Biological Assessment
of the Effects on Wildlife Resources
from the Gray's Creek Fire Salvage Project

Council Ranger District
Payette National Forest
USDA Forest Service

14 April 2008

Summary

This Biological Assessment (BA) was completed to disclose the effects of the Gray's Creek Fire Salvage Project on federally-listed wildlife species and proposed species and critical habitats.

The following determinations are presented in the BA.
The proposed action may affect, but is not likely to adversely affect the Canada lynx.
The proposed action may affect, but is not likely to adversely affect the Northern Idaho ground squirrel.
No proposed species or critical habitats occur on the Council Ranger District.

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Introduction

The Grays Creek fire started on August 30, 2007, as the result of a dry lightning storm. A prolonged period of hot, dry weather and record low fuel moistures combined with high winds resulting in rapid fire spread across approximately 25,000 acres of Forest Service, private, State of Idaho, and Bureau of Land Management lands (Figure 1). Approximately half of the fire occurred on the Payette National Forest (PNF).

The fire created a mosaic of low, moderate, and high intensity burned areas. Forested areas that burned at moderate to high intensity experienced high levels of mortality with many areas of stand replacement. Low intensity burned areas have varying levels of mortality depending upon pre-fire levels of ground fuels, topography, and understory vegetation conditions.

A Burned Area Emergency Rehabilitation (BAER) plan was completed and identified several measures to reduce risks to life, property, and resources resulting from the fire. These included relief culvert replacements, road drainage and surface improvements, cut and fill slope stabilization, erosion control and hazard tree removal along recreational trails, and replacement of culverts on the Middle Fork Weiser River road at the Warm Springs, Bar, and Boulder Creek crossings. These new crossings would be designed to pass 100 year flows and provide for passage of fish and other aquatic organisms.

Field work completed by the Interdisciplinary Team in support of this project has identified additional recovery needs that are being included in special federal fire recovery funding requests ("In- the-Black" monies). These efforts along with the BAER treatments will continue into next field season and will be considered as part of the baseline conditions and cumulative effects analysis completed for this project.

A 2001 environmental analysis of a large scale vegetation and watershed management project within much of the fire area (Middle Fork Weiser River Environmental Impact Statement [EIS]) is being used as a source of information for this analysis. To date, 5.6 miles of road obliteration is the only activity analyzed by the EIS that has been implemented. Given the changed conditions resulting from the fire, remaining activities analyzed by the Middle Fork EIS and covered under the Middle Fork EIS Record of Decision (ROD) will not be implemented.

Project Location

The Grays Creek Fire Salvage Project is located in the Middle Fork Weiser River and portion of the Little Weiser River watershed, approximately 5-10 miles south-southeast of Council, Idaho, in Adams County (Figure 1). The project area can be reached by taking Highway 95 south from Council, for approximately 5 miles, to the Middle Fork Weiser River Road. Primary access to the fire area is along the Middle Fork Weiser River Road and adjoining forest roads #50214 (Fall Creek Road), #50521 (Sugarloaf Road) and #50591 (Cabin Creek Road). The project area consists of approximately 10,322 acres of National Forest System lands, located in Township 16N, Range 2E, in all or portions of Sections 31 and 32; Township 16N, Range 1E, in all or portions of Section

36; Township 15N, Range 2E, in all of portions of Sections 4-8, and 18; Township 15N, Range 1E, in all or portions of Sections 1-4, 9-15, 21-23, 26-28, and 33-35; and Township 14N, Range 1E, in all or portions of Sections 2 and 3, as displayed using the Boise Meridian on the Payette National Forest Travel Map.

Purpose and Need

The primary purpose and need for this proposal is to recover the economic value of severely damaged merchantable trees and facilitate reforestation of fire damaged areas resulting from the Grays Creek Fire in the Grays Creek, Fall Creek, and Middle Fork Weiser River drainages on the Council Ranger District. There also is a need to maintain wildlife, watershed, and other important natural and cultural resources values in the fire-affected area.

Description of the Proposed Action

The following activities are being proposed to meet the stated purpose and need. This proposal focuses salvage and reforestation activities on an estimated 3,660 acres of the 10,322 acre project area on NFS lands outside of the Council Mountain Inventoried Roadless Area (Figures 2, 3, 4). Depending on the date of the decision document for the project, salvage harvest could start by late April, 2008, and should be completed by the end of December, 2008. ***For purposes of this BA, the most extreme level of salvage activities were considered, assuming that any lower level of activity would have equal, or less, affect on wildlife resources. This project was designed to provide appropriate habitat for white-headed woodpeckers (Picoides albolarvatus). An Action Area was delineated to identify the area within the Weiser River Watershed where proposed project activities could affect wildlife resources. The wildlife analyses included evaluation at the project and Action Area levels.***

Salvage Harvest Activities

The project area lies within a larger area that is classified as 5.2 Management Prescription Category in the Forest Plan. This area of National Forest land is managed for commodity production emphasis within forested landscapes. Therefore, commercial harvest of merchantable trees severely damaged by the fire, or subsequent fire-related bark beetle activity, is proposed on an estimated 3,108 acres.

Determining which trees will die from fire-related injuries has been studied for years and several models have been developed (See literature in the Gray's Creek Fire Salvage Project Environmental Assessment). While no model will ever be 100 % accurate, crown scorch and basal girdling are relatively easy to assess and can be used to identify severely damaged trees. These severely damaged trees have a low probability of surviving the fire damage and subsequent bark beetle attacks over the next 3-4 years.

The general process for evaluating a potential salvage tree would be to determine the amount of scorched crown, and then, if necessary, either evaluate cambium viability, or look for evidence of boring dust (frass) from successful bark beetle insect attacks on the tree.

The level of crown scorch would be assessed by visually estimating the percent of the pre-fire crown volume that was killed by the fire. Crown scorch evaluation would be easiest within the first year, because most trees would still retain scorched and blackened needles, allowing for easy assessment of crown scorch conditions.

To evaluate cambium viability, the base of the tree bole would be divided into four quadrants. Quadrants would be sampled using an axe to remove a small (about 1-inch square) section of bark to expose the cambium (inner bark, phloem) and allow for evaluation. If the cambium is brown, dried, blue stained, or contains bark beetle galleries, it is nonfunctioning and the tree would be considered dead. If the cambium were moist and white (or light green), the tree would be classified as live and would not be harvested. Sampling would start in the two most obviously scorched quadrants at the root crown. If two or more cambial samples are dead, the tree would be considered severely damaged, because its chances of survival are low.

The following key would be used to identify trees to salvage:

Salvage ponderosa pine (*Pinus ponderosa*) and western larch (*Larix occidentalis*):

Percent Crown Scorch

1) If < 25 % of the live crown is remaining – tree considered severely damaged.
2) If > 25 % of the live crown is remaining, **and** there is bole scorch or char then evaluate the condition of the cambium.

Cambium Evaluation

1) If 2 or more of the sample quadrants are dead – tree considered severely damaged.

Salvage Douglas-fir (*Pseudotsuga menziesia*):

Percent Crown Scorch

1) If < 35 % of the live crown is remaining – tree considered severely damaged.
2) If > 35 % of the live crown is remaining, **and** there is bole scorch or char then evaluate the condition of the cambium.

Cambium Evaluation

1) If 2 or more of the sample quadrants are dead – tree considered severely damaged.

Salvage grand fir (*Abies grandis*), Engelmann spruce (*Picea engelmannii*), lodgepole pine (*Pinus contorta*), and subalpine fir (*Abies lasiocarpa*):

Percent Crown Scorch

1) If < 50 % of the live crown is remaining – tree considered severely damaged.
2) If > 50 % of the live crown is remaining, **and** there is bole scorch or char then evaluate the condition of the cambium.

Cambium Evaluation

1) If 2 or more of the sample quadrants are dead – tree considered severely damaged

For assessing damage associated with bark beetles, salvage any tree species:

1) If >/= 50 % of the bole circumference exhibits beetle frass or blue stain, regardless of the fire damage.

Severely damaged trees in excess of wildlife and soil productivity needs would be removed, using a combination of harvest methods. Harvest systems would include 1,900 acres of ground-based harvest, including tractor, jammer, and off-road jammer harvest equipment; 502 acres of skyline harvest; and 706 acres of helicopter harvest. Ground-based harvest equipment would be limited to designated skid trails. Existing landing areas, work roads, or skidtrails would be used when practical. Log haul would utilize existing and temporary roads.

Temporary roads, landings, and skidtrails would be fully reclaimed after harvest, by ripping/grubbing to the depth of compaction, pulling any berms or fill material to re-establish the natural slope profile (as feasible), and scattering of available on-site slash to provide protective ground cover.

Tops and limbs of harvested trees would be retained on site to provide for ground cover and to retain micro-sites and coarse woody debris (CWD) where needed. Whole-tree yarding would be used, in areas with adequate levels of CWD, to reduce excess fuels and allow for more economical operations.

Other Salvage Considerations

To provide snag habitat for wildlife, clumps/groups of snags would be retained across salvage harvest areas as described below:

- Wildlife snags would be retained in clumps, where available, across harvest units, and for all Potential Vegetation Groups (PVGs) identified in the project area. This clumped distribution of snags is proposed to provide nesting and foraging sites for white-headed woodpeckers, in accordance with Forest Plan direction for Region 4 Sensitive wildlife species [the white-headed woodpecker also is a Management Indicator Species (MIS) for the PNF] and following habitat requirements of white-headed woodpeckers, as identified in recent research literature (Saab et al. 2004, USDA Forest Service 2006, Russell et al. 2007, Saab et al. 2007).

- Wildlife snag clumps would generally consist of 5 or more large size class trees, >/= 20 inches diameter at breast height (DBH) (following snag retention criteria as suggested by V. Saab, Forest Service ornithologist, personal communication, 2007). Snags may be any tree species. Because of the specified size requirements, these snags would often be larger diameter ponderosa pine, followed by Douglas-fir, western larch, and grand fir.

- We note that 5 ponderosa pines of the preferred size class may not be available in every acre of each salvage unit. When clumps of the required number of large diameter trees are not available in a unit, the minimum number required for the salvage unit may be either clumped, as feasible, or distributed as they occur

across the unit. In such cases, the number of large DBH trees would be supplemented by the next tree species available, such as Douglas-fir, or grand fir.

- Likewise, some salvage units may not have any snags in the larger size class. In such cases, the required number of snags will be retained in the 10-19 inch DBH size class, using the species preference noted above.

- These snag requirements differ slightly (higher numbers of snags; larger size class of snags; snags retained in clumps; snags distributed over the entire harvest unit) from the snag retention requirements suggested in the Forest Plan (USDA Forest Service 2003, Table A-8, p. A-9). The project snag requirements provide more snag retention than suggested in the Forest Plan, because they are designed to meet specific white-headed woodpecker habitat requirements, which also would trend habitat towards the historic fire regime, as described by Wisdom et al. (2000). This snag retention strategy also will provide various habitat components for other R4 Sensitive species, such as pileated woodpeckers (also a PNF MIS), flammulated owls, boreal owls, and fishers, which all require snags for cavity nesting and/or feeding.

- Approximately 5-18 tons of fire-damaged material per acre (65-75 % of which is >/= 15 inch diameter logs) would be felled and retained on the ground for CWD to provide future soil production, long-term site productivity needs, and wildlife habitat in moderate to high intensity burn areas, where appropriate levels of CWD burned in the fire. This level of CWD (25 % above the normal Forest Plan requirements) is estimated to require from 8-11 trees per acre >/= 15 inch DBH to be felled and retained on-site, depending on the PVGs identified for each salvage unit (see the Soils section in the EA for more details). In very low to low intensity burn areas, 4-14 tons of fire-damaged material per acre would be retained on the ground for CWD, following the normal Forest Plan requirements.

- In specific circumstances, salvage harvesting may be allowed in RCAs, following review and approval by the District fisheries biologist and in accordance with Forest Plan standards and guidelines (see Fisheries discussion in the EA).

- Other features incorporated into the project design include no salvage or equipment operations within the Council Mountain Inventoried Roadless Area, and no permanent road construction.

Reforestation Activities

Reforestation (seedling planting) would be implemented in fire-damaged young plantations, salvage harvest areas, and RCAs that burned at moderate and high intensity. Adequate natural regeneration is not expected, except in moist riparian areas and in some areas positioned on lower slopes and north aspects, due to lack of nearby conifer seed sources. Cone development was poor in this area in 2007 and little seed is expected to be produced from the remaining live trees in 2008. Furthermore, it is difficult to predict when the next abundant cone crop will occur. As grasses and brush species re-vegetate

the burned areas, natural regeneration from the seeds of remaining live trees would become less likely to provide adequate future conifer regeneration.

An estimated 550 acres of young plantations burned by the fire would be replanted in 2008 as follows:

- Manual scalping of duff, litter, and ground vegetation from a 2 ft x 2 ft area to prepare planting spots.

- Planting a mix of ponderosa pine, Douglas-fir, and western larch seedlings at varied spacing to take advantage of existing micro sites, resulting in 270-390 trees per acre.

- Seedling stocking rates may exceed those usually used in plantations, where seedling losses are likely caused by northern pocket gophers (*Thomomys talpoides*) and ground squirrels (*Spermophilus* spp). In order to prevent take of Northern Idaho ground squirrels that may be in the project area, no rodenticides or trapping will be used to control the expected seedling mortality caused by these animals.

An estimated 2,720 acres in harvest units would be planted in 2009 and 2010. This includes all the moderate to high intensity burned areas and portions of the low intensity burn areas. Planting would be completed as follows:

- Manual scalping of duff, litter, and ground vegetation from a 2 ft x 2 ft area to prepare planting spots.

- Planting a mix of ponderosa pine and Douglas-fir seedlings at varied spacing to take advantage of existing micro sites, resulting in 270-390 trees per acre. In addition, a small number of suitable areas would also include western larch as part of the planting mix.

An estimated 190-590 acres of RCAs in moderate to high intensity burn areas, where tree seed sources are lacking, would be evaluated for planting needs. The level of riparian planting would be dependent upon site specific conditions and funding availability.

Planting would be completed as follows:

- Manual scalping of duff, litter, and ground vegetation from a 2 ft x 2 ft area to prepare planting spots.

- Planting a mix of ponderosa pine, Douglas-fir, and Engelmann spruce seedlings at varied spacing to take advantage of existing micro sites, resulting in 175-200 trees per acre.

By 2009, shrub and grass cover may become a concern in some areas for competition with tree seedlings. In these areas, where slopes allow (< 45 %), excavators may be used to scalp planting areas where the vegetation is too dense to scalp by hand. This activity would involve walking an excavator through areas and reaching out as far as possible to clear small (2-3 ft x 2-3 ft) planting sites with the bucket. Steeper areas, where use of excavator spot planting preparation is not an option, would be prioritized for planting in 2009 and areas < 45 % slope would be planned for planting in 2010.

Road Activities

An estimated 4.4 miles of temporary roads would be built to accommodate harvest activities. These roads consist of short spurs, ranging from 0.25 to 1.0 mile in length, and are proposed to allow for access to landing locations for skyline and ground-based harvest systems. Roads would be located on suitable terrain outside of landslide prone areas. Without these roads, helicopter harvesting would be required in these areas. Temporary roads would be reclaimed upon completion of salvage activities. Reclamation would include ripping the compacted road surfaces to the depth of compaction, re-contouring to the natural slope profile (as much as possible) where needed, and scattering of available organic matter (logs, limbs, needles, etc.) across 35-50 % of the disturbed area to serve as protective ground cover.

In addition, several miles of native surface or poor-condition roads used for log haul would be reconstructed to improve surface and drainage conditions and assist in reducing sediment impacts from proposed salvage activities. Reconstruction would include gravelling the travel surface or stream crossings, installing drain dips or water bars, and clearing of relief ditches and culverts as needed.

Several temporary and permanent road easements also would be secured to facilitate harvest, log haul, and subsequent reforestation in areas accessed through other ownerships in the project area. Improvements to private roads (surfacing, drainage, etc.) also would be completed as part of easement agreements.

An estimated 2.4 miles of existing, old harvest work roads with identified erosion or sediment concerns are identified for decommissioning, to reduce watershed impacts and assist in off-setting impacts from salvage activities. Additional decommissioning may be identified as needed to further reduce and mitigate environmental impacts of proposed salvage activities. Decommissioning would include ripping the existing compacted road surfaces to the depth of compaction, re-contouring to the natural slope profile (as much as possible), where needed, scattering of available organic matter (logs, limbs, needles, etc.) across 35-50 % of the disturbed area, use of on-site vegetation “plugs” and seeding/mulching with weed-free straw and seed, to facilitate ground cover re-establishment and reduce the potential for soil erosion. Roads proposed for decommissioning will not be needed for long-term forest management access and have been prioritized for decommissioning in the former Middle Fork Weiser River EIS.

Wildlife Species Considered for Analysis

Following the Endangered Species Act of 1973 (ESA), as amended, the USDI Fish and Wildlife Service (FWS) identified the Canada lynx and Northern Idaho ground squirrel (NIDGS) as Threatened terrestrial wildlife species in the bi-annual Forest-wide Quarterly Species List (#2008-SL-0116, dated 10 Jan 2008). No Endangered or Proposed wildlife species are listed for the Council Ranger District and there is no Critical Habitat or Proposed Critical Habitat identified on the District.

Canada lynx (*Lynx canadensis*)

Status and Management

The Final Rule to list the lynx as Threatened under ESA by the FWS occurred in March 2000 (65 CFR 16052). In 2000, the Forest Service, as part of an interagency team, developed the Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000), to provide a consistent and effective approach to conserve Canada lynx on federal lands. During 2002, an effort began to amend existing Forest Plans that were several years from revision, or had just completed revision, so that they would be consistent with the LACS. The intent of this amendment is to make existing Plans that have little, if any, direction for lynx management, consistent with the LCAS. The final EIS for this amendment was signed March 23, 2007.

The PNF is within the area covered by the Northern Rockies Lynx Amendment, but is not included in the amendment process, because the PNF revised the Forest Plan in 2003 and included appropriate LCAS direction. An attempt also was made to make the Forest Plan direction consistent with the Northern Rockies Lynx Amendment, but because the latter document took 4 more years to complete, some sections differ from Forest Plan and LCAS direction.

Distribution

The lynx has a circumboreal distribution. In North America, the Canada lynx range includes nearly all of Canada and Alaska, and extends south into the northern, forested portions of the conterminous United States. In the western states, lynx are known to occur in Washington, Idaho, Montana, and Wyoming, along the spine of the Rocky Mountains.

Lynx may be present in the vicinity of the PNF; there was one verified lynx sighting in 1957, but there has been no verified lynx observation since then (PNF wildlife observation files 2006). The Idaho Conservation Data Center maintains statewide records of rare animal observations (Idaho Conservation Data Center 2002). There are 38 records through 2002 for lynx in the Southwest Idaho Ecogroup (Boise, Payette, and Sawtooth national forests) and 5 records through 2002 for lynx on the PNF (Table 1). Several unverified lynx observations by qualified observers have been recorded on the Council Ranger District over the past decade (Council Ranger District wildlife observation files 2008). The nearest of these observations was in the vicinity of Bear

Creek, near the Forest Service Bear Work Center, in 1996, about 20 miles northwest of the Gray's Creek Fire project area, and involved a fire fighting crew viewing an adult female and kitten.

During 1999, a national effort was undertaken to collect lynx hair samples for DNA analysis. This survey was not intended to be a population monitoring or presence/absence detection approach, but rather an attempt to determine DNA variability for any lynx detected from collected hair samples. Survey areas were selected by local biologists, for the highest likelihood of encountering a lynx and collecting a hair sample. No hair samples were obtained from the PNF during the survey, but 2 lynx hair samples were collected on the Boise National Forest in 1999.

Life History

Preferred prey of lynx consists primarily of snowshoe hares (*Lepus americanus*) (35-97 % of lynx diet, especially in winter) and red squirrels (*Tamiasciurus hudsonicus*), as well as ground squirrels (*Spermophilus* spp.), porcupines (*Erethizon dorsatum*), beavers (*Castor canadensis*), mice (*Peromyscus* spp.), voles (*Microtus* spp.), shrews (*Sorex* spp.) grouse (*Bonasa* umbellus, *Dendragapus* obscurus, *D. canadensis*), fish, and ungulate carrion. Snowshoe hares are mostly nocturnal during the winter (Foresman and Pearson 1999). Likewise, lynx are more nocturnal hunters. Habitat for snowshoe hares generally consists of young conifer stands with relatively dense and interconnected canopies that provide both understory cover and food. Snowshoe hare population densities, in terms of patch size and spatial arrangement, in north-central Idaho range from 0.2-25 acres. Lynx predation rates on snowshoe hares are high (> 80 %). Snowshoe hare populations tend to be cyclical in nature; however, there is limited evidence that population cycles occur in the southern portion of their range, because of high predation rates (Wirsing et al. 2002).

Decades of aggressive fire suppression on federal lands have likely reduced the quality and quantity of lynx and snowshoe hare habitat, by altering the amount and pattern of vegetation types and structural stages (Ruediger et al. 2000). Fire had been a dominant influence historically in the northern Rocky Mountains.

Forest management practices, such as commercial harvest, road construction, and post-harvest thinning, can influence lynx habitat quality and prey abundance and distribution. Snowshoe hares may reach highest densities in young, dense coniferous or coniferous-deciduous forests and in forests with a dense understory of shrubs, aspen, and /or conifers. Red squirrels appear in the later stages of forest development, when mature cone-bearing trees are common.

Timber harvest is not a substitute for natural disturbance processes. Timber harvest may result in removal of biomass, especially larger trees; selective removal of particular tree species; removal, thinning, and planting that may give a competitive advantage to certain tree species; and the construction of roads that may be used as travel routes after the project has been completed. As a result, forest composition and structure have changed in these areas, with stands generally becoming more homogeneous, composed of more

shade-tolerant species with more canopy layers, and being more susceptible to severe fire, insects, and diseases (Quigley et al. 1997).

Denning habitat for lynx occurs in mature and late structural boreal forests, or higher elevation montane forests, with locally abundant CWD present. Fire suppression and logging have altered the mosaic of habitats needed to support prey species and for denning site structural quality (Ruediger et al. 2000, Wisdom et al. 2000).

Threats

Major risk factors for lynx include direct human threat (shooting, trapping, vehicle collisions), as well as Foraging and Denning habitat modifications. Lynx have evolved a competitive advantage in deep snow environments, due to their large paws that allow them to hunt prey in deep snow, where other predators cannot. However, snow trails compacted by human activity may allow other predators to access prey in deep snow conditions, where historically they were excluded. Advances in snowmobile capabilities have raised concerns about intrusion into previously isolated areas. Human access into lynx habitat during winter also can increase threats, because lynx tracks can be detected by poachers on snowmobile, traversing vast forest areas in a short time period. The legal harvest of lynx was closed in Idaho in 1996 (McKelvey et al. 2000, Wisdom et al. 2000).

Current conditions of lynx habitat have resulted from many factors, primarily related to fire. Timber harvest has had relatively minor effects, given the small amount of activity that has occurred in high-elevation lodgepole pine and subalpine fir forests. Fire suppression, on the other hand, has occurred for many decades over the entire Forest, resulting in changes to forest structure and composition, and an increase in fire fuels. Fire regimes for the PNF are as follows:

- Non-lethal, - 0-35 years frequency, low severity;
- Mixed1 - 35-100 years frequency, mixed severity;
- Mixed2 - 35-100+ years frequency; and
- Lethal - 200+ year's frequency, stand-replacing severity.

Most lynx habitat is within the Mixed 2 and Lethal fire regimes. Since 1991, an estimated 38 % of the PNF has been burned by wildfire. Lethal fires that have occurred during the past 20 years are listed in Table 2.

Habitat

The FWS identified five Primary Constituent Elements of lynx habitat: (1) Space for individual and population growth and normal behavior; (2) Food, water, air, light, minerals, or other nutritional or physiological requirements; (3) Cover and shelter; (4) Sites for breeding, reproduction, or rearing of offspring; and (5) Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distribution of a species (USDI Fish and Wildlife Service 2008). These habitat elements were used to delineate Proposed Critical Habitat for lynx. None of the PNF was identified as Critical Habitat for lynx.

Effects to lynx are analyzed based on threats associated with habitat quality and human disturbance factors, which are evaluated within Lynx Analysis Units (LAUs) that have been delineated across the Forest, using 5th Level Hydrologic Unit (HU) boundaries whenever possible. If 5th Level HU were not appropriate, a combination of 6th Level HUs was used. Thirty-eight LAUs are delineated on the PNF.

The Weiser River Section 7 Watershed contains three LAUs: Little Weiser, Middle Fork Weiser, and Northwest Council Mountain LAUs (Table 3, Figure 5). The amount of suitable and potential habitat in each LAU was calculated for the Southwest Idaho Ecogroup (Boise, Payette, and Sawtooth national forests), during revision of the Forest Plans (USDA Forest Service 2003). At that time, LANDSAT data were used to predict and map lynx habitat, because they were the only data set that could be consistently applied across the entire Ecogroup. These data (PVGs and structural mapping) are highly dependent on canopy closure and likely a poor predictor of snowshoe hare habitat, which is dependent on understory conditions (Wirsing et al. 2002).

The LCAS provides six standards for analyzing lynx habitat condition, which is based on the risk of habitat being altered to a point of being Unsuitable. These standards are:

(1) At the project level, if more than 30 % of lynx habitat in a LAU is currently in Unsuitable condition, no further reduction of Suitable condition shall occur as a result of vegetation management by federal agencies (Ruediger et al. 2000, p. 7-3).

The Middle Fork Weiser LAU (500,033 acres) is the only LAU that overlays the project area. Within the Gray's Creek Fire perimeter, only one polygon of 42 acres is mapped as Suitable lynx habitat; however, this polygon is not in the project area. Therefore, the proposed action will not further reduce the amount of Suitable lynx habitat available in the LAU.

(2) Within an LAU, maintain Denning habitat in patches generally larger than 5 acres, comprising at least 10 % of lynx habitat.

None of the proposed activities will alter Denning habitat in the LAU, because no Potential or Suitable Lynx Habitat is mapped for the project area.

(3) Maintain habitat connectivity within and between LAUs.

Within the Middle Fork Weiser LAU, habitat connectivity will remain intact within low and moderate intensity burn sites, because of the mosaic of tree and understory vegetation growth patterns created by the fire. Connectivity between the Middle Fork Weiser, Little Weiser, and Northwest Council Mountain LAUs should remain as identified prior to the Gray's Creek Fire.

(4) No more than 15 % of lynx habitat within an LAU shall be changed to an Unsuitable condition, within a 10-year period, by agency management actions (e.g. timber sales, salvage sales).

No lynx habitat will be made unsuitable as a result of the proposed project.

(5) Pre-commercial thinning will only be allowed when stands no longer provide snowshoe hare habitat.

As part of the reforestation portion of the proposed salvage project, 550 acres of plantation destroyed by the Gray's Creek Fire would be replanted with an appropriate conifer species mix, at a stocking level designed to reduce rodent damage to seedlings and removing the need to kill gophers and ground squirrels through trapping or use of rodenticides. Due to the higher stocking rates used in these plantings, it is likely that pre-commercial thinning may be necessary in these plantations at some point in the future. An assessment of snowshoe hare and lynx habitat would be required prior to approval of the thinning project. This standard does not preclude the proposed salvage project.

(6) On Federal lands in lynx habitat, allow no net increase in groomed or designated over-the-snow routes and snowmobile play areas by LAU.
No groomed snowmobile routes or designated play areas occur in the project area.

Determination for Canada lynx

Upon review of the above analysis and discussion, it is my determination that the proposed action may affect, but is not likely to adversely affect, the Canada lynx.

Rationale for Determination

- Although no confirmed observations of lynx are recorded for the Action Area, LAUs and lynx habitat have been identified in the area by a PNF lynx management team.Lynx habitat does exist in the Action Area. Three LAUs have been mapped and lynx habitat identified.
- No lynx habitat occurs in the project area; therefore, there are no changes in Suitable, Unsuitable, or Denning habitats.
- The proposed project would not alter lynx habitat connectivity.
- Pre-commercial thinning may occur in replanted plantations decades from now, following prey species surveys and lynx analysis at that time.
- No groomed snowmobile routes or play areas occur in the proposed project area.

Northern Idaho ground squirrel (*Spermophilus brunneus brunneus*)

Status and Distribution

The Northern Idaho ground squirrel (NIDGS) is a threatened species under the Endangered Species Act of 1973, as amended (61 CFR 7596). The Final Rule for this listing (65 CFR 17779) is dated April 5, 2002. A Recovery Plan was completed in 2003 (USDI Fish and Wildlife Service 2003).

Originally considered to be one species, the Idaho ground squirrel is currently comprised of two subspecies - the Northern (*S. b. brunneus*) and Southern (*S. b. endemicus*) (Yensen 1991). The NIDGS has the most restricted geographical range of any *Spermophilus* taxa and one of the smallest ranges among North American land mammals (Gill and Yensen 1992).

This subspecies is currently known from 43 isolated sites in Adams and Valley counties, Idaho, with a range of about 720 square miles (Evans Mack and Bond 2007) (Figure 6). In 1985, the total squirrel population at 18 known sites was about 5,000. In 1995, the total population had declined to fewer than 1,000, distributed through 19 colonies (Sherman and Gavin 1997). As of December 2007, the overall NIDGS adult/yearling population was conservatively estimated at 1,040, showing a decrease of ~26 % from 2006, attributed to a "reduced focus survey" of larger area sites (Evans Mack and Bond 2007).

The historical distribution of NIDGS included parts of west-central Idaho, in Adams and Valley counties. Currently, the species has been documented to occur on a tableland, between Cuddy and Seven Devils mountains, in the valleys to the east (Lost Valley Reservoir and Price Valley), and in Long Valley, further east and south (Yensen 1991). The main concentration of NIDGS occurs in a large meadow complex on private lands near the community of Bear, in the Brownlee Watershed. The meadow complex measures approximately 6.21 by 18.63 miles, but the squirrels occupy < 1,235.5 acres total area.

Given the extremely low population levels and disjunct and isolated habitat that presently occurs, population viability is a concern for this species (USDI Fish and Wildlife Service 2003; Wisdom et al. 2000). In 1996, while the NIDGS was still a federal Candidate species, a Conservation Agreement, between the PNF and the FWS, was developed to address this viability concern and encourage habitat improvement opportunities. Prior to, and since, this agreement, the PNF has been implementing NIDGS habitat improvement projects to decrease tree encroachment on currently occupied sites, and to connect adjacent populations (USDI Fish and Wildlife Service 1996). These projects appear to be beneficial to NIDGS, but the activities are still being evaluated to determine their effectiveness.

Life History

NIDGS emerge in mid-March through early April and cease above ground activity in late July or early August (Yensen 1991). Adult (2 years old) males emerge first, followed by adult females, then yearlings. Entrance into seasonal torpor is in about the same order, with pups active approximately 1 month later than adult males. Ground squirrels are diurnally active. Newly emerged females remain near their hibernacula, where they are located and courted by adult males. On the first or second afternoon following their emergence, females are sexually attractive to males for only a few hours. The NIDGS diet consists of forbs, grasses, seeds, and other green vegetation (Yensen 1991).

Habitat

NIDGS habitat generally consists of drier meadows surrounded by ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*) forests. The species originally appeared to be restricted to elevations between 3,800 to 6,000 feet, but recent locations have expanded the known suitable elevation to 7,500 feet. In suitable habitat, the squirrels are usually associated with deeper, well-drained soils, generally on south-facing slopes, with < 30 % slope. The xeric meadows typically have a shallow

(< 3.3 feet to bedrock), reddish-brown to yellowish-red skeletal-loam or clay-loam soil (Yensen 1991). These drier portions of meadows are occupied by Idaho ground squirrels only in the absence of Columbia ground squirrels (*S. columbianus*). Vegetation in these drier meadows often is dominated by *Artemisia rigida* (stiff sage) or *A. tridentata vaseyana* (mountain big sage), with *Lomatium sp*., *Sedum stenopetalum, Allium sp*., *Gilia aggregata, Brodiaea douglasii,* various bunchgrasses, and other forbs.

Threats

A number of factors have been attributed the decline of the species. They include meadow invasion by conifers, changes in land use (such as golf course development and agricultural land conversion), public access (particularly off-road vehicle use and shooting), road construction, overgrazing by sheep and cattle, and dispersed and developed campground expansion. Main predators of NIDGS include badgers, coyotes, and prairie falcons. Mortality from predation by badgers can occur during hibernation (Yensen 1993). NIDGS also is threatened by environmental stochastic events, such as winter mortality, predation, and disease, as well as competition from the larger Columbian ground squirrel. Information also suggests that past and present livestock grazing has modified the herbaceous communities that are important to NIDGS (Sherman and Runge 2002), although some researchers admit that grazed sites may, at times, be used by NIDGS over un-grazed sites. This may suggest an historic link to grazing by large ungulates, such as elk or bison. Table 4 summarizes threats to the species as identified in the NIDGS Recovery Plan.

NIDGS is considered to be primarily threatened by habitat loss, due to seral forest encroachment into former meadow habitats that may fragment suitable habitats and isolate colonies. Fire suppression activities and the dense re-growth of conifers after logging activities likely have reduced available NIDGS habitat, including linear dispersal corridors. The lack of dispersal corridors may have caused isolated populations to become extinct, as habitat availability reduction continued.

The range of Columbian ground squirrels overlaps the distribution of NIDGS. Sherman and Yensen (1994) reported that the segregation of the two species is due to competitive exclusion as opposed to differing habitat requirements. Past forest management activities, such as fire exclusion, may have modified these habitats (increased density of vegetation) and unknowingly given Columbian ground squirrels a competitive advantage over NIDGS in areas where the two species are in close proximity. These habitat changes have reduced meadow size and eliminated dispersal corridors along valley bottoms (Yensen and Sherman 1997).

Researchers suggest NIDGS may have been forced into shallower soils by the Columbian ground squirrel (Yensen 1993). Columbian ground squirrels are larger and may be competing for the deeper soils that provide better over-winter protection and better forage vegetation. In areas where both species occur, NIDGS tends to occupy the shallower soil areas. Columbian ground squirrels need the deeper soils, due to their larger body size.

The NIDGS is primarily granivorous and ingest large amounts of grass seeds, stems, and herbs to store body energy for the long period it spends in torpor from August through late March of each year. Hibernation in shallow soils makes NIDGS susceptible to freezing during periods of lower snow depths and colder temperatures, particularly if individuals do not have an adequate fat reserve. Over-winter mortality appears to be a contributing variable in the decline of NIDGS, particularly when snow levels are low. The soils tend to freeze to lower depths when snow levels are inadequate. When snow levels are high, NIDGS are insulated from freezing or running out of stored energy during torpor. Researchers have found that population crashes do occur at some sites when snow levels are below normal. Due to the small sizes of individual populations and the small total number of individuals, the NIDGS may have little resilience to such population declines.

Summary of NIDGS Recovery Plan Objectives

The Recovery Plan for NIDGS summarizes objectives, criteria, and strategies for recovery of the species. The goal of the recovery plan is to increase population size and establish a sufficient number of viable metapopulations, so that the species can be delisted. This number has been identified as 10 metapopulations, consisting of more than 500 individuals for 5 consecutive years.

Grays Creek Fire Salvage Analysis for NIDGS

During fire suppression activities, Forest Service Wildlife Biologists and Resource Advisors surveyed 14 different areas for NIDGS over a large portion of the open slopes and ridges within the Gray's Creek Fire perimeter, while identifying areas where bulldozer and hand fire lines could be constructed (Figure 9). The majority of these surveys were conducted from August 30 to October 30, 2008. The remaining surveys for NIDGS presence were conducted in potential NIDGS habitat within and outside the fire boundary, after the fire was considered under control. No NIDGS were observed in the fire area and no sign of NIDGS digging (dens, feeding sites) were located. Potential NIDGS habitat was located on the ground by identifying botanical and geological characteristics of known NIDGS habitat, by visiting historic NIDGS survey sites, and by applying modeled habitat locations from a NIDGS potential habitat map, produced by the NIDGS Technical Committee (Crist and Nutt 2007).

The nearest known NIDGS colony is located on the privately owned OX Ranch, 12 miles northwest of the project area. Between the OX Ranch and the Gray's Creek Fire area is the Weiser River valley, which is intensively manipulated for livestock, occupied by a population over 1,000 people, and includes the towns of Council, Mesa, and Fruitvale. Historically, there was a population of NIDGS in the Indian Valley area, within 5 miles of the project area; that population has not been detected in the last decade. There is some speculation among NIDGS researchers that the Indian Valley population may have been the southernmost colony of NIDGS and that the southern end of the valley may have been occupied by Southern Idaho ground squirrels *Spermophilus brunneus endemicus*) historically. The Recovery Plan for the Northern Idaho Ground Squirrel (US Fish and Wildlife Service 2003) identified 17 metapopulations, where habitat conditions were correct for supporting NIDGS. One of those metapopulations, West Mountain, is

near Burnt Basin, about 4 miles southeast of the Gray's Creek Fire. No NIDGS have been transplanted to the West Mountain site.

Mitigation

Because NIDGSs would have been in hibernation during the time of the 2007 surveys, their presence in the project area cannot be precluded. Therefore, prior to any road construction or log landing preparation, Forest Service wildlife staff will conduct a survey of the site to verify the presence or absence of NIDGS. Surveys of these sites will be conducted three times prior to construction. If NIDGS, or NIDGS sign, are identified in the route of a planned temporary road, the road will be either re-routed an appropriate distance around the occupied site, or, following Conferencing with the FWS at Level 1, the road construction will be cancelled. Similarly, any log landing noted with NIDGS, or NIDGS sign, present will be relocated to a site outside the occupied area. If a Forest Service road passes through a site determined to be occupied by NIDGS, all vehicle traffic will be restricted to a maximum speed of 15 mph through the site, to reduce the chances of vehicle-caused mortality. Any road passing through an occupied NIDGS site will be monitored by wildlife staff during the project, to identify potential problems associated with vehicle activities. Any NIDGS observations will be reported to the FWS and Idaho Department of Fish and Game (IDFG), to allow for appropriate coordination of project activities. These same procedures were used successfully in the 2007 recovery activities for the Bear Tornado on the Council Ranger District.

Determination for NIDGS

Upon review of the above analysis and discussion, it is my determination that the proposed action may affect, but is not likely to adversely affect, the Northern Idaho ground squirrel. ***Rationale for Determination***

- Although no observations of NIDGS are recorded for the Action Area, historic range and potential habitat for NIDGS have been mapped for the PNF and are identified for the area analyzed.
- Surveys conducted for NIDGS during and after the Gray's Creek Fire did not identify the presence of NIDGS in the Action Area.
- Prior to road construction and log landing preparation, wildlife staff will conduct additional surveys to determine the presence of NIDGS.
- If NIDGS presence is detected, appropriate mitigation measures will be initiated and interagency NIDGS specialists will be contacted, to ensure coordination of the planned mitigation.

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Table 1. Idaho CDC - 2002 Lynx Occurrence Records.

Lynx Analysis Unit Name	Number of Records
PNF-Disappointment-Little Squaw	1
PNF- Chamberlain	2
PNF- Cabin Canyon	1
PNF-Upper North Fork Payette	1
PNF Total	**5**

Table 2. Acres Burned in Three Decades on the Payette National Forest, including Lynx habitat, from 1970-2000 (USDA Forest Service 2003b, Forest Plan Biological Assessment for the Payette National Forest).

Decade	Payette	Decade	Payette
1971-1980	3,407	1971-1980	735
1981-1990	201,999	1981-1990	53,842
1991-2000	673,643	1991-2000	289,437
Total Burned	**879,049**	**Totals**	**344,014**
Percent Burned 1971-2000	38	Acres of Lynx Potential Habitat	840,455
		Percent of Potential Habitat Burned, 1971-2000	40

[a] Some of the areas burned in the 1991-2000 period, re-burned areas that burned during other time periods, but none of the burned acres were double counted in the totals. Fires less then 100 acres in size are not represented in these tables.

Table 3. Potential and suitable lynx habitat by LAU in the Weiser Section 7 Watershed.

LAU	Total Acres	Potential Habitat Acres	Suitable Habitat Acres	% of Suitable Habitat
Little Weiser	37,927	4,122	3,707	90%
Middle Fork Weiser	50,033	6,467	6,156	95 %
Northwest Council	36,406	3,728	3,406	91 %

Table 4. Summary of threats to the Northern Idaho ground squirrel as identified in the Recovery Plan.

Threat	Description
Present or threatened destruction, modification, or curtailment of the species or habitat or range	Loss of meadow habitat due to long-term fire suppression, conifer encroachment, and/or development modifies and replaces squirrel habitat. The primary threat to the Northern Idaho ground squirrel is meadow invasion by conifers (Sherman and Yensen 1994).
Over-utilization for commercial, recreational, scientific, or educational purposes	Human-caused mortality through shooting (recreational plinking) is a major threat to the species
Disease or Predation	Predation by badgers, hawks, and prairie falcons may be a threat due to the low population numbers in most colonies
Inadequacy of existing regulatory mechanisms	Effective regulatory mechanisms to control shooting do not currently exist. Also, there are no regulatory mechanisms to enhance or maintain habitat on public lands
Other natural or man-caused factors affecting the species' continued existence	Encroachment into meadow by invading conifer trees, due to fire suppression and natural succession, reduce available habitat
	Northern Idaho ground squirrels inhabit shallow soil areas and may be prone to fluctuating water tables and freezing during harsh, but dry winters
	Poisoning through use of rodenticide may reduce the population
	Northern Idaho ground squirrels are competitively inferior to Columbian ground squirrels under present habitat and environmental conditions

Figure 1. Grays Creek Fire Location, Land Ownership, and Proposed Fire Salvage Project Area.

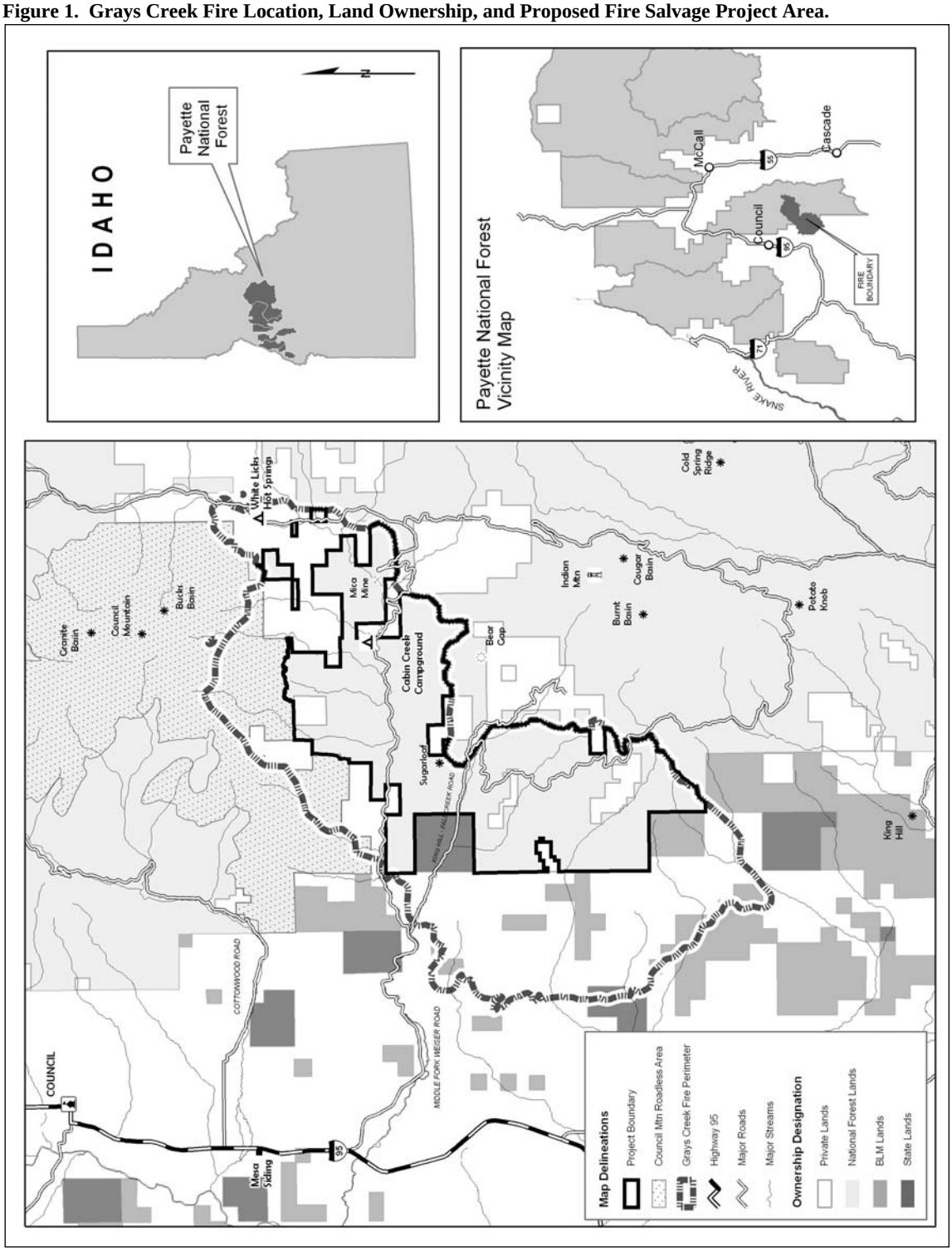

Figure 2. Proposed Salvage and Road Activities in the Grays Creek Portion of the Grays Creek Fire Salvage Project Area.

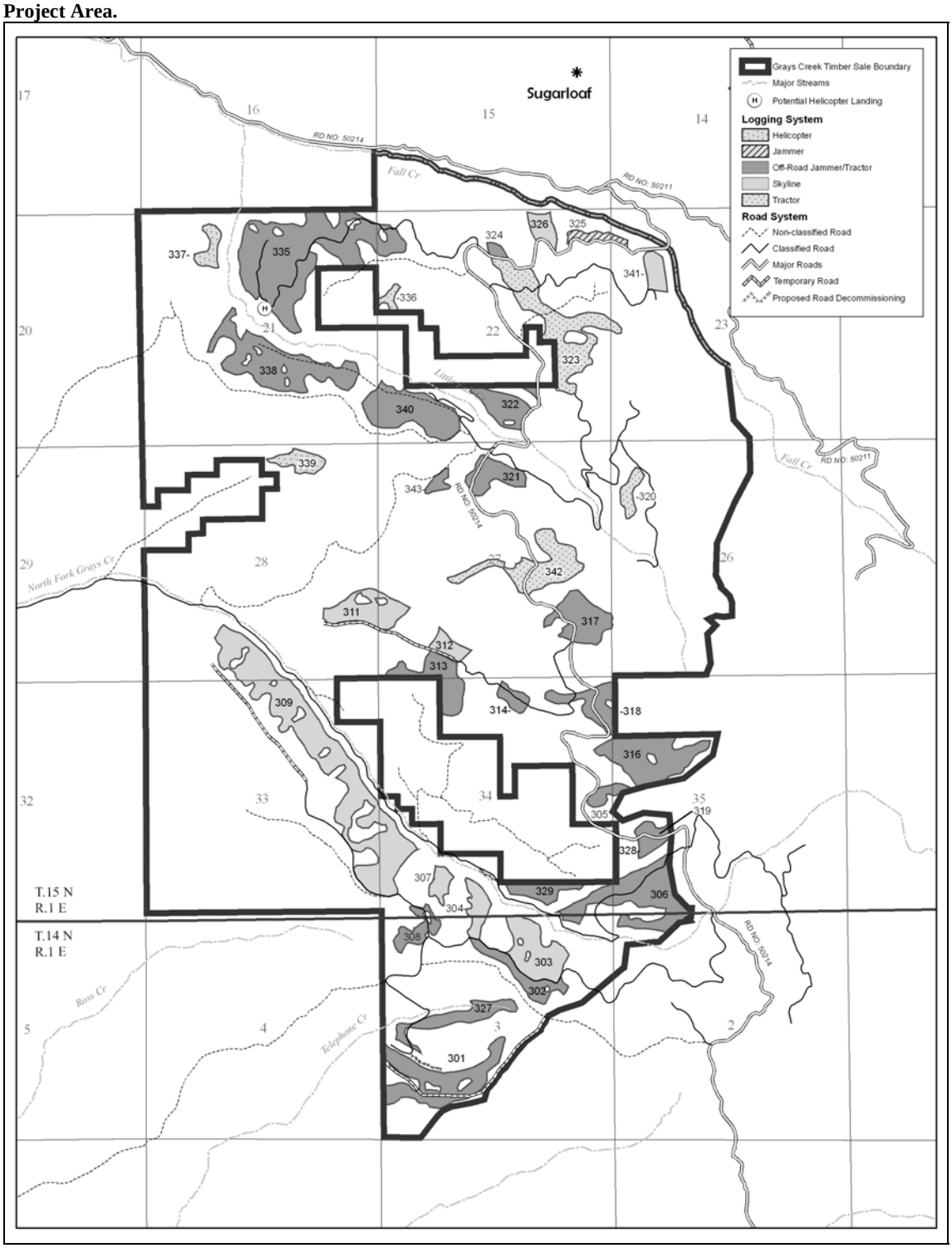

Figure 3. Proposed Salvage and Road Activities in the Sugarloaf Portion of the Grays Creek Fire Salvage Project Area.

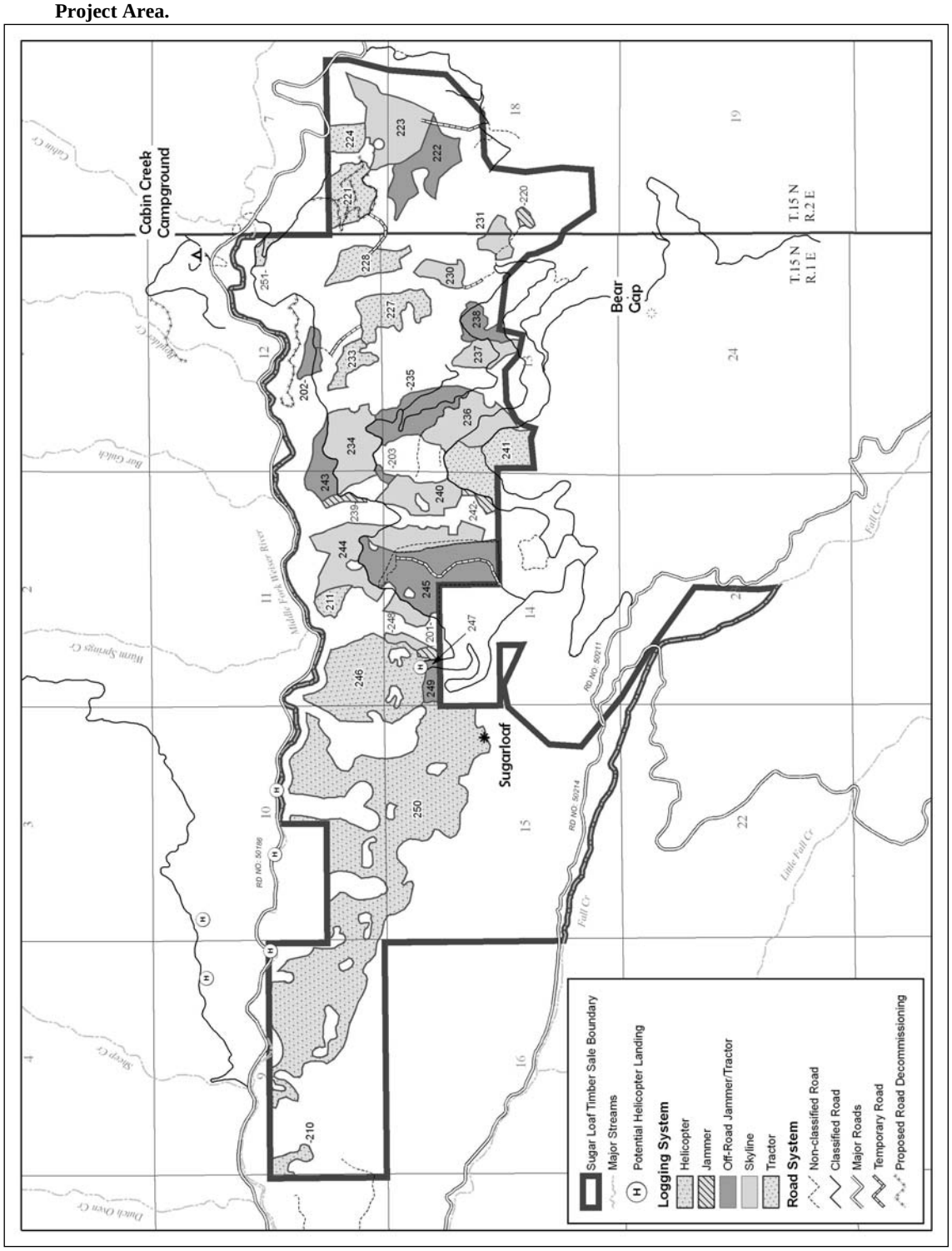

Figure 4. Proposed Salvage and Road Activities in the Middle Fork Portion of the Grays Creek Fire Salvage Project Area.

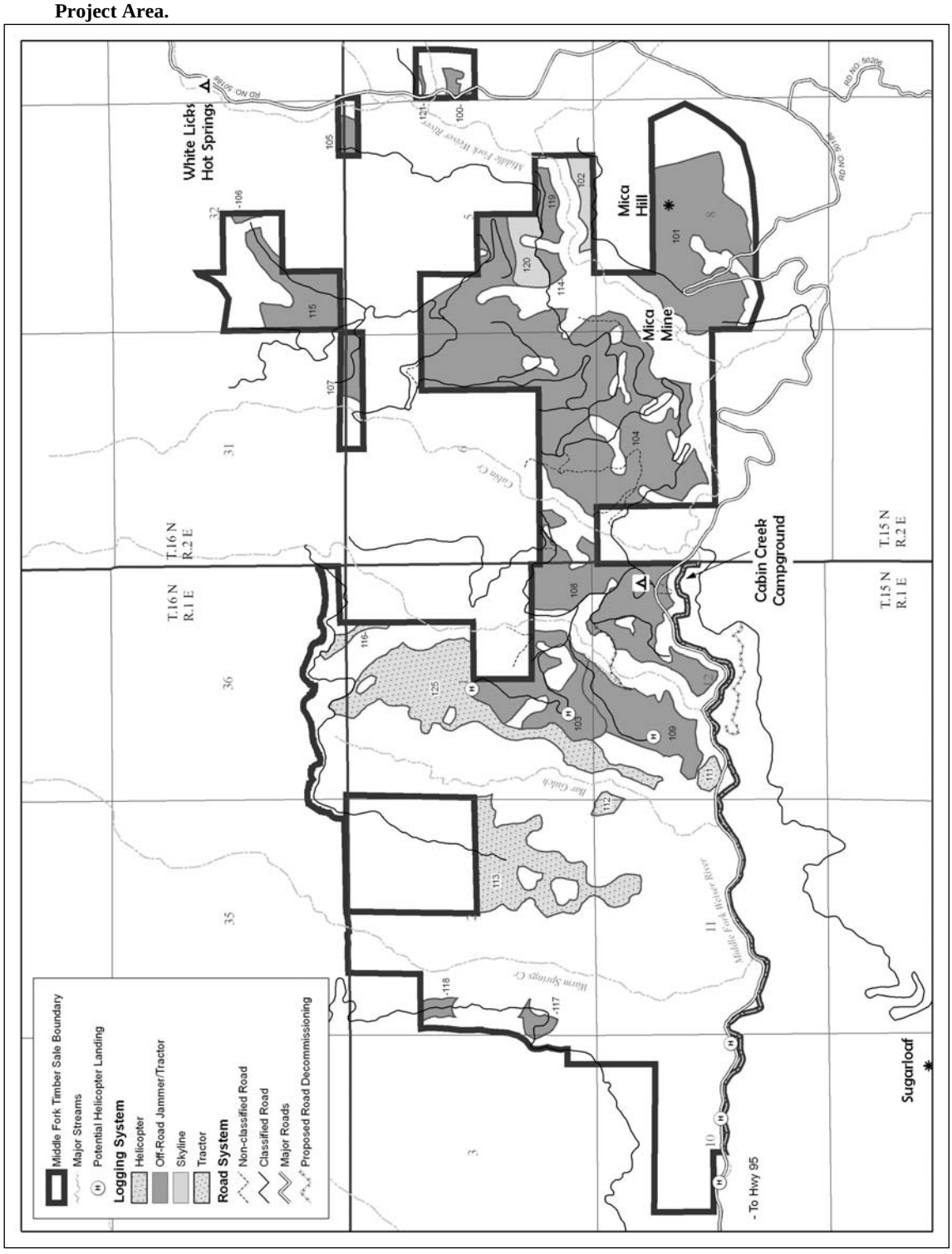

Figure 5. Lynx Analysis Units (LAUs) in the vicinity of the Gray's Creek Fires Salvage Project area.

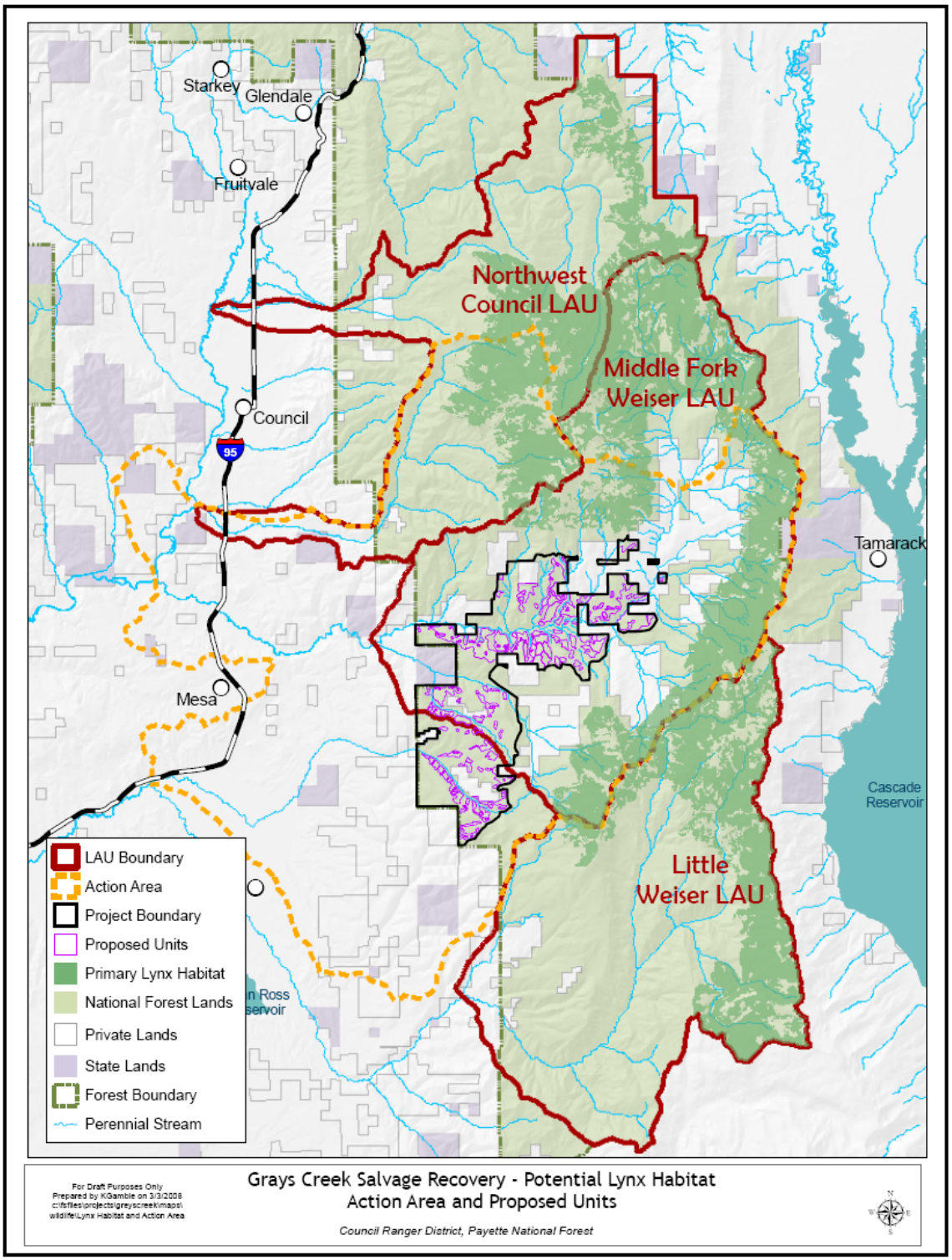

Figure 6. Known occupied locations of Northern Idaho ground squirrel on the Payette National Forest, 2007 (from Evans Mack and Bond 2007).

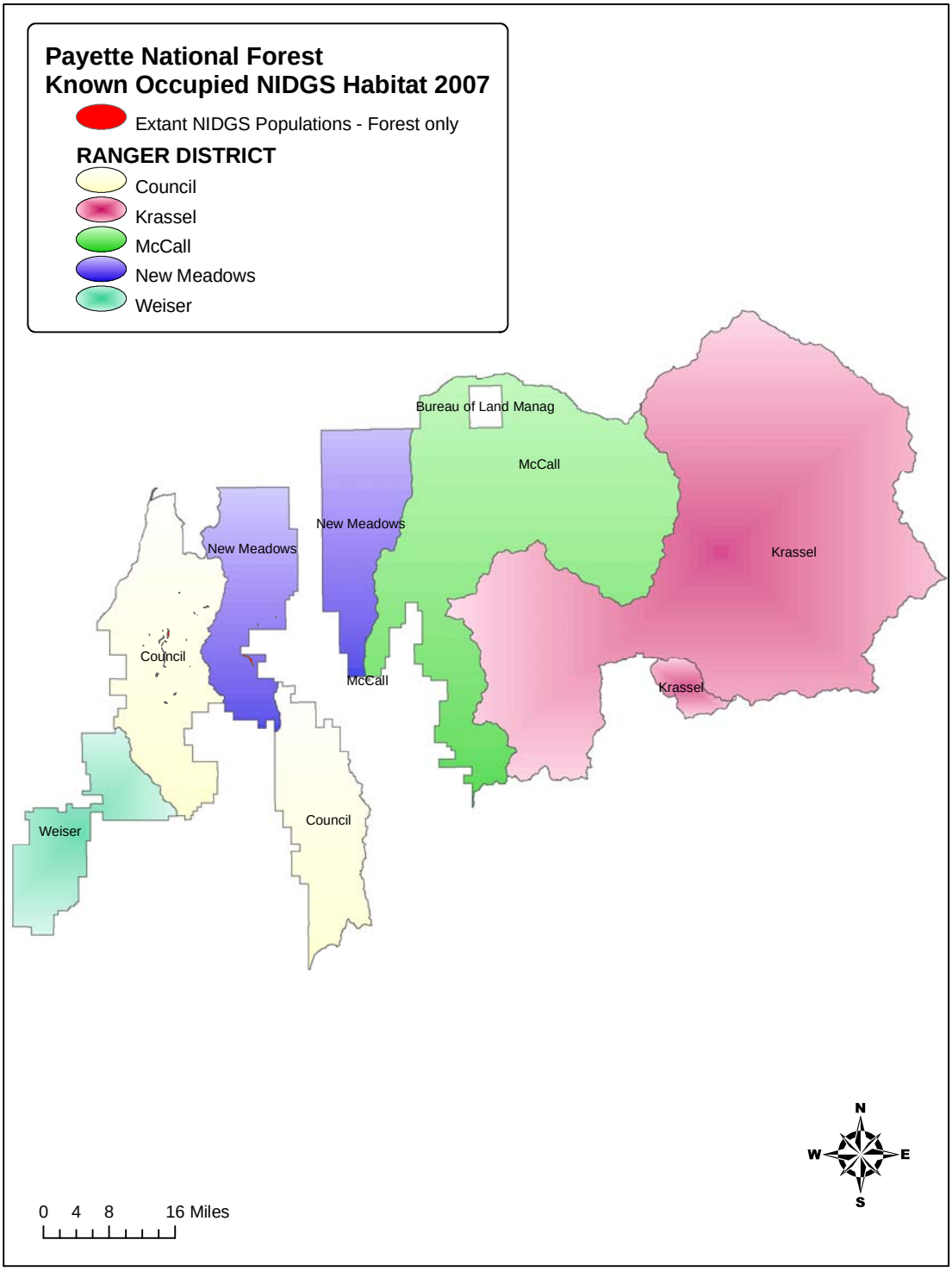

Figure 7. Potential habitat for the Northern Idaho ground squirrel in the vicinity of the Gray's Creek Fire Salvage Project.

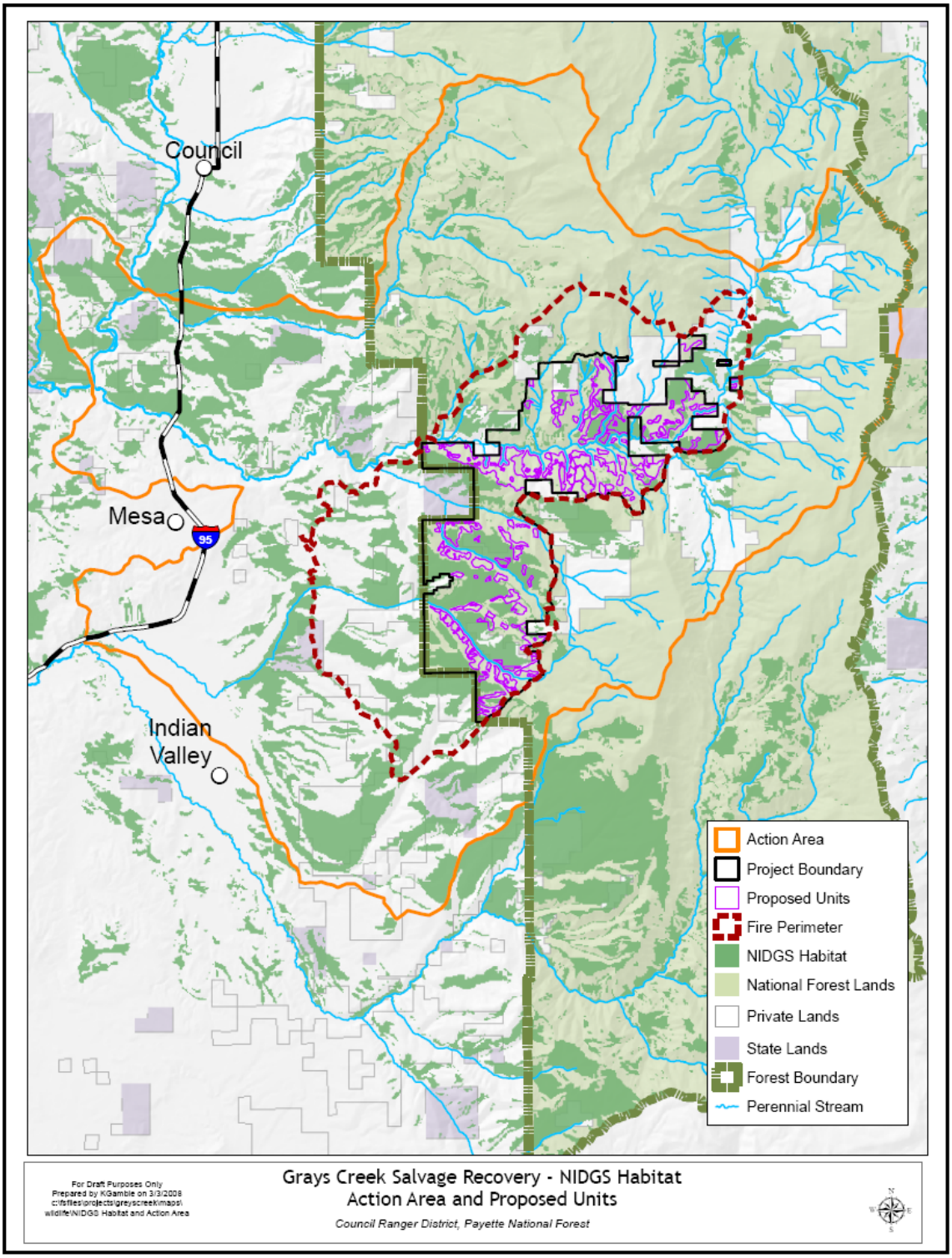

Figure 8. Potential habitat for the Northern Idaho ground squirrel in the Gray's Creek Fire Salvage Project.

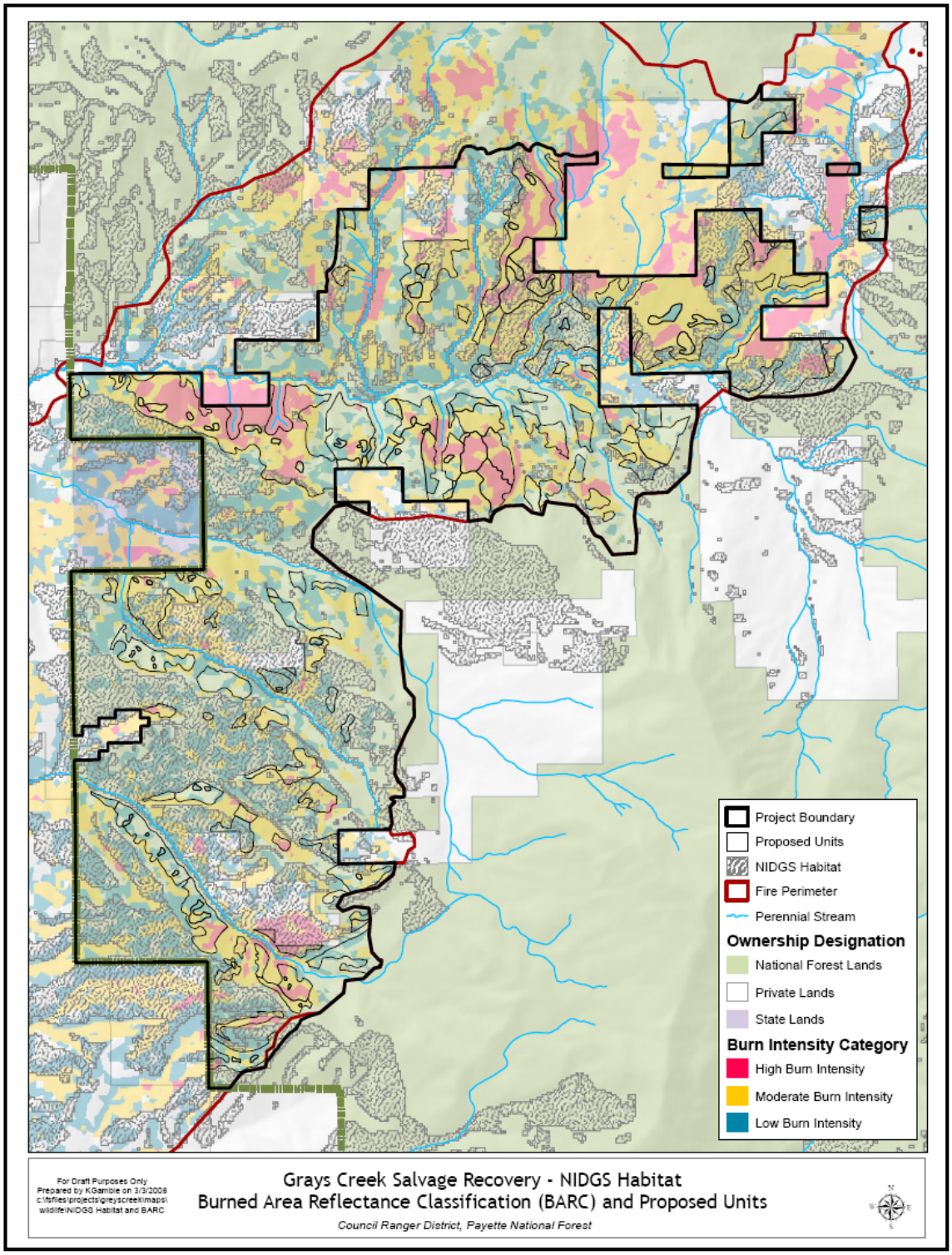

Figure 9. Areas surveyed by Resource Advisors and Council Ranger District wildlife staff for Northern Idaho ground squirrels during, and immediately after, the Gray's Creek Fire in 2007.