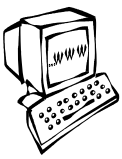
Region One
Vegetation Classification, Mapping, Inventory and Analysis Report



$\bar{x} = \frac{\sum x}{n}$

Numbered Report 08-04 v1.0 **September 2, 2008**

Wildlife Habitat Estimate Updates for the Region 1 Conservation Assessment

Renate Bush
Renee Lundberg

USDA Forest Service, Region 1, Forest and Range Management
200 E. Broadway, Missoula, MT 59802

Overview

In 2006, Dr. Fred Samson, former Regional Wildlife Biologist, wrote *A Conservation Assessment of the Northern Goshawk, Blacked-backed Woodpecker, Flammulated Owl, and Pileated Woodpecker in the Northern Region* (USFS 2006). This paper documents updates to the habitat models used in Region 1 and provides estimates of habitat amounts. Estimates in this paper replace Appendix 3 in the USFS 2006 document.

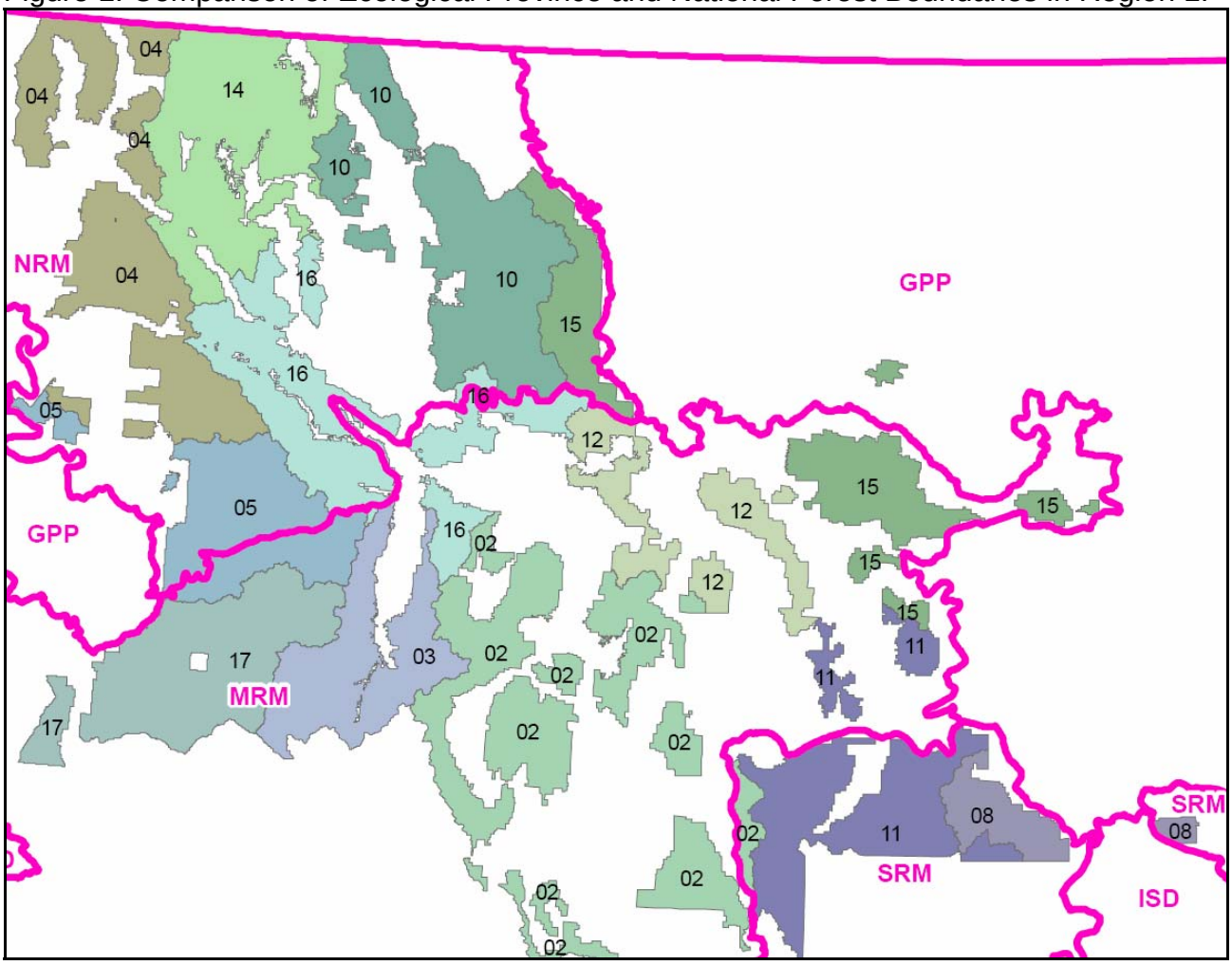
Updates to Models

An error was found in the conversion from metric to English units in USFS (2006) Table 7 for total basal area in the Goshawk Nest, MRMEP model. The estimates for goshawk nest habitat for the MRMEP model (table 1) been updated.

In the pileated nest and forage models, PIEN and PIEN-1MIX, spruce dominance types, were removed from the final model and associated documentation based on recommendations from Forest biologists, but the estimates in the USFS (2006) appendix 3 were not updated. The estimates of pileated nest and forage habitat in Table 6 and Table 7 reflect this change.

USFS 2006 groups Region 1 Forests according to the Ecological Province that the majority of the Forest is contained within. The Bitterroot National Forest was mistakenly included in the Northern Rocky Province (NRMEP) forest group. It belongs in the Middle Rocky Province (MRMEP) forest group, see Figure 1. The model documentation and estimates reflect this change. The result was an increase in Goshawk Nest (Table 1), Goshawk PFA (Table 2), and Flammulated Owl (Table 5) habitat estimates.

Figure 1. Comparison of Ecological Province and National Forest Boundaries in Region 1.



Formatting errors in several of the model queries used to derive estimates for the assessment resulted in fewer plots being classified as habitat than what actually met documented criteria. The model queries have been updated and estimates reflect these changes. This results in an increase in Goshawk PFA (Table 2), Marten (Table 8), and Fisher Winter (Table 9) habitat estimates.

The Forest Vegetation Simulator (FVS) refit canopy cover equations for many tree species found in Region 1. These equations are used to populate canopy cover estimates within FSVeg, R1 FIA summary database, and other summary databases created for data residing in FSVeg. Most of the models in 2006 have canopy cover as an independent variable. Canopy cover estimates in the summary database were updated to reflect the FVS modifications. This change caused changes to estimates for all models in which canopy cover is an independent variable.

Results

Tables 1 through 10 provide habitat estimates for the Region, by Forest, and by Forest groups. These tables replace Appendix 3 in Samson 2006. Appendix A provides complete information on the wildlife habitat models used in Region 1 for data residing in FSVeg and Summary Databases. Appendix B documents changes in the number of FIA PSUs and plots that met the wildlife model criteria when various modifications and updates were applied to the data.

Table 1: Goshawk Nest Habitat Estimates derived from FIA data, using models documented in Samson (2005), updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Goshawk Nest Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Goshawk Nest Habitat	Hectares Goshawk Nest Habitat
Beaverhead-Deerlodge	02	2.2	1.5	2.9	547	442	53,685	21,726
Bitterroot	03	3.5	2.2	4.8	252	226	39,613	16,031
Idaho Panhandle	04	1.4	0.8	2.2	413	397	32,967	13,342
Clearwater	05	2.0	1.1	3	305	300	31,801	12,870
Custer	08	0.2	0	0.7	195	105	1,006	407
Flathead	10	0.2	0	0.5	382	338	3,828	1,549
Gallatin	11	0.9	0.3	1.5	285	223	10,342	4,185
Helena	12	3.5	1.9	5.2	149	138	25,494	10,317
Kootenai	14	1.4	0.8	2	370	352	24,770	10,024
Lewis & Clark	15	1.9	1.1	2.9	299	267	23,953	9,694
Lolo	16	1.0	0.5	1.6	347	327	17,693	7,160
Nez Perce	17	2.5	1.5	3.5	339	308	47,117	19,068
“Northern Rocky Prov.” Forest Group	04, 05,10,14,16	1.2	0.9	1.5	1817	1714	126,349	51,133
“Middle Rocky Prov.” Forest Group	02, 03,12,15,17	2.5	2.1	3	1586	1381	157,850	63,881
“Southern Rocky Prov.” Forest Group	08,11	0.7	0.3	1.1	480	328	11,565	4,680
Region 1	All	1.7	1.4	1.9	3883	3423	314,419	127,244

Table 2: Goshawk PFA Habitat Estimates derived from FIA data, using models documented in USFS 2005, updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Goshawk PFA Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Goshawk PFA Habitat	Hectares Goshawk PFA Habitat
Beaverhead-Deerlodge	02	14.9	13.1	16.8	547	442	363,593	147,144
Bitterroot	03	14.2	11.7	16.9	252	226	160,714	65,040
Idaho Panhandle	04	6.3	4.8	7.7	413	397	148,354	60,038
Clearwater	05	3.9	2.6	5.4	305	300	62,012	25,096
Custer	08	7.2	4.6	10.1	195	105	36,218	14,657
Flathead	10	1.8	1.2	2.5	382	338	34,449	13,941
Gallatin	11	9.5	7.4	11.7	285	223	109,169	44,180
Helena	12	16.7	13	20.5	149	138	121,641	49,227
Kootenai	14	3.6	2.7	4.7	370	352	63,694	25,777
Lewis & Clark	15	13.0	10.7	15.3	299	267	163,891	66,326
Lolo	16	3.1	2.2	4.1	347	327	54,848	22,197
Nez Perce	17	14.6	12.3	17.2	339	308	275,166	111,358
“Northern Rocky Prov.” Forest Group	04, 05,10,14,16	3.8	3.3	4.4	1817	1714	400,104	161,920
“Middle Rocky Prov.” Forest Group	02, 03,12,15,17	14.5	13.5	15.6	1586	1381	915,531	370,510
“Southern Rocky Prov.” Forest Group	08,11	8.8	7.1	10.5	480	328	145,391	58,839
Region 1	All	8.6	8.1	9.1	3883	3423	1,590,589	643,703

Table 3: Goshawk Forage Habitat Estimates derived from FIA data, using models documented in USFS 2005, updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Goshawk Forage Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Goshawk Forage Habitat	Hectares Goshawk Forage Habitat
Beaverhead-Deerlodge	02	40.0	37.2	42.7	547	442	976,089	395,018
Bitterroot	03	33.4	29.7	37.2	252	226	378,018	152,982
Idaho Panhandle	04	39.0	35.8	42.1	413	397	918,379	371,663
Clearwater	05	36.2	32.7	39.7	305	300	575,596	232,941
Custer	08	19.4	14.9	24.1	195	105	97,586	39,493
Flathead	10	29.3	26.5	32.1	382	338	560,749	226,932
Gallatin	11	27.1	23.5	30.7	285	223	311,419	126,030
Helena	12	41.3	35.9	46.8	149	138	300,825	121,742
Kootenai	14	34.8	31.9	37.7	370	352	615,712	249,175
Lewis & Clark	15	36.9	33.1	40.7	299	267	465,198	188,263
Lolo	16	39.7	36.5	42.9	347	327	702,407	284,260
Nez Perce	17	36.2	32.9	39.8	339	308	682,261	276,107
"Northern Rocky Prov." Forest Group	04, 05,10,14,16	35.9	34.5	37.3	1817	1714	3,779,928	1,529,716
"Middle Rocky Prov." Forest Group	02, 03,12,15,17	37.6	36	39.2	1586	1381	2,374,067	960,772
"Southern Rocky Prov." Forest Group	08,11	24.6	21.7	27.6	480	328	406,434	164,481
Region 1	All	35.5	34.5	36.5	3883	3423	6,565,805	2,657,145

Table 4: Black-backed Woodpecker Nest Habitat Estimates derived from FIA data, using models documented in Samson (2006), updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Black-backed Nest Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Black-backed Nest Habitat	Hectares Black-backed Nest Habitat
Beaverhead-Deerlodge	02	16.2	14.1	18.4	547	442	395,316	159,982
Bitterroot	03	8.0	5.9	10.1	252	226	90,543	36,642
Idaho Panhandle	04	43.9	40.8	47.1	413	397	1,033,765	418,359
Clearwater	05	28.6	25.4	32.1	305	300	454,753	184,036
Custer	08	11.6	7.9	15.7	195	105	58,350	23,614
Flathead	10	6.2	4.7	7.9	382	338	118,657	48,020
Gallatin	11	24.8	21.2	28.4	285	223	284,989	115,333
Helena	12	14.2	10.5	18	149	138	103,431	41,858
Kootenai	14	11.1	9.2	13	370	352	196,391	79,478
Lewis & Clark	15	17.4	14.6	20.3	299	267	219,362	88,774
Lolo	16	13.3	11.2	15.5	347	327	235,315	95,231
Nez Perce	17	38.0	34.6	41.8	339	308	716,185	289,836
"Northern Rocky Prov." Forest Group	04, 05,10,14,16	21.2	19.9	22.5	1817	1714	2,232,158	903,342
"Middle Rocky Prov." Forest Group	02, 03,12,15,17	19.7	18.4	21.1	1586	1381	1,243,860	503,383
"Southern Rocky Prov." Forest Group	08,11	20.5	17.8	23.3	480	328	338,695	137,068
Region 1	All	20.6	19.7	21.4	3883	3423	3,810,017	1,541,893

Table 5: Flammulated Owl Habitat Estimates derived from FIA data, using models documented in USFS 2005, updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Flammulated Owl Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Flam Owl Habitat	Hectares Flam Owl Habitat
Beaverhead-Deerlodge	02	0.3	0	0.5	547	442	7,321	2,963
Bitterroot	03	1.4	0.6	2.3	252	226	15,845	6,412
Idaho Panhandle	04	1.4	0.7	2.2	413	397	32,967	13,342
Clearwater	05	1.0	0.4	1.7	305	300	15,900	6,435
Custer	08	0.2	0	0.7	195	105	1,006	407
Flathead	10	0.3	0.1	0.7	382	338	5,741	2,324
Gallatin	11	1.2	0.4	2.1	285	223	13,790	5,581
Helena	12	1.4	0.3	2.8	149	138	10,197	4,127
Kootenai	14	0.7	0.4	1.2	370	352	12,385	5,012
Lewis & Clark	15	0.7	0.2	1.4	299	267	8,825	3,571
Lolo	16	1.0	0.5	1.7	347	327	17,693	7,160
Nez Perce	17	2.1	1.2	3.1	339	308	39,579	16,017
“Northern Rocky Prov.” Forest Group	04, 05,10,14,16	1.0	0.7	1.2	2069	1940	105,290	42,610
“Middle Rocky Prov.” Forest Group	02, 03,12,15,17	1.0	0.7	1.3	1334	1155	63,140	25,552
“Southern Rocky Prov.” Forest Group	08,11	0.9	0.3	1.5	480	328	14,870	6,018
Region 1	All	1	0.8	1.2	3883	3423	184,952	74,849

Table 6: Pileated Woodpecker Nest Habitat Estimates derived from FIA data, using models documented in USFS 2005, updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Pileated Nest Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Pileated Nest Habitat	Hectares Pileated Nest Habitat
Beaverhead-Deerlodge	02	1.3	0.8	1.8	547	442	31,723	12,838
Bitterroot	03	3.9	2.5	5.5	252	226	44,140	17,863
Idaho Panhandle	04	18.3	15.8	20.7	413	397	430,932	174,396
Clearwater	05	16.9	14	19.9	305	300	268,718	108,749
Custer	08	0.8	0	1.7	195	105	4,024	1,629
Flathead	10	2.8	1.9	3.8	382	338	53,587	21,686
Gallatin	11	3.0	1.7	4.3	285	223	34,474	13,952
Helena	12	1.7	0.6	3.1	149	138	12,383	5,011
Kootenai	14	6.0	4.7	7.5	370	352	106,157	42,961
Lewis & Clark	15	1.2	0.6	1.9	299	267	15,128	6,122
Lolo	16	5.6	4.2	7.1	347	327	99,080	40,097
Nez Perce	17	15.9	13.2	18.7	339	308	299,667	121,274
"Northern Rocky Prov." Forest Group	04, 05,10,14,16	10.0	9.1	11	1817	1714	1,052,905	426,105
"Middle Rocky Prov." Forest Group	02, 03,12,15,17	5.0	4.3	5.8	1586	1381	315,700	127,762
"Southern Rocky Prov." Forest Group	08,11	2.3	1.4	3.3	480	328	38,000	15,378
Region 1	All	7.3	6.7	7.8	3883	3423	0	0

Table 7: Pileated Woodpecker Forage Habitat Estimates derived from FIA data, using models documented in USFS 2005, updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Pileated Forage Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Pileated Forage Habitat	HectaresPileated Forage Habitat
Beaverhead-Deerlodge	02	1.9	1.3	2.7	547	442	46,364	18,763
Bitterroot	03	6.8	4.9	8.9	252	226	76,962	31,146
Idaho Panhandle	04	31.0	27.8	34	413	397	729,994	295,424
Clearwater	05	21.3	18.2	24.6	305	300	338,680	137,062
Custer	08	2.3	0.7	4.2	195	105	11,569	4,682
Flathead	10	4.8	3.6	6.1	382	338	91,863	37,177
Gallatin	11	5.3	3.6	7.2	285	223	60,905	24,648
Helena	12	4.9	2.9	7.1	149	138	35,691	14,444
Kootenai	14	11.7	9.8	13.7	370	352	207,007	83,774
Lewis & Clark	15	3.6	2.5	4.8	299	267	45,385	18,367
Lolo	16	8.9	7.1	10.7	347	327	157,467	63,726
Nez Perce	17	23.6	20.4	27	339	308	444,789	180,004
“Northern Rocky Prov.” Forest Group	04, 05,10,14,16	15.9	14.8	17.1	1817	1714	1,674,119	677,507
“Middle Rocky Prov.” Forest Group	02, 03,12,15,17	8.2	7.2	9.2	1586	1381	517,749	209,530
“Southern Rocky Prov.” Forest Group	08,11	4.3	3	5.8	480	328	71,043	28,751
Region 1	All	11.7	11	12.4	3883	3423	2,163,941	875,735

Table 8: American Marten Habitat Estimates derived from FIA data, using models documented in USFS 2005, updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Marten Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Marten Habitat	Hectares Marten Habitat
Beaverhead-Deerlodge	02	33.9	31.1	36.6	547	442	827,236	334,778
Bitterroot	03	36.5	32.3	40.8	252	226	413,104	167,181
Idaho Panhandle	04	55.3	51.9	58.7	413	397	1,302,214	526,999
Clearwater	05	56.8	52.9	60.8	305	300	903,146	365,498
Custer	08	16.6	12.4	21	195	105	83,501	33,793
Flathead	10	29.6	26.6	32.7	382	338	566,491	229,256
Gallatin	11	33.5	29.6	37.6	285	223	384,965	155,793
Helena	12	29.1	24.2	34.2	149	138	211,961	85,780
Kootenai	14	36.0	32.8	39.2	370	352	636,943	257,767
Lewis & Clark	15	29.6	25.9	33.3	299	267	373,167	151,019
Lolo	16	39.0	35.7	42.3	347	327	690,022	279,248
Nez Perce	17	53.2	49.5	57.3	339	308	1,002,659	405,771
“Northern Rocky Prov.” Forest Group	04, 05,10,14,16	43.4	41.8	45	1817	1714	4,569,607	1,849,295
“Middle Rocky Prov.” Forest Group	02, 03,12,15,17	37.3	35.6	39.1	1586	1381	2,355,125	953,106
“Southern Rocky Prov.” Forest Group	08,11	28.1	25	31.3	480	328	464,259	187,883
Region 1	All	39.5	38.4	40.6	3883	3423	7,305,614	2,956,542

Table 9: Fisher Winter Habitat Estimates derived from FIA data, using models documented in USFS 2005, updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Fisher Winter Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Fisher Winter Habitat	Hectares Fisher Winter Habitat
Beaverhead-Deerlodge	02	28.6	25.5	31.9	547	442	697,904	282,438
Bitterroot	03	25.0	21	29.3	252	226	282,948	114,507
Idaho Panhandle	04	50.7	47	54.3	413	397	1,193,893	483,162
Clearwater	05	43.2	39.1	47.3	305	300	686,899	277,984
Custer	08	7.2	3.8	11.1	195	105	36,218	14,657
Flathead	10	34.9	31.6	38.2	382	338	667,923	270,305
Gallatin	11	29.5	25	34	285	223	338,999	137,191
Helena	12	21.9	17	27.1	149	138	159,517	64,556
Kootenai	14	32.3	28.9	35.7	370	352	571,480	231,275
Lewis & Clark	15	32.4	28.2	36.7	299	267	408,466	165,304
Lolo	16	29.1	25.4	32.7	347	327	514,863	208,362
Nez Perce	17	40.7	36.8	45.1	339	308	767,072	310,430
“Northern Rocky Prov.” Forest Group	04, 05,10,14,16	38.4	36.7	40	1817	1714	4,043,154	1,636,242
“Middle Rocky Prov.” Forest Group	02, 03,12,15,17	30.8	29	32.7	1586	1381	1,944,715	787,015
“Southern Rocky Prov.” Forest Group	08,11	22.4	18.8	25.8	480	328	370,086	149,772
Region 1	All	33.8	32.6	34.8	3883	3423	6,251,386	2,529,901

Table 10: Fisher Summer Habitat Estimates derived from FIA data, using models documented in USFS 2005, updated 2006 and in this paper.

Forest / Geographic Area	Forest #	Percent Fisher Summer Habitat	90% Confidence Interval Lower Bound	90% Confidence Interval Upper Bound	Total # PSUs	# Forested PSUs	Acres Fisher Summer Habitat	Hectares Fisher Summer Habitat
Beaverhead-Deerlodge	02	7.9	6.4	9.4	547	442	192,778	78,016
Bitterroot	03	8.4	6.2	10.6	252	226	95,070	38,474
Idaho Panhandle	04	22.1	19.3	25	413	397	520,415	210,609
Clearwater	05	23.0	19.7	26.3	305	300	365,710	148,001
Custer	08	1.1	0.2	2.4	195	105	5,533	2,239
Flathead	10	8.6	6.9	10.3	382	338	164,589	66,608
Gallatin	11	10.2	7.8	12.8	285	223	117,213	47,435
Helena	12	4.8	2.5	7.4	149	138	34,963	14,149
Kootenai	14	9.8	7.9	11.8	370	352	173,390	70,170
Lewis & Clark	15	7.0	5.1	9.1	299	267	88,249	35,714
Lolo	16	8.6	6.7	10.6	347	327	152,159	61,578
Nez Perce	17	23.5	20.3	27.1	339	308	442,904	179,241
"Northern Rocky Prov." Forest Group	04, 05,10,14,16	14.5	13.4	15.6	1817	1714	1,526,712	617,852
"Middle Rocky Prov." Forest Group	02, 03,12,15,17	11.0	9.9	12.1	1586	1381	694,541	281,077
"Southern Rocky Prov." Forest Group	08,11	7.3	5.6	9.1	480	328	120,608	48,810
Region 1	All	12.4	11.6	13.1	3883	3423	2,293,408	928,130

Literature Cited

Berglund, Doug, R. Bush, R. Lundberg. Region One Vegetation Council Existing Vegetation Classification System and Adaptations to Mapping Projects. Region 1 Vegetation Classification, Inventory, and Analysis Report #08-02, 2008. http://fsweb.r1.fs.fed.us/forest/inv/classify/r1_ex_veg_classification.pdf

Bush, Renate, D. Berglund, A. Leach, R. Lundberg, J.D. Zeiler. Overview of R1-FIA Summary Database, Region 1 Vegetation Classification, Inventory, and Analysis Report #06-02, 2006. http://fsweb.r1.fs.fed.us/forest/inv/fia_data/r1_fia_sdb.pdf

USDA Forest Service – Northern Region. 2005 (amended March 6, 2006). F.B. Samson. A Conservation Assessment of the Northern Goshawk, Blacked-backed Woodpecker, Flammulated Owl, and Pileated Woodpecker in the Northern Region, USDA Forest Service. Unpublished report on file, Northern Region, Missoula, Montana, USA.

Appendix A: Wildlife Habitat Models used to derive habitat estimates for data in the R1 FIA Summary Database. These models are also used in intensified grid and project-level summary databases, where data is available. * indicates R1 Existing Vegetation Classification System attribute (Berglund and others, 2008).

		ATTRIBUTES									
Species Habitat Model	**Geographic Extent**	**Stand Size ***	**Canopy Cover**	**PVT Group**	**Vertical Structure Class ***	**Aspect**	**Total BA**	**Dead TPA 15"+**	**Dead TPA 10"+**	**Dead TPA 9"+**	**Dominance Groups***
		basal area weighted average diameter	% canopy cover, calculated by the Forest Vegetation Simulator (FVS)	potential veg habitat groups (see Appendix C)	1 = 1 story 2 = 2 story 3 = 3 story C=continuous n = not calc.	class	total basal area/ac				Dominance_04 groups (see Appendix D)
Goshawk Nest	F04, F05, F10, F14, F16 (“NRMEP”)	10-18	68-92		1 or 2	Aspect = NE, N, NW	115-247				PICO, PICO-1MIX, ABGR, ABGR-1MIX, ABLA, ABLA-1MIX, IMXS, LAOC, LAOC-1MIX, PIMO3, PIMO3-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, TGCH, TSHE, TSHE-1MIX, POTR5, POTR5-1MIX, BEPA, BEPA-1MIX
	F02, F03, F12, F15, F17 (“MRMEP”)	13-18	34-71		1 or 2		121-253				PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, IMXS, POTR5, POTR5-1MIX
	F08, F11 (“SRMEP”)	10-15	60-80		1 or 2		105-181				PICO, PICO-1MIX, PIPO, PIPO-1MIX, IMXS, PSME, PSME-1MIX, POTR5, POTR5-1MIX
Goshawk PFA	F04, F05, F10, F14, F16 (“NRMEP”)	≥ 7	≥ 70		1 or 2		115-250				ABGR, ABGR-1MIX, ABLA, ABLA-1MIX, IMXS, LAOC, LAOC-1MIX, PIMO3, PIMO3-1MIX, PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, TGCH, TSHE, TSHE-1MIX, POTR5, POTR5-1MIX, BEPA, BEPA-1MIX

		ATTRIBUTES									
Species Habitat Model	**Geographic Extent**	**Stand Size ***	**Canopy Cover**	**PVT Group**	**Vertical Structure Class ***	**Aspect**	**Total BA**	**Dead TPA 15"+**	**Dead TPA 10"+**	**Dead TPA 9"+**	**Dominance Groups***
Goshawk PFA	F02, F03, F12, F15, F17 (“MRMEP”) and F08, F11 (“SRMEP”)	≥ 7	≥ 50		1 or 2		115-250				ABGR, ABGR-1MIX, ABLA, ABLA-1MIX, IMXS, LAOC, LAOC-1MIX, PIMO3, PIMO3-1MIX, PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, TGCH, TSHE, TSHE-1MIX, POTR5, POTR5-1MIX, BEPA, BEPA-1MIX
Goshawk Forage	R1	NA	≥ 40		N, 1, or 2						ABGR, ABGR-1MIX, ABLA, ABLA-1MIX, IMXS, LAOC, LAOC-1MIX, PIMO3, PIMO3-1MIX, PICO, PICO-1MIX, PIPO, PIPO-1MIX, PSME, PSME-1MIX, TGCH, TSHE, TSHE-1MIX, THPL, THPL-1MIX, POTR5, POTR5-1MIX, BEPA, BEPA-1MIX
Pileated Nest	R1							>1			ABGR, ABGR- 1MIX, IMXS, LAOC, LAOC-1MIX, PSME, PSME-1MIX, PIPO, PIPO-1MIX. TSHE, TSHE-1MIX, THPL, THPL-1MIX, POPUL, POPUL-1MIX, BEPA, BEPA-1MIX, TGCH, POTR5, POTR5-1MIX
Pileated Forage	R1									>1	ABGR, ABGR- 1MIX, IMXS, LAOC, LAOC-1MIX, PSME, PSME-1MIX, PIPO, PIPO-1MIX. TSHE, TSHE-1MIX, THPL, THPL-1MIX, POPUL, POPUL-1MIX, BEPA, BEPA-1MIX, TGCH, POTR5, POTR5-1MIX
Flamulated Owl	F04, F05, F10, F14, F16 (“NRMEP”)	≥ 14	35-85		1 or 2	Aspect = SE,S, SW, W, LR (Criteria for Group 2)			≥ 1		Group1: PIPO, PIPO-1MIX; Group 2: PSME, PSME-1MIX

		ATTRIBUTES									
Species Habitat Model	**Geographic Extent**	**Stand Size ***	**Canopy Cover**	**PVT Group**	**Vertical Structure Class ***	**Aspect**	**Total BA**	**Dead TPA 15"+**	**Dead TPA 10"+**	**Dead TPA 9"+**	**Dominance Groups***
	F02, F03, F12, F15, F17 (“MRMEP”) and F08, F11 (“SRMEP”)	≥ 12	35-85		1 or 2	Aspect = SE,S, SW, W, LR for (Criteria for Group 2)			≥ 1		Group1: PIPO, PIPO-1MIX; Group 2: PSME, PSME-1MIX
Fisher Summer (Group 1)	R1	≥ 14	≥ 40	ABGR2, ABGR3, ABLA1, ABLA2, ABLA3, THPL1, THPL2, TSHE, PICEA							Group 1: ABGR, ABGR-1MIX, ABLA, ABLA-1MIX, PIEN, PIEN-1MIX, IMXS, LAOC, LAOC-1MIX, PIMO3, PIMO3-1MIX, PSME, PSME-1MIX, TGCH, TSHE, TSHE-1MIX, THPL, THPL-1MIX, TASH, TABR2 , TABR2-1MIX
Fisher Summer (Group 2)	R1	≥ 9	≥40	ABGR2, ABGR3, ABLA1, ABLA2, ABLA3, THPL1, THPL2, TSHE, PICEA							Group 2: PICO, PICO-1MIX, BEPA, BEPA-1MIX, POPUL, POPUL-1MIX, POTR5, POTR5-1MIX
Fisher Winter	R1		≥ 40	ABGR2, ABGR3, ABLA1, ABLA2, ABLA3, THPL1, THPL2, TSHE, PICEA							ABGR, ABGR-1MIX, ABLA, ABLA-1MIX, PIEN, PIEN-1MIX, IMXS, LAOC, LAOC-1MIX, PIMO3, PIMO3-1MIX, PSME, PSME-1MIX, TGCH, TSHE, TSHE-1MIX, THPL, THPL-1MIX, TASH, TABR2 , TABR2-1MIX, PICO, PICO-1MIX, BEPA, BEPA-1MIX, POPUL, POPUL-1MIX, POTR5, POTR5-1MIX

		ATTRIBUTES									
Species Habitat Model	**Geographic Extent**	**Stand Size ***	**Canopy Cover**	**PVT Group**	**Vertical Structure Class ***	**Aspect**	**Total BA**	**Dead TPA 15"+**	**Dead TPA 10"+**	**Dead TPA 9"+**	**Dominance Groups***
Marten	R1	≥ 9	≥ 30								ABGR, ABGR-1MIX, ABLA, ABLA-1MIX, IMXS, LAOC, LAOC-1MIX, PICO, PICO-1MIX, PSME, PSME-1MIX, TSHE, TSHE-1MIX, THPL, THPL-1MIX, POTR5, POTR5-1MIX, BEPA, BEPA-1MIX, POPUL, POPUL-1MIX, PIEN, PIEN-1MIX, TASH, TGCH, TABR2, TABR2-1MIX, PIPO, PIPO-1MIX, PIMO3, PIMO3-1MIX, TSME, TSME-1MIX
Black-backed	R1	Habitat if the plot has ≥ 8 recently dead trees per acre between 8"-16" diameter									

Appendix B: Summary and comparison of changes in number of FIA PSUs and plots that meet wildlife model criteria

Model Version	Description		Goshawk Nest	Goshawk PFA	Goshawk Forage	Black-backed	Flamulated Owl	Marten	Fisher Summer	Fisher Winter	Pileated Nest	Pileated Forage
1	USFS 2006 document	# PSUs	38	141	723		54	1825	513	1270	396	939
		# Plots	263	1353	6727		162	6952	2098	5952	1186	1949
2	Revised Models due to basal area conversion, FVS canopy cover estimate modifications, and deletion of PIEN from pileated models	# PSUs	40	157	762	1643	59	1788	547	1451	396	939
		# Plots	266	1318	6549	3442	161	6784	2139	6141	1180	1940
3	6/08 Corrections to WL query format errors	# PSUs	40	162	762	1643	59	1894	547	1452	396	939
		# Plots	266	1376	6549	3442	161	7099	2139	6151	1180	1940
4	Moving of F03 to "MRMEP" forest group	# PSUs	48	189	762	1643	60	1894	547	1452	396	939
		# Plots	298	1517	6549	3442	162	7099	2139	6151	1180	1940

Appendix C: Potential Vegetation Type (PVT) Groups used in Wildlife Habitat Modeling

The potential vegetation type (PVT) groups of PICEA, ABGR2, ABGR3, THPL1, THPL2, TSHE, ABLA1, ABLA2, ABLA3 were used in some of the habitat models (see Appendix A). The table documents the Habitat Type Codes included in each of these groups. PVT based on presence and absence of seral species.

The PVT groups are in the *MT_ID_PVT_1004* field of the R1_FSVeg_Summary_Database (Bush and others, 2006). These groups were originally developed for use in the Cohesive Fire Strategy HFR, FRCC (http://www.fs.fed.us/r1/cohesive_strategy/index.htm). The Cohesive Strategy Team has been abolished and website is not maintained or updated. Author/Data Stewards: Jeff Jones, now with LANDFIRE / Mary Manning, R1 Planning

Habitat Type Code	PVT_MT04	PVT_ID04
410	picea	picea
420	picea	picea
421	picea	picea
422	picea	picea
430	picea	picea
440	picea	picea
450	picea	picea
460	picea	picea
461	picea	picea
462	picea	picea
470	picea	picea
480	picea	picea
510	abgr2	abgr2
511	abgr2	abgr2
512	abgr2	abgr2
515	abgr2	abgr2
516	abgr3	abgr3
517	abgr3	abgr3
518	abgr3	abgr3
519	abgr3	abgr3
520	abgr3	abgr3
521	abgr3	abgr3
522	abgr3	abgr3
523	abgr3	abgr3
524	abgr3	abgr3
525	abgr3	abgr3
526	abgr3	abgr3
529	abgr3	abgr3
530	thpl2	thpl2
531	thpl2	thpl2
532	thpl2	thpl2
533	thpl2	thpl2
534	thpl2	thpl2
535	thpl2	thpl2
540	thpl1	thpl1
541	thpl1	thpl1
542	thpl1	thpl1

Habitat Type Code	PVT_MT04	PVT_ID04
545	thpl2	thpl2
546	thpl2	thpl2
547	thpl2	thpl2
548	thpl2	thpl2
550	thpl1	thpl1
555	thpl1	thpl1
560	thpl1	thpl1
565	tshe	tshe
570	tshe	tshe
571	tshe	tshe
572	tshe	tshe
573	tshe	tshe
574	tshe	tshe
575	tshe	tshe
576	tshe	tshe
577	tshe	tshe
578	tshe	tshe
579	tshe	tshe
590	abgr2	abgr2
591	abgr2	abgr2
592	abgr2	abgr2
610	abla1	abla1
620	abla2	abla2
621	abla2	abla2
622	abla2	abla2
623	abla2	abla2
624	abla2	abla2
625	abla2	abla2
630	abla1	abla1
635	abla1	abla1
636	abla1	abla1
637	abla1	abla1
640	abla3	abla3
641	abla3	abla3
650	abla1	abla1
651	abla1	abla1
652	abla1	abla1

Habitat Type Code	PVT_MT04	PVT_ID04
653	abla1	abla1
654	abla1	abla1
655	abla1	abla1
660	abla2	abla2
661	abla2	abla2
662	abla2	abla2
663	abla2	abla2
670	abla2	abla4
671	abla2	abla2
672	abla2	abla4
673	abla2	abla2
674	abla2	abla4
690	abla3	abla4
691	abla3	abla3
692	abla3	abla4

Habitat Type Code	PVT_MT04	PVT_ID04
693	abla3	abla3
694	abla3	abla4
720	abla3	abla3
730	abla3	abla3
731	abla3	abla4
732	abla3	abla4
733	abla3	abla4
740	abla2	abla2
750	abla3	abla3
770	abla3	abla3
780	abla3	abla3
790	abla3	abla3
791	abla3	abla3
792	abla3	abla3
810	abla4	abla4

Appendix D: Tree Species and Dominance Group Look-up Table
Refer to R1 Existing Vegetation Classification System (Berglund and others, 2008) for more information on Dominance Group_04 classification.

Tree Species	Dominance Group_04
Douglas-fir	PSME
Engelmann spruce	PIEN
Grand fir	ABGR
Lodgepole pine	PICO
Mountain hemlock	TSME
Paper birch	BEPA
Ponderosa pine	PIPO
Subalpine fir	ABLA
Western hemlock	TSHE
Western larch	LAOC
Western red cedar	THPL
Western white pine	PIMO3
Aspen	POTR5
Mix of shade intolerant species	IMXS
Mix of shade tolerant species (grand fir, cedar, western hemlock)	TGCH
Mix of shade tolerant species (subalpine fir, spruce, mountain hemlock)	TASH