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To: District Ranger, Helena Ranger District

Introduction

New wildlife information related to amount of habitat available for certain management indicator species (MIS) on the Helena National Forest (HNF) has become available. Specifically, the new Forest Inventory and Analysis (FIA) data has allowed the HNF to undertake an analysis, using FIA, of the forest-wide habitat of the northern goshawk, pileated woodpecker, hairy woodpecker and the American marten.

The HNF also completed an update of the results of the habitat model analysis based on the use of Timber Stand Management Reporting System (TSMRS) data which was previously referenced in the Clancy-Unionville FSEIS. This information was updated as the wildfires of 2003 changed the baseline habitat upon which the habitat model analysis was conducted. In addition, there has been reported additional population data and trend information for certain species, including the data published in the HNF Annual Monitoring Report Fiscal Years 2002/03.

The following report documents the findings of this new information and how this information affects the Clancy Unionville Record of Decision. The focus species for which this new information is analyzed are: northern goshawk, pileated woodpecker, hairy woodpecker, and American marten.

Summary

Habitat analyses for pileated woodpeckers, northern goshawks, hairy woodpeckers, and American marten have been conducted using two different datasets:

- FIA data are used to describe Forest level abundance and distribution of habitat (See models in Appendices A-D)
- TSMRS data are used at the Forest level to provide another means by which to assess abundance and distribution

The FIA dataset is discussed in more detail in the Old Growth Supplemental Information Report (SIR) and enables analysis of forest-wide and landscape abundance and distribution of wildlife habitat. FIA data are statistically reliable. Each FIA sample location is located at randomized point within a regular, systematic cell in a standardized grid[1] across the entire United States, with each point located approximately every 6000 acres. The Helena National Forest has 150 FIA sample points, of which 139 are forested. FIA sample points (n=13, out of the 139 forested sample points) affected by recent fire or timber harvest are not included in the analysis. The FIA

[1] See http://fia.fs.fed.us/

sampling frame is appropriate to make scientifically defensible and reliable inferences regarding the condition of forests within sufficiently large areas, regardless of their management regime. Each estimate for wildlife modeling used in this report represents a mean point estimate and is associated with an upper and lower bound. Confidence intervals for each estimate are included below.

TSMRS is a set of databases that house various types of data for the HNF. These data include activities such as timber harvest, natural changes due to ecological factors such as fire, canopy closure, and forest type. Individual tree data are stored in FOREST SERVICE VEGETATION (FSVEG). Specific habitat elements in these two databases were combined with spatial data to model wildlife habitat. The documentation for TSMRS and FSVEG can be found in the record. The TSMRS sample stands are a targeted dataset and do not represent a random sample across the Forest.

Wildlife habitat elements stored in FIA and TSMRS differ due to the scale and nature of the databases. Nevertheless, both FIA and TSMRS data sets contribute to understanding the distribution and abundance of habitat for the pileated woodpecker, northern goshawk, hairy woodpecker, and American marten. The HNF applied habitat models to these two data sets to estimate the amount of habitat forest-wide and by landscape. Habitat is the basis for modeling because it reflects the interaction of populations and the carrying capacity of the landscape (Schamberger and O'Neil 2000).
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For the TSMRS data set, 1998 Regional habitat models were utilized. These models are available from the Northern Region Regional Office Water, Wildlife, Fish, and Rare Plants Program, Missoula, Montana and are in the Clancy Unionville record. For the FIA data set, new preliminary models have been developed to utilize the FIA data. These habitat models are based on habitat parameters established from species observations and location information from Region 1. The description of these models can be found in the record for this SIR.

Wildlife Habitat Abundance and Distribution based on Habitat Models Using FIA

The results of the Forest-wide FIA analysis for pileated woodpeckers, goshawks, hairy woodpeckers, and marten are described below. Table 1 summarizes the percentage of habitat (point estimate) at the Forest level with associated confidence intervals. Table 2 summarizes total acres of habitat, Forest-wide, based on the point estimate described in Table 1.

Table 1. Summary of percent of habitat, forest-wide on the Helena National Forest, for selected MIS species based on FIA analysis.

Management Indicator Species		Lower Bound[2]	Point Estimate	Upper Bound
Pileated Woodpecker	Nest Habitat	1.7	3.2	4.9
	Foraging Habitat	31.5	37.4	43.4
Northern Goshawk	Nest Habitat	0.1	0.4	0.7
	Post-fledgling Area	3.7	4.9	6.1
	Foraging Habitat	34.2	37.6	41.0
Hairy Woodpecker	Nest Habitat	3.0	4.9	7.0
	Foraging Habitat	30.2	36.1	42.2
American Marten		19.6	24.3	29.2

Table 2. Summary of acres of habitat, forest-wide on the Helena National Forest, for selected MIS species based on FIA analysis.[3]

Management Indicator Species		Acres of Potential Habitat
Pileated Woodpecker	Nest Habitat	30,020
	Foraging Habitat	339,356
Northern Goshawk	Nest Habitat	3,916
	Post-fledgling Area	44,377
	Foraging Habitat	340,661
Hairy Woodpecker	Nest Habitat	45,682
	Foraging Habitat	327,609
American Marten		220,581

Wildlife Habitat Abundance and Distribution based on Habitat Models using Updated TSMRS

The HNF in this SIR completed an update of the results of the habitat model analysis which was previously referenced in the Clancy-Unionville FSEIS. Habitat had been modeled for goshawk, pileated and hairy woodpeckers, and the American marten in 2002. Since that time, wildfires, winter killed trees, and harvest activity have resulted in a changed baseline. To reflect these changes, the models that were used for the initial analyses have been rerun to reflect the most recent landscape conditions. Table 3 reflects the summary of habitat, Forest-wide, based on updated TSMRS analyses. See also the attached maps.

[2] All confidence intervals are reported at the 90% level except for the goshawk that is reported at the 70% level because of sample size.

[3] Forest-wide acres differ slightly from individual landscape acres due to rounding errors associated with each level of analysis.

Table 3. Summary of habitat, forest-wide on the Helena National Forest, for selected MIS species based on updated TSMRS analysis.

Management Indicator Species		Acres of Potential Habitat Based on 2004 Run
Pileated Woodpecker	Nesting, Roosting, Foraging Habitat	77,477
	Additional Foraging Habitat	97,933
Northern Goshawk	Potential Habitat/ >40%	91,824
	Potential Habitat/< 40% [4]	195,460
Hairy Woodpecker		257,179
American Marten	Primary Habitat	86,120
	Secondary Habitat	49,748

The following discusses the habitat analysis results for each species.

Pileated Woodpecker

Introduction

The pileated woodpecker is used as an indicator of mature forests primarily because of their preference for large diameter snags as nest trees that tend to occur more frequently in mature forests (Bull and Jackson 1995). In the Northern Rockies, pileated woodpeckers tend to use mature cottonwood bottoms, mixed conifer, ponderosa pine, among other habitat types (Hutto 1995). Forests with a component of western larch, ponderosa pine, or black cottonwood are also used in the northern Rocky Mountains (McClelland 1979, McClelland and McClelland 1999).

Habitat Analysis Based on FIA Runs at the Regional and Forest Levels

Table 1, above, summarizes habitat from the FIA analysis for pileated woodpeckers that was based on the aforementioned models. Table 4 summarizes the FIA analysis conducted at the landscape level and is described in acres of habitat.

Table 4. Forest-wide FIA analysis for pileated woodpeckers by landscape.

Landscape Area	Nesting Habitat (Acres)	Foraging Habitat (Acres)
Big Belts	11,041	142,430
Elkhorns	0	13,848
Divide	6,435	69,713
Blackfoot	9,250	75,323
TOTAL	**26,726**	**301,316**

[4] A 40% slope constraint was imposed on the overall potential habitat.

Habitat Analysis Based on TSMRS Data

Estimates of habitat for pileated woodpeckers have increased when based on the updated TSMRS (Table 5). The total potential habitat (175,410 acres) represents approximately 42% of the forested land[5]. Of the 77,476 acres of nesting, roosting, and foraging (NRF) habitat, approximately 16,920 acres are inventoried acres that have old growth characteristics. This represents approximately 22% of the nesting, roosting, and foraging habitat total acres[6]. Not all acres available for potential pileated woodpecker NRF habitat have been inventoried. Therefore, the 22% figure is likely conservative. See also attached maps.

Table 5. Forest-wide TSMRS analysis for pileated woodpecker habitat by landscape.

Landscape	Nesting, Roosting, Foraging Habitat	Additional Foraging Habitat
Big Belts	36,458	25,082
Elkhorns	9,686	9,126
Divide	13,518	28,569
Blackfoot	17,814	35,156
TOTAL	**77,476**	**97,933**

Estimates of pileated woodpecker habitat based on FIA and TSMRS differ for two reasons. First, the 1998 pileated woodpecker habitat model which uses TSMRS includes a larger number of habitat parameters, i.e., live tree size (dbh) and a canopy closure, and therefore would be more restrictive in estimating available habitat. Second, the 2004 pileated woodpecker habitat model uses FIA data which is based on stand dominance by a particular tree. Use of stand dominance provides more of a landscape versus individual tree or stand view of habitat for the pileated woodpecker.

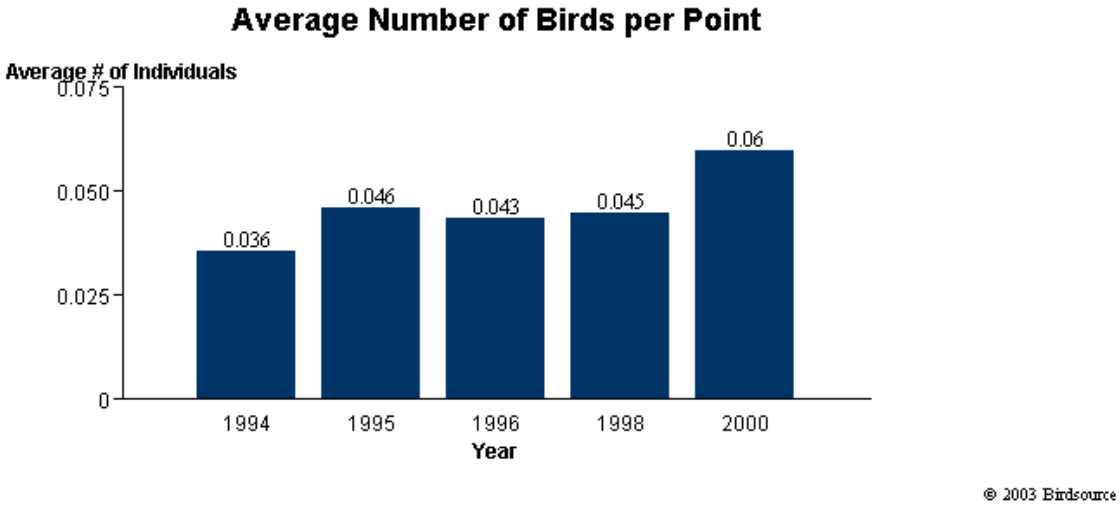
Available Trend Data

The long-term trend maps provided by the USGS Biological Resources Division (http://www.mbr-pwrc.usgs.gov/bbs/bbs.html, accessed July 10, 2004) show an increase in Idaho and Montana except around Glacier National Park. In addition, Regional landbird monitoring data for the Helena National Forest (Figure below) indicate that the average number of birds detected during surveys has increased since 1994. Also, the Helena National Forest Annual Monitoring Report Fiscal Years 2002/03 indicates that pileated woodpeckers have been surveyed and are present on the Forest.

[5] Total forested land potentially available as pileated woodpecker habitat based on modeling rules in R1 Pileated Woodpecker Model is approximately 415,567 acres. This excludes subalpine fir, spruce, and lodgepole pine types (as well as non-forested lands).

[6] Additional foraging habitat was not used in the calculations of old growth since this habitat does not incorporate an old growth or older forest component.

Landbird monitoring data for the Helena National Forest.



Analysis and Conclusions

FIA Analysis

The FIA analysis indicates that pileated woodpecker habitat is widely distributed across the Forest, with the exception of nesting habitat in the Elkhorn Mountain Range. The amount and distribution of habitat is both a reflection of the capability and current condition of the landscape as well as the number of plots within each landscape. The Elkhorns, for example, have fewer FIA plots than other areas on the Forest and the fact that there is no nesting habitat is a reflection of the small sample size. Pileated woodpeckers surveys conducted during the 2004 field season for the North Elkhorns Birds and Burns project identified two pairs in that area. This, coupled with the TSMRS analysis, demonstrates the potential for nesting habitat and confirms the absence of nesting habitat via the FIA analysis is an artifact of the small sample size.

The Forest-wide old growth analysis based on FIA also indicates a well distributed pattern of old growth across all landscapes (***See Old Growth Sir)***.

TSMRS Analysis

The TSMRS analysis provides a conservative estimate of pileated woodpecker habitat and is a reflection of the difficulty to estimate habitat structure and number and distribution of snags.

Conclusions

Both FIA and TSMRS have strengths and limitations relative to modeling and providing an estimate of potential pileated woodpecker habitat. FIA queries may represent the stronger dataset for pileated woodpeckers because of the incorporation of snags as a habitat component. FIA data should be interpreted in conjunction with the FIA old growth analysis to fill in gaps created by small sample sizes in some of the landscapes (i.e. Elkhorns). The old growth FIA query and analysis does not 'ask' for a snag component while the pileated woodpecker model does and may explain why old growth is indicated in the Elkhorns but not pileated woodpecker nesting habitat.

The TSMRS data indicate the presence of habitat in all landscapes. The 1998 Regional Model (that TSMRS is based upon) assumes snags are considered when selecting for large (live) trees. While this is a valid assumption, it is likely that snags are under represented in the TSMRS database. The TSMRS data do provide a spatial context not represented by the FIA data.

Relationship of the New Information to the Clancy-Unionville FSEIS Analysis

The Clancy-Unionville FSEIS found concerning the impacts of the project on pileated woodpeckers and viability that the Divide landscape should contain enough pileated woodpecker habitat to maintain a 'small but viable population of pileated woodpeckers' (Chapter Three, pages 157-165). This is based on the availability of habitat (as determined through modeling efforts and field reconnaissance) and observations of pileated woodpeckers both in the project area and in the Divide landscape.

Based on regional literature referenced in that document and relative to the Helena National Forest as a whole:

- The population is widely but sporadically distributed
- Barriers[7] to interactions exist and may result in empty habitat blocks
- The population has a high probability of persistence over 50-100 years based on the conclusion that there are no insurmountable…habitat problems.

Based on my review of the new information on pileated woodpeckers presented in this and the Old Growth SIR and information contained in the project file, I have determined that the conclusions presented in the Clancy Unionville Final Supplemental Environmental Impact Statement are accurate and that the project results in minimal effects to pileated woodpecker habitat and "sufficient habitat would remain throughout…the Helena National Forest to support viable populations of all management indicator species" (Chapter Three, page 179, FSEIS).

Recommendations

Considering the above analyses, I do not recommend further environmental analysis for the Clancy Unionville project. The effects described in the FSEIS, wildlife section, are valid. The vegetation management actions authorized by the Clancy Unionville project are consistent with the Helena National Forest responsibilities relative to species' viability.

Northern Goshawk

Introduction

The northern goshawk, like the pileated woodpecker, is also used as an indicator of mature forests. Northern goshawks occupy coniferous and mixed forests throughout much of the northern United States and use a wide variety of forest types for nesting and foraging (Bright-Smith and Mannan 1994, Graham et al. 1994, Hargis et al. 1994, Squires and Reynolds 1997).

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[7] Barriers for pileated woodpeckers may include small patch size, and low survival and recruitment associated with factors other than habitat (weather, genetics, predators).

Recent studies suggest that goshawks may not be as tied to old growth forests as previously understood. McGrath et al. (2003) indicate that old growth forest structures are not useful in predicting goshawk nesting habitat. High understory reinitiation stages[8] and old growth stages may be equal in terms of goshawk nest selection. In the northern Rockies, goshawks are often associated with mature forest, not necessarily old growth forests (Squires and Ruggerio 1996, Clough 2000, pages 67-68). Survey efforts on the Helena National Forest indicate that goshawks are using mature forests as habitat. Some of these habitats have an old growth component, while other areas do not have this component (Helena National Forest Annual Monitoring Report Fiscal Years 2002/03).

Habitat Analysis Based on FIA Runs at the Regional and Forest Levels

Table 1, above, summarizes habitat from the FIA analysis for goshawks that was conducted by the Regional Office for the Forest. Table 6 summarizes the FIA analysis conducted on Forest and structures the data by landscape.

Table 6. Forest-wide FIA analysis for northern goshawks by landscape.

Landscape Area	Nest Habitat(Acres)	Post-fledgling Area (Acres)	Foraging Habitat (Acres)
Big Belts	1,104	14,353	97,161
Elkhorns	1,538	1,538	30,774
Divide	0	15,015	91,164
Blackfoot	1,321	7,928	89,859
TOTAL	**3,964**	**38,836**	**308,960**

Habitat Analysis Based on TSMRS Data

Estimates of habitat for goshawks have increased when based on the updated TSMRS (Table 7). Potential habitat on <40% slope has decreased while potential habitat on >40% slope has increased. The total potential habitat (287,284 acres) represents approximately 34% of the forested land. Of the 287,284 acres of total potential habitat, approximately 43,012 acres are inventoried acres that have old growth characteristics. This represents approximately 15% of the potential habitat. Not all acres available for potential goshawk have been inventoried to determine old growth characteristics. Therefore, as with the pileated woodpecker analysis above, the 15% figure is likely conservative. See also attached maps.

Table 7. Potential goshawk based on TSMRS, by landscape.

Landscape	Potential Habitat >40% Slope	Potential Habitat <40% Slope
Big Belts	27,603	56,038
Elkhorns	4,847	28,478
Divide	9,467	54,012
Blackfoot	49,907	56,932
TOTAL	**91,824**	**195,460**

[8] This is described in McGrath et al. (2003) as "characterized by the colonization of the forest floor by advance regeneration and the continuation of competition in the overstory" (page 10, figure 2).

Estimates of goshawk habitat based on FIA and TSMRS differ for several reasons. The 1998 goshawk habitat model which uses TSMRS includes narrower habitat parameters, overall, than the models based on the FIA data, especially relative to foraging habitat. Also, the FIA data are based on stand dominance by a particular tree which provides more of a landscape perspective rather than a stand view of goshawk habitat.

Available Trend Data

The long-term trend maps provided by the USGS Biological Resources Division (http://www.mbr-pwrc.usgs.gov/bbs/bbs.html, accessed July 10, 2004) show that goshawks are widely distributed in the Northern Region and are reported to be on the increase in west-central Montana. Also, the Helena National Forest Annual Monitoring Report Fiscal Years 2002/03 indicates that goshawks have been surveyed and are present on the Forest.

Analysis and Conclusions

FIA Analysis

The FIA analyses indicate that, overall, goshawk habitat is widely distributed across the Forest. Some landscapes have more potential habitat than others; this is both a reflection of the capability and current condition of the landscape as well as the number of data plots within each landscape. For example, the Divide landscape has zero aces of nesting habitat which is a reflection of the sample size in that landscape and not the capability of the landscape to provide goshawk habitat (as demonstrated by the TSMRS analysis below). Furthermore, the habitat models based on FIA data are restricted to northerly aspects. Our data indicate that our known nests are not limited to northerly aspects. The Clancy Unionville FSEIS also identifies the presence of goshawk habitat in that project area and in the Divide landscape (Chapter Three, Pages 159 - 160).

Given that goshawks typically require about 30 acres/nest stand, the above total acres of 3964 would indicate that habitat is available for up to 130 breeding pairs (Reynolds et al, 1992).

TSMRS Analysis

The TSMRS analysis provides a conservative estimate of goshawk habitat and is a reflection of the difficulty to estimate habitat structure. However, the TSMRS analysis does indicate that habitat is well distributed across the Forest.

Conclusions

Both FIA and TSMRS have strengths and limitations relative to modeling and providing an estimate of goshawk habitat. FIA data should be interpreted in conjunction with the FIA old growth analysis to fill in gaps created by small sample sizes and habitat model parameters in some of the landscapes (i.e. Divide).

The TSMRS data indicate the presence of goshawk habitat in all landscapes. Furthermore, the TSMRS data do provide a spatial context not represented by the FIA data. Based on the abundance and distribution of habitat, as reflected in the FIA and TSMRS analyses, and the available trend data, it appears that the Helena National Forest is contributing to the viability of northern goshawks.

Relationship of the New Information to the Clancy-Unionville FSEIS Analysis

The Clancy-Unionville FSEIS found concerning the impacts of the project on goshawks and viability that the Clancy Unionville project area supports a viable goshawk population and has sufficient habitat to support more goshawk homeranges than are currently occupied. This conclusion is based on an analysis of recommendations from existing goshawk research (including research conducted in Montana) (See pages Chapter Three 159-160, FSEIS). Field surveys of potential goshawk habitats as well as modeled habitat and monitoring of previously occupied home ranges also were used to conclude that the Clancy Unionville project will continue to support goshawk viability.

Based on regional literature referenced in that document and relative to the Helena National Forest as a whole:

- The population is well distributed
- There are some barriers[9] to population interactions and habitat occupancy
- The population has a high probability of persistence over 50-100 years

Based on my review of the new information on northern goshawks presented in this and the Old Growth SIR, I have determined that the conclusions presented in the Clancy Unionville Final Supplemental Environmental Impact Statement are accurate and that the project results in minimal effects to goshawk habitat and "sufficient habitat would remain throughout…the Helena National Forest to support viable populations of all management indicator species" (Chapter Three, page 179, FSEIS).

Recommendations

Considering the above analyses, I do not recommend further environmental analysis for the Clancy Unionville project. The effects described in the FSEIS, wildlife section, are valid. The vegetation management actions authorized by the Clancy Unionville project are consistent with the Helena National Forest responsibilities relative to species' viability.

Hairy Woodpecker

Introduction

The hairy woodpecker is used as an indicator of snag habitat. They are year-round resident primary cavity nesters, which subsequently provide nest cavities for a myriad of other small birds and mammals. Hairy woodpeckers reside in many forest communities and utilize a variety of tree sizes. They feed on insects, primarily ants, wood borers, and grubs as well as fruits and berries. Hairy woodpeckers forage on a variety of substrates including snags and down logs. They may concentrate in areas of insect outbreaks in response to the increased food source (Sousa 1997). This species is a fire-adapted species associated with habitat that is characterized by recurring fires of various intensities.

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[9] These barriers are similar to those described for the pileated woodpecker although habitat configurations and the juxtaposition of nesting habitat to PFAs and foraging habitat could pose barriers to goshawk distribution and abundance. Other barriers include weather, disturbance, competition from other wildlife, etc.

Habitat Analysis Based on FIA Runs at the Regional and Forest Levels

Table 1, above, summarizes habitat from the FIA analysis for hairy woodpeckers that was conducted by the Regional Office for the Forest. Table 8 summarizes the FIA analysis conducted on Forest and structures the data by landscape.

Table 8. Forest-wide FIA analysis for hairy woodpeckers by landscape.

Landscape Area	Nest Habitat (Acres)	Foraging Habitat (Acres)
Big Belts	18,769	142,430
Elkhorns	1,538	10,771
Divide	7,507	66,496
Blackfoot	13,214	70,037
TOTAL	**41,031**	**289,735**

Habitat Analysis Based on TSMRS Data

Estimates of habitat for hairy woodpeckers have increased when based on the updated TSMRS (Table 9). The total potential habitat (257,179 acres) represents approximately 31% of the forested land that could contribute to hairy woodpecker habitat. This includes approximately 74,000 additional acres not reflected in the original analysis that is a result of recently burned habitat which provides foraging and nesting opportunities for hairy woodpeckers. See also attached maps.

Table 9. Potential hairy woodpecker habitat based on TSMRS, by landscape.

Landscape	Potential Habitat (Acres)
Big Belts	84,849
Elkhorns	22,140
Divide	47,948
Blackfoot	102,242
TOTAL	**257,179**

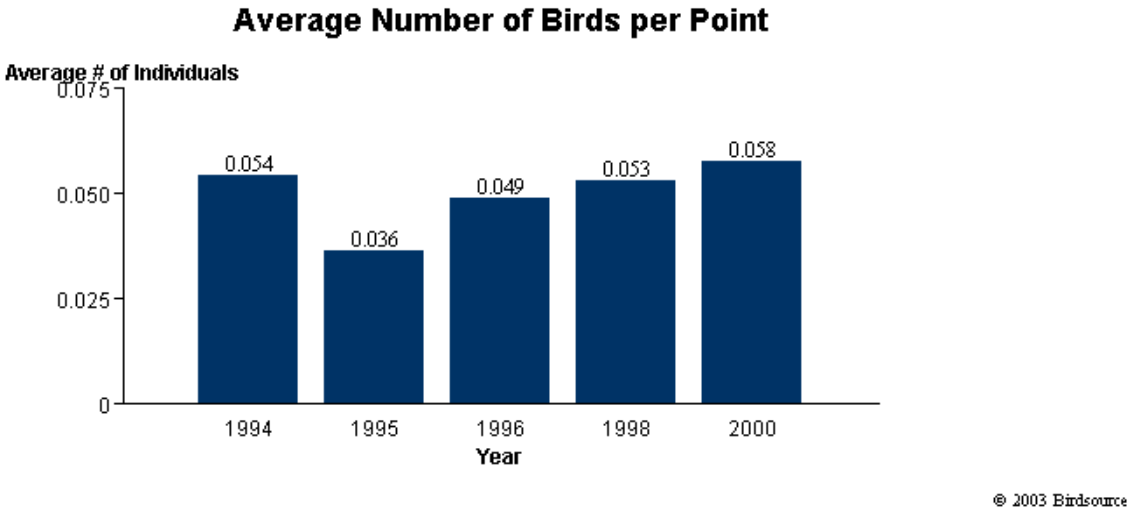
Estimates of hairy woodpecker habitat based on FIA and TSMRS differ for several reasons. Primarly, the habitat model that uses TSMRS includes a parameter that restricts tree size whereas the model that uses FIA data does include this filter. Furthermore, FIA data are based on stand dominance by a particular tree which provides more of a landscape versus individual tree of stand view of habitat for hairy woodpeckers.

Available Trend Data

The long-term trend maps provided by the USGS Biological Resources Division (http://www.mbr-pwrc.usgs.gov/bbs/bbs.html, accessed July 10, 2004) show an increase in Idaho and Montana except around the Custer National Forest. Regional landbird monitoring data for the Helena National Forest (Figure below) indicate that the average number of birds detected during surveys has increased since 1994. Also, the Helena National Forest Annual Monitoring

Report Fiscal Years 2002/03 indicates that hairy woodpeckers have been surveyed and are present on the Forest.

Landbird monitoring data for the Helena National Forest.



Analysis and Conclusions

FIA Analysis

The FIA analyses indicate that hairy woodpecker habitat is widely distributed across the Forest. Some landscapes have more potential habitat than others; this is both a reflection of the capability and current condition of the landscape as well as the number of plots within each landscape.

TSMRS Analysis

The TSMRS analysis provides a conservative estimate of hairy woodpecker habitat and is a reflection of the difficulty to estimate habitat structure and number and distribution of snags.. However, the TSMRS analysis does indicate that habitat is well distributed across the Forest.

Conclusions

Both FIA and TSMRS have strengths and limitations relative to modeling and providing an estimate of potential hairy woodpecker habitat. FIA queries may represent the stronger dataset for hairy woodpeckers because of the incorporation of snags as a habitat component.

The TSMRS data indicate the presence of habitat in all landscapes. The 1998 Regional Model (that TSMRS is based upon) assumes snags are considered when selecting for mature (live) trees. While this is a valid assumption, it is likely that snags are under represented in the TSMRS database. The TSMRS data do provide a spatial context not represented by the FIA data.

Based on the abundance and distribution of habitat, as reflected in the FIA and TSMRS analyses, and the available trend data, it appears that the Helena National Forest is contributing to the viability of hairy woodpeckers.

Relationship of the New Information to the Clancy-Unionville FSEIS Analysis

The Clancy-Unionville FSEIS found concerning the impacts of the project on hairy woodpeckers and viability that habitat is widely distributed and abundant in the Clancy Unionville area and that hairy woodpeckers are viable and that ecological conditions are capable of sustaining this viability over time (Chapter Three, pages 157-165). This conclusion is based on habitat modeling, landbird surveys, general wildlife surveys, and regular observations of hairy woodpeckers in a variety of forest structures.

Based on regional literature referenced in that document and relative to the Helena National Forest as a whole:

- The population is widely distributed, robust, and resilient
- There are some barriers[10] to population interactions and habitat occupancy
- The population has a very high probability of persistence over 50-100 years

Based on my review of the new information on hairy woodpeckers presented in thisSIR, I have determined that the conclusions presented in the Clancy Unionville Final Supplemental Environmental Impact Statement are accurate and that the project results in minimal effects to hairy woodpecker habitat and "sufficient habitat would remain throughout…the Helena National Forest to support viable populations of all management indicator species" (Chapter Three, page 179, FSEIS).

Recommendations

Considering the above analyses, I do not recommend further environmental analysis for the Clancy Unionville project. The effects described in the FSEIS, wildlife section, are valid. The vegetation management actions authorized by the Clancy Unionville project are consistent with the Helena National Forest responsibilities relative to species' viability.

American Marten

Introduction

The American marten is used as an indicator used to monitor the quality of large continuous blocks of mature cover. Martens prefer mature forests with relatively dense canopies and fallen logs and down woody debris (Buskirk et al. 1989, 1992, Coffin 1994). Marten dependence on mature forests in the central Rockies does seem to be linked to the availability of coarse woody debris that provides resting sites and thermal cover. Habitat in the northern Rocky Mountains includes old spruce/fir forests, subalpine fir with whitebark pine and larch, lodgepole pine with

[10] Barriers include distribution of habitat (foraging and nesting habitat juxtapositions) as well as those previously described for pileated woodpeckers and goshawks including disturbance, weather, predation, and competition from other insect gleaning animals.

fir or spruce, as well as low elevation cedar and grand fir forests (Koehler et al. 1990). Ruggerio et al. (1998) found that marten use rock crevices, snags, and logs as denning habitat.

Habitat Analysis Based on FIA Runs at the Regional and Forest Levels

Table 1, above, summarizes habitat from the FIA analysis for martens that was conducted by the Regional Office for the Forest. Table 10 summarizes the FIA analysis conducted on Forest and structures the data by landscape.

Table 10. Forest-wide FIA analysis for American marten by landscape.

Landscape Area	Potential Habitat (Acres)
Big Belts	82,808
Elkhorns	10,771
Divide	47,190
Blackfoot	56,823
TOTAL	**197,593**

Habitat Analysis Based on TSMRS Data

Estimates of habitat for martens have decreased when based on the updated TSMRS (Table 11). under the new runs of the habitat model. This is based on the reductions associated with the wildfires of 2003 that reduced marten habitat, as well as updated information that reflect harvest activity and insect and disease killed trees. The total potential habitat (135,866 acres) represents approximately 16% of the forested land that could contribute to marten habitat. See also attached maps.

Table 11. Potential hairy woodpecker habitat based on TSMRS, by landscape.

Landscape	Primary Habitat (Acres)	Secondary Habitat (Acres)
Big Belts	11,340	6,577
Elkhorns	11,698	8,099
Divide	22,780	13,798
Blackfoot	40,301	21,273
TOTAL	**86,119**	**49,747**

Estimates of marten habitat based on FIA and TSMRS differ for several reasons. The 1998 marten habitat model which uses TSMRS includes parameters for patch size, elevation, and distance between patches not included in the FIA based model. Also, the model based on FIA data uses stand dominance that provides more of a landscape versus stand view of habitat for martens.

Available Trend Data

While there are no available trend data per se, surveys conducted by Forest and other personnel indicate that marten are present on the Forest. The Helena National Forest Annual Monitoring

Report Fiscal Years 2002/03 indicates that marten have been surveyed and are present on the Forest.

Analysis and Conclusions

FIA Analysis

The FIA analyses indicate that marten habitat is widely distributed across the Forest. Some landscapes have more potential habitat than others; this is both a reflection of the capability and current condition of the landscape as well as the number of plots within each landscape. As indicated above, FIA does not have a spatial parameter. Patch size and distance between patches is an important characteristic of an areas' capability to provide marten habitat; therefore, these relationships are important in understanding the value of modeled habitat for marten. The FIA estimate of marten habitat may be high due to the fact that down woody debris is not included as a modeling parameter at this time.

TSMRS Analysis

The TSMRS analysis provides a conservative estimate of marten habitat and is a reflection of the difficulty to estimate down woody material. However, the TSMRS analysis does indicate that habitat is well distributed across the Forest and does include in its models juxtaposition of patch size and distance between patches.

Conclusions

Both the FIA and TSMRS have strengths and limitations relative to modeling and providing an estimate of potential marten habitat. Both datasets indicate the presence of habitat in all landscapes. The TSMRS data do provide a spatial context not represented by the FIA data.

Based on the distribution of habitat, as reflected in the FIA and TSMRS analyses, it appears that the Helena National Forest is contributing to the viability of martens.

Relationship of the New Information to the Clancy-Unionville FSEIS Analysis

The Clancy-Unionville FSEIS found concerning the impacts of the project on martens and viability that sufficient habitat is present throughout the Divide landscape to support viable marten populations (Chapter Three, pages 157-165). This conclusion is based on modeled and field verified habitat.

Based on regional literature referenced in that document and relative to the Helena National Forest as a whole:

- The population may be widely but sporadically distributed
- There are some barriers[11] to population interactions and habitat occupancy
- The population has a high probability of persistence over 50-100 years

[11] Barriers include distance between patch sizes, availability of coarse woody debris, predation, competition, mortality (including trapping mortality) as well as recruitment and survival.

Based on my review of the new information on martens presented in this SIR, I have determined that the conclusions presented in the Clancy Unionville Final Supplemental Environmental Impact Statement are accurate and that the project results in minimal effects to marten habitat and "sufficient habitat would remain throughout…the Helena National Forest to support viable populations of all management indicator species" (Chapter Three, page 179, FSEIS).

Recommendations

Considering the above analyses, I do not recommend further environmental analysis for the Clancy Unionville project. The effects described in the FSEIS, wildlife section, are valid. The vegetation management actions authorized by the Clancy Unionville project are consistent with the Helena National Forest responsibilities relative to species' viability.

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Submitted by:

Denise Pengeroth July 10, 2004

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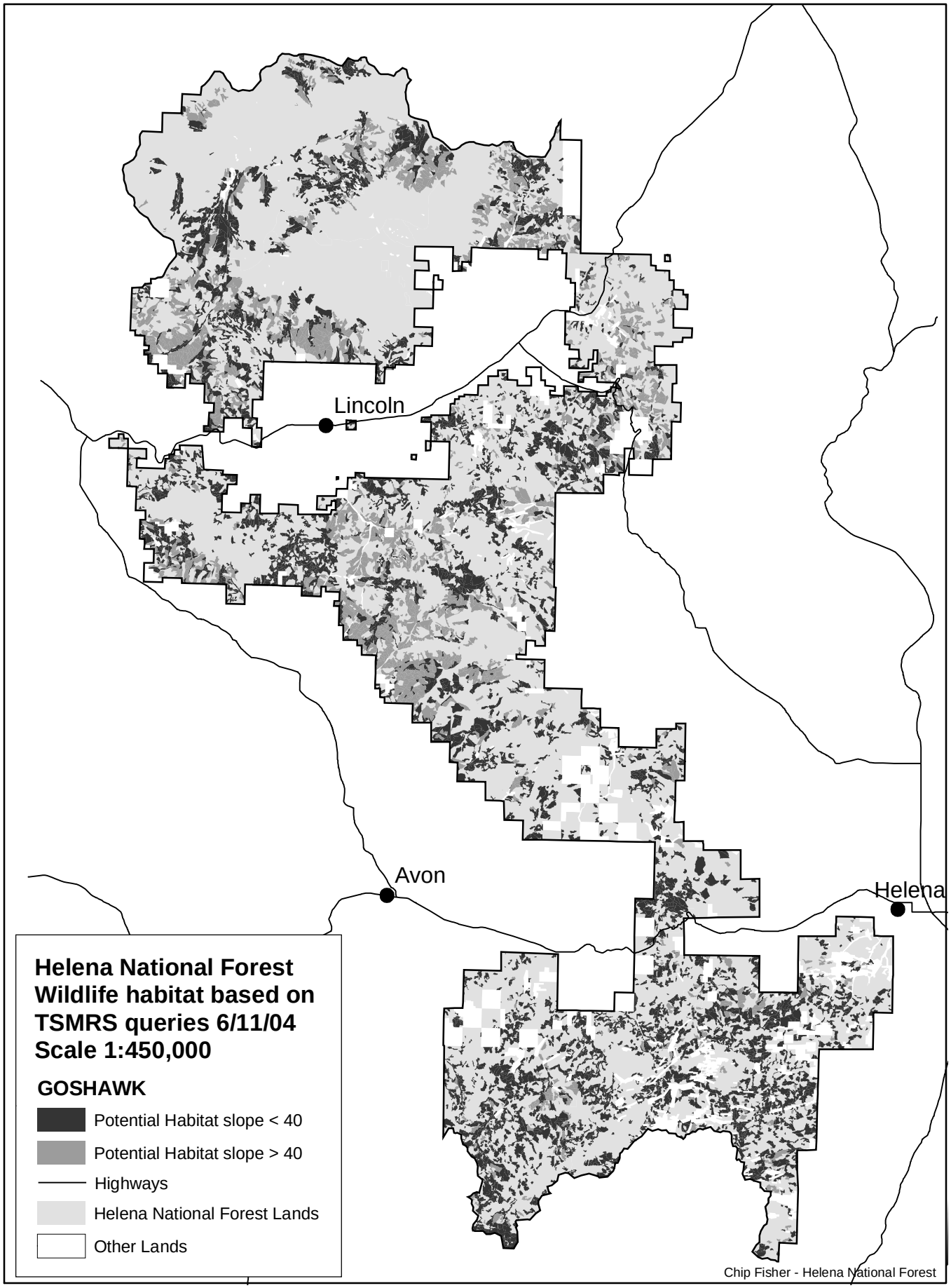
Helena National Forest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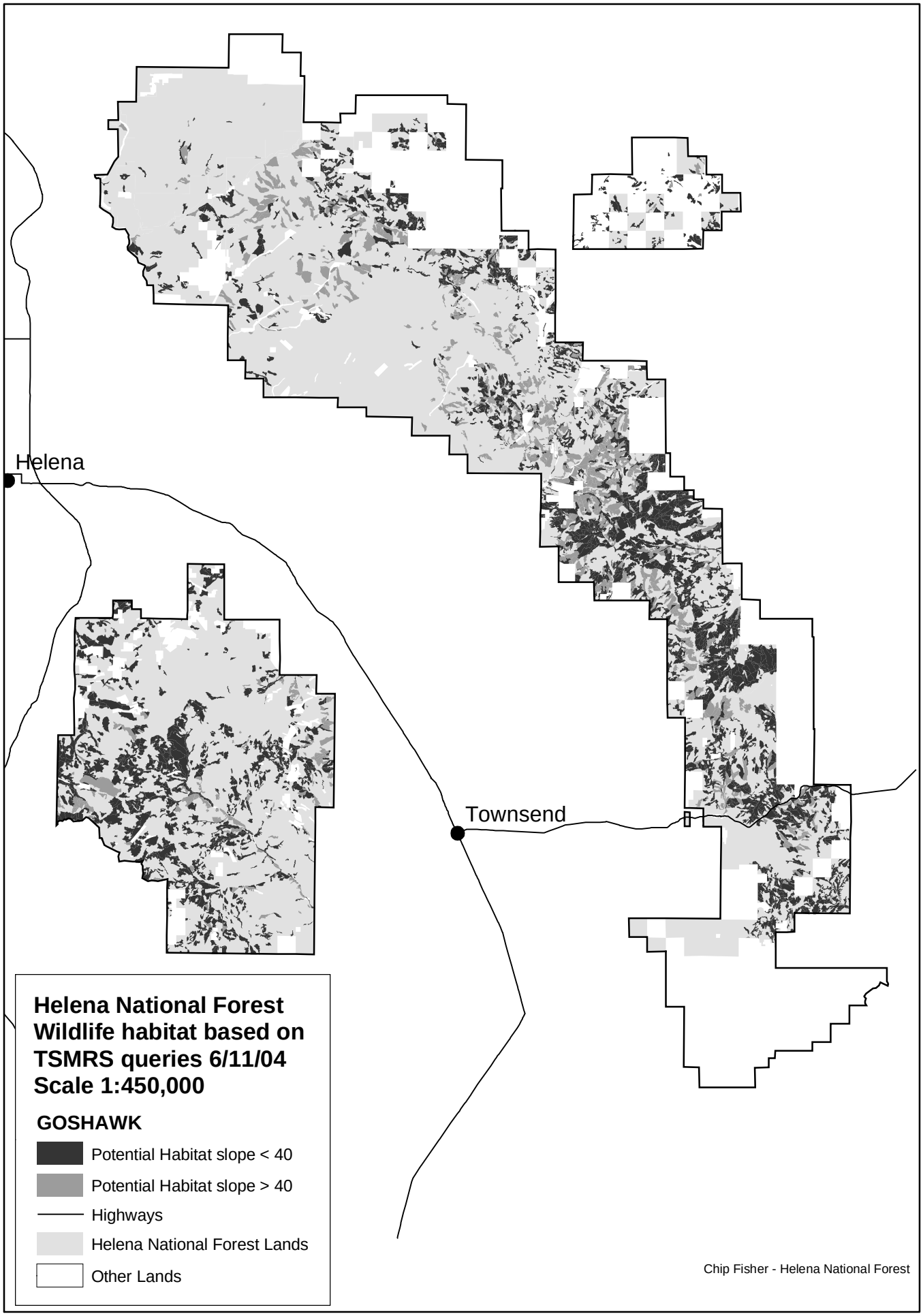
Other Lands
Chip Fisher - Helena National Forest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Other Lands
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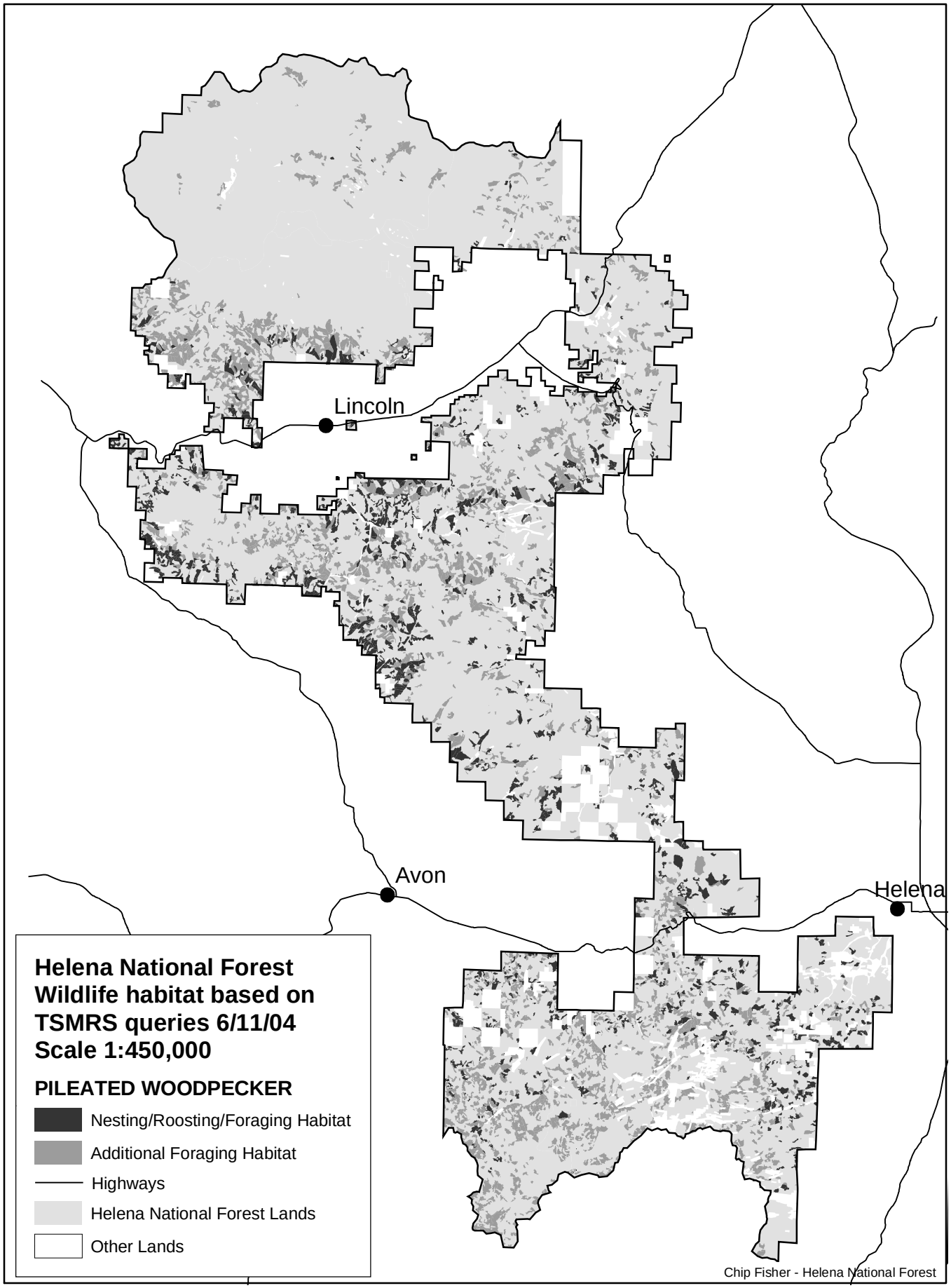
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Additional Foraging Habitat
Highways
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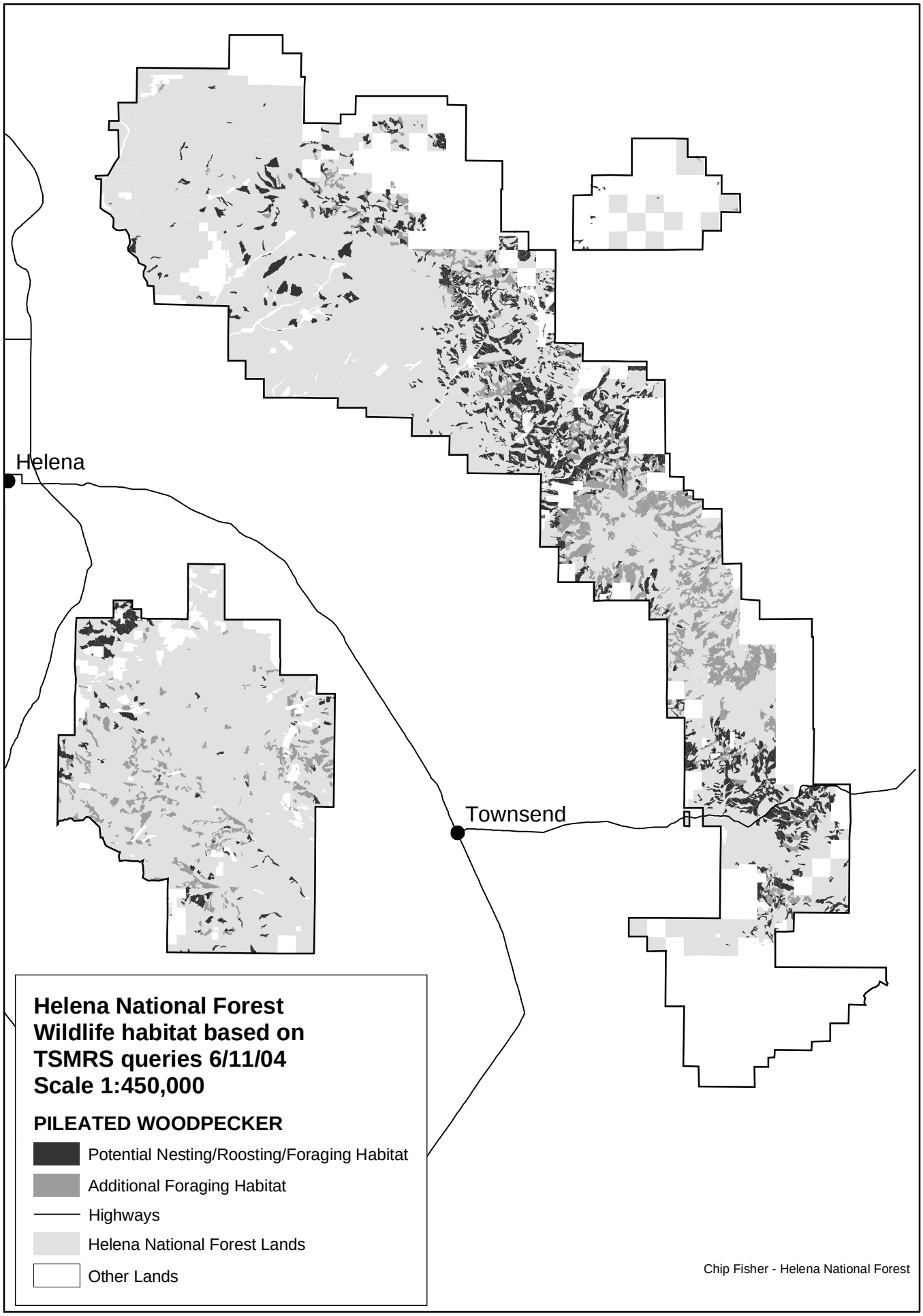
Other Lands
Chip Fisher - Helena National Forest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Highways
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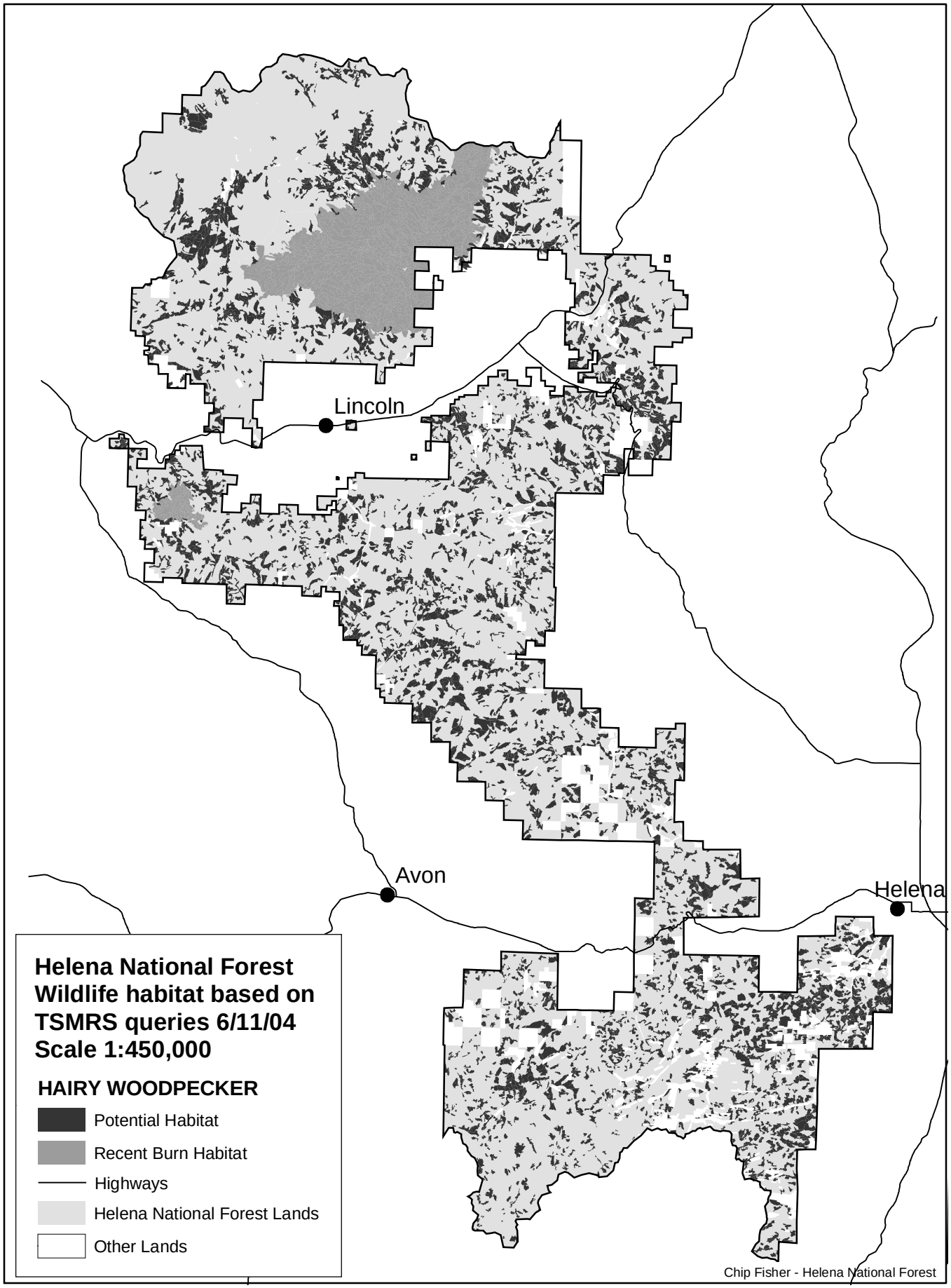
Other Lands
Chip Fisher - Helena National Forest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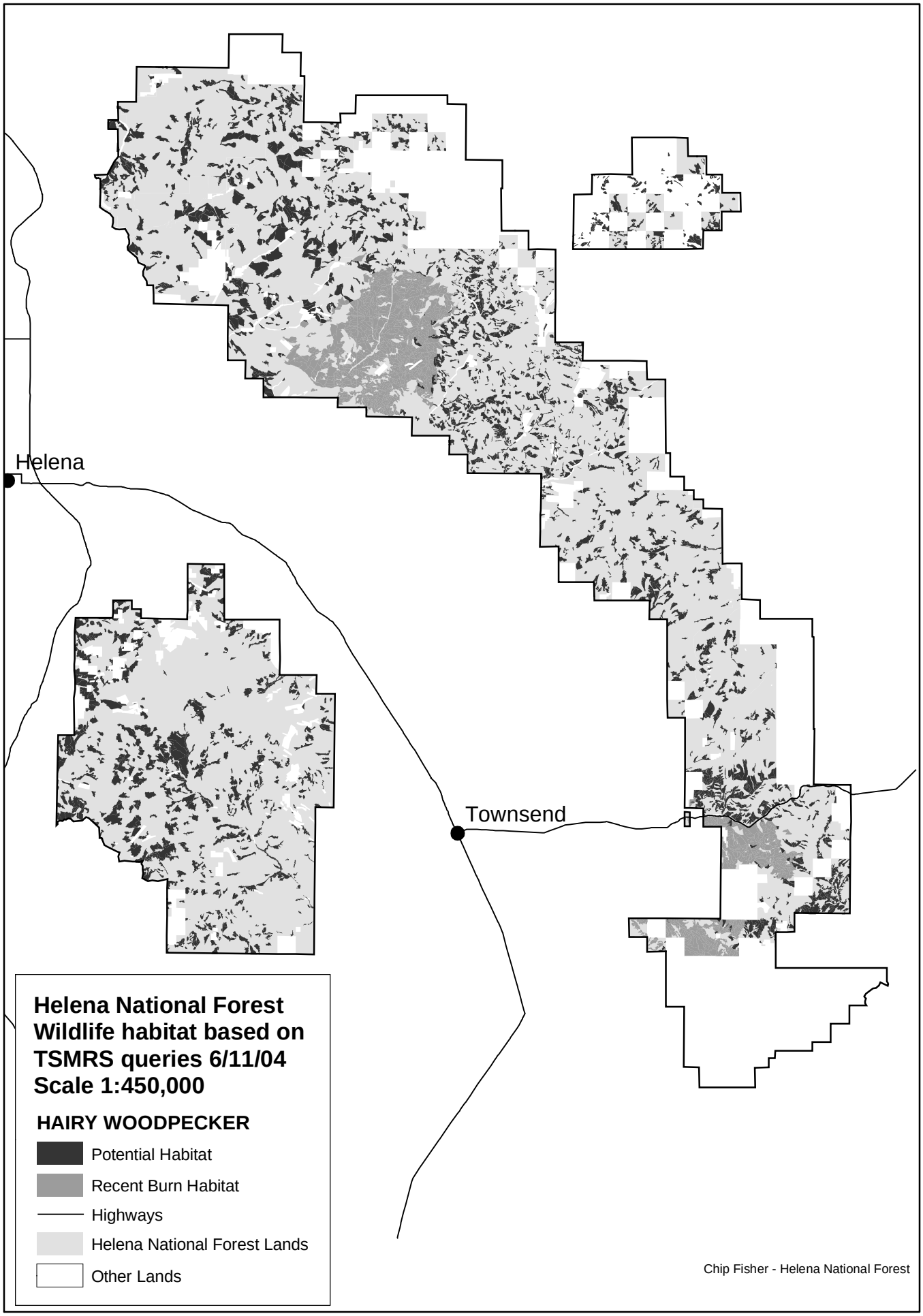
Potential Habitat
Recent Burn Habitat
Highways
Helena National Forest Lands
Other Lands
Chip Fisher - Helena National Forest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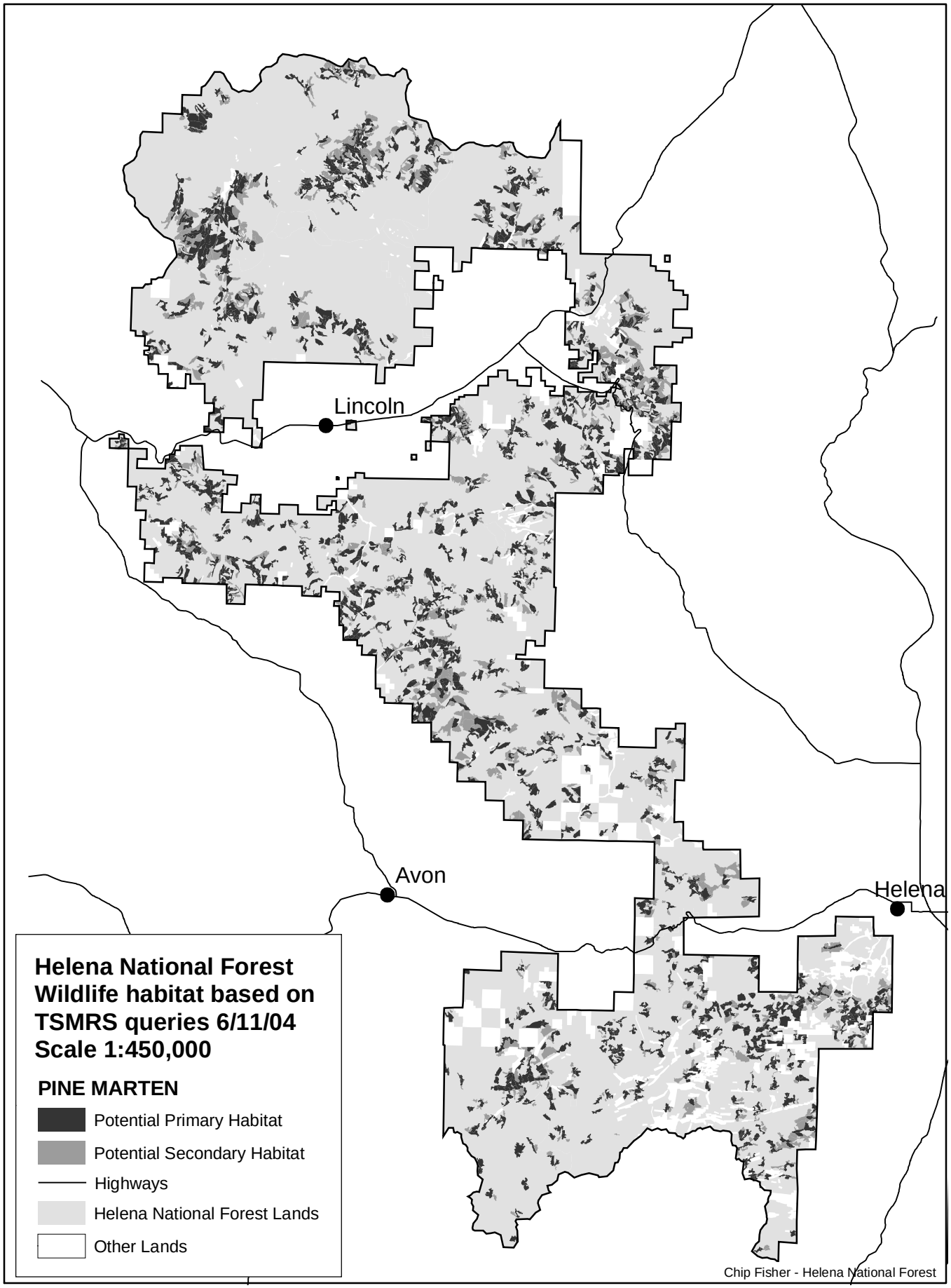
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Other Lands
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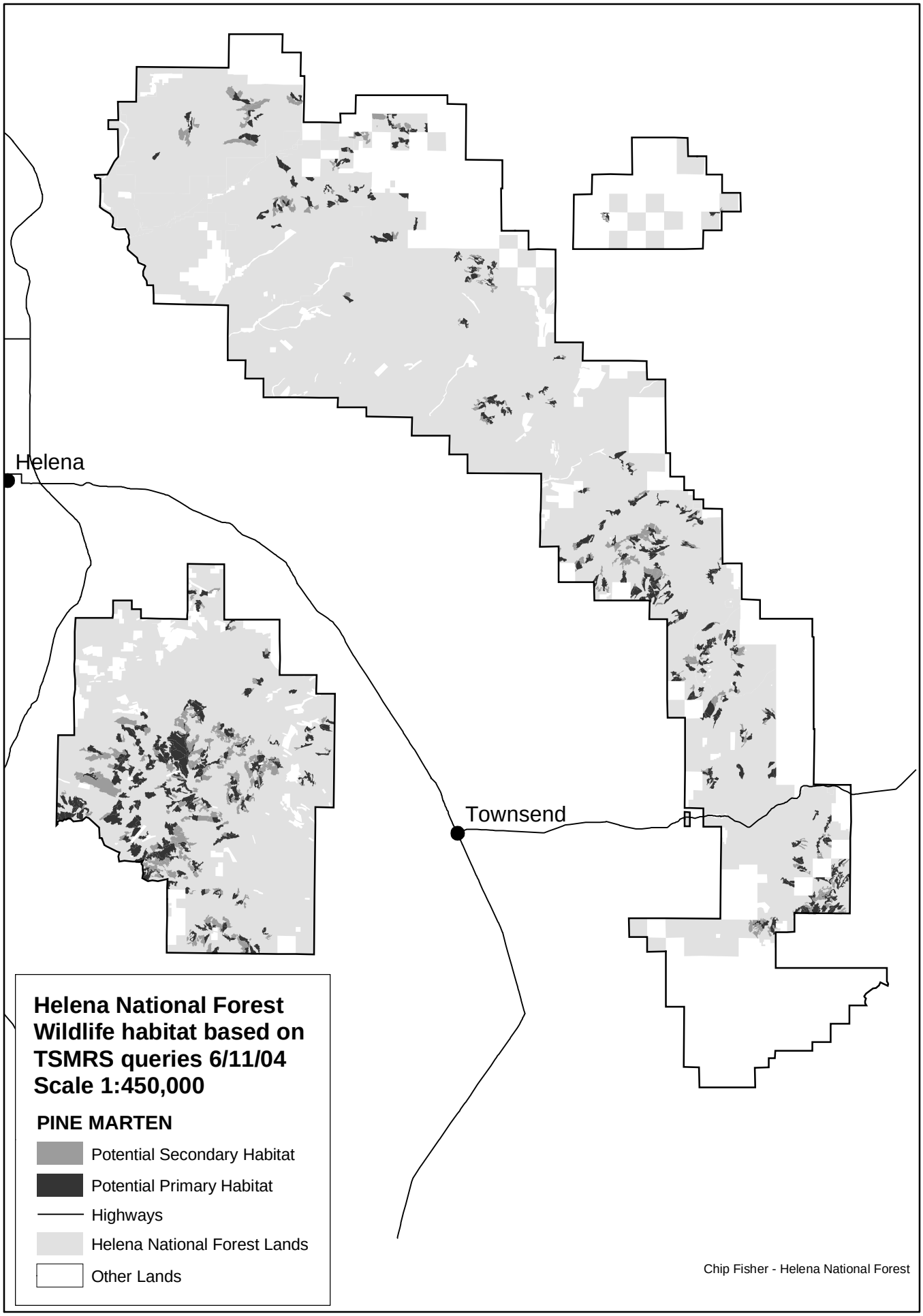
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PINE MARTEN
Potential Secondary Habitat
Potential Primary Habitat
Highways
Helena National Forest Lands
Other Lands
Chip Fisher - Helena National Forest

PRELIMINARY REGIONAL HABITAT MODEL

Samson, 2004[1]

Pileated Woodpecker

(*Dryocopus pileatus*)

Background

Forests with a component of western larch, ponderosa pine, or black cottonwood are used by pileated woodpeckers in the northern Rocky Mountains (McClelland 1979, McClelland and McClelland 1999). At Coram Experimental Forest in northwestern Montana, McClelland et al. (1979) found that cavity nesters, including pileated woodpeckers, preferred western larch as a nest tree even though Douglas-fir was 5 times more abundant. Ponderosa pine was uncommon in this study area, but appeared to be a preferred nest tree; large black cottonwoods were also favored. Hutto (1995) reported in the Northern Rocky Mountains that mature cottonwood bottoms, riparian areas, ponderosa pine, mixed conifer, cedar-hemlock, and larch stands were used by the pileated wood pecker. One primary characteristic of pileated woodpecker habitat are large snags (Bull and Jackson 1995).

Habitat Model and Amounts

As estimate of available nest and foraging habitat is possible based on known habitat use (McClelland 1979, Hutto 1995, McClelland and McClelland 1999) and a distribution of snags considered adequate in size (6 inches, Bull and Jackson 1995) for a bowl at the bottom of the nest. The following describes a pileated woodpecker nest habitat model using variables in Forest Inventory and Analysis (FIA).

	Middle Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province
Dominance Group	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL
Snags	>=15 inches	>=15 inches

[1] Fred Samson, U.S. Forest Service, Northern Region, Water, Wildlife, Fish, and Rare Plants Program, Missoula, Montana, May 2004

The following describes a pileated woodpecker foraging habitat model using variables in FIA.

	Middle Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province
Dominance Group	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL

Literature cited

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PRELIMINARY REGIONAL HABITAT MODEL

Samson, 2004[2]

Northern Goshawk

(Accipiter gentiles)

Summary

The northern goshawk (hereafter referred to as goshawk) is a large forest raptor occupying boreal and temperate forests throughout the Holarctic (Penteriani 2002). The goshawk in North America breeds in forested areas from Alaska to Newfoundland. In winter, some individuals may undergo short movements to lower elevations while other individuals may migrate from forested areas to the Great Plains and on occasion to southeastern states (Squires and Reynolds 1997).

Understanding habitat requirements for the goshawk in the interior Pacific Northwest and elsewhere is handicapped because few studies equally sampled all habitats and seral stages (Squires and Reynolds 1997). Providing broad-based and ecologically sound habitat recommendations based on studies that differ in sampling design require a meta-analysis (Gurevitch et al. 2001). Habitat recommendations are not available for the goshawk other than in general terms for that reason (Kennedy 2002).

Goshawks use a wide variety of cover types for nesting (Block et al. 1994). Nests are typically in mature forest stands 24 to 240 acres in area with high canopy closure and near the bottom of moderate hill slopes (Squires and Reynolds 1997). In the interior Pacific Northwest, goshawk nest sites are reported to be in live Douglas-fir, ponderosa pine and western larch; aspect, basal area, stand density, and canopy closure are important in site selection; and oldgrowth forest is used in proportion to availability (McGrath et al. 2003). A goshawk pair may construct 1 to 8 alternate nests within a nest area, with the distance between nests ranging up to 2080 feet (Squires and Reynolds 1997).

Habitat use by foraging goshawks is poorly understood (Squires and Reynolds 1997). Beier and Drennen (1997) in northern Arizona report the goshawk forages in forests with greater canopy and greater density of trees in contrast to the remaining landscape. Yet Hargis et al. (1994) in California report both the nesting phase and post-fledging phase home ranges are more often associated with heterogeneous landscapes. Many goshawk prey are linked to structural characteristics, i.e., snags and down woody material, and foraging habitat can be managed for with an emphasis on stand spacing and canopy layering (Reynolds et al. 1992).

Few studies beyond those in Northern Europe describe winter habitat requirements for the goshawk. Squire and Reynolds (1997) report that the goshawk in winter in boreal regions feeds primarily of red squirrels that are widely distributed to include areas bordering agricultural

[2] Fred Samson, U.S. Forest Service, Northern Region, Water, Wildlife, Fish, and Rare Plants Program, Missoula, Montana, May 2004

landscapes. In the Rocky Mountains, goshawks in winter use cottonwood riparian areas, aspen, spruce/fir, lodgepole pine, ponderosa pine and open habitat (Squires and Reynolds 1997).

Cross-scale habitat analyses to include nesting and foraging habitat are few and limited for the most part to eastern France (Penteriani et al 2001). In that study, a stepwise logistic regression showed that 4four variables of the nest stand structure (tree size, high crown volumes, high flight space and short distance to trails) and low avian richness in two relatively large size categories were significant predictors of goshawk nest site selection. The low avian species richness may reflect selection of habitat unfavorable to birds that prey on goshawk eggs and fledgings.

More detailed information of goshawk nest site, foraging and winter habitat, and general behavior and ecology are found in recent published reviews (Block et al. 1994, Squires and Reynolds 1997), unpublished reviews (Kennedy 2002), and in recent peer reviewed literature (e.g., Penteriani et al. 2001, Penteriani 2002, and McGrath et al. 2003).

Goshawk Nests in the Northern Region

Nest-site characteristics in western Montana and northern Idaho may include mature forests with a closed canopy (75-85%) on moderate slopes (15-35%) with northerly aspects (Hayward and Escano 1989). Both water and a large opening were usually within 0.5 km of a nest site. Whitford (1991) examined 12 nests on the Lewis and Clark National Forest in eastern Montana. Douglas-fir stands with nest sites were structurally different than oldgrowth Douglas fir stands, i.e., limited to north aspects, with more but smaller snags and, smaller but more down logs, and live trees tended to be smaller and younger.

Clough (1990) studied 19 goshawk nests in the northern half of the Flint Creek range, Beaverhead-Deerlodge National Forest in east-central Montana. Nests were located in a 3 km-wide area that encompassed the interior Douglas-fir zone adjacent to the grassland/forest interface. Random points were used by Clough to compare habitat available and use. Goshawk nests were 1) located in either Douglas-fir (57.9%) or lodgepole pine (42.1%), 2) found within 1 to 5 km of the grassland/timber interface, 3) on North facing slopes (82.6%), and 4) independent in distance to water. Goshawk nest site stands 1) did not exhibit oldgrowth characteristics (only 3 of 19 had oldrowth characteristics); 2) had significantly higher density of large trees, greater canopy closure, greater shrub density; and multiple canopy layers.

A recent review (March 2004) of the goshawk in the Northern Region suggests about 374 nest locations are known. This review is not based on a science-based survey using a widely-agreed to protocol to survey for goshawks. It is no more than a summary of nests located during project activities or accidental to other activities. In each case, however, one or more goshawks were observed on or near a nest.

The number of estimated territories is less than the number of nests, given a goshawk pair may have multiple nests within a territory. The criterion to evaluate number of territories was to consider all nests within a 640 area to have been constructed by a pair, therefore within one territory.

The goshawk in the Northern Region prefers Douglas-fir, ponderosa pine, lodgepole pine and larch for nest sites (215 of 287 nests, 74.9%). Whether these cover types are being selected or used is proportion to availability is unknown.

Tree size for a goshawk nest site varies considerably across the Northern Region (4 to 31 inches dbh). A general increase in tree size is evident from east to west and south to north--a pattern consistent with the general productive/moisture gradient in the Northern Region. Similarly, tree height and height to nest followed a similar east/west and south/north gradient.

Habitat Model

The following describes use of Forest Inventory and Analysis (FIA) to analyze habitat for the goshawk.

	Middle Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Southern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province
Aspect	0-60, 300-360	0-60, 300-360	0-60, 300-360
BA_WTD_DBH	>=7 inches	>=7 inches	>=7 inches
Dominance Group	PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX	PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, LAOC, POTR5, ABGR, TSHE, BEPA, PIMO3	PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX
Structure Class	C	C	C
BA Total	120-220 $feet^2$/acre	115-247 $feet^2$/acre	105-188 $feet^2$/acre
Canopy	34-70 %	77-92%	60-80%

The following is a summary of FIA variables used in the nest post-fledgling area habitat analysis.

	Middle Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Southern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province
Aspect	0-90, 90-270	0-90, 90-270	0-90, 90-270
BA_WTD_DBH	>=7 inches	>=7 inches	>=7 inches
Dominance Group	PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX	PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, LAOC, POTR5, ABGR, TSHE, BEPA, PIMO3	PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX
Size Class	5-8.9, 9-13.9, 14-20.9, >21 inches	5-8.9, 9-13.9, 14-20.9, >21 inches	5-8.9, 9-13.9, 14-20.9, >21 inches
Structure Class	C or 2	C or 2	C or 2
BA Total	120-220 $feet^2$/acre	115-247 $feet^2$/acre	105-188$feet^2$/acre
Canopy	>50%	>50%	>50%

The following is a summary of FIA variables used in the foraging area habitat analysis.

	Middle Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Southern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province
Aspect			
BA_WTD_DBH			
Dominance Group	PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX	PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, LAOC, POTR5, ABGR, TSHE, BEPA, PIMO3	PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX
Size Class			
Structure Class	1 or 2	1 or 2	1 or 2
BA Total			
Canopy	>40%	>40%	>40%

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PRELIMINARY REGIONAL HABITAT MODEL

Samson, 2004[3]

Hairy Woodpecker

(*Picoides villosus*)

Background

The hairy woodpecker is a habitat generalist species. In the Northern Rocky Mountains, it may nest in cottonwood bottoms, riparian areas, aspen, ponderosa pine, mixed conifer, spruce/fir, cedar/hemlock, as well as recently and mid-successional burn areas and mid-successional clearcuts (Hutto 1995, Redmond et al. 2001). It appears to be absent from white pine, western red cedar, or lodgepole pine unless they have been burned or subject to timber harvest.

Habitat Model and Amounts

As estimate of available habitat is possible based on known (Hutto 1995) and estimated habitat (Redmond et al. 2001) use and a distribution of snags considered adequate in size (10 inches, Accessed June 3, 2004; <www.fmf.ca/HS/HS.report9.pdf>) for a nest.

The following describes a hairy woodpecker nest habitat model using variables in Forest Inventory and Analysis (FIA).

	Middle Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province
Dominance Group	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL
Snags	>=10 inches	>=10 inches	>=10 inches

[3] Fred Samson, U.S. Forest Service, Northern Region, Water, Wildlife, Fish, and Rare Plants Program, Missoula, Montana, May 2004

The following describes a hairy woodpecker foraging habitat model using variables in FIA.

	Middle Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province
Dominance Group	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL	TSME, TSME-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, THPL, THPL-1MIX, LAOC, LAOC-1MIX, ABGR, ABGR-1MIX, BEPA, POPUL

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PRELIMINARY REGIONAL HABITAT MODEL

Samson, 2004[4]

American Marten

(Martes americana)

Background

Habitat for the American marten in the northern Rocky Mountains is reported to include old spruce/fir forests (Burnet 1981) with relatively dense canopies and fallen logs and coarse woody debris (Buskirk et al. 1989, 1992). Other authors (Koehler et al. 1990) report use of subalpine forest with whitebark pine and larch, lodgepole pine when mixed with fir or spruce, as well as low elevation cedar and grand fir forests. Important den structures included rock crevices (28%), snags (25%), red squirrel middens and (19%), and logs (16%) (Ruggiero et al. 1998).

American marten populations may reflect a fairly recent expansion into the Pacific Northwest and gene flow among populations appears to be high (Stone et al. 2002, Small et al. 2003). Trapping in a study in Quebec is reported to have an affect on marten populations, i.e., the proportion of young in the harvest was a sensitive indicator of the annual rate of overall population increase (Fryxell et al. 2001).

Habitat Model and Amounts

The following describes a habitat model (Burnet 1981, Buskirk et al. 1989, 1992, Koehler et al. 1990, Ruggiero et al. 1998) for the American marten using Forest Inventory and Analysis (FIA).

	Middle Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province
Dominance Group	ABLA, ABLA-1MIX, PIEN, PIEN-1MIX, PIAL, PIAL-1MIX, TSME, TSME-1MIX, PIPO, PIPO-1MIX	ABLA, ABLA-1MIX, PIEN, PIEN-1MIX, PIAL, PIAL-1MIX, TSME, TSME-1MIX, PIPO, PIPO-1MIX	ABLA, ABLA-1MIX, PIEN, PIEN-1MIX, PIAL, PIAL-1MIX, TSME, TSME-1MIX, PIPO, PIPO-1MIX
Canopy	>=40%	>=40%	>=40%
Down woody material	1000 Hour tons per acre	1000 Hour tons per acre	1000 Hour tons per acre

[4] Fred Samson, U.S. Forest Service, Northern Region, Water, Wildlife, Fish, and Rare Plants Program, Missoula, Montana, May 2004

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