



File Code: 2600/1950

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## A. INTRODUCTION

The Regional Forester of Region 1 Forest Service has designated other species as being "Sensitive". Forest Service direction is to maintain viable populations of "Sensitive" species and to ensure that those species do not become threatened or endangered because of Forest Service actions. The sensitive species was last updated in 2004. A separate Biological Assessment for threatened and endangered species was completed for this project, and concurred through consultation with the U.S. Fish and Wildlife Service in the summer of 2006. The purpose of this biological evaluation is to evaluate the effects of the proposed vegetation treatments which involve mechanical thinning operations, utilizing both ground based tractor and helicopter logging techniques, on sensitive wildlife and plant species.

### **Proposed Action & Project Location**

The Big Timber Ranger District of the Gallatin National Forest is initiating a proposal for a vegetation treatment project on approximately 180 acres in Big Timber Canyon, which is located approximately twenty miles northwest of Big Timber, Montana on the eastern slopes of the Crazy Mountains near Crazy Peak (See the attached Vicinity Map). The legal description for the proposal is T3N, R12E, Sections 2 & 4, Sweet Grass County, MT.. The proposal includes approximately 155 acres in Section 2 (Unit 1), approximately 25 acres in Section 4 (Unit 2), and consists of thinning densely stocked stands of Douglas-fir, to increase the health and vigor of the remaining trees and make them less susceptible to future Douglas-fir bark beetle attacks (See the Attached Project Proposal Map).

### **Project Background**

The Big Timber Canyon Vegetation Treatment Project analysis area encompasses approximately 26,500 acres of forested and non-forested lands. The analysis area consists of timber Compartments 104 and 105, which range from 5,700 to 10,600 feet in elevation across a variety of aspects and have slopes ranging from 10 to 90 percent, with average slopes of approximately 30-50 percent.

Landtypes for the proposal area vary from 35-1C (Unit 1) to 34-1C and 35-1B (Unit 2). All of these landtypes consist of reasonably stable, productive soils that are capable of handling some disturbance, as long as Best Management Practices (BMPs) are utilized. The Forest Soil Scientist has completed on the ground reviews of both proposed units (See initial soils report located in the Project File).



The Big Timber Canyon Vegetation Project analysis area is approximately 40 percent forested (almost 50 percent of this general area is rock/scree). This was determined by using Satellite Imagery Land Cover Classification System 3 (SILC3) data, which is a classification system developed by the Wildlife Spatial Analysis at the University of Montana, to create regional land cover type, tree size and tree canopy databases for Montana and Idaho. The forested areas are mainly composed of cool to moist Douglas-fir habitat types on the lower elevations, with cooler and moister subalpine fir habitat types at the higher elevations.

Several of the low elevation Douglas-fir dominated stands within the analysis area are densely stocked, having stand conditions that are especially conducive to supporting Douglas fir beetle outbreaks. The 2004 and 2005 Aerial Insect and Disease Detection Surveys noted scattered pockets of mortality from Douglas-fir bark beetles in stands throughout the Big Timber Canyon area. Much of the mortality is likely associated with the ongoing drought common throughout much of this part of the United States and the high tree densities (measured in basal area per acre) commonly found in moist Douglas-fir forests.

In September of 2005, Ken Gibson, the Forest Service Northern Region Entomologist visited the project area to assess the situation. Small groups (10-20) of beetle killed Douglas-fir were noted in a widely distributed pattern throughout the drainage, verifying the results of the annual aerial survey that was conducted in July of that year. Observations confirmed the presence of Douglas-fir beetles in the drainage, not at outbreak levels, but at a level to suggest that increasing beetle-caused mortality and populations of beetles are certainly possible, especially if any major stand disturbance (such as windthrow, insect defoliation, or wildfire) were to occur in the area.. The Regional Entomologist suggested that reducing the basal area to 80-100 per acre would be the optimum level for increasing stand vigor in order to reduce the likelihood of future Douglas-fir bark beetle epidemics in the treated areas (See the Regional Entomologist Trip Report located in the Project File).. Stand density reduction has been shown to be the most effective method of reducing beetle-caused mortality by reducing tree competition for moisture and exposing material to sunlight (USDA 1994, Leslie E. and Bradley, T. 2001).

Approximately 1,550 acres or 26% of the forested area in Timber Stand Compartment 104 and 1,570 acres or 30% of the forested area in Timber Stand Compartment 105 is considered to be old growth as defined by Region 1 Guidelines (Green et. al.). Old growth stands were queried using ArcView, the Timber Stand Management Recordkeeping System (TSMRS), which is a Forest Service stand exam database and the SILC3 database, using ground-truthed data when it was available. The Forest Plan (page III-41) requires that we strive to maintain at least 10% old growth by timbered compartment. Presently, both compartments are well above the 10% standard (See the vegetation specialist's report located in the Project File).

The Crazy Mountains are somewhat unique having checkerboard ownership patterns, limited access to and within the Forest, as well as severe topography limiting public use and recreation opportunities on the National Forest System (NFS) lands. The Big Timber Canyon Road, #197 represents the only public access to NFS lands on the entire east side of the Crazy Mountains (including the Lewis and Clark National Forest). Due to this limited access, legal public recreation use is concentrated on those NFS lands immediately accessible from Big Timber Canyon and Big Timber Creek Trail, #119.

Besides system trails, the only developed recreation facilities are located along the Big Timber Canyon Road. The Halfmoon area at the end of the road consists of the Halfmoon Campground and day use Picnic Area as well as the Big Timber Creek Trail Trailhead. The Big Timber Canyon Picnic Area near the Forest boundary also provides picnicking and dispersed camping opportunities adjacent to the Big Timber Canyon Road.

The project area is not located in an inventoried roadless area. The vast majority of the Crazy Mountains, located on the Big Timber Ranger District, are within the Crazy Mountain Roadless Area No.1-541. No Wilderness designation exists in the Crazy Mountains.

The Forest recognizes the outstanding scenic quality of the Crazy Mountains. The 1987 Gallatin National Forest Plan directs that the NFS lands in the vicinity of the proposed treatment units are to be managed as Partial Retention Visual Quality Objectives (VQOs). This means that management activities remain visually subordinate to the characteristic landscape. Historic cutting on private land below Half Moon Campground has been rather extensive but, does not dominate the viewshed. Past cutting that has occurred on NFS lands in the drainage is within the acceptable bounds of Forest Service visual objectives.

**Table 1. Big Timber Canyon vegetation project estimates of acreages by unit and treatment type.**

Unit #	Location	Approx. Size (Acres)	Objective of Treatment
1	Section 2	155	Remove Douglas fir bark beetle infested trees, thin to a basal area of 80-110 to increase health and vigor of remaining stand, blend with adjacent private previously thinned land, increase species diversity of understory vegetation for wildlife forage
2	Section 4	25	Remove Douglas fir bark beetle infested trees, thin to a basal area of 80-110 to increase health and vigor of remaining stand, blend with adjacent previously thinned National Forest System land.

## B. ANALYSIS OF EFFECTS

**Table 2. Analysis of effects and cumulative effect summary for Regional Forester’s Sensitive specie for the Taylor For Fuels reduction Project.**

Species	Habitat Affected	Species Affected	Cumulative Effects
<b>Black-backed Woodpecker</b>	Yes	No	None
<b>Peregrine falcon</b>	Yes	No	None
<b>Flammulated owl</b>	No	No	None
<b>Harlequin duck</b>	No	No	None
<b>Western big-eared bat</b>	No	No	None
<b>Wolverine</b>	Yes	No	None
<b>Northern goshawk</b>	Yes	No	None
<b>Yellowstone Cutthroat trout</b>	No	No	None

Species	Habitat Affected	Species Affected	Cumulative Effects
Western Toad	No	No	None
Northern Leopard frog	No	No	None

### **Black-backed woodpecker**

The black-backed woodpecker is an insectivorous bird that inhabits boreal and montane forest of western North America. This bird is highly adapted to fire and natural disturbance processes, as evidenced by the soot-colored plumage of its solid black back. Which provides excellent camouflage as the bird forages on charred trees (Dixon and Saab 2000). Hutto (1995) described the black-backed woodpecker as more restricted to burned forest habitat than any other forest bird species thought to be dependent upon a particular vegetative cover type in the Northern Rockies. The black-back is primarily a sedentary species; i.e. it does not migrate seasonally, and may stay in the area of a particular burn as long as the insects upon which it feeds remain abundant (Dixon and Saab 2000). The range of the black-back is primarily confined to the northwest portion of the state in Montana (MTFWP 2006). There are only sixteen confirmed breeding records for the species. Only one record is from southern Park County in the south-central portion of the state and all the others were from northwestern counties northeast of the continental divide (MTFWP 2006). There are no recently burned areas or large scale bug infestations in the vicinity of the proposed project. The proposed project is located in northeastern southern portion of Sweetgrass County, Montana and there are no confirmed breeding records for this species in this portion of the state. Surveys for black-backed woodpeckers were conducted during 2005 and no birds were detected in the project vicinity. Therefore, it was determined that there would be no impact to this species.

### **Peregrine falcon**

The peregrine falcon was delisted; i.e. removed from the Endangered Species List, in August 1999 and is now treated as a sensitive species by the Forest Service. The primary reason for the decline of peregrine falcons in North America has been widely documented with the use of DDT pesticides that caused thinning of eggshells in nesting birds (USDI 1984: 10). Since the used of DDT was banned by the Environmental Protection Agency peregrines have enjoyed a remarkable population recovery across all of there former range. The Peregrine Falcon Recovery Plan recommended that no human activity be allowed within one-half mile of any occupied nesting site (USDI 1984:88). There is a known peregrine falcon nesting eyrie northwest of the Halfmoon campground located in cliffs above Big Timber Creek. The eyrie was discovered in spring of 2006 and is a new location that was not previously occupied. Annual surveys will continue for the eyrie and will be conducted annually. This site is approximately ¼ mile from the nearest proposed treatment unit (Unit 2) around the Halfmoon Campground area and over 1.5 miles from the larger treatment unit (Unit 1). The proposed activity will occur in the fall/winter months when peregrines are not present in the area. Therefore, it was determined that there would be no impact to this species.

### **Wolverine**

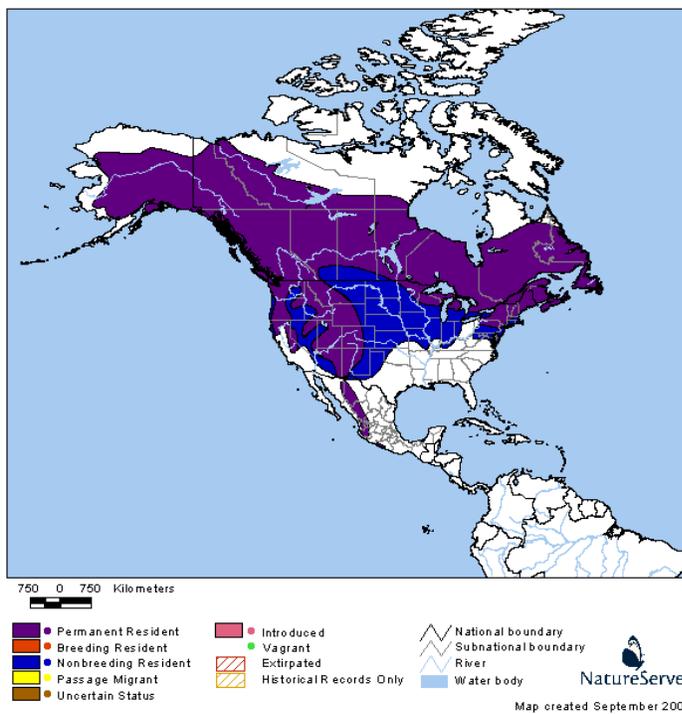
The wolverine is the largest bodied terrestrial mustelid (Banci 1994: 99). Its distribution is circumpolar; it occupies the tundra, taiga and forest zones of North America and Eurasia (Wilson

1982). Typical weights for adult males are 12-18 kg and for adult females 8-12 kg (Banci 1994: 99). Although wolverines are powerful carnivores capable of taking down prey animals much larger than themselves, they are opportunistic omnivores with a generalist foraging strategy that includes scavenging animal carrion, feeding on berries and insect larvae, as well as direct predation of small, medium and large mammals and birds (Banci 1994: 113). All wolverines tend to avoid humans. And females with young are particularly sensitive to human disturbance. Females den at relatively high elevations (8-10,000 ft.) in mature old growth forests, as well as large boulder talus fields and mountain cirques (Banci 1994: 110). Deep soft snow is often used for tunneling and den construction (Copeland 1996:94-95). Wolverines have not been documented in the vicinity of the proposed Big Timber Canyon Treatment units, but are likely to occur at higher elevations in roadless habitats. The proximity of the project areas to structures, roads and human influences would limit the potential of the immediate project area as wolverine habitat. Therefore, it was determined that there would be no impact to this species.

**Northern goshawk**

***Overall Population Status, Distribution, and Local Occurrence Records***

The goshawk is found throughout North America with breeding documented from Alaska to Newfoundland and south through the Rocky Mountains, Sierra Mountains, and into Mexico. In Montana goshawks breed in mountainous or coniferous regions of the state (primarily in the west – Figure 1) and occasionally winter in the lower valleys of western Montana (Montana Bird Distribution Committee 1996, T. McEneaney pers. comm. in Hart et al. 1998).



**Figure 1.** North American goshawk distribution. "Data provided by NatureServe in collaboration with Robert Ridgely, James Zook, The Nature Conservancy - Migratory Bird Program, Conservation International - CABS, World Wildlife Fund - US, and Environment Canada - WILDSpace."

The species is considered globally secure, and in Montana, the population is considered stable and moderately vulnerable to threats to habitat or population. The goshawk is on the State’s “Species of

Concern” list (MNHP 2004).

The most recent petition for listing the goshawk under the Endangered Species Act occurred in 1997. After a formal 12-month review by a scientific committee, the U.S. Fish and Wildlife Service (Service) determined that listing under ESA was not warranted. Analysis of data from 17 states comprising 222 million acres indicated “that the goshawk population is well distributed and stable at the broadest scale (63 FR 35183 (June 29, 1998)).

The species and its habitat appear abundant and well distributed across Region 1 (USDA-FS 2005b and Samson 2006 including internal citations). On the Gallatin National Forest, no comprehensive survey has been conducted primarily because over 70% of the forest is designated wilderness or road-less habitat. Northern goshawks are known to nest on all of the Ranger Districts on the Forest (M. Cherry pers. comm.).

An occupied goshawk nest was discovered in the analysis area in 2006. The territory was defined and two alternate nests with the area were discovered south of Big Timber Creek in summer 2006 (Appendix A, Map 10).

### ***Biological Information for Goshawks:***

The northern goshawk occurs in a variety of forested areas throughout North America (Squires and Reynolds 1997). Some remain in a breeding area year-round, while others begin migration from breeding grounds in late September and continue through November (Ibid.). In winter, limited information indicates goshawks use a greater variety of habitats than in summer (summarized in Samson 2006, internal citations omitted here).

Pair formation and nest building begins in early April and egg-laying occurs in April and May. The adult female typically defends the nest while males hunt for food. The young fledge off the nest in mid- to late-July, remaining in the territory until September when they disperse from the area, often traveling long distances. Territories range in size from 570 to 3,500 ha (1,409 to 8,649 acres) (Kennedy 2003). From one to five alternate nests are constructed by the northern goshawk within the home range.

Because of wide scale differences among geographic regions and scientific methodology in studies conducted in the interior Pacific Northwest, consistent and precise management recommendations for goshawks are not available, therefore managers draw on information from Reynolds et al. 1992 as well as recent, statistically reliable research (detailed in Samson 2006 including extensive internal literature citations). Reynolds et al. 1992 provided the most comprehensive analysis of goshawks in the southwestern United States, describing a nest area of approximately 30 acres with larger trees and dense canopy closure that serves as the center of all activities during the breeding season; a post-fledging area of approximately 170 ha (420 acres) comprised of a variety of forest types and canopy covers, defended by the adult goshawk pair during the nesting season and used by fledglings to refine hunting and flying skills until they disperse in fall; and a 5,400-acre (approximate) foraging area comprised of a diversity of vegetative types. Reynolds et al. (1992) defines a post-fledging family area (PFA) as “the area of concentrated use by the goshawk family after young leave the nest”. The composition of vegetative types, including tree canopy closures and size class distributions located

outside the nest area (typically composed of higher canopy closures, mature trees, and open under story conditions) blend into the surrounding landscape beyond the PFA scale, such that, no difference in habitat composition in occupied versus random foraging areas can be detected (McGrath 2003). As such, the Region concentrates management efforts at the PFA and nest area scales.

In its comprehensive status review of the species (see above), the Service found that while the goshawk typically uses mature forests or larger trees for nesting habitat (the nest area), it is considered a forest habitat generalist, using a variety of types and ages. The Service found no evidence in its finding that the goshawk is dependent on large, unbroken tracts of “old growth” or mature forest, 63 FR 35183 (June 29, 1998). Conversely, Greenwald et al. 2005 prepared a literature review of a *few* selected studies concluding that goshawks select mature to old-growth forests in their home range and criticizing the management recommendations of Reynolds et al. 1992. However, Reynolds et al. 2005 rebutted Greenwald et al. 2005 by providing a more comprehensive review of the literature, which supports the Service’s review, finding that Greenwald’s criticisms were based on misunderstandings of the desired goshawk habitats described in the MRNG [Reynolds et al. 1992]; an under-appreciation of the extent of variation in vegetation structure among forest types and seral stages used by goshawks; a limited understanding of the ecological factors limiting goshawks; a failure to understand the dynamic nature of forest habitats; and incomplete reviews of the literature. A peer-reviewed, version of the above paper will appear in Wildlife Society Bulletin within a couple of weeks of this writing.

In fact, goshawks can use small patches of mature habitat to meet their nesting requirements within a mosaic of habitats of different age classes (detailed in Samson (2006) including extensive internal citations). For example, on the Beaverhead Deerlodge NF mature habitat quantified in PFAs centered on nests averaged only 11.3% of 420 acres (Clough 2000), whereas, on the Targhee in Wyoming and Montana mature habitat averaged 60% (Patla 1997). Productivity levels of goshawks in the Clough 2000 study that occurred in a heavily managed landscape were greater than those of Patla (1997) and fell above or within the ranges of studies done in managed and unmanaged landscapes through the western United States. More than habitat composition or any other factor (i.e. prey abundance), territoriality determines nest distribution, and spring weather determines nest success (i.e. Joy 2002, Reich 2003).

The goshawk is a generalist, opportunistic predator (detailed in Samson 2006, including extensive internal citations). Prey items are taken on the ground, on vegetation, in the air, and include tree squirrels, ground squirrels, rabbits, hares, songbirds, and grouse that rely on a variety of forested and **non-forested** habitats (*Ibid.*).

### ***Goshawk Habitats and Use of the Analysis Area:***

Using Samson (2006), nesting habitat for goshawks was defined as single or two-storied stands with the upper canopy dominated by lodgepole pine or Douglas-fir trees, with average tree diameters > 5” (pole-sized or larger), and upper canopy closures > 34%. Foraging habitat included all mature and old growth lodgepole pine or Douglas-fir and meadow/open Douglas-fir areas (Table 11 below and summarized in Table 10 above). Primary goshawk habitat is defined as the sum of all suitable nesting and foraging habitat. Secondary habitat includes all lodgepole pine and Douglas-fir stands dominated by seedling/saplings, and all age and size classes in spruce/fir dominated stands. Goshawks have been observed hunting on the edge of seeding/sapling stands and occasionally found nesting in spruce/fir (i.e. Clough 2000), however, these habitats are generally not preferred nor considered highly suitable due to their lack of the structural components (i.e. open under story conditions, nest platforms) typical

of where the species does occur. Non-habitat includes large lakes, rock/tallus slopes, or permanent land clearings.

**Table 3. Summary of habitat available to goshawks for nesting and foraging in the 26,554-acre analysis area, Big Timber Canyon Vegetation Project.**

FOREST TYPE	PRIMARY GOSHAWK HABITAT ACRES	NESTING HABITAT	FORAGING HABITAT ACRES	SECONDARY HABITAT ACRES	NON-HABITAT*
Lodgepole Pine	724 old growth/mature 216 pole sized 914 total	724 old growth/mature 216 pole sized 914 total	724 old growth/mature 216 pole sized	60 seedling/sapling	
Douglas-fir	2,360 old growth/mature 1,504 pole size 3,864 total	2,360 old growth/mature 1,504 pole size 2,282 total	2,360 old growth/mature 1,504 pole size 2,282 total	161 acres sapling/seedling	
Spruce/fir (all)				994 old growth/mature 502 pole-sized 129 seed/sapling 1,625 Total	
Limber Pine/Pygmy Forest				3,600 old growth/mature 1,520 pole size 85 seed/sapling 5,205 total	
Meadows/Open Douglas-fir	1,870		1,870	1,870	
Non-habitat					12,777
<b>Totals</b>	<b>6,648</b>	<b>4,928</b>	<b>6,648</b>	<b>7,075</b>	<b>12,777</b>

\*Whitebark Pine/Limber Pine, Water, Rock, permanent land clearings.

Table 3 demonstrates that the majority of Forest Service lands in the analysis area are available to goshawks for nesting and/or foraging (13,723 of 26,554 acres). The occupied PFA is described in the direct and indirect effects section below and displayed in Appendix A, Maps 9 and 10).

***Direct and Indirect Effects***

All harvest treatments are concentrated in Douglas-fir stands with active and potential Douglas Fir Beetle infestations within 500 meters of a developed recreation site, private ranch, or road that receive heavy use by the public yearlong and do not provide goshawks with suitable, security nesting or foraging habitat (Appendix A, Map 1). Thinning treatments in potential Douglas Fir and Lodgepole pine nesting and foraging habitat will target a portion of the larger diameter trees most susceptible to beetle infestation and retain some of the larger available trees in the upper canopy with at least 40% canopy cover. No treatments will occur at any time in occupied nest areas.

Samson (2006) summarized recent (2000 and newer) studies on the effects of vegetation treatments on northern goshawks that show: (1) the majority of goshawk pairs move from nest stands when stand structure is modified by more than 30%; (2) human disturbance is not a factor if 70% of the nest stand

structure is maintained and timber management operations are time restricted during the nesting period; (3) treatments have no effect on goshawk breeding area occupancy, nest success, or productivity 1 to 2 years after treatment; (4) no difference in the productivity of northern goshawks occurs in logged versus unlogged areas.

To meet disturbance thresholds in numbers (1) and (2) above, during implementation of this project, no treatments or treatment-related disturbance will occur at any time in occupied nest areas to ensure 100% of the nest area (defined in Reynolds et al. 1992) is conserved. This will be achieved by placing a conservative 40-acre no harvest buffer around the known nest site, resulting in a contiguous no harvest area of 40 acres as per Region 1 direction (Brewer et. al. 2006). In addition, no ground disturbing activities will occur within the PFA from mid-April through August 15 to ensure that the goshawk family is adequately protected during the courtship, egg-laying, incubation, early nestling, and late fledgling periods (refer to biological information above). The same mitigation will apply to any newly discovered nest.

Table 4 shows the composition of the occupied PFA by tree canopy cover class pre- and post-treatment (displayed in Appendix A, maps). In the PFA (Section 2), 125 acres will receive selective harvest treatments. As this table shows Douglas fir and mix conifer > 12 “ dbh with > 45% canopy cover will comprise 32% of the PFA post-treatment and provide ample suitable nesting and squirrel foraging habitat for goshawks after project implementation is complete. In the secondary canopy class (25-45%) approximately 30 acres will be treated which represents a negligible 4% change in the amount of habitat in the PFA. In addition, we will be retaining sufficient younger age class trees for recruitment over time into the > 45% canopy class. Post-treatment, high canopy cover (281 acres of the 752-acre PFA) will be maintained which is well within the ranges of productive goshawk PFAs found in this part of the species range (Clough 2000). No change in productivity is expected.

**Table 4. Post fledging family area (Reynolds et al. 1992) canopy cover classes by vegetation type pre- and post-treatment in the 752 acre PFA in Section 2 of the Big Timber Canyon Vegetation Project.**

<b>PFA VEGETATION TYPE</b>	<b>CANOPY COVER CLASS</b>	<b>PRE-TREATMENT ACRES IN EACH CANOPY COVER CLASS (% OF PFA)</b>	<b>ACRES PROPOSED FOR TREATMENT (TREATMENT TYPE)</b>	<b>POST-TREATMENT ACRES REMAINING IN EACH CANOPY COVER CLASS (% OF PFA)</b>
Non-habitat: Water/riparian	Non-forest	63 (8 %)	n/a	n/a
Open meadows and meadows with seedling/sapling encroachment (primary foraging habitat)	< 25%	96 (13%)	n/a	n/a
Douglas fir & Mixed Conifer > 5” in diameter (primary nesting and foraging habitat)	25 to 45%	197 (26 %)	30 - 8” to 12” dbh thin to 80-100 basal area.	167 (22%)
Douglas Fir > 12” in diameter	> 45%	406 (54%)	125 – 12” to Maximum dbh thin to 80-100 basal area.	281 (37%)
<b>TOTAL</b>		752 (506 FS)	190	

Table 5 shows the vegetative composition of home range (primary and secondary habitat) habitat available to goshawks in the analysis area compared with the approximations recommended by Reynolds et al. 1992 to support nesting goshawks and their prey.

**Table 5. Vegetative Composition of Goshawk Home ranges in the Big Timber Canyon Vegetation Project analysis area. Table shows acres and percent of primary and secondary goshawk habitat in forested areas in each of three tree size classes as well as meadow foraging compared with the recommendations of Reynolds et al. 1992, Vegetation Structural Stages (VSS) for supporting goshawks and their prey.**

<b>TRADITIONAL SIZE CLASSES</b>	<b>ACRES OF PRIMARY AND SECONDARY HABITAT IN EACH SIZE CLASS IN THE ANALYSIS AREA</b>	<b>%</b>	<b>REYNOLDS ET AL. 1992 RECOMMENDATIONS. VEGETATION STRUCTURAL STAGES (VSS)</b>
<b>% mature (&gt; 8.9 inches dbh)</b>	<b>4,558 mature</b>	<b>33% mature</b>	<b>VSS 4 and 5 40%</b>
<b>Old Growth (Green et al. 1992)</b>	<b>3,120 old growth</b>	<b>19% old growth</b>	<b>VSS 6 – 20%</b>
<b>% pole-sized (5-8.9 inches dbh)</b>	<b>3,742</b>	<b>27%</b>	<b>VSS 3 20%</b>
<b>% seedling/sapling (0-4.9 inches dbh)</b>	<b>435</b>	<b>3%</b>	<b>VSS 2 10%</b>
<b>TOTAL FORESTED</b>	<b>13,542</b>		
<b>Meadow</b>	<b>1,870</b>	<b>13%</b>	<b>VSS 1 10%</b>
<b>TOTAL ALL</b>	<b>26,554</b>		

### *Cumulative Effects for Goshawks*

Past, present, and reasonably foreseeable future actions were analyzed for cumulative impacts to goshawks (Appendix C with additional information in project file).

**Table 6. Past vegetative treatments, types, ownership, acreage and period in Big Timber Canyon analysis area (26,554 acres), Gallatin National Forest between 1980 and present.**

HARVEST TYPE	OWNERSHIP	ACREAGE OF TREATMENT	PERIOD (year) OF TREATMENT
Clear Cut	Forest Service	21 ac.	1980's
Clear Cut	Forest Service	9 ac.	1980's
Clear Cut	Forest Service	14 ac.	1980's
Clear Cut	Forest Service	6 ac.	1980's
Clear Cut	Private	97 ac.	1980's
Clear Cut	Private	21 ac.	1980's
Clear Cut	Private	17 ac.	2000
Shelterwood	Forest Service	19 ac.	1980's
Shelterwood	Forest Service	30 ac.	1980's
Shelterwood	Private	59 ac.	1980's
Shelterwood	Private	24 ac.	1980's
Shelterwood	Private	6 ac.	1980's
	<b>Total Forest Service</b>	99 acres	
	<b>Total Private</b>	224 acres	
	<b>Total</b>	323 acres	
	<b>Total Analysis Area</b>	26,554 acres	

Table 6 above shows that <1 % (99 of 26,554 acres) of forested areas on National Forest lands in the analysis area received clear-cut logging treatments that are now in various stages of the seedling/sapling or pole-sized stages and likely do not provide suitable nesting habitat. Stands that are now pole-sized and larger may provide foraging habitat. This project does not prescribe clear-cut treatments. Approximately 224 acres (1%) of the forested acres on private lands in the analysis area have also been clear-cut and are in various stages of regeneration.

Past, thinned (shelterwood harvest) acres encompass <1% (49 of 26,554 acres) of forested areas on National Forest lands in the analysis area, thus little measurable impact to goshawk habitat and most forest habitat in the analysis provides good to excellent goshawk foraging and nesting opportunities. . The project will add another 1% (180 acres) of selective harvest in Douglas-fir mixed conifer stand effecting some of the canopy closure in the immediate area, but having little measurable impact within the analysis area.

Past, ongoing, and foreseeable commercial clear-cut and thinning treatments on private timber lands are not likely or anticipated. However, potential harvestable acres in the analysis area with accessibility represent less than 3 percent of the area. Most of the private lands in the analysis area are inaccessible because they are surround by National Forest that is designated as roadless. The accessible private lands in general had/have high densities of small diameter trees where the suitability of foraging and nesting habitat for goshawks is of lower value. This is a result of past harvest (224 acres), historical wildfires and because the timbered areas are a result of encroachment on grassland or

meadow habitat. There are no known occupied nesting locations that have been or is expected to be impacted by these activities, and adequate nesting and foraging habitat remains in the analysis area.

Developed recreation sites (Halfmoon campground and Big Timber Canyon picnic area, and the private Dude Ranch along the Big Timber Canyon road FSR 197) are adjacent to the occupied nest area that has received ongoing use by the public for years that will continue long into the future. Persistent human presence in the 80-acre nest area has apparently not been enough to cause breeding adults to abandon the territory, suggesting the species can tolerate human presence in close proximity to the nest. Reports of goshawk presence in Big Timber Canyon have been known for a number of years (pers. comm. B. Van Cleve), and the territory was occupied during the 2006 breeding seasons, although the number of young that fledged is unknown. Whether or not the same breeding pair has been present in the territory is also unknown.

Based on current best available habitat information for the Gallatin National Forest, it appears that habitat is abundant and well distributed across the landscape for northern goshawk. Mature to old growth forest comprises 64.1% of the Gallatin NF, and about 21% of the mature to old growth forest is in Inventoried Roadless/Wilderness Status (B-D NF Wildlife Habitat Viability Analysis, Query 1 – Mature to Old Growth Cover-types by Inventoried Roadless/Wilderness Status; Hillis, et. al. 2003). Reproductive rates for goshawks nesting on the Gallatin are expected to be similar to the Deerlodge N.F., which average 2.6 fledglings per nest, and adjusted nesting success is about 68%, above or well within the ranges reported in studies done in managed and unmanaged landscapes throughout the western United States (Clough 2000). Samson (2006) shows similar results for the Gallatin National Forest and shows that goshawk viability in the region is not an issue.

***Determination for Goshawks***

The project as proposed *May Impact Individuals or Habitat, but is not expected to result in reduced viability for the population or species*. Preferred Douglas-fir habitat will not be impacted. Nest areas will not be impacted. Breeding goshawks will be adequately protected during the courtship, egg laying, incubation, hatchling, and fledgling periods through timing restrictions that prohibit ground disturbing activities from mid-April through mid-August. Canopy cover classes in the known occupied PFA post-treatment will approximate those found in productive territories on the Forest. The vegetative composition of home range (primary and secondary habitat) habitat available to goshawks in the analysis area approximates those recommended by Reynolds et al. 1992. No change in breeding area occupancy or productivity is expected. Goshawks and goshawk nesting and foraging habitats are abundant and well distributed across the forest and region.

**C. DETERMINATION SUMMARY**

Table 7. Effects determinations for sensitive wildlife species. Determinations are: No impact, Beneficial impact, May adversely impact individuals or habitat but not likely to cause a trend to federal listing or loss of viability (May adversely), and Likely to result in a trend to federal listing or loss of viability (Likely to).

<b>Sensitive Species</b>	<b>Determination</b>	<b>Rationale</b>
Black-backed Woodpecker	NI	Project is located in an unburned forest of very low forage and nesting habitat value.

Peregrine falcon	NI	Project is located in area with low foraging value for this species. We do have an eyrie nearby-may need more discussion here
Flammulated Owl	NI	Suitable habitat is not present in the proposed project area. Project elevation exceeds 6000 feet.
Harlequin Duck	NI	Suitable habitat is not present in the proposed project area (ducks have never been observed in Big Timber Creek and suitable nesting island are not present).
Trumpeter Swan	NI	Suitable habitat is not present in the proposed project area (no streams rivers or riparian habitat).
Western Big-eared Bat	NI	Project area does not contain any caves or suitable habitat
Wolverine	NI	Project would not affect wolverine denning or foraging habitat.
Northern Goshawk	MIIH	Project area contains suitable nesting and foraging habitat and a known and active nest location exists in the project area. Mitigation measures have been incorporated to prevent any direct or indirect impact to these individuals. Additional surveys and monitoring will be conducted to mitigate any impacts to undiscovered goshawks and to access effectiveness of mitigation measures.
Yellowstone Cutthroat trout	NI	Suitable habitat is not present in the proposed project area. Big Timber Creek does not contain any populations of this species
Western toad	NI	Suitable habitat is not present in the proposed project area (no streams rivers or riparian habitat).
Northern leopard frog	NI	Suitable habitat is not present in the proposed project area (no streams rivers or riparian habitat).

#### D. SENSITIVE PLANT SUMMARY

Table 8. Effects determinations for sensitive plants. Determinations are: No impact (NI), Beneficial impact, May adversely impact individuals or habitat but not likely to cause a trend to federal listing or loss of viability (MIIH). I would consider adding description of the habitats in which these species are found to the text.

<b>Sensitive Plant Species</b>	<b>Determination</b>	<b>Statement of Rationale</b>
<i>Adoxa moschatellina</i> Musk-root	MIIH	Suitable habitat present may be present but species is not known in the project vicinity.
<i>Aquilegia brevistyla</i> Small-styled columbine	MIIH	Suitable habitat present may be present but species is not known in the project vicinity.
<i>Balsamorhiza macrophylla</i> Large-leaved balsamroot	NI	Suitable habitat not present.
<i>Cypridium calceolus var. parviflorum</i> Small yellows lady's-slipper	NI	Suitable habitat not present
<i>Drosera anglica</i> English sundew	NI	Suitable habitat not present
<i>Eleocharis rostellata</i> Beaked spikerush	NI	Suitable habitat not present
<i>Epipactis gigantean</i> Giant helleborine	NI	Suitable habitat not present
<i>Eriophorum gracile</i> Slender cottongrass	NI	Suitable habitat not present
<i>Gentianopsis simplex</i> Hiker's gentian	NI	Suitable habitat not present
<i>Goodyera repens</i> Northern rattlesnake-plantain	MIIH	Suitable habitat may be present but species its not known in the project vicinity.
<i>Haplopappus macronema var. macronema</i> Discoid goldenweed	NI	Suitable habitat not present
<i>Juncus hallii</i>	NI	Suitable habitat not present

Hall's rush		
<i>Mimulus nanus</i> Dwarf purple monkeyflower	NI	Suitable habitat not present
<i>Polygonum douglasii</i> var. <i>austiniae</i> Austin's knotweed	NI	Suitable habitat not present
<i>Ranunculus jovis</i> Jove's buttercup	NI	Suitable habitat not present
<i>Salix barrattiana</i> Barratt's willow	NI	Suitable habitat not present
<i>Shoshonea pulvinata</i> Shoshonea	NI	Suitable habitat not present
<i>Thalictrum alpinum</i> Alpine Meadowrue	NI	Suitable habitat not present
<i>Veratrum californicum</i> California false-helliborine	NI	Suitable habitat not present

The Big Timber Canyon Vegetation project is within a moist and dry-site Douglas Fir and lodgepole pine mixed conifer forest, and there are no known locations of sensitive plants. The Proposed treatment units were surveyed for sensitive plants during the growing season in 2006. No sensitive plants were found in the proposed project area. Therefore, it is very unlikely that any sensitive plants would be destroyed or disturbed by the project, although a small amount of suitable habitat could be altered for those species with suitable habitat present.

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