Management Indicator Species (MIS) Report - Part II
For the Panther Salvage Project

Klamath National Forest
Happy Camp Ranger District

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Date: May 2009

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Date: June 2009
INTRODUCTION

The purpose of this report is to evaluate and disclose the impacts of the Panther Salvage Project on the Management Indicator Species (MIS) identified in the Klamath National Forest (NF) Land and Resource Management Plan (LRMP) (USDA 1995) which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). This report documents the effects of two alternatives (Proposed action-Alternative 2), and No Action (Alternative 1), for the Panther Salvage Project on the habitat of selected MIS. Detailed descriptions of the project alternatives are found in the Panther Fire Salvage Project Environmental Analysis.

DESCRIPTION OF THE PROPOSED PROJECT

Project Area – Existing Condition
The proposed project is located on 255 acres of the 60,780 acres of the Elk Creek watershed. It is generally located south of the community of Happy Camp in Siskiyou County, California within the Klamath National Forest. The elevation ranges from 2,500’ to 5,000’. The habitat is mixed conifer forest interspersed with madrone, black oak and manzanita.

The Panther Fire started from a lightning storm on July 22, 2008. The fire had consumed over 50,000 acres by the fall of 2008. The Panther Fire made its final and most intense run on October 1, 2008, burning an additional 13,000 acres before the rains halted its advance. A combination of topography, fuel loading and a major weather event resulted in intense fire activity, causing considerable tree mortality across these additional acres.

Portions of the project area experienced intense fire behavior during the 2002 Stanza Fire and burned again during the Panther Fire. The intensity of the Panther Fire has reduced the availability of the conifer seed source to naturally reforest the landscape. The heavy fuel loadings and overhead snag hazards present unsafe work conditions for firefighters and render the project area vulnerable to future intense wildfires.

Project Area - Desired Future Condition
The desired future condition for the project area is a healthy, mixed conifer forest that provides a diversity of habitat conditions, including areas with and without salvage harvest, areas with full site preparation and planting, and completely untreated areas. Treated areas would have a forest composition and structure more resilient to wildfires approaching or exiting the Marble Mountain Wilderness. The forest composition and structure, as well as reduced fuel loads and snag hazards, in treated areas would also provide for greater firefighter safety in the event of a future wildfire.

Purpose and Need for Action
The purpose of this project is to (1) recover economic value from timber lost to the Panther Fire, (2) facilitate conifer revegetation, and (3) provide for fire fighter safety while decreasing potential future wildfires’ resistance to control.

Proposed Action
In order to meet the purpose and need described above, the Happy Camp Ranger District of the Klamath National Forest proposes salvage harvesting, slashing, and appropriate fuels treatments on National Forest lands encompassing approximately 255 acres within 12 units. The salvaged trees would be sold as commercial sawtimber. The predominant logging system would be cable,
as there is little opportunity for ground-based harvesting. No new roads would be constructed. Approximately 200 feet of temporary landing access road would be constructed; the road would be decommissioned following completion of project activities. Fuels treatments within salvage units would include slashing and hand piling, yarding of unmerchantable material or a combination of the three. The appropriate fuels treatment would be chosen to meet immediate project objectives as well as desired future conditions. Conifer reforestation would follow the fuels treatment activities as needed. Harvest activities are scheduled to begin in 2009 and would likely be completed by 2010; associated activities would likely be completed by 2013.

SELECTION OF PROJECT-LEVEL MIS

Management Indicator Species (MIS) for the KNF are identified in the LRMP S&G 8-21 through 8-34. A review was conducted using the MIS Report Part I - Project Level Assessment Checklist to determine: 1) if the project is within the range of any MIS, 2) if habitat for which the species is an indicator is present within or adjacent to the proposed treatment areas, and 3) if there are potential direct, indirect or cumulative effects on habitat components.

The following associations and MIS will not be discussed further because the habitats for which these species were selected are not in or adjacent to the project area as documented in the Panther Fire Salvage MIS Project Level Assessment Part I. Therefore, the project will not directly or indirectly affect the habitat for these species and will, therefore, have no impact on forest-level habitat or population trends for these species:

**Hardwood Species Association**
- Acorn woodpecker
- Western gray squirrel

**River/Stream Species Association**
- Rainbow trout
- Steelhead
- Tailed frog
- Cascades frog
- American dipper
- Northern water shrew
- Long-tailed vole

**Marsh/Lake/Pond Species Association**
- Northern red-legged frog
- Western pond turtle

**Grassland/Shrub-Steppe Species Association**
- Pronghorn
- Montane vole
- Loggerhead shrike
- Swainson’s hawk
- Sage thrasher
- Burrowing owl

**Mature Ponderosa Pine Species Association (Eastside Pine)**
- Flammulated owl
- White-headed woodpecker
- Pinyon jay
The following species associations and MIS were selected for analysis for the Panther Fire Salvage Project due to the presence of suitable habitat that may be impacted by the project activities, as described in the Panther Fire Salvage MIS Project Level Assessment Part I. Species associations and MIS associated with habitats that may be affected by project activities are analyzed below.

Snag Association

Black Backed Woodpecker
White-headed woodpecker
Downy woodpecker
Red breasted sapsucker
Hairy woodpecker
Pileated woodpecker
Vaux's swift

The MIS for snag dependent species association will be discussed as a group because the snag habitat within the analysis area is the result of high intensity wildfire and these recently burned and/or killed trees are not typical snag habitat. The cavity nesting, snag dependent MIS species that would be impacted by the proposed project have interdependent and complex life cycles that rely specifically on this habitat type, in particular the black-backed woodpecker with habitat needs that focus almost exclusively on snags and burned trees for both foraging and nesting.

Klamath National Forest – Forest Plan Standards & Guides for selected MIS

Species Associations (Guilds/Management Indicator Species, Assemblages)

8-21 Use Species Associations listed below, the most current research information, Wildlife Habitat Capability Models or Wildlife Habitat Relationships Models to assess landscape and project-level impacts to habitat conditions. Develop and update these species associations and models based on local information and new research information.

Snag Association

Downy woodpecker, Red breasted sapsucker, Hairy woodpecker, Black Backed Woodpecker, White-headed woodpecker, Pileated woodpecker, Vaux's swift

8-22 Assess the availability of snags within each landscape. Provide for an average of 5 snags per acre, in a variety of size and decay classes, within each landscape. These snags need not be equally distributed. The actual number of snags to be maintained in areas managed for timber production may vary from 2 to 5, depending on the amount of snags available within the surrounding landscape and the desired future condition of that landscape.

8-23 Maintain snag densities through the full timber rotation by providing green replacement trees to become snags of adequate size when existing snags fall. The size of snags and green trees to be retained within a given managed stand should be greater than the average diameter of the stand.

8-24 Retain snags and replacement snags in clumps when possible. Consider the susceptibility of snags to windthrow and site preparation activities. Designated wildlife trees should be protected from woodcutting and Forest management activities.
8-25 Retain snags with the largest DBH as they tend to last longer and make the best wildlife habitat.

Use Tables 4-4 and 4-5 as guidelines in ecosystem analysis and project-level planning. The relative numbers of hard and soft snags in various size classes show the habitat needs of the different cavity-association Forest wildlife species. The number of snags on a given acre will vary, depending on the site and on the number of snags within the landscape.

**Table 4-4. Numbers of Snags Required per 100 acres to Support "Good" Quality Habitat for Primary Cavity-Association Species. ( ) = Number of Snags per 100 acres**

<table>
<thead>
<tr>
<th>Snag diameter (DBH)</th>
<th>General snag decay stage</th>
<th>Total snags by diameter class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hard (2-3)</td>
<td>Soft (4-5)</td>
</tr>
<tr>
<td>11+</td>
<td>Downy (16)</td>
<td></td>
</tr>
<tr>
<td>15+</td>
<td>Red Breasted/Black Backed (45)</td>
<td>Hairy/White Hd. (225)</td>
</tr>
<tr>
<td>20+</td>
<td>Vaux's swift (200+)</td>
<td></td>
</tr>
<tr>
<td>24+</td>
<td>Pileated (14)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total snags: (500)</td>
</tr>
</tbody>
</table>

**Table 4-5. Green Tree Retention for Future Snags (to be provided in a range of the above DBH classes)**

<table>
<thead>
<tr>
<th></th>
<th>High capability</th>
<th>Moderate capability</th>
<th>Low capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 5 per acre</td>
<td>2 - 5 per acre</td>
<td>&lt; 2 per acre</td>
<td></td>
</tr>
</tbody>
</table>

**PROJECT DESIGN SPECIFICATIONS and EFFECTIVENESS RATIONALE**

KNF Forest Plan Standards and Guides 8-21, 8-22, 8-23, 8-24, 8-25 will be met or exceeded with the snag retention guidelines within the Project Design Specifications.

Additional Design Specifications are in place for the proposed project. Only those specifications that were directly pertinent to this evaluation are listed below. For all other Project Design Features designed for the Panther Fire Salvage project see Chapter 2 of the EA.

**SNAG RETENTION**

- Retain all pre-existing larger snags (>14dbh). If these must be felled, then leave on landscape as downed wood.

Retention of large snags created by insect, disease or lightening strike that existed prior to the fire is of increased biological importance as these are biological legacies and will continue to provide a wide variety of habitat needs for a wide variety of species.

- Retain the largest snags in clumps or groups, situated around live trees if possible.
Leave groups would be distributed throughout harvest units and consist of the largest snags available, situated with large, live trees if possible. Snags or dying trees that contain cat faces, broken or forked tops, hollows or cavities would be first priority for retention. The total number of snags per acre required within each harvest unit may be captured within leave groups. Leave groups may contain the total number of snags retained for an individual harvest unit, represented as a percentage of the overall area rather than on a snag per acre basis. For example, a 20 acre unit would require a minimum of 40 to 100 snags to be retained overall (with an emphasis on retaining the maximum number of snags within this parameter). These snags would be retained as ¼-acre to 3-acre groupings within harvest units, rather than distributed individually on each acre within the unit.

Retaining denser clumps of large snags would promote the longer-term persistence of suitable snags as nesting habitat for cavity-nesting birds (Russell 2006). Snags in large burned areas have greater exposure to wind, causing them to fall at high rates. Haggard and Gaines (2001) found that treatments with snags distributed in clumps and individually dispersed had the highest abundance and species richness of cavity nesting species. Saab and Dudley (1998) found in their study that all bird species selected nest sites with higher tree densities than that measured at random sites, and cavity nesters as a group selected clumps of snags rather than snags that were retained in uniform, evenly-spaced distributions.

- Retain a minimum of 5 snags per acre

Snag retention guidelines for this project are based on KNF LRMP Standards and Guidelines. While these snag guidelines do not require provision of snag habitat on a per acre basis, these guidelines would be met or exceeded, leaving the actual number of snags left in the project area higher through the retention of clumps of snags for other resource areas such as hydrology (clumps within Riparian Reserves), scenery (visual retention objectives), soil, and general safety for harvest activities (grouping of hazard trees within and on the perimeter of units).

It is important to note that while these guidelines would be applied to harvest units they would likely vary throughout the project area, depending on the burn pattern and severity, and on the locations of unburned patches and trees.

In addition, only burned trees that meet the criteria for mortality (see Chapter 2 for a description of Mortality Guidelines) would be selected for removal, leaving many trees that may die but do not meet these criteria within the units. This would also result in additional remaining snags, above required levels, within the project area. The remaining burned areas of the forest that would not be treated would provide abundant snags along the perimeter of the project area and the forested areas beyond.

- Select for snags with broken tops as first priority

Many studies have found that broken top snags are the most frequently used type of snag for nesting of multiple species of cavity excavators (Hutto 1995, Saab and Dudley 1998, Haggard and Gaines 2001). A broken top provides an avenue for heart rotting fungi which makes the snag more suitable for cavity excavation. Broken top trees are especially important in burns because
they provide nest sites for the first few years following a high intensity fire when other trees are not as easily excavated due to case-hardening (Saab and Dudley 1998).

ENVIRONMENTAL BASELINE

The proposed project is located on 255 acres of the 60,780 acres of the Elk Creek watershed. The habitat is mixed conifer forest interspersed with madrone, black oak and manzanita.

The Panther fire burned with varying degrees of severity across approximately 63,000 acres (Table 1). Areas proposed for harvest are within the area impacted by the severe fire behavior of the October “run” up the Elk Creek drainage that impacted 13,000 acres in addition to the 50,000 acres burned during the July 22 lightening storm.

Only those areas that are accessible by road, without steep slopes, can utilize existing landings, are within Matrix or Riparian Reserves land allocations, require very minimal temporary road construction and have merchantable timber that will contribute to the local economy were considered for the project. This totaled 255 acres, within 12 units, with the remaining 7,592 acres of moderate to high severity burn left unharvested. Areas proposed for salvage harvest represent a very small portion (3%) of the high and moderate severity burned areas (Table 2; Figure 1).

Figure 1: Acres of Elk Creek 5th field watershed affected by the Panther fire salvage project.
Table 1. Acres burned with the Panther Fire (2008)

<table>
<thead>
<tr>
<th>Total acres of Elk Creek watershed</th>
<th>Acres of watershed burned in high or moderate severity</th>
<th>% of watershed burned in high or moderate severity</th>
<th>Acres of watershed burned in low severity</th>
<th>% of watershed burned in low severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>60,767</td>
<td>7,846</td>
<td>13%</td>
<td>1,736</td>
<td>3%</td>
</tr>
</tbody>
</table>

Table 2: Area affected by proposed project

<table>
<thead>
<tr>
<th>Acres proposed for harvest</th>
<th>% of watershed burned in high or moderate severity</th>
<th>% of high to moderate severity burned area proposed for harvest</th>
<th>% of total watershed proposed for harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>255</td>
<td>13%</td>
<td>3%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Overall available habitat

Total available habitat for post fire dependent snag associated species is defined for the purposes of this analysis as coniferous forest burned within 5 years of the current proposed project with high to moderate intensity, within the Elk Creek 5th field watershed and throughout the Happy Camp district. After 5 years the primary cavity nesting bird species composition changes in response to the life cycle of the wood boring beetles they prey upon (Hutto 2006, Kotliar 2002). Species composition also changes in response to the loss of foraging and nesting structures as snags fall. Forest canopies become more open, providing more suitable foraging conditions for aerial insect foragers. This definition was spatially bounded by the Happy Camp district boundary due to the way in which individual wildfire acreages and burned severities are tracked, and by the 5th field watershed in order to provide known acre figures from which to base a comparison for the purposes of the analysis.

Table 3. Overall available post fire, snag associated habitat across the Happy Camp Ranger District. Acres burned with moderate to high burn intensity on the Happy Camp district of the Klamath NF within the last 5 years.

<table>
<thead>
<tr>
<th>Year of Wildfire</th>
<th>Wildfire name</th>
<th>Acres burned with moderate to high burn intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Titus</td>
<td>3,026</td>
</tr>
<tr>
<td>2007</td>
<td>Elk Complex</td>
<td>3,822</td>
</tr>
<tr>
<td>2008</td>
<td>Panther</td>
<td>24,202</td>
</tr>
<tr>
<td>2008</td>
<td>Siskiyou-Blue</td>
<td>18,642</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total: 49,692</td>
</tr>
</tbody>
</table>
DIRECT AND INDIRECT EFFECTS
OF THE PROPOSED ACTION ON PROJECT-LEVEL MIS

MIS CATEGORY: SNAG ASSOCIATION

Tree Removal

Black-backed woodpeckers are considered habitat specialists, relying heavily on post-fire conditions (particularly moderate to severely burned coniferous forests), and are therefore most susceptible to reductions in this specific habitat type. The strength of the association of black backed woodpeckers with postfire snag conditions makes it a useful indicator for wildlife associated with this habitat (Hutto 1995). Other species such as the hairy, downy and white-headed woodpecker (and the mountain bluebird, which is not an MIS but uses cavities excavated in previous years by black-backed woodpeckers) have strong, but not exclusive, associations with this habitat type.

Conifer stands that have burned with moderate or severe intensity are a distinct type of habitat and have a distinct set of species that rely on it. Those species can be divided into either primary cavity nesters or secondary cavity nesters, or into categories defined by the type of food item foraged upon such as wood/bark foragers or aerial (insect) foragers. For species that forage for wood boring beetles, the window of opportunity is short, due to the 2-3 year life cycle of most wood boring beetles (Haggard and Gaines 2001).

The importance of recently burned forests to breeding cavity-nesting birds is well known (Hutto 1995, Saab 2008, Russell 2006). Densities of cavity nesters in burned forests change with time since the initial fire (Saab 2007). Species that obtain their insect prey from wood, such as black-backed woodpeckers, rapidly colonize postfire forests and then experience population declines as time since fire increases, likely due to declines in bark and wood-boring beetles (Saab 2007).

Postfire salvage logging removes snags that provide breeding, roosting, and foraging habitat for many species (Kotliar 2002, Hutto and Gallo 2006). Studies indicate that wood and bark foraging species favor unlogged burned forests due to greater foraging opportunities in areas with high snag densities, whereas some aerial insectivores and other open-space foragers can use partially logged postfire forests due to more open space for aerial foraging maneuvers (Saab and Dudley 1998, Haggard and Gaines 2001, Saab 2002). Prey availability and predation pressure also differ between salvage-logged and unlogged areas and may influence the overall use of these areas (Saab 2007).

Snag abundance is a limiting factor for primary cavity excavators because they excavate a nest cavity each year (Haggard and Gaines 2001). Primary cavity excavators are important members of forest ecosystems because the cavities they excavate may be used by secondary cavity nesters, including bats, American marten, many owl species, and other birds and because they influence insect numbers.

Saab and Dudley (1998) found species such as black backed and hairy woodpeckers to be most abundant in stands with a high density of snags. Species that are considered to be more habitat generalists, and are also more abundant throughout their range, were found to be more abundant in the stands with the lower snag densities. Species that are associated with open-canopy stands, such as Vaux’s swift, downy woodpecker, and western bluebird may benefit from postfire
logging in dense stands where it would take years for the snags to fall on their own to create open conditions (Saab 2002) though these species are not nearly as restricted to post fire habitat and commonly occur in naturally open, unburned, conifer forests as well.

Salvage logging influences densities or relative abundances of cavity nesting and some non-cavity nesting birds (Cahall 2007, Hutto 2006). Maintaining unsalvaged areas in burned forests will provide habitat for species of birds negatively influenced by salvage logging (Cahall 2007, Saab and Dudley 1998, Dudley 2005). Retaining large snags after salvage logging will provide foraging habitat for woodpeckers (Cahall 2007). Much of the area burned by the Panther fire and left untreated is within wilderness and LSR land allocations where a lack of access will preclude any further disturbance to the post fire habitat in the area.

It is important to emphasize the proportion of area proposed for salvage logging in relation to the overall burned area, and the overall availability of this habitat type, specifically areas that burned in high and moderate severity that will not be treated. Within the entire burned area of the Elk Creek watershed, there were 7,846 acres burned in high or moderately high severity with the October run of the Panther fire, with 255 acres (3%) of this proposed for harvest.

Postfire timber harvest can compound the original impacts to the habitat from the fire, whether they are negative or positive (Hutto 1995, Hutto and Gallo 2006, Caton 1996, Saab and Dudley 1998, Hanson 2008). Removing burned trees/snags from 3 percent of the fire-affected area in the 5th field watershed and 0.5% of the fire-affected area on the District may have some effect on individuals, but the small area affected likely will have no impact on populations or population trends across the larger area. The threshold at which postfire removal of trees, in addition to fire-caused mortality, has no limiting effects on overall availability of post fire habitat is unknown (Saab and Dudley 1998, Saab 2002, Hutto 2006) but is unlikely to be met by the proposed project due to the abundance of severely burned habitat that will remain untreated.

**Planting**

Planting a mix of coniferous species within severely burned areas of the Panther fire would likely have no immediate direct or indirect impacts to the MIS species listed above. Plantations are long term investments that take many years to materialize into seral stages or habitat types usable by any of the species listed above. Habitat elements needed for nesting by these species would not be achieved for at least 40 to 50 years if growing conditions are favorable.

**CUMULATIVE EFFECTS**

Current baseline conditions in the analysis area are a result of wildfire and past logging practices. There are no additional actions proposed for the analysis area that would further degrade or remove post fire, snag habitat as described above in the reasonably foreseeable future. There is no commercial logging planned in the analysis area. Potential future actions in the analysis area include conifer planting and incidental forest visitor activities such as hunting, hiking, wood cutting, and camping (see Table 5 of the Wildlife BE/BA for a detailed list of Past, Present and Future Foreseeable Actions in the analysis area). None of these would have further, additive impacts to habitat for snag associated species.
There are no direct or indirect effects expected from the No Action Alternative.

REFERENCES

Cahall, R.E. and J.P. Hayes. 2007. Influences of postfire salvage logging on forest birds in the Eastern Cascades, Oregon. Oregon State University, Corvallis, Oregon.


