Wildlife

Sensitive Species

Introduction

Sensitive wildlife species are those species that may show evidence of a current or predicted downward trend in population numbers or in habitat suitability that could substantially reduce species distribution. The Regional Forester has identified 12 wildlife species as sensitive, including the delisted bald eagle and peregrine falcon. The northern goshawk is no longer a sensitive species in Region One; it has been determined that the goshawk population is not in a downward trend and goshawk species distribution is not in danger of reduction. Potential effects to the northern goshawk will be analyzed with old growth associated species.

The bald eagle, common loon, harlequin duck, northern bog lemming, northern leopard frog, peregrine falcon, western (Townsend's) big-eared bat, and wolverine are sensitive wildlife species that have been determined to not be affected by this project and will not be discussed further in this report.

Analysis Area

Spatial Bounds

The Mid Swan Blowdown Salvage Project Area, approximately 4,480 acres, was the area considered for the evaluation of direct and indirect effects on sensitive wildlife species. The Upper Swan Valley was the scale used for cumulative effects. This area is large enough to include the home ranges of several individuals or pairs of a species, and is representative of the effects of fire, natural tree mortality, timber harvest, road management, and other potential effects, across the landscape. The actions proposed that could directly, indirectly, or cumulatively affect sensitive species are contained within this area.

Temporal Bounds

The length of time for effects in this cumulative effects analysis is approximately 3 to 5 years. This is based on the probable contract length for the proposed salvage project and the timeframes for related activities.

Black-backed Woodpecker

Data Sources, Methods, & Assumptions Used

Data used included stand exams, VMAP Data, field surveys of snags and downed logs, old growth surveys, project area field visits, research literature, and GIS and dataset information for features such as general forest attributes, habitat type, and forest type.

Measurement Indicators

Based on current knowledge of the life history, biology, and ecology of the black-backed woodpecker, certain elements are thought to be essential to the conservation of the species. These elements include the presence of dead and dying, insect-infested trees (forage), and large snags (nesting). The effects analysis for the black-backed woodpecker focused on the presence of insects and potential nesting trees and the potential effects the proposed blowdown salvage could have on these habitat characteristics.

Affected Environment

Historic Condition

Black-backed woodpeckers forage in areas with concentrations of dead or decaying trees and logs, often in recently burned forests. The trees in which they feed have frequently only been dead for 2 to 3 years, since these trees harbor the most insects. They use live or dead trees (usually 8 to 12 inches DBH) for nesting. Black-backed woodpecker populations have always been transitory. When an epidemic, windstorm, or fire occurred in the past, black-backed woodpeckers would move into that area. As time went on and the insect numbers decreased, the woodpeckers would move on to another area. There was probably more feeding habitat historically. Fire suppression efforts and salvage of fire-killed, windthrown, and insect-infested trees has reduced the habitat potential for black-backed woodpeckers in the Swan Valley and across northwest Montana.

Existing Condition

Black-backed woodpeckers are known to occur throughout the Swan Valley, usually in low numbers. Mature and old growth forest stands in the Swan Valley provide potential habitat conditions for a low-density population. Black-backed woodpeckers have been observed in the Crazy Horse Fire Area, due to the recent increase in dead or decaying trees. For additional information on the status of the black-backed woodpecker on the Flathead National Forest, and the status at broader scales, reference the document, Flathead National Forest Evaluation and Compliance with NFMA Requirements to Provide for Diversity of Animal Communities (Project File Exhibit F-4).

Recent studies in Montana have shown that habitat for the black-backed woodpecker is currently abundant and well distributed across the Northern Region and by Forest (Samson 2005, USDA 2007). In addition, habitat amounts are expected to increase as fires and insect outbreaks continue to increase in size and in a pattern distinctly different from that evident historically (Gallant 2003, Hessburg and Agee 2003 and others).

Environmental Consequences

The Mid Swan Project consists of three action alternatives and a No Action Alternative. The alternatives are described in detail in Chapter 2 of this EA. The Cumulative Effects Worksheet, located in the Wildlife Project File (Project File Exhibit F-3) considers and describes proposed activities in addition to the past, current, and reasonably foreseeable activities listed at the beginning of this chapter in Tables 3-1 and 3-2. Those activities that cumulatively contribute indiscernible effects to Sensitive Wildlife Species are not included in this section. Those activities that cumulatively affect these species are listed below.

Alternative A - No Action
Direct, Indirect, and Cumulative Effects

Under Alternative A there would be no salvage of blowndown trees. This would be beneficial to black-backed woodpeckers since these woodpeckers are associated with dead and decaying trees and logs (forage areas). In addition, existing snags would not be disturbed by salvage activities or removed incidentally or for commercial use. This would be beneficial due to the use of snags and live trees for nesting.

Indirectly, under Alternative A, if a wildfire happened to burn into an area with large accumulations of blowdown, the fire intensity would be greater and the potential for fire spread would increase. This, however, would not necessarily be a negative circumstance for the black-backed woodpecker, since this woodpecker responds positively to wildfire events.

Timber harvest on NFS lands and on private and State lands in the Swan Valley would continue, probably salvaging a portion of the potential feeder and nesting trees for black-backed woodpeckers. High levels of human activity would continue, with the possibility for potential feeder trees to be taken out as firewood. Although there may be an increase in firewood cutting from open roads, no additional access for such activities would occur with the implementation of Alternative A.

Fire suppression efforts would continue, and to the extent that they are successful, black-backed woodpecker population levels would remain low. Since 2001, there have been a number of large wildfires on the Flathead National Forest and throughout western Montana. For the next 2 to 3 years, and possibly longer, black-backed woodpecker numbers in the Flathead should remain high.

Alternative A would not contribute to negative cumulative effects to the black-backed woodpecker.

Alternative B (Proposed Action)
Direct and Indirect Effects

Forage and Nesting Habitat

As a result of implementing Alternative B, a direct effect to the black-backed woodpecker would be the reduction of potential feeder trees and logs and a reduction in the amount of potential nesting habitat. Newer dead logs (2 to 3 years) are more likely to have insects in them, so the new blowdown is higher quality forage than the older logs that may be on the ground.

Alternative B includes salvage of blowdown in old growth habitats and salvage in RHCA's (riparian habitats). Old growth and riparian habitats usually have a higher proportion of down logs and dead or dying trees. The potential for foraging and nesting habitat for black-backed woodpecker is generally higher in old growth forest habitats or in riparian areas. Under Alternative B (in old growth Units 2, 5, 13, and 18), all snags would be retained and approximately 27 to 30 tons per acre of down woody material would be retained, where available (Design Criteria, Table 2-14). In non old growth salvage units the minimum retention for down woody material would be approximately 12 tons per acre, where available. In

addition, 4 snags average per acre that are 12 to 20 inches DBH and 4 snags average per acre that are greater than 20 inches DBH would be left, where available (Design Criteria, Table 2-14). These amounts and kind of down woody material specified in these Design Criteria were developed by the Wildlife Biologist and Silviculturist to balance habitat needs, ecological contributions, and fire hazard. There would still be a decrease in the amount of available foraging and nesting habitat for the black-backed woodpecker under Alternative B, but the retention of snags and down woody material in the salvage units would help to mitigate the loss.

Temporary Roads

Approximately 1.3 miles of temporary road would be needed to access salvage units under Alternative B. Only 0.3 miles of temporary road would be newly constructed; there is also 1.0 mile of historic road templates that would be used for temporary road access under Alternative B. Where newly constructed temporary road occurs, some snags may be cut down and some woody debris may be moved. Snags removed to clear for a temporary road would be left on the ground as down woody material. The roads would be reclaimed following vegetative treatments. Public use of closed roads would not be permitted, reducing the risk of losing potential black-backed woodpecker foraging and nesting habitat to firewood cutters.

Security/Mortality Risk

Under Alternative B it is possible that project implementation would directly affect individual black-backed woodpeckers through disturbance or incidental mortality. It is also possible that the more open canopies caused by the wind event, and the subsequent salvage of the blowndown trees, may create openings that facilitate increased firewood gathering. This could lead to decreased habitat and habitat security for black-backed woodpeckers in the project area.

Other roads that are managed as closed roads would be used for accessing units. An increase in public access increases the risk of losing high quality snags to firewood cutters. Public use of closed roads would not be permitted and temporary roads would be reclaimed following use. Reclaiming roads following use should help reduce the risk of snag loss over the longterm.

Alternative B (Proposed Action) Cumulative Effects

Human caused threats to snag and downed woody associated species include activities that reduce the availability or use of snag/downed woody habitat. Activities that have reduced dead tree habitat in the Mid Swan Blowdown Salvage Project Area, and throughout the Swan Valley, are timber management, road building, agricultural conversion, residential development, firewood cutting, fire suppression, and disease control.

On many of the roads in the salvage area, public access has been restricted through seasonal or yearlong road closures. This has helped to reduce the loss of important snag habitat to firewood cutters.

Fire suppression has been the greatest factor limiting the distribution of potential black-backed woodpecker habitat. Prior to 2001, there had been few wildfires of considerable size since 1926. Then, across the Flathead National Forest and most of western Montana, large acreages of black-backed woodpecker habitat were created by wildfires. Between 2001 and 2004, approximately 200,000 acres in over 70 fires burned on the Flathead National Forest, creating a substantial amount of black-backed woodpecker habitat. Less than 5 percent of this habitat was salvage harvested, leaving the vast majority of potential black-backed woodpecker habitat intact. In the southern portion of the Swan Valley, the 11,000-acre Crazy Horse Fire (2003) created thousands of snags with only a portion of the snags removed through salvage on about 600 acres. In 2006, about 1,800 acres containing thousands of trees were burned in the Holland Peak Fire, south of the blowdown salvage area. Most of these snags remain on site.

As discussed in Westerling et al. (2006), virtually all climate model projections indicate that warmer springs and summers would occur over the region in coming decades:

> "These trends will reinforce the tendency toward early spring snowmelt and longer fire seasons. This will accentuate conditions favorable to the occurrence of large wildfires, amplifying the vulnerability the region has experienced since the mid-1980's."

Furthermore, a recent state insect and disease condition report shows dramatic increases in acreages of tree mortality from 2002 to 2005 (USDA 2006). South of the Mid Swan Blowdown Salvage Project Area, in the Pierce Lake Vicinity, an on-going mountain pine beetle epidemic is potentially providing foraging opportunities for black-backed woodpecker.

Recently, PCTC has offered up tracts of land in the Swan Valley for sale to the Forest Service, conservation buyers, or other private individuals. There is a concern that an increase in private parcels of land in the Swan Valley may further fragment wildlife habitat and reduce the availability of snag and down woody habitat. It is anticipated however, that this condition could improve due to the Montana Legacy Project, a project whereby many of the PCTC sections in the Swan Valley have been purchased by The Nature Conservancy and The Trust for Public Land, to be eventually conveyed to the Forest Service. This future land conveyance would create larger blocks of public land that can be managed in larger patch sizes.

Significant adverse cumulative effects to the black-backed woodpecker are not expected as a result of implementing Alternative B because;

1. Broad scale analysis has demonstrated that there appears to be little risk of population loss (Project File Exhibit F-4);
2. Although salvage of blowndown trees would alter the current amount of down woody habitat in treated stands, large amounts of down woody material would be retained;
3. The proposed salvage in non old growth forest stands would retain a snag component, meeting or exceeding minimum forest plan standards where sufficient snags currently exist; and
4. Salvage of blowdown in old growth stands would retain all snags.

Alternative C
Direct and Indirect Effects

Forage and Nesting Habitat

A direct effect to the black-backed woodpecker as a result of implementing Alternative C would be the reduction of potential feeder trees and logs and a reduction in the amount of potential nesting habitat.

Under Alternative C, there would be no salvage of blowdown in old growth habitats. Old growth habitats usually have a higher proportion of down logs and dead or dying trees. The potential for foraging and nesting habitat for black-backed woodpecker is generally higher in old growth areas. Under Alternative C, these areas would continue to provide important foraging and nesting habitat for black-backed woodpeckers. Under Alternative C, there would still be salvage of blowdown in RHCA's (riparian areas). These habitats can be important snag and down woody habitat, but to a lesser degree than old growth habitats.

Salvage of blowdown in the proposed units in Alternative C would decrease the amount of available foraging and nesting habitat for the black-backed woodpecker. Under Alternative C, the retention of snags and down woody material in the salvage units would help to mitigate the loss. The minimum retention for down woody material would be approximately 12 tons per acre, where available. In addition, 4 snags

average per acre that are 12 to 20 inches DBH and 4 snags average per acre that are greater than 20 inches DBH would be left, where available.

Temporary Roads

Approximately 0.5 miles of temporary road would be needed to access salvage units under Alternative C. None of this temporary road would be new construction. In Alternative C, the proposed temporary roads are located on existing historic templates. The effect to potential black-backed woodpecker habitat as a direct result of building the contemporary road would be minimal. The roads would be reclaimed following salvage activities. Public use of closed roads would not be permitted, reducing the risk of losing potential black-backed woodpecker foraging and nesting habitat to firewood cutters.

Security/Mortality Risk

Under Alternative C, it is possible that project implementation would directly affect individual black-backed woodpeckers through disturbance or incidental mortality. It is also possible that the more open canopies caused by the wind event, and the subsequent salvage of the blowndown trees, could create openings that facilitate increased firewood gathering. This could lead to decreased habitat and habitat security for black-backed woodpeckers in the project area.

Other roads that are managed as closed roads would be used for accessing units. An increase in public access increases the risk of losing high quality snags to firewood cutters. Public use of closed roads would not be permitted.

Alternative C
Cumulative Effects

Activities that have reduced dead tree habitat in the Mid Swan Blowdown Salvage Project Area, and throughout the Swan Valley, are timber management, road building, agricultural conversion, residential development, firewood cutting, fire suppression, and disease control. On many of the roads in the salvage area, public access has been restricted through seasonal or yearlong road closures. This has helped to reduce the loss of important snag habitat to firewood cutters.

As described above, in the Alternative B discussion, fire suppression has been the greatest factor limiting the distribution of potential black-backed woodpecker habitat. Between 2001 and 2008, many fires have burned across the Flathead National Forest, creating a substantial amount of black-backed woodpecker habitat. In addition, climate model projections indicate that warmer springs and summers will occur over the region in coming decades. This would accentuate conditions favorable to the occurrence of large wildfires, and influence a probable increase in insect and disease related tree mortality, which is potentially beneficial for the black-backed woodpecker.

Significant adverse cumulative effects to the black-backed woodpecker are not expected as a result of implementing Alternative C because;

1. Broad scale analysis has demonstrated that there appears to be little risk of population loss;
2. There would be no blowdown salvage in important old growth habitats; and
3. The proposed salvage would retain a snag component and down woody material, which would meet or exceed minimum Forest Plan requirements where sufficient snags and down woody debris currently exist.

Alternative D
Direct and Indirect Effects

Forage and Nesting Habitat

As a result of implementing Alternative D, a direct effect to the black-backed woodpecker would be the reduction of potential feeder trees and logs and a reduction in the amount of potential nesting habitat. Newer dead logs (2 to 3 years) are more likely to have insects in them, so the new blowdown is higher quality forage than the older logs that may be on the ground.

Alternative D includes salvage of blowdown in old growth habitats. Old growth habitats usually have a higher proportion of down logs and dead or dying trees. The potential for foraging and nesting habitat for black-backed woodpecker is generally higher in old growth forest habitats. Under Alternative D (in old growth Units 2, 5, 13, and 18), all snags would be retained and approximately 27 to 30 tons per acre of down woody material would be retained, where available. Under Alternative D, there would be no salvage of blowdown in RHCA's. These riparian habitats can be important snag and down woody habitat, but to a lesser degree than old growth habitats.

In non old growth salvage units, the minimum retention for down woody material would be approximately 12 tons per acre, where available. In addition, 4 snags average per acre that are 12 to 20 inches DBH and 4 snags average per acre that are greater than 20 inches DBH would be left, where available. There would still be a decrease in the amount of available foraging and nesting habitat for the black-backed woodpecker under Alternative D, but the retention of snags and down woody material in the salvage units would help to mitigate the loss.

Temporary Roads

Approximately 1.1 miles of temporary road would be needed to access salvage units under Alternative D. Only 0.1 miles of temporary road would be newly constructed; there is also 1.0 mile of historic road templates that would be used for temporary road access under Alternative D. Where newly constructed temporary road occurs, some snags may be cut down and some woody debris may be moved. Snags removed to clear for a temporary road would be left on the ground as down woody material. The roads would be reclaimed following vegetative treatments. Public use of closed roads would not be permitted, reducing the risk of losing potential black-backed woodpecker foraging and nesting habitat to firewood cutters.

Security/Mortality Risk

Under Alternative D it is possible that project implementation would directly affect individual black-backed woodpeckers through disturbance or incidental mortality. It is also possible that the more open canopies caused by the wind event, and the subsequent salvage of the blowndown trees, could create openings that facilitate increased firewood gathering. This could lead to decreased habitat and habitat security for black-backed woodpeckers in the project area.

Other roads that are managed as closed roads would be used for accessing units. An increase in public access increases the risk of losing high quality snags to firewood cutters. Public use of closed roads would not be permitted.

Alternative D
Cumulative Effects

Human-caused threats to snag and downed woody associated species include activities that reduce the availability or use of snag/downed woody habitat. Activities that have reduced dead tree habitat in the Mid Swan Blowdown Salvage Project Area, and throughout the Swan Valley, are timber management, road

building, agricultural conversion, residential development, firewood cutting, fire suppression, and disease control.

As described above, fire suppression has been the greatest factor limiting the distribution of potential black-backed woodpecker habitat. Between 2001 and 2008, many fires have burned across the Flathead National Forest, creating a substantial amount of black-backed woodpecker habitat. In addition, climate model projections indicate that warmer springs and summers will occur over the region in coming decades. This would accentuate conditions favorable to the occurrence of large wildfires, and influence a probable increase in insect and disease related tree mortality, which is potentially beneficial for the black-backed woodpecker.

Recently, PCTC has offered up tracts of land in the Swan Valley for sale to the Forest Service, conservation buyers, or other private individuals. There is a concern that an increase in private parcels of land in the Swan Valley could further fragment wildlife habitat and reduce the availability of snag and down woody habitat. It is anticipated, however, that this condition may improve due to the Montana Legacy Project.

Significant adverse cumulative effects to the black-backed woodpecker are not expected as a result of implementing Alternative D because;

1. Broad scale analysis has demonstrated that there appears to be little risk of population loss;
2. Although salvage of blowndown trees would alter the current amount of down woody habitat in treated stands, large amounts of down woody material would be retained, sufficient to meet or exceed minimum Forest Plan standards;
3. The proposed salvage in old growth habitats would retain a down woody component; and
4. Salvage of blowdown in old growth stands would retain all snags.

Determination

In accordance with FSM 2673.42, a determination has been made as to the degree of impact the activities proposed might have on sensitive species. Based on available information on the black-backed woodpecker's distribution, presence/absence from the project area, habitat requirements, and management strategies, as well as project design and location, the determination for Alternative A is "**beneficial impact**" and the determination for each of the action alternatives is **"may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species."**

FISHER

Data Sources, Methods, and Assumptions Used

Data used included aerial photography, VMAP Data, project area field visits, research literature, and GIS and dataset information for features such as general forest attributes, habitat type, forest type, and mapped riparian areas.

Measurement Indicators

Based on current knowledge of the life history, biology, and ecology of fisher, certain elements are thought to be essential to the conservation of the species. These elements include the presence of denser canopy

cover forest, snag and down woody habitat characteristics, and adjacent riparian habitats. These elements of fisher habitat, and the anticipated effects to these elements from project implementation, are the measurement indicators used in this analysis.

Affected Environment

Historic Condition

Fishers are large, weasel-like predators that occupy a variety of upland and lowland forests, with an affinity for forested riparian habitats. They show a close association with coniferous forests with complex physical structure, especially old, uneven aged stands, although dense immature forest stands are also used. This is probably a reflection of the importance of good snow interception during winter months (Allen 1983), the need for protection from predators, prey availability, and the availability of hollow logs, tree cavities, brush piles, burrows, etc., for shelter, rest, and denning. Although fishers use edge, ecotones, and wetlands, they still appear to be an interior forest species, making limited use of small openings, but generally not using larger openings. Fishers have been found to prefer to rest in stands that exceed 60 percent canopy cover, and avoid stands with less than 40 percent canopy cover (Jones 1991). The highest quality fisher habitat is dense (60 to 80+ percent cover) coniferous and mixed coniferous/deciduous forest with an available water source (Ruggerio et al. 1994). Riparian areas are important year-round. They are used extensively for travel and resting, and provide optimal habitat for favored prey species (e.g., snowshoe hare, grouse, voles, squirrels, and mice). In one study (Powell and Zielinski 1994), it was found that fisher very rarely strayed far from streams [within 328 feet 100 meters)] or other wet sites. Sites used by the fisher for shelter or sleeping include hollow logs, tree cavities, brush piles, and used burrows and/or dens. In a study done in Idaho, the average diameter of trees used by fisher as resting sites was 22 inches (Jones 1991). Maternity dens tend to be hollow cavities high in trees.

In the Northern Rockies, fishers have existed under a disturbance regime that has created numerous openings in a matrix of mature forested habitats. The denser, coniferous stands near water, which are preferred by fisher, would have experienced longer intervals between fire than drier, more open forest lands. The increased pulse of large logs on the ground that would have followed a fire or insect event would have been beneficial over time.

During the late 19th and early 20th centuries, trapping, logging, and the conversion of forested areas to agricultural lands contributed to the fisher being extirpated from much of its range in the United States and eastern Canada. The fisher appeared to be eliminated from Montana at one time, as there were no trapping records in Montana from 1920 to1960. Within Montana and Idaho, over a million acres of mature coniferous forest burned in the early part of the 20th century. This may have played a role in the decline of fisher populations. In addition, managed forests may have limited availability of the large, diverse areas of mature and old growth forest with riparian areas which have been described as primary fisher habitat.

Existing Condition

Fishers are common in the Northeastern and Midwestern portions of the United States, but rarer in the West. Restrictions on harvesting, and re-introduction programs in the late 1950s, have contributed to population recovery in portions of the fisher's historic range. In the Rocky Mountains, fisher occur in Idaho, Wyoming, and Montana. Since 1968, fisher occurrence has been verified in the Flathead, Mission, Swan, and Whitefish Ranges (Vinkey 2003). Fishers are known to occur in the Swan Valley, but at low population densities. It is believed that fisher population density is usually low due to a relatively large home range, which can vary from 16 to 32 square miles (USFS 1994).

The fisher habitat assessment in the Swan Valley (USDA 1994) described how, due to numerous wetlands in the Swan Valley and the availability of moist forest conditions, fisher habitat appeared to be extensive and well distributed in the valley's lower elevation zones. Although fisher in the Swan Valley are not restricted entirely to stream course zones, they are usually found, as described above, within 330 feet

(100 meters) of streams or other wetland habitats where cover is available. Riparian habitats, as well as old growth habitats in the Swan Valley, are more likely to provide the dense canopy cover and complex structure (e.g., snags, broken tops, down woody material) that fisher are associated with. These habitats in the Swan Valley are very important for fisher and provide key travel and movement corridors in light of the intermingled land ownership.

Environmental Consequences

Alternative A - No Action
Direct, Indirect, and Cumulative Effects

No blowdown salvage activities would be implemented under this alternative. There would be no direct effects to fisher foraging, resting, or denning habitat.

Blowndown trees are a natural occurrence in forested habitats, and the accumulation of significant amounts of down woody debris on the forest floor is an important habitat characteristic for many species, including fisher. In several of the forest stands where salvage is proposed, especially some of the old growth salvage units, the addition of down woody debris is probably an improvement over pre-wind event conditions. (For more on standing and down woody habitat, see the Wildlife Section on Snag and Down Woody Associated Wildlife Species).

Indirectly, under the No Action Alternative, it could be expected that a wildfire that might occur in an area with large accumulations of blowdown would burn more intensely and have a greater potential of growing larger and becoming a stand replacement event. Though the precise impacts of a potential wildfire are dependent on location and many other conditions, to the degree that such fires were stand replacing, they could reduce the amount of fisher habitat available.

Alternative B
Direct and Indirect Effects

Canopy Cover Reduction

Implementation of Alternative B would not decrease the existing amount of canopy cover in the proposed salvage units because no live overstory trees would be removed. The wind event itself may have decreased habitat quality for fisher, or displaced fisher altogether if the canopy cover is less than 40 percent. There would be no significant effects to forest canopy cover with implementation of Alternative B.

Snag and Down Woody Habitat

Snags and down woody material are important components of fisher habitat and are used for resting, denning, and shelter. They are also important components for fisher prey habitat. Snag and down woody habitat would be reduced in the proposed salvage units.

To mitigate the effects of snag loss on fisher in non-old growth treatment units, 4 snags average per acre that are 12 to 20 inches DBH with a minimum height of 10 feet, and 4 snags average per acre that are greater than 20 inches DBH with a minimum height of 10 feet would be left, where available.

To mitigate the effects on fisher of the loss of down woody material, in the non-old growth units, at least 12 tons per acre would be retained, where available. The longest pieces (e.g., 16-foot logs or longer) with the largest size (e.g., 15 inches DBH or greater) would be retained. These longer and larger diameter pieces would be the most beneficial.

Treatment in Old Growth and Riparian Habitats

Under Alternative B, blowdown salvage would occur in old growth habitats. Reducing the amount of snags or down woody material in old growth stands can remove habitat features that are essential or very important to many old growth associated species, including the fisher (Bull et al. 2005). Research suggests that retaining the bulk of the largest material may decrease these effects (Bull and Blumton 1999, Porter et al. 2005). Under Alternative B, all snags would be retained in the existing old growth units (Units 2, 5, 13, and 18). To maintain appropriate coarse woody material in old growth stands, approximately 27 to 30 tons per acre would be retained, where available. Retained down woody material would consist of the longest (e.g., 16 feet or longer) and largest (e.g., 15 inches DBH or greater) pieces.

Under Alternative B, there would also be salvage of blowdown in RHCAs. As described previously, fisher are strongly associated with riparian habitats. There would be a decrease in snags and down woody habitat in the RHCAs.

The potential for disturbance and displacement of fisher would be greater in old growth and riparian habitats. Design Criteria for grizzly bear and bull trout would help mitigate this potential for disturbance in important fisher habitat. There would be no salvage activity in any of the proposed units during the Spring Period for grizzly bear (4/1 through 6/15) and no salvage activity in Units 3, 4, 6, 8, 10, and 14 for bull trout security from 9/1 through 9/30.

Temporary Roads

There are 1.3 miles of temporary road proposed under Alternative B (approximately 1.0 mile of historic templates and 0.3 miles of newly constructed temporary road). Temporary roads would be reclaimed following use. Other roads that are managed as closed roads would be used for accessing treatment areas. Public use of closed roads or temporary roads would not be permitted, reducing the risk of losing high quality snags to firewood cutters.

Alternative B (Proposed Action) Cumulative Effects

The Swan Valley has a well-developed system of glacial potholes, wet meadows, seeps, and riparian connections throughout the valley floor along both sides of the Swan River. The ecological contribution that these wetland habitats contribute to various wildlife species, including fisher, is very important (Project File Exhibit R-2). There has been a loss of ecological integrity to many of these complexes, as well as to mature and old growth forest habitats, as a result of residential development, forest management, permanent road construction, drought, and both fire suppression on the one hand and large-scale wildfire on the other. All of these factors combined have undoubtedly affected the amount and the connectivity of potential fisher habitat in the Upper Swan Valley.

The Mid Swan Blowdown Salvage Project is located near the community of Condon, Montana. There are part-year and yearlong residences in the area as well as many recreational opportunities. The level of human activity in the area increases the chance for disturbance or displacement of fisher. There is also an increased risk for the removal of snags (firewood), an important component of fisher habitat. Other human activity in the area includes various road use permits, easements, and ongoing outfitter guide permits.

The existing intermingled ownership pattern in the Swan Valley presents difficulties in managing habitat connectivity with patch sizes that occurred historically. It is anticipated that, in the future, this condition would improve due to the Montana Legacy Project, a project whereby many of the PCTC sections in the Swan Valley have been purchased by The Nature Conservancy and The Trust for Public Land, to be eventually conveyed to the Forest Service. This future land conveyance would create larger blocks of public land that can be managed in larger patch sizes.

Hillis and Lockman (2003) mapped fisher habitat in Region One, where fishers are generally limited to west of the Continental Divide. Fisher habitat was defined as low to mid elevation, mesic, mature and old forests, within 328 feet (100 meters) of streams. To address patch size and habitat connectivity relevant for fishers, they excluded any patch of habitat that was less than 160 acres and more than 600 feet from the nearest patch of adjacent cover (Jones 1991, Ruggiero et al. 1994). That habitat was compared against levels of habitat that would have been available in pre-fire suppression/pre-logging periods. What they found was that fisher habitat occurs at historically normal levels at both the Flathead National Forest and Region One scales. This should not be interpreted that management activities have not had adverse effects on fisher habitat. Rather, when fisher habitat was mapped, it clearly showed portions of Region One where timber harvest activities on both corporate and NFS lands had fragmented and reduced the acres of existing fisher habitat. Hillis and Lockman (2003), however, point out that even during the 1970s and 1980s, when timber harvest was intensive, riparian zones were generally avoided, which could explain why habitat loss and fragmentation were not greater. More recently, Samson (2006) showed that on the Forests and the Region as a whole, forested ecosystems are more extensive now than in historic times. Research on fisher is on-going. Multiple agencies and organizations, including the Forest Service, are currently conducting surveys to detect fisher in the Rocky Mountains.

Alternative B would not contribute significantly to negative cumulative effects on fisher in the Swan Valley because:

1. The proposed blowdown salvage would not affect existing canopy cover;
2. The proposed Design Criteria (Table 2-14) for the retention of large snags and coarse woody debris would help to mitigate negative effects to fisher and would meet or exceed minimum Forest Plan standards in that regard;
3. Roadless and wilderness areas in the Swan Valley help to reduce the risks of mortality attributed to humans such as vehicle collisions, trapping and predator control needs; and
4. Road closures for grizzly bear security continue to benefit the fisher.

Alternative C
Direct and Indirect Effects

Canopy Cover Reduction

Implementation of Alternative C would not decrease the existing amount of canopy cover in the proposed salvage units because no live overstory trees would be removed. There would be no significant effects to forest canopy cover with implementation of Alternative C.

Snag and Down Woody Habitat

Snag and down woody habitat would be reduced in the proposed salvage units. To mitigate the effects on fisher from the loss of snag habitat, 4 snags average per acre that are 12 to 20 inches DBH with a minimum height of 10 feet, and 4 snags average per acre that are greater than 20 inches DBH with a minimum height of 10 feet would be left, where available.

To mitigate the effects on fisher from the loss of down woody habitat, at least 12 tons per acre would be retained, where available. The longest pieces (e.g. 16 foot logs or longer) with the largest size (e.g. 15 inches DBH or greater) would be retained. These longer and larger diameter pieces would be the most beneficial.

Treatment in Old Growth Habitats

Under Alternative C, there would be no blowdown salvage in important old growth habitats.

Treatment in Riparian Habitats

Under Alternative C, blowdown salvage would occur in RHCAs. Reducing the amount of snags or down woody material in riparian habitats can remove habitat features that are essential or very important to the fisher. Under Alternative C, there would be a decrease in snags and down woody habitat in the RHCAs.

The potential for disturbance and displacement of fisher would be greater in riparian habitats. Design Criteria for grizzly bear and bull trout would help mitigate this potential for disturbance in important fisher habitat. There would be no salvage activity in any of the proposed units during the Spring Period for grizzly bear (4/1 through 6/15) and no salvage activity in Units 3, 4, 6, 8, 10, and 14 for bull trout security from 9/1 through 9/30.

Temporary Roads

There are 0.5 miles of temporary road proposed under Alternative C (all historic templates; no newly constructed temporary road). Temporary roads would be reclaimed following use. Other roads that are managed as closed roads would be used for accessing treatment areas. Public use of closed roads or temporary roads would not be permitted, reducing the risk of losing high quality snags to firewood cutters.

Alternative C
Cumulative Effects

As described above under Alternative B, there has been a loss of ecological integrity to many of the wetland complexes, as well as to mature and old growth forest habitats, as a result of residential development, forest management, permanent road construction, drought, and both fire suppression and wildfire. All of these factors combined have undoubtedly affected the amount and the connectivity of potential fisher habitat in the Upper Swan Valley.

The level of human activity in the blowdown salvage area increases the chance for disturbance or displacement of fisher. There is also an increased risk for the removal of snags (firewood), an important component of fisher habitat.

The existing intermingled ownership pattern in the Swan Valley presents difficulties in managing habitat connectivity with patch sizes that occurred historically. It is anticipated that, in the future, this condition would improve due to the Montana Legacy Project. This future land conveyance would create larger blocks of public land that can be managed in larger patch sizes.

Research on fisher is ongoing. Multiple agencies and organizations, including the Forest Service, are currently conducting surveys to detect fisher in the Rocky Mountains.

Alternative C would not contribute significantly to negative cumulative effects on fisher in the Swan Valley because:

1. The proposed blowdown salvage would not affect existing canopy cover;
2. Under Alternative C, there is no blowdown salvage proposed in important old growth habitats;
3. The proposed Design Criteria for the retention of large snags and coarse woody debris would help to mitigate negative effects to fisher and would meet or exceed minimum Forest Plan standards in that regard;

4. Roadless and wilderness areas in the Swan Valley would help to reduce the risks of mortality attributed to humans such as vehicle collisions, trapping, and predator control needs; and

5. Road closures for grizzly bear security continue to benefit the fisher.

Alternative D
Direct and Indirect Effects

Canopy Cover Reduction

Implementation of Alternative D would not decrease the existing amount of canopy cover in the proposed salvage units. There would be no significant effects to forest canopy cover with implementation of Alternative D.

Snag and Down Woody Habitat

Snags and down woody material are important components of fisher habitat and are used for resting, denning, and shelter. They are also important components for fisher prey habitat. Snag and down woody habitat would be reduced in the proposed salvage units.

To mitigate the effects on fisher, relative to loss of snag habitat in non-old growth treatment units, 4 snags average per acre that are 12 t0 20 inches DBH with a minimum height of 10 feet, and 4 snags average per acre that are greater than 20 inches DBH with a minimum height of 10 feet would be left, where available.

To mitigate the effects on fisher relative to loss of down woody habitat in the non-old growth units, at least 12 tons per acre would be retained, where available. The longest pieces (e.g., 16 foot logs or longer) with the largest size (e.g., 15 inches DBH or greater) would be retained. These longer and larger diameter pieces would be the most beneficial.

Treatment in Old Growth Habitats

Under Alternative D, blowdown salvage would occur in old growth habitats. Under Alternative D, all snags would be retained in the existing old growth units (Units 2, 5, 13, and 18). To maintain appropriate coarse woody material in old growth stands, approximately 27 to 30 tons per acre would be retained, where available. Retained down woody material would consist of the longest (e.g., 16 foot or longer) and largest (e.g., 15 inches DBH or greater) pieces.

The potential for disturbance and displacement of fisher would be greater in old growth habitats. Design Criteria for grizzly bear and bull trout would help mitigate this potential for disturbance in important fisher habitat. There would be no salvage activity in any of the proposed units during the Spring Period for grizzly bear (4/1 through 6/15) and no salvage activity in Units 3, 4, 6, 8, 10, and 14 for bull trout security from 9/1 through 9/30.

Treatment in Riparian Habitats

Under Alternative D, there would be no blowdown salvage in RHCAs.

Temporary Roads

There are 1.1 miles of temporary road proposed under Alternative D (approximately 1.0 mile of historic templates and 0.1 mile of newly constructed temporary road). Temporary roads would be reclaimed following use. Other roads that are managed as closed roads would be used for accessing treatment

areas. Public use of closed roads or temporary roads would not be permitted, reducing the risk of losing high quality snags to firewood cutters.

Alternative D
Cumulative Effects

As described above under Alternatives B and C, there has been a loss of ecological integrity to many of the wetland complexes, as well as to mature and old growth forest habitats, as a result of residential development, forest management, permanent road construction, drought, and both fire suppression and wildfire. All of these factors combined have undoubtedly affected the amount and the connectivity of potential fisher habitat in the Upper Swan Valley.

The existing intermingled ownership pattern in the Swan Valley presents difficulties in managing habitat connectivity with patch sizes that occurred historically. It is anticipated that, in the future, this condition would improve due to the Montana Legacy Project. This future land conveyance would create larger blocks of public land that can be managed in larger patch sizes.

Research on fisher is ongoing. Multiple agencies and organizations, including the Forest Service, are currently conducting surveys to detect fisher in the Rocky Mountains.

Alternative D would not contribute significantly to negative cumulative effects on fisher in the Swan Valley because:

1. The proposed blowdown salvage would not affect existing canopy cover;
2. Under Alternative D, there is no blowdown salvage proposed in important RHCAs;
3. The proposed Design Criteria for the retention of large snags and coarse woody debris would help to mitigate negative effects to fisher and would meet or exceed minimum Forest Plan standards in that regard;
4. Roadless and wilderness areas in the Swan Valley would help to reduce the risks of mortality attributed to humans such as vehicle collisions, trapping, and predator control needs; and
5. Road closures for grizzly bear security continue to benefit the fisher.

Determination

In accordance with FSM 2673.42, a determination has been made as to the degree of impact the activities proposed may have on sensitive species. Based on available information on the fisher's distribution, and on project design, Alternative A would have "**no impac**t" on fisher. The action alternatives "**may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species**." Alternative C and Alternative D would have lesser impacts on fisher than Alternative B.

Flammulated Owl

Data Sources, Methods, and Assumptions Used

Data used included stand exams, VMAP Data, flammulated owl surveys, project area field visits, research literature, and GIS and dataset information for features such as general forest attributes, habitat type, and forest type.

Measurement Indicators

Based on current knowledge of the life history, biology, and ecology of the flammulated owl, certain elements are thought to be essential to the conservation of the species. These elements include the presence of open ponderosa pine forest or forest with similar features, and large snags for nesting. The effects analysis for flammulated owl focused on these habitat characteristics.

Affected Environment

Historical Condition

These small (6 to 7 inch) owls are found in older, more open, dry forests. The stands can be mixed conifer species, but there is usually a ponderosa pine component. The stands are typically open canopies (35 to 65 percent). Flammulated owl nests are generally located in mature to old growth stands, in live or dead trees from 12 to 25 inch DBH. The owl is a cavity nester, using either natural cavities or previously excavated woodpecker holes. The flammulated owl is insectivorous, and feeds in meadows or forests with an open understory in order to maneuver while catching moths, beetles, caterpillars, crickets, and other small insects.

Based on historical reference conditions, it is probable that mature, open grown, ponderosa pine stands were more abundant in the past than now. A Swan Valley timber inventory, dated from the 1930s, indicates that there were approximately 19,000 acres of open-grown mature forest. This inventory shows mature ponderosa pine, western larch, and Douglas-fir distributed in relatively large continuous forests, intermixed with lodgepole pine, Douglas-fir, spruce, and cottonwood trees. Today, about 3,000 acres of NFS lands support large diameter ponderosa pine forest in the Swan Valley. This represents about 15 percent of the 1930s inventory. The decline can be largely attributed to land clearing in the valleys, road construction, and timber harvest. In addition, a current threat to open-grown, drier site old growth, is the fire suppression policy of the last 100 years. Before the advent of aggressive fire suppression, the older forests on drier sites experienced frequent low-intensity ground fires. Since the early 1900s, effective fire suppression has allowed many of the remaining mature stands of ponderosa pine and western larch to become densely overgrown with mid-story and understory Douglas-fir, subalpine fir, spruce, and grand fir trees. The increase in these shade-tolerant species is changing the open-grown forest character, which is beneficial to some species, but probably not beneficial to the flammulated owl.

Existing Condition

Recent surveys for flammulated owls in the Upper Swan Valley (2005) detected flammulated owl in ponderosa pine forest that had been underburned. Numerous surveys for flammulated owl were conducted throughout the Swan Valley in mixed forest types without a ponderosa pine component, but no flammulated owls were detected in these stand types. Forest stands where ponderosa pine is a dominant or co-dominant species occur in the Mid Swan Blowdown Salvage Project Area.

Environmental Consequences

Alternative A - No Action
Direct, Indirect, and Cumulative Effects

No blowdown salvage activities are proposed under Alternative A. There would be no direct effects on flammulated owl as a result of implementing Alternative A, and human activity and associated disturbance would be less under this alternative. Indirectly, by choosing not to salvage blowdown in the Mid Swan Project Area, there may be an increased risk of a more intense fire in areas of significant blowdown,

should a wildfire burn through those areas. Although it is not possible to quantify this risk, the effects would be negative to flammulated owl if large patches of mature or old growth ponderosa pine forest were burned. Natural vegetative succession, combined with fire suppression management, would indirectly affect flammulated owl habitat as other tree species grow into the understory and mid-story creating dense, mixed species stands. Cumulatively, as described in the Vegetation Section of this EA, there is less available flammulated owl habitat than what existed historically.

Alternative B (Proposed Action) and Alternative D Direct and Indirect Effects

Alternatives B and D will be analyzed together because their potential effects to flammulated owl are very similar.

Effects to Open Grown Ponderosa Pine Habitat

Open grown, large diameter, ponderosa pine forests are considered optimal or preferred habitat for flammulated owl (Holt et al, 1990). Since flammulated owls have been found to prefer forested stands with open canopies of 35 to 65 percent (McCallum et al. 1994), the actual wind event probably improved habitat conditions for flammulated owl in some forest stands by opening the canopy up. In other stands, where almost the entire overstory blew over (e.g., Units 4, 6, and 8), there is not enough overstory remaining to provide habitat for flammulated owl.

Approximately 60 percent of the proposed salvage area (11 units - 417 acres) would occur in forest stands with a large tree, ponderosa pine component. The salvage units in Alternatives B and D that may provide potential flammulated owl habitat are Units 1, 2, 3, 5, 10, 11, 13, 14, 18, 19, and 23. Under Alternatives B and D, the proposed blowdown salvage in these units would not affect the canopy cover in these salvage units; only down trees would be removed.

Effects to Large Snag Habitat

The proposed blowdown salvage would reduce the existing number of snags in the treated stands, which would negatively impact flammulated owls by reducing the amount of available nesting habitat. To mitigate the effects on snag associated species in non-old growth treatment units, 4 snags average per acre that are 12 to 20 inches DBH with a minimum height of 10 feet, and 4 snags average per acre that are greater than 20 inches DBH with a minimum height of 10 feet would be left, where available (See Design Criteria, Table 2-14).

Alternatives B and D propose salvage treatment in 4 old growth stands (61 acres). All of these old growth forest stands have a ponderosa pine component and large snags; they would be potential flammulated owl habitat. Old growth habitats frequently have an abundance of larger snags, making them higher quality habitat for flammulated owl than other forest stands with a ponderosa pine component. Reducing the amount of snags in old growth stands can remove habitat features that are essential or very important to many wildlife species (Bull et al., 2005). Research suggests that retaining the bulk of the largest material may decrease these effects (Bull and Blumton 1999, Porter et al. 2005). In order to maintain sufficient snags in the existing old growth stands where salvage is proposed, the Design Criteria for salvage in old growth would retain all snags (Table 2-14). However, although snags are not targeted for removal, they are sometimes removed inadvertently due to logging activity, or if they are deemed a hazard to the woods workers, they are removed for safety reasons. Under Alternatives B and D, there would be the potential for a small decrease in snag habitat in old growth stands where salvage is proposed.

Habitat Security/Displacement

During actual implementation of the blowdown salvage activities associated with Alternatives B or D, there is the potential to directly affect flammulated owls by disturbing them and displacing them shortterm. Disturbance during the nesting period would have the most potential impact. Potential negative effects to nesting would be decreased by logging restrictions from April 1 through June 15 (SVGBCA). All of the salvage units in Alternatives B and D would be treated outside of the spring period (April 1 through June 15). This would minimize the potential for disturbance of flammulated owls during a portion of the nesting period.

Temporary Roads

Approximately 1.3 miles of temporary road would be needed to access salvage units under Alternative B; slightly less under Alternative D (1.1). Some snags may be cut down to put in the temporary roads. Snags removed to clear for a temporary road would be left on the ground as down woody material. The roads would be reclaimed following vegetative treatments. Public use of temporary or closed roads would not be permitted, reducing the risk of losing high quality snags (nesting habitat) to firewood cutters.

Alternative B (Proposed Action) and Alternative D Cumulative Effects

The ponderosa pine forest communities that are used by flammulated owls have probably experienced more disturbance than other forest communities due to the accessibility of the lower elevation dry forests and their dependence on relatively frequent, lower intensity fire to maintain their condition. Grazing, agricultural conversion, housing development, logging, and fire suppression are examples of human actions that have significantly affected ponderosa pine communities, and consequently flammulated owl habitat, throughout their range.

Shortterm viability of the flammulated owl in the Forest Service's Northern Region is not an issue (Samson 2005). There is no scientific evidence that the flammulated owl is decreasing in numbers and habitat estimates show that flammulated owl habitat is well distributed and abundant throughout the Region (Project File Exhibit F-4). Survey work done in 2005 and 2006 detected flammulated owls on 9 out of the 12 forests around the Region.

Alternative B and Alternative D would not contribute significantly to cumulative effects on the flammulated owl in the Upper Swan Valley because:

1. Flammulated owl occurrence in the Mid Swan Blowdown Salvage Project Area is uncommon;
2. Standards and guidelines for retaining snags would be followed;
3. Flammulated owl habitat is well distributed and abundant throughout the Region; and
4. Short term viability of the flammulated owl in the Forest Service's Northern Region is not an issue (Samson 2005).

Alternative C Direct and Indirect Effects

Alternative C differs from Alternatives B and D in that there is no blowdown salvage proposed in any old growth stands under Alternative C.

Effects to Open Grown Ponderosa Pine Habitat

Under Alternative C, the Mid Swan Project would not affect the canopy cover in salvage units; only down trees would be removed.

Effects to Large Snag Habitat

The salvage units in Alternative C that could provide potential flammulated owl habitat are Units 1, 3, 10, 11, 14, 19, and 23. The proposed blowdown salvage would reduce the existing number of snags in the treated stands, which would negatively impact flammulated owls by reducing the amount of available nesting habitat. To mitigate the effects on snag associated species, 4 snags average per acre that are 12 to 20 inches DBH with a minimum height of 10 feet, and 4 snags average per acre that are greater than 20 inches DBH with a minimum height of 10 feet would be left, where available.

Under Alternative C, there is no salvage proposed in old growth habitat. Old growth habitats frequently have an abundance of larger snags, making old growth stands with a ponderosa pine component higher quality habitat for flammulated owl than other forest stands with a ponderosa pine component. These habitats would remain unaffected by the proposed salvage under Alternative C.

Habitat Security/Displacement

During actual implementation of the blowdown salvage activities; there is the potential to directly affect flammulated owls by disturbing them and displacing them short-term. Disturbance during the nesting period would have the most potential impact. Potential negative affects to nesting would be decreased by logging restrictions from April 1 through June 15 (SVGBCA). All of the salvage units in Alternative C would be treated outside of the spring (April 1 through June 15) period. This would minimize the potential for disturbance of flammulated owls during a portion of the nesting period.

Temporary Roads

Approximately 0.5 miles of temporary road would be needed to access salvage units under Alternative C. Some snags may be cut down to put in the temporary roads. Snags removed to clear for a temporary road would be left on the ground as down woody material. The roads would be reclaimed following vegetative treatments. Public use of temporary or closed roads would not be permitted, reducing the risk of losing high quality snags (nesting habitat) to firewood cutters.

Alternative C
Cumulative Effects

As described above, residential development, logging, and fire suppression are examples of human actions that have significantly affected ponderosa pine communities, and consequently flammulated owl habitat, throughout their range.

Short-term viability of the flammulated owl in the Forest Service's Northern Region is not an issue (Samson 2005). Habitat estimates show that flammulated owl habitat is well distributed and abundant throughout the Region (Project File Exhibit F-4).

Alternative C would not contribute significantly to cumulative effects on the flammulated owl in the Upper Swan Valley because:

1. There is no proposed salvage in old growth habitats with a ponderosa pine component;
2. Flammulated owl occurrence in the Mid Swan Blowdown Salvage Project Area is uncommon;

3. Standards and guidelines for retaining snags would be followed;
4. Flammulated owl habitat is well distributed and abundant throughout the Region; and
5. Short term viability of the flammulated owl in the Forest Service's Northern Region is not an issue (Samson 2005).

Determination

In accordance with FSM 2673.42, a determination has been made as to the degree of impact the activities proposed may have on sensitive species. Based on available information on the flammulated owl's distribution, presence/absence from the project area, habitat requirements, and project design and location, Alternative A would have "**no impact**" on flammulated owl. The action alternatives "**may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species."** Alternatives B and D would have a higher potential for negatively impacting flammulated owl than Alternatives A and C.

WESTERN (BOREAL) TOAD

Data Sources, Methods, and Assumptions Used

Data used included open road densities, aerial photography, amphibian survey data, project area field visits, research literature, and GIS and dataset information for riparian habitats and general forest attributes.

Measurement Indicators

Based on current knowledge of the life history, biology, and ecology for the western boreal toad, certain elements are thought to be essential to the conservation of the species. These elements are secure breeding and nursery habitat. Effects to these elements as a result of project implementation are the measurement indicators used in this analysis.

Affected Environment

Historical Condition

Adult western toads are largely terrestrial, will travel considerable distances from water, and are found in a variety of habitats from valley bottoms to high elevations. They breed in lakes, ponds, slow streams, and roadside ditches, preferring shallow areas with mud bottoms.

Historical data indicate that boreal toads were widely distributed and very common in Montana and other western states, but the species has apparently undergone severe population declines in the past 25 years (Curium 1996). Surveys in the late 1990s indicate that they are absent from many historic locations and that they now occupy less than 10 percent of suitable habitat (Maxell 2000). Factors associated with population declines range from natural population fluctuations to the effects of human-induced factors such as pollution, pesticides, habitat destruction/alteration, increases in UV radiation, and the introduction of predators or competitors.

The Swan Valley has a well-developed system of glacial potholes, wet meadows, seeps, and riparian connections (Project File Exhibit R-2). Historically, there would have been abundant western toad habitat in the Upper Swan Valley.

Existing Condition

Cumulative impacts related to forest management, residential development, and drought, have affected the hydrologic integrity of some of the riparian systems in the upper Swan Valley. Over time, the overall abundance of potential breeding habitat across the Swan Valley may not have changed much, but pre-settlement riparian habitats were undoubtedly more secure for the western toad. Disturbance of wet areas that are important to the western toad, and lands adjacent to wet areas, has increased. Timber management, road building, livestock grazing, residential development, agriculture, and recreational activities have decreased the amount of functional breeding habitat for the western toad throughout the Upper Swan Valley. Roads can be obstacles for toads as they are slow moving and vulnerable to being run over by vehicles and may be more susceptible to predation when crossing roads.

Western toads were once common and widespread in western Montana, but are now becoming uncommon and local. Amphibian surveys have documented the occurrence of western toads in the Upper Swan Valley. The ponds, wetlands, and streams occurring in or adjacent to the proposed project area provide potential breeding habitat for the western toad.

Environmental Consequences

Alternative A - No Action
Direct, Indirect, and Cumulative Effects

Under Alternative A, there would be no blowdown salvage activity. There would be no direct effects on the western toad and less overall human disturbance in the forest stands where blowdown occurred as a result of implementing Alternative A.

Indirectly, there may be an increased risk of a wildfire burning more intensely if it burns through an area with large accumulations of blowdown. Depending on the specific location and extent of such fires, there is the possibility that such fires could change vegetation enough to trigger hydrologic affects that may affect boreal toad habitat. However, specific effects are not possible to predict.

Alternative B (Proposed Action) and Alternative C
Direct and Indirect Effects

Breeding Habitat

Under both Alternative B and Alternative C, there would be salvage logging of blowndown trees in RHCAs. This could directly affect important toad breeding habitat associated with streams, ponds, or other natural wetland areas.

Non-Breeding Habitat

Salvage of blowdown and the associated temporary road construction would be likely to alter existing non-breeding habitat for the western toad. Based on this species' ability to occupy a wide variety of habitats, the salvage of blowndown trees would not preclude use of these areas by western toads following salvage. If adult western toads are present during actual logging or during temporary road construction, individual mortality could occur.

Down Woody Habitat

Down woody material is important hiding cover for western toads and provides resting areas. There would be a decrease in down woody material in all of the proposed salvage units under Alternatives B and C. To maintain appropriate down woody material in the old growth units, at least 27 to 30 tons per acre would be retained, where available to attain the tonnage objectives. The longest pieces (e.g., 16-foot logs or longer) with the largest size (e.g., 15 inches DBH or greater) would be retained. In the non old growth units, at least 12 tons per acre would be retained, where available. The longest pieces with the largest size would be retained (See Design Criteria, Table 2-14) to attain the tonnage objectives.

Alternative B (Proposed Action) and Alternative C Cumulative Effects

In addition to activities associated with the proposed Mid Swan Blowdown Salvage Project, there are other established human activities and developments in the area, including timber management, road building and maintenance, residential development, agricultural use, and recreational activities, that have decreased the amount of functional breeding habitat and have decreased the security on non-breeding habitat in the project area and throughout the Upper Swan Valley.

Alternatives B and C would not contribute significantly to these cumulative effects because individual western toad mortality would be infrequent; not affecting the species at the population level.

Alternative D Direct and Indirect Effects

Breeding Habitat

There is no salvage treatment proposed in RHCAs under this alternative. There would be no direct or indirect effects to important toad breeding habitat associated with streams, ponds, or other natural wetland areas. Protection of breeding and nursery habitat would occur through a combination of protective measures in the Montana Streamside Management Zone Law, Montana Water Quality Act, and INFISH standards. Roadside ditches that hold water long enough into the summer to provide breeding sites would not be protected unless they were associated with streams or other protected sites.

Non-Breeding Habitat

Salvage of blowdown and the associated temporary road construction are likely to alter existing non-breeding habitat for the western toad. Based on this species' ability to occupy a wide variety of habitats, the salvage of blowndown trees would not preclude use of these areas by western toads following salvage. If adult western toads are present during actual logging or during temporary road construction, individual mortality could occur.

Down Woody Habitat

Down woody material is important hiding cover for western toads and provides resting areas. There would be a decrease in down woody material in all of the proposed salvage units under Alternative D. To maintain appropriate down woody material in the old growth units, at least 27 to 30 tons per acre would be retained, where available to attain the tonnage objectives. The longest pieces (e.g., 16-foot logs or longer) with the largest size (e.g., 15 inches DBH or greater) would be retained. In the non old growth units, at least 12 tons per acre would be retained, where available. The longest pieces with the largest size would be retained to attain the tonnage objectives.

Alternative D
Cumulative Effects

As described in the cumulative effects discussion for Alternatives B and C, there are other established human activities and developments in the area, including timber management, road building and maintenance, residential development, agricultural use, and recreational activities, which have decreased the amount of functional breeding habitat and have decreased the security on non-breeding habitat throughout the Upper Swan Valley.

Alternative D would not contribute significantly to these cumulative effects because there would be no additional cumulative effects to breeding habitat under Alternative D, and individual western toad mortality would be infrequent, not affecting the species at the population level.

Determination

In accordance with FSM 2673.42, a determination has been made as to the degree of impact the activities proposed might have on sensitive species. Based on available information on the western toad's distribution, habitat requirements, and project design and location, the No Action Alternative would have "**no impact**" on the western toad. Alternatives B, C, and D "**may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species.**" Alternatives B and C would have greater negative impacts on the western toad than Alternative D.

Regulatory Framework and Consistency

The USDA Forest Service is bound by Federal statutes (ESA, NFMA), regulation (USDA 9500-4), and agency policy (FSM 2670) to conserve biological diversity on NFS lands. Federal laws and direction applicable to sensitive species include the NFMA and FSM direction 2670. Amendment 21 to the Flathead's Forest Plan has standards to conduct analyses to review programs and activities, to determine their potential effect on sensitive species, and to prepare a biological evaluation. The Flathead Forest Plan also states that "adverse impacts to sensitive species or their habitats should be avoided." A goal in Forest Plan Amendment 21 is to "ensure that Forest Service actions do not contribute to the loss of viability of native species."

In accordance with FSM 2673.42, determinations have been made as to the degree of impact the proposed activities may have on sensitive species.

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