global warming patterns and trends. More

recently, the extensive *Arctic Climate Impact Assessment* (2004) has provided compelling evidence that among numerous other effects (1) arctic climate is now warming more rapidly than the rest of the earth, (2) much larger changes are projected in the future, and (3) arctic warming and its consequences have worldwide implications.

Other indirect effects of global warming may have beneficial or detrimental effects on lynx. A recent study of the effect of climatic change on wildfire in the western U.S. (McKenzie et al. 2004) determined that with warming climate fire seasons would likely be extended and that total area burned is likely to increase. As a result significant changes in the distribution and abundance of dominant plant species in some ecosystems may occur. Some species that are sensitive to fire may decline, whereas the distribution and abundance of species favored by fire may be enhanced. Stand replacing fires are a common occurrence throughout much of lynx habitat and often provide conditions conducive to producing good quality snowshoe hare habitat.

It appears likely that climate change may affect lynx over the long term by altering the extent of deep snow habitats preferred by lynx. Kerr and Packer (1998) used the general circulation model developed at the Goddard Institute of Space Sciences for the Intergovernmental Panel on Climate Change to predict future mammal diversity patterns in Canada. Based upon their analysis they predicted that at least 25 mammal species, including Canada lynx, are limited by the Arctic Ocean in their ability to disperse northward and are likely to undergo significant losses of habitat (Keer and Packer 1998). Features of the snow may also influence lynx interaction with snowshoe hare. Stenseth et. al. (2004) have shown that large-scale climatic fluctuations can influence lynx population biological patterns. Since the effects of global warming are occurring over relatively long periods, the effects on lynx over the short term (10-15 years) are less clear. More focused research is needed on the effect of climate change on specific threatened and endangered species such as the Canada lynx, to more accurately predict specific effects of climate change in the northern Rockies.

In summary, there is incomplete or unavailable information upon which to base any more detailed analysis of climate change risk factors for the lynx. The best available information does provide some evidence that climate change poses risks, but the exact nature of these risks remains uncertain. In addition, it is unlikely the effects of climate change would substantially alter lynx habitat over the next decade or two and since the effects are unknown it is premature to include additional management direction at this time. Standard VEG S1 addresses the quantity of winter snowshoe hare habitat, whether created by wildland fire or timber harvest.

Management direction related to human uses

Over-the-snow winter recreation

Lynx have very large feet in relation to their body mass, providing them a competitive advantage over other carnivores in deep snow. Various reports and observations have documented coyotes using high elevation, deep snow areas (Buskirk et al. 2000a). Coyotes use open areas because the snow is more compacted there, according to research conducted in central Alberta (Todd et al. 1981). In another study in Alberta, coyotes selected hard or shallow snow more often than lynx did (Murray et al. 1994). Related research is currently underway in northwestern Montana, northern Utah, and north-central Washington (see Appendix F).

In ***Alternative B, Standard HU S1*** would maintain the existing level of groomed and designated routes. All action alternatives contain Objectives HU O1 and HU O3 that discourage expanding snow-compacting human activities. Alternatives B, C, and D contain Standard HU S1 that would allow existing over-the-snow areas to continue but not grow. Alternative E, the DEIS preferred alternative, contains Guideline HU G11 that discourages the growth of designated over-the-snow route and play areas. All alternatives would allow existing special use permits and agreements to continue.

Some people asked that no dispersed over-the-snow use be allowed off groomed or designated trails and areas, saying the no net increase in groomed or designated routes did not go far enough. Others said the management direction should be in the form of a standard, not a guideline.

Some people said standards related to over-the-snow use should be removed. They said there is no evidence to show that coyotes and other predators use packed snow trails to compete with lynx for prey, and that amount of compaction created by snowmobiles is insignificant compared to the compaction created naturally by the weather. They were particularly concerned that if such language was introduced into plans, it could be difficult to change, incrementally restricting the places where snowmobiling is allowed. Others wanted an allowance made to increase use.

The FWS agreed that it is prudent to maintain the status quo and restrict expansion of over-the-snow routes until more information is available because of the possibility that, over time, unregulated expansion could impair further conservation efforts. They also said current, ongoing research in Montana may shed some information on the effects of snow compaction on lynx. They suggested careful consideration of the most recent information and the reality of possible impairment of options for the future. They suggested considering language that could provide more guidance on conditions where the expansion of over-the-snow routes would be warranted and acceptable.

The ID team reviewed the results of research conducted since the DEIS was released. Within lynx habitat in northwestern Montana, twelve radio-collared coyotes were monitored over three winter seasons to assess how coyotes interacted with compacted snowmobile trails (Kolbe 2005). Coyotes remained in lynx habitat having deep snow conditions and traveled on compacted snowmobile trails more than expected. However, coyotes used compacted snowmobile trails for less than eight percent of their travel and used compacted and uncompacted roads similarly (Kolbe 2005). Coyotes did strongly select for shallower and more supportive snow surfaces when traveling off of compacted trails. In this study coyotes primarily scavenged ungulate carrion that were readily available while snowshoe hare kills comprised only three percent of coyote feeding sites (Kolbe 2005).

In the Uinta Mountains of northeastern Utah and three comparative study areas (Bear River range in Utah and Idaho, Targhee NF in Idaho, Bighorn NF in Wyoming) Bunnell (2006) found that the presence of snowmobile trails was a highly significant predictor of coyote activity in deep snow areas.

From track surveys it was determined that the vast majority of coyotes (90 percent) stayed within 350 meters of a compacted trail and that snow depth and prey density estimates (snowshoe hares and red squirrels) were the most significant variable in determining whether a coyote returned to a snowmobile trail (Bunnell 2006). Of the four study areas recent lynx presence has only been documented on the Targhee NF.

These recent studies reaffirm the following findings: there is no conclusive evidence that demonstrates that coyote competition is currently negatively affecting lynx populations.

The Listing Decision stated,

> *… the variability of snow conditions and frequency of fresh snows in the winter habitats that support lynx, continually reduce or alter the availability of snow trails and shallow snow depths used by coyotes in lynx habitat, making it more difficult for coyotes to effectively hunt in these areas regularly during the winter.*

The 2000 Biological Opinion stated,

> *Additional information needs on the interrelationships between lynx and other carnivores during deep snow periods, and the influence of compacted snow routes on interspecific competition are identified in the LCAS. While dietary overlap suggests the possibility of competition between coyotes and lynx (Staples 1995, O'Donoghue et al. 1998), there are no data available that demonstrate that coyote competition is currently negatively affecting lynx populations. The LCAS would limit the expansion of winter dispersed recreation activities in lynx habitat until more conclusive information is available.*

The FWS Remand Notice (Appendix P) states,

> *Despite the lack of evidence that competition with any species is negatively affecting lynx, the final rule expanded the theory that ski and snowmobile trails and roads that are maintained for winter recreation and forest management create packed snow corridors that give other species, particularly coyotes, access to lynx winter habitat on all land ownerships. This theory has neither been proven or disproven at this time (Roe et al. 2001)…Because no evidence has been provided that packed snowtrails facilitate competition to a level that negatively affects lynx, we do not consider packed snowtrails to be a threat to lynx at this time.*

Based on this information, the ID team reevaluated management direction related to over-the-snow activities. An alternative to prohibit all snow-compacting activities or to limit dispersed use was evaluated, but not considered in detail because current research indicates this level of management direction is unwarranted (USDI FWS 2000a; Appendices O and P).

An alternative to drop all direction limiting snow compaction was not developed in detail because there is evidence competing predators use packed trails, suggesting a potential effect on individual lynx. The ID team decided it was prudent to maintain the status quo and not let over-the-snow routes expand. However, the ID team also decided it was reasonable to retain the direction as a guideline in Alternative F. The intent is to follow the management direction in guidelines. However, there may be some cases where expansion of over-the-snow routes would be warranted and acceptable, or where research indicates there would be no harm to lynx. Guidelines are better suited to adaptive management.

There is also no basis to establish any particular threshold of allowable increases. However, alternative language has been developed that would allow expanding winter recreation in some places where heavy public use existed in 1998, 1999, or 2000. Such increases are addressed in Standards HU S1 in Alternatives C and D, and Guideline HU G11 in Alternatives E and F.

Some people said winter logging has negatively affected lynx so it should be limited. They said the alternatives should provide the flexibility to rule out winter logging in sensitive lynx habitat.

The management direction does not specifically address winter logging. The management direction does address logging (VEG Objectives, Standards, and Guidelines) and road use (Objective HU O6 and Guidelines HU G6, G7, G8, G9). Winter logging is often used to reduce effects on soils or to other species such as grizzly bears. Timber sale contracts identify which roads may be used for access.

Winter logging could affect lynx by providing access to competitors using

plowed roads. Generally, such access takes place for just one or two seasons on a given route. Snowmobile use tends to be more consistent from year to year.

Effects of winter logging are even more speculative than for regularly compacted trails. The ID team decided that site-specific designing of access to timber sales at the project level could take lynx needs into account and minimize effects, so there was no need to ban or otherwise specifically address winter logging.

Ski areas

The LCAS identified risk factors associated with ski areas, including *short-term effects* on denning, foraging, and diurnal security habitat and *long-term effects* on movement within and between home ranges (LCAS, p. 2-10). Ski areas may eliminate habitat and pose a threat to movements; but most were constructed before lynx became a conservation issue (Hickenbottom et al. 1999, p. 70). Mitigation measures can be developed at the project level to lessen the effects of existing developments.

In ***Alternative B, Objectives ALL O1, HU O2, HU O3, and HU O4; Standards ALL S1 and HU S2; and Guidelines HU G1, HU G2, HU G3, and HU G10*** provide management direction about ski area development, expansion, and operations to provide for lynx movement, security, and habitat needs.

Alternative C, D, and E change Standard HU S2 to Guideline HU G10. Standard HU S2 requires diurnal habitat to be maintained, if needed. In most cases diurnal habitat can be provided outside the ski area, especially those areas where there is only one ski area per mountain range. Since the need to provide diurnal habitat is only found in a few places in the northern Rockies, the ID team determined it was better suited as a guideline.

Some people said ski areas should be removed or at least prevented from expanding. Others recommended the final preferred alternative retain Standard HU S2.

FWS did not comment on this change. There is no information that indicates removal of ski areas is warranted, nor limiting their expansion, as long as lynx needs are considered. The ID team also determined that since ski areas are dispersed across the northern Rockies the management direction for providing diurnal habitat should be retained as a guideline.

Mineral and energy development

The LCAS said the main risk factors associated with minerals and energy development is related to the potential for plowed roads to provide access for lynx competitors.

In ***Alternative B, Objectives ALL O1, HU O1, and HU O5, Standards ALL S1 and HU S3, and Guidelines HU G4, and HU G5*** provide management direction for mineral and energy development. Standard HU S3 says to keep mineral and energy development to designated routes. This standard was changed to Guideline HU G12 in Alternative E.

Some people said lease stipulations identifying constraints on developing oil & gas, coal, or geothermal resources should be one of the decisions made as a part of the management direction. One commenter said the management direction in HU S3 should be retained as a standard.

The scoping proposed action contained a guideline that said stipulations should be developed at the leasing stage to limit the timing of activities and surface use and occupancy for actions proposed in lynx habitat. Alternative B, the Proposed Action, does not include similar language, nor do any of the other alternatives.

The main effects of leases and mines on lynx are related to the potential for plowed roads to provide access for lynx competitors, particularly coyotes (LCAS). In the planning area, about 39 wells or well pads are predicted to be developed over the next ten years; most of them on the Bridger-Teton National Forest (see the *Minerals* section in Chapter 3).

To address the risk of providing access to competitors, the action alternatives contain direction restricting mineral access to specified routes, encouraging remote monitoring, developing reclamation plans, and managing public access. See Standard HU S3 and Guideline HU G4. This direction applies to areas already leased.

When an energy-related project is proposed on leased lands, the lessee must obtain approval from the BLM and FS for any activities, even though the lessee has legal rights to develop. All leases include a standard term (Sec 6. of Lease Terms) that says the "lessee shall conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources…" Before any disturbance may take place, surveys or studies may be needed to find the extent of impacts to other resources. If in the conduct of operations threatened or endangered species are observed the lessee shall immediately contact the lessor, and the lessee shall cease any operations that would result in the destruction of such species (cite in project file). Standard lease terms say drilling operations can be moved either in place – up to 200 meters, or in time – up to 60 days (43 CFR 3101.1-2).

An ID team would review the existing lease terms and the existing plan, as amended, to find if any further site-specific resource protection measures should be applied as conditions of approval for the surface-use plan of operations. The management direction in the plan, as amended by the chosen alternative would be applied as conditions of approval, where appropriate, for new drilling permits.

The standard terms allow timing and location adjustments to be made where needed and all action alternatives address the risk of providing access to lynx competitors. Mineral activities are not widespread, are subject to laws and regulations, and are not considered a threat to lynx populations as a whole (USDI FWS 2000a, and Appendix P). Their effects are appropriately evaluated

and mitigated at the project level. In light of the existing guidance and constraints on leased minerals, the lynx ID team recommended that no further lease stipulations were needed to provide for the conservation and recovery of lynx. Therefore, the language in the scoping proposed action was dropped, and an alternative to specifically include lease stipulations was not considered in detail.

The management direction requiring use of only designated routes was kept as a guideline in Alternative F, to be consistent with other similar management direction for over-the-snow recreation.

Roads

Little information is available about the effects of roads and trails on lynx or its prey (Apps 2000; McKelvey et al. 2000d). Roads may reduce lynx habitat by removing forest cover. Along less-traveled roads where the vegetation provides good hare habitat, sometimes lynx use the roadbeds for travel and foraging (Koehler and Brittell 1990; LCAS, p. 2-12).

Roads and trails facilitate human use during winter. Snow compaction on roads and trails may give competing carnivores winter access into lynx habitat (Buskirk et al. 2000a), a concern addressed in Standards HU S1 and HU S3, and Guidelines HU G11 and HU G12.

Although many species of wildlife are disturbed when forest roads are used (Ruediger 1996), preliminary information suggests lynx do not avoid roads (Ruggiero et al. 2000a) except at high traffic volumes (Apps 2000). In denning habitat, when roads are used during summer, lynx may be affected if they move their kittens to avoid the disturbance (Ruggiero et al. 2000b; LCAS, p. 2-12).

A recent analysis on the Okanogan NF in Washington showed lynx neither preferred nor avoided forest roads, and that the low road density in the study area did not appear to affect lynx habitat selection (McKelvey et al. 2000c; USDI FWS 2000a, p. 39). This analysis did not address potential indirect effects on habitat quality.

Alternative B – as well as Alternatives C, D, and E contain management direction that would minimize snow compaction in new places in lynx habitat and provide for habitat connectivity. The direction is found in ***Objectives ALL O1, HU O1, and HU O6; Standards HU S1, HU S3, and LINK S1, and Guidelines ALL G1, HU G4, HU G6, HU G7, HU G8, HU G9, HU G11, and HU G12.***

Some people said more restrictions on roads were needed to conserve lynx. They wanted new road construction halted, road densities identified and existing roads closed or eliminated, or they wanted the roads guidelines turned into standards.

Other people said there should be no road-related standards or guidelines, saying no evidence exists that roads harm lynx. Some people said Guideline HU G9 should be deleted because there are no compelling reasons to close roads.

The ID team reviewed the LCAS and other literature, including the FWS Remand Notice (Appendix P), and found no information indicating road building should be banned or that further restrictions were needed. The standards and guidelines adequately address the known risks associated with roads.

The ID team also evaluated whether the road-related guidelines should be made into standards. The ID team determined guidelines were the appropriate level of management direction because roads have not been found to be a threat to lynx populations. Some management direction is warranted because roads may affect individual lynx.

The ID team also evaluated whether an alternative should be developed that dropped all road-related guidance. Alternative A covers this, and the available information indicates some direction is needed to make sure lynx needs are considered in road management decisions; therefore, a separate alternative to drop road-related direction was not considered in detail. The ID team did change the emphasis of Guideline HU G6 in Alternative B from prohibiting road upgrades to mitigating the effects in Alternatives C, D, E, and F.

Some people asked for a standard limiting the density of roads.

The density of roads does not appear to affect lynx habitat selection. On page 2-12, the LCAS said there was no compelling evidence to suggest managing road densities was necessary to conserve lynx.

All alternatives contain Guideline HU 9, which says public use should be restricted on new roads. New roads are to be decommissioned after use if they are not needed for other reasons.

The scoping proposed action included a guideline to prioritize reducing road densities in lynx habitat. This guideline was dropped from the DEIS Proposed Action, Alternative B, because in 2000, the Roads Analysis policy was adopted at 36 CFR 212.5(2). This new federal regulation says all FS road systems must be evaluated based on their environmental effects to see whether they should be kept or decommissioned. Therefore, the guideline is no longer needed.

The ID team decided not to consider a road density standard in detail because there is no compelling evidence it is needed. Guideline HU G9 provides direction on new roads, and the Roads Policy requires reviewing existing roads.

Highways

Highways impact lynx by fragmenting habitat and impeding movement. As traffic lanes, volume, speeds, and rights-of way increase, the effects on lynx are increased. As human demographics change, highways tend to increase in size and traffic density.

In ***Alternative B, Objective ALL O1 and Standard LINK S1*** are designed to maintain linkage and habitat connectivity by identifying highway crossings.

Alternatives C, D, and E also have the same objective and standard.

Some people said more should be done than just identifying highway crossings. FWS did not comment on management direction related to highways.

The LCAS recommended project standards for highways. It says to "Identify, map and prioritize site-specific locations, using topographic and vegetation features, to determine where highway crossings are needed to reduce highway impacts on lynx and other wildlife". Alternatives B, C, D, E and F include Standard LINK S1 which reflects the intent of the LCAS recommendations. In addition, Guideline ALL G1 says "Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal land. Methods could include fencing, underpasses or overpasses."

As noted in Chapter 3, Transportation Section, portions of three highways are likely to be reconstructed in linkage areas in the next ten years. Each state agency, Wyoming, Idaho and Montana are incorporating wildlife crossing into their highway design packages (Wyoming Department of Transportation, 2005; Idaho Transportation Department 2004; Montana DOT, FHWA, Confederated Kootenai and Salish Tribes 2006). Therefore no further management direction regarding wildlife crossings in the form of standards was found to be warranted.

Other suggestions

Prohibit logging in lynx travel corridors

Some people said logging should not be allowed in lynx travel corridors.

Studies of lynx and snowshoe hare have documented lynx presence and reproduction and snowshoe hare abundance in a variety of managed landscapes (Appendix P). While it is assumed lynx would prefer to travel where there is forested cover, the literature contains many examples of lynx crossing large, unforested openings (Roe et al. 2000).

In the northern Rockies, lynx habitat occurs at higher elevations and, therefore is naturally fragmented by topography into island-like patches (McKelvey et al. 2000b). Lynx cross intervening landscapes, made up of shrub-steppe, grassland, low-elevation forested, or unforested valleys, and in some cases, desert, to reach these habitat islands (Appendix P).

Retaining vegetation to provide cover for lynx and habitat for prey is desirable. For those plans already amended by INFISH (Inland Native Fish Strategy) and PACFISH (Interim Strategy for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California), management direction exists to retain riparian habitat and provide for connectivity (Hickenbottom et al. 1999, p.71).

Logging units can be designed to provide cover or movement corridors

between blocks of lynx habitat. The action alternatives include Standard ALL S1, which requires logging to maintain habitat connectivity.

The ID team evaluated this concern and determined that the action alternatives already included a standard to maintain habitat connectivity. No compelling evidence has been presented to show logging in travel corridors effects lynx, so an alternative prohibiting it is not warranted.

Establish only objectives for lynx management, not standards

Some people would like all the proposed management direction to be objectives. They said standards should not be established because there is so little information about lynx.

Objectives describe desired resource conditions. Standards are required management actions that tell resource managers how to achieve the objectives; standards can include requirements to refrain from taking action in some situations.

Much of the reason the management direction is needed is that existing plans fail to reduce or eliminate the adverse effects of land management activities on lynx. Lynx was listed by the FWS as a threatened species because of the lack of management direction in existing plans. The 1999 BA found existing plans were likely to adversely affect lynx because of the lack of management direction.

Adding more objectives would not answer this need because objectives only describe desired conditions. Standards provide greater assurance that the desired conditions would be met; they are better regulatory mechanisms. Standards describe what the limits are for activities and the sideboards for management.

The ID team evaluated this comment, and decided that establishing only objectives would not meet the Purpose and Need.

Apply lynx conservation measures to areas that have not been mapped as lynx habitat

Some people wanted the proposed management direction to be applied to areas that have not been identified as lynx habitat.

Alternative B would apply management direction to lynx habitat identified at the time a project is proposed – see Chapter 1.

The criteria for identifying lynx habitat were developed in the LCAS (pp. 4-8 to 4-11) based on snow conditions, vegetation types, and the verified historical distribution of lynx as described in the Ruggiero et al. 2000a (see FEIS Appendix B).

To be considered lynx habitat, an area must be able to support the type and arrangement of vegetation that sustains enough snowshoe hares, and experience the deep snow winters where lynx have a competitive advantage (Appendix P). Landscapes with these characteristics are considered capable of providing habitat components adequate for lynx to persist over time.

While lynx sometimes may occur in areas outside of lynx habitat, it is

unlikely that those areas provide what lynx need to persist over time. No scientific basis has been offered for applying lynx conservation measures to habitats other than those described in the LCAS. There is no basis to conclude that applying the measures to other habitats would provide any additional benefits to lynx. Consequently, no alternatives have been developed to expand where management direction would be applied.

During site-specific project analysis, maps of lynx habitat would be reviewed and updated based on local information. In addition, ESA requires that adverse effects on lynx must be addressed whenever projects may affect them. Future plan amendments or revisions may also consider lynx and information about local lynx presence as appropriate. However, at this time and at the broad scale of this proposal, there is no basis for directing the conservation measures to apply to anything but the lynx habitat identified using the existing criteria.

Apply the management direction only to occupied lynx habitat

The ID team considered whether to develop alternatives to apply the management direction only to occupied lynx habitat rather than to all identified lynx habitat. In the DEIS, the ID team said the management direction should apply to all habitats that could support lynx. The ID team reevaluated this recommendation based on public comments received on the DEIS and new information since the DEIS.

Some people asked that the direction apply only to occupied habitat (places where the presence of lynx has been proven) and areas likely to sustain lynx.

When the DEIS was issued in January 2004 no information was available regarding which units were considered occupied or unoccupied by lynx or what areas were needed to sustain lynx.

In May of 2005 the FS and FWS signed a new *Canada Lynx Conservation Agreement* (USDA FS, USDI FWS 2005) to replace the 2000 Conservation Agreement, which had expired. The 2005 agreement only applied to NFS land mapped as occupied lynx habitat, and was only in force until the forest plans were amended or revised to conserve lynx. The agreement also said the agencies would work together to identify occupied habitat.

The *Amendment to the Conservation Agreement*, dated May12, 2006, between the FS and FWS defined occupied habitat on national forests in the northern and southern Rocky Mountains and the Cascade Range (Forest Service Region 1, 2, 4 and 6). (Note: The conservation agreement was reissued in October 2006 with an extend expiration date).

All lynx habitat on an entire national forest is considered "occupied" by lynx when:

1. There are at least two verified lynx observations or records since 1999 on the national forest unless they are verified to be transient individuals; or

2. There is evidence of lynx reproduction on national forest.

Based on these considerations twelve national forest units within the planning area are considered occupied; six are not – see Table 1-1 and Appendix C. Several disjunct mountain ranges on the Custer, Gallatin, Helena and Lewis and Clark NFs are also considered unoccupied.

In November 2006, the FWS designated critical habitat for the Canada lynx (USDI FWS 2006). In its listing it defines critical habitat as (i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. Conservation is a process which contributes to improving the status of a species.

The final rule did not include NFS lands covered by a conservation agreement for lynx, which includes portions of the Flathead, Helena, Idaho Panhandle, Kootenai, Lewis and Clark, and Lolo National Forests. These units meet criterion (I) above; however they did not meet criterion (II) because the FS is following the conservation agreement which says to consider the LCAS when designing projects or activities. These units do not reflect all units that are occupied by lynx. Other units, including the Targhee, Custer, Gallatin, Bridger-Teton, and Shoshone National Forests are occupied but were not considered for designation as critical habitat. None of the unoccupied units, the Nez Perce, Salmon-Challis, Beaverhead-Deerlodge, Bitterroot, Ashley or Bighorn NFs – or the disjunct mountain ranges on the Custer, Gallatin, Helena and Lewis and Clark NFs– were considered for critical habitat.

In addition to the critical habitat listing, the FWS also issued a *Recovery Outline* in 2005 (USDI FWS 2005a). The outline identifies *core, secondary* and *periphery* habitat. *Core* areas include areas with the strongest long-term evidence of persistence of lynx populations within the contiguous United States. Core areas have both persistent verified records of lynx occurrence over time and recent evidence of reproduction. There are no unoccupied units that have been identified as core.

The *Recovery Outline* says, "Focusing lynx conservation efforts in these core areas would ensure the continued persistence of lynx in the contiguous United States by addressing fundamental principles of conservation biology." It goes on to say "Recovery of lynx will be achieved when conditions have been attained that will allow lynx populations to persist long term in each of the identified cores areas".

Secondary areas are those with historical records of lynx presence with no record of reproduction; or areas with historical records and no recent surveys to

document the presence of lynx and/or lynx reproduction. If future surveys document presence and reproduction in secondary areas, the area could be elevated to core. Secondary areas may support lynx during dispersal movements or other periods, allowing animals to then return to core areas.

Four of the National Forests that are unoccupied are considered secondary habitat. One unit, the Nez Perce NF had not been surveyed for lynx presence but is currently being surveyed. Based on the survey efforts the Nez Perce NF would either be identified as occupied or remain as unoccupied.

In *peripheral areas* the majority of historical lynx records are sporadic and generally corresponds to periods following cyclic lynx population highs in Canada. There is no evidence of long-term presence or reproduction that might indicate colonization or sustained use of these areas by lynx. Two units, the Bighorn and Ashley National Forests, and the disjunct mountain ranges on the Custer and Lewis and Clark have been identified as peripheral habitat. None of these areas are occupied at this time.

Based on this new information and to be responsive to comments the ID team determined it would be reasonable to consider an alternative that only applies the management direction to occupied habitat. All core areas are occupied and these are the areas which have been identified as necessary to sustain lynx.

Therefore, the ID team decided to evaluate Alternative F under two scenarios: (1) management direction would be incorporated into all forest plans and would apply to all mapped lynx habitat, whether or not occupied; and (2) management direction would be incorporated into all forest plans but would only apply to occupied habitat. Under scenario 2, the direction would be "considered" for unoccupied units, but would not have to be followed until such time as lynx occupy the unit.

Move lynx into unoccupied habitat

Some people said the proposal should propose transplanting lynx into unoccupied habitat.

Transplanting is outside the scope of the Purpose and Need to manage habitat to conserve lynx; therefore, this comment was not considered in further detail.

Restrict hare hunting

Some people said the proposal should restricting hare hunting.

The states regulate hunting. Regulating hunting is outside the authority of the FS, which is a federal land management agency. Therefore, the ID team did not consider this comment in further detail.

Include all the recommendations in the LCAS

People said some requirements in the LCAS were missing from the scoping proposed action.

The ID team rearranged the LCAS recommendations to match the format of land management plans. Some recommendations from the LCAS were not included in the alternatives because they were instructions about how to map lynx habitat, they were

descriptions of an analysis process, or they were already required in existing plan direction. FEIS Appendix A is a crosswalk between the LCAS, and the scoping proposed action, the DEIS/FEIS Proposed Action (Alternative B), and Alternative F, the FEIS preferred alternative. Appendix A displays what recommendations were put into Alternative B, what recommendations from the LCAS were not included in the proposal, and explains why they were not included.

Include an alternative that: 1) prohibits grazing; 2) prohibits snowmobiles; 3) does not let ski areas expand one more foot; 4) bans road construction; 5) bans loggers and mining and oil and gas leases; and 6) bans hunting.

A few people wanted an alternative that closed the public land to most uses.

Many of these prohibitions were considered individually, but not in detail (see previous discussions in this section). The Purpose and Need for the proposed proposal is to incorporate management direction that conserves and promotes recovery of Canada lynx by reducing or eliminating adverse effects from land management activities on NFS lands, **while** still preserving the overall multiple-use direction in existing plans (FEIS, p. 1). Banning or prohibiting many of the activities on federal land is beyond what is necessary to conserve lynx, and would not preserve the overall multiple-use direction in existing plans. Therefore, the ID team did not consider this comment in further detail.

Consider a standard that requires engaging in spatially explicit landscape planning within very large management areas and is conservative in retaining habitat components.

One person wanted a standard requiring the units to do landscape planning.

The standards and guidelines in the alternatives were developed to address the risk factors to lynx identified in the LCAS.

The ID team reviewed this comment and determined there is no reason to compel a unit to do landscape planning because planning, in and of itself, does not address the risk factors.

The standards and guidelines do not prohibit nor compel a forest to do landscape planning. However, in Standard VEG S1 landscape planning may be used to modify the 30 percent requirement. Also, as noted in the discussion on VEG S1 on page 71 to 73 FWS was concerned about expanding the area of analysis beyond one LAU. Therefore, the ID team decided not to consider this in further detail.

Other concerns

People asked other questions in their scoping letters and in the comments on the DEIS that were not about the effects of the management direction.

Resource topics

People were concerned about the effects of Alternative B and the other action alternatives on various resources, including:

- *Other wildlife*
- *Range management*
- *Recreation*
- *Developing and exploring for minerals*
- *Economic well-being*
- *Social concerns*

The effects on these resource topics are discussed in Chapter 3, but did not lead to developing other alternatives.

Why was lynx listed as a threatened species?

The Listing Decision is not the responsibility of the FS. FWS is the agency responsible for listing decisions. They made the decision to list lynx based on several criteria included in ESA. On March 24, 2000, the FWS decided lynx should be listed as a threatened species because of the lack of guidance to conserve lynx in existing National Forest Land and Resource Plans (Appendix O).

Once a species is listed under ESA, federal land management agencies, such as the FS are responsible to make sure their actions are not likely to jeopardize the continued existence of that species, or to result in destroying or unfavorably changing its habitat. We are required to conserve the species, to take steps to eliminate or reduce the risk factors that led to the species being listed.

What is the scientific basis for the Proposed Action?

Proposed Action, Alternative B, is based on the conservation recommendations identified in the LCAS (Ruediger et al 2000). A team of biologists from FS, BLM, FWS, and the National Park Service developed the LCAS. They evaluated the scientific information available about lynx and its prey and the habitat needs of both.

In the LCAS, literature was cited to support management recommendations. For many issues, little information existed. In these cases, assumptions or inferences were made based on the collective experience and professional judgment of the team members in consultation with other lynx experts. The rationale was documented in the LCAS in these situations.

Most lynx research has been conducted in Alaska and Canada, with a small but growing number of studies completed in the contiguous United States, which contains the southern portion of lynx range. Most research has focused on demographics and ecology, with little emphasis on management, except for regulating trapping quotas.

At the time the LCAS was being developed, another team of scientists was preparing an assessment of the scientific basis for lynx conservation. They

published the *Ecology and Conservation of Lynx in the United States (Ruggiero et al.* 2000a). Their findings were integrated into the LCAS.

Chapter 8 of the LCAS identifies what research is needed, where little is known about the effects on lynx and its prey from such human-driven actions as precommercial thinning, snow compaction, highways, forest road densities, human developments, livestock grazing, etc. Several ongoing research efforts address these topics (See FEIS Appendix F). Research is underway in southern British Columbia, Montana, Wyoming, Washington, Utah, Idaho, Colorado, and Maine that could lead to further insights for lynx management.

In developing the Proposed Action the ID team reviewed and considered the LCAS, the *Ecology and Conservation of Lynx in the United States*, the 1999 BA, the 2000 BO, the Listing Decision, the Remand Notice (Appendix P), and other information currently available.

Why is not more being done than what was included in the Proposed Action? How do you know the Proposed Action will be enough?

Some people proposed prohibiting timber harvest in old-growth or mature stands, prohibiting grazing, further restricting or prohibiting all over-the-snow activities and removing roads in lynx habitat.

These suggestions were discussed in the previous section entitled *Management direction considerations*.

The LCAS recommendations were designed to conserve lynx, and were based on the best scientific information available. The primary source of this information, the *Ecology and Conservation of Lynx in the United States* (Ruggiero, et al. 2000a) was peer-reviewed scientific literature.

The LCAS recommendations were designed to retain future management options; a conservative approach, intended to avoid irrevocable commitments of resources that might ultimately prove to be crucial to lynx. The LCAS biology team determined that if the recommended measures were implemented, they would conserve lynx (LCAS, p. 7-1).

In addition, on page 58, the 1999 BO from the FWS said,

> *The direction provided by the conservation measures would assist Federal agencies in avoiding negative impacts on lynx. Based on the best scientific and commercial information currently available, we believe that Plans that incorporate the conservation measures, and projects that implement them, are generally not expected to have adverse impacts on lynx. Implementation of the measures in the LCAS across the range of lynx is expected to lead to the conservation of the species.*

The Proposed Action incorporated essentially all the recommended conservation measures in the LCAS (see Appendix A, the crosswalk between the LCAS, and the proposed action). The ID team determined the effects of Alternative B would be the same as those resulting from the LCAS. While the effects would

be slightly different for each of the action alternatives, all of the action alternatives would contribute to conserving lynx by addressing the deficiencies in existing plans, which was the basis for listing lynx as threatened.

Except for the issue about the effects of management activities on winter snowshoe hare habitat in multistoried forests, the public comments have identified no new information that suggests effects on lynx would be greater than anticipated. This information has been incorporated into the standards and guidelines in Alternative F.

Based on the ID team's review, there is no reason to consider conservation measures beyond those recommended in the LCAS because including them would not produce additional benefits for lynx. Further, most of the addition suggested measures would not meet the Purpose and Need of conserving lynx while maintaining the multiple-use objectives in existing plans.

As noted, more research is needed and is underway. If new information suggests different management direction is required to conserve and recover lynx, then plans would be reviewed. Subsequent planning, including ongoing and scheduled revisions, may address lynx needs where there is a need to respond to information on an individual administrative unit.

Why was just one proposal proposed for a four-state area?

The FS believes that whenever practical, management direction should be developed at the local level. In this case, developing direction locally was not practical because new information affecting many plans needed to be addressed consistently. Even though the proposal covers a large area, its scope was narrowly defined.

Why was the proposal limited to 18 national forests, instead of all the administrative units in the northern Rockies geographic area? Will this result in inconsistent management?

Eleven National Forests and the BLM units in the geographic area are addressing new information about lynx in separate planning processes (see Chapter 1).

The ID team has coordinated with these units to ensure the management direction for lynx is as consistent as possible across the range of lynx. Even so, it is likely planning for individual units would result in different decisions because of differing habitat conditions, historic management, the amount and kind of information available, and the ways direction would be integrated with other needs in these plans.

How does the National Lynx Survey affect this proposal?

The National Lynx Survey was a systematic national study conducted to evaluate lynx distribution in the listing area. When the survey detected the presence of lynx, researchers followed up with snow-tracking surveys (Squires et al., 2004 and McKelvey et al., in press) and sometimes radio-telemetry studies. This was done to help determine whether an

individual lynx passed through the area or there were lynx living in the area.

The results of the survey increased our knowledge about the distribution of lynx and their use of habitat. The survey also identified those National Forests and other public lands that are occupied by lynx.

How does the fact that hybrid lynx were found in Minnesota affect this proposal?

In 2003, FS scientists using DNA analysis discovered the first scientific evidence of hybridization in the wild between a Canada lynx and a bobcat.

Because of these findings, the FS conducted a DNA analysis of most of the lynx hair samples collected under the National Lynx Survey to see if hybridization had occurred elsewhere. So far, no additional instances have been detected.

There is no evidence of hybridization in the planning area, so this issue does not affect the proposal and there is no need to address the single case of hybridization further.

Why are trapping and shooting not addressed in the Proposed Action?

These activities are outside the jurisdiction of the FS, which is a federal land management agency.

The states regulate trapping and shooting. Trapping for lynx is not allowed in Montana, Idaho, Wyoming, Utah, or Washington. Occasionally, lynx are incidentally captured during the trapping seasons for bobcat and wolverine, mostly in Idaho, Montana, and Wyoming.

Why is predator control not addressed in the Proposed Action?

On federal lands, the USDA Wildlife Service is responsible for predator control. Predator control activities are outside the jurisdiction of the FS. There is less predator control going on now than historically occurred. It is aimed at target species and it generally takes place outside lynx habitat, in lower elevation rangelands (LCAS, p. 4-12).

Since the ban on poisons such as 1080, predator control on federal lands likely has a low potential to affect lynx (LCAS, p. 4-12). Predator control on private lands is not as closely controlled as that on federal lands, but generally occurs outside lynx habitat.