

Appendix 9

Species Habitat Estimates for the Idaho Panhandle National Forests

Forested Habitat

Number of FIA sample plots on the Idaho Panhandle National Forests (IPNFs) either by Ecological Subsection (Bailey 1996) or by 4th Code Hydrologic Unit (HUC) are shown in Table 25. The number of sample plots per Ecological Subsection or HUC reflects the size of area managed by the IPNFs.

Table 25. Number of sample plots in an Ecological Subsection (Bailey 1996) or 4th Code Hydrologic Unit (HUC) on the Idaho Panhandle National Forests.

Ecological Subsection	Number of sample plots	4 th Code HUC	Number of sample plots
M333Aa	27	17010104	83
M333Ab	93	17010105	36
M333Ac		17010213	14
M333Ba	88	17000214	36
M333Be	5	17010215	62
M333Da	116	17010301	81
M333Db	101	17010302	13
M333Dd	26	17010303	4
M333De		17010305	117
		17060308	3
Total	456		456

The wildlife habitat relationship models developed for this conservation assessment represent three scales: 1) a Region-wide description where the full range of habitats used by a species is included in the model; 2) a Province-wide description where the full range of habitats used by a species within that particular Ecological Province is included; and 3) a Forest-specific model where local conditions are considered in the development of the habitat relationship model.

Table 26 summarizes the Region-wide, Ecological Province, and IPNFs wildlife habitat relationship models and describes any addition to the IPNFs models. A summary of habitat estimates based of each (Regional, Province, and IPNFs) model and for each of the four species also is included in Table 26.

This March 6 2006 version replaces all earlier versions.

Table 26. Habitat estimates based of each (Regional, Province, and IPNFs) model and for the four species. Differences in species-specific model by Region, Province or by Idaho Panhandle National Forests are displayed.

	R1 model	Province model	IPNFs 4th code HUC	IPNFs Ecological Subsection (Bailey 1996)	IPNFs model additions
<i>Northern goshawk</i>					
Nest	137,420	16,201	16,201	16,201	
PFA	145,225	58,132	57,007	57,007	
Foraging	376,266	381,193	292,251	292,251	Added =>23 cm ba_wt_dbh ¹
<i>Flammulated owl</i>					
Forest	33,602	13,342	7,795	7,795	Canopy coverage% of 40-70%; SE, S, SW, W, and LR aspect ² ; snag =>35 cm
<i>Black-backed woodpecker</i>					
Nest			606,125	606,125	FSVeg query only for IPNFs
Foraging			268,846	268,846	FSVeg query only for IPNFs
<i>Pileated woodpecker</i>					
Nest	175,349		172,833	172,833	
Foraging	296,377		291,651	291,651	

This March 6 2006 version replaces all earlier versions.

Table 26 continued				
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¹ BA_WTD_DBH is the sum of the diameter of the tree times the number of trees the tree represents times basal area of the tree divided by total basal area.

² Southeast (SE), south (S), southwest (SW), west (W) and level rolling (LR).

Habitat Estimates—Northern Goshawk

Table 27 demonstrates abundant habitat for the northern goshawk on the IPNFs by Ecological Subsection (Bailey 1996). The size of an area that describes a northern goshawk nest site varies from 10 to 12 ha (Reynolds et al. 1992), therefore nest habitat exists on the IPNFs for upwards to 1350 nests or 270 to 675 pairs (assuming one to five alternative nests are constructed).

Table 27. Habitat estimates (ha) for the northern goshawk for the IPNFs by Ecological Subsection (Bailey 1996).

Subsection	Nest	Pfa	Foraging
M333Aa		1,135	17,587
M333Ab	1,737	11,587	46,930
M333Ac		110	
M333Ba	1,185		23,104
M333Be		1569	3,991
M333Da	4,949	15,528	124,957
M333Db	6,462	12,120	61,685
M333Dd	2,025		14,173
M333De			
Forest	16,201	57,007	292,251

Northern goshawk pfa (Table 27) habitat on the IPNFs would support upwards to 238 pairs, assuming a northern goshawk requires about 240 ha for a pfa (range is from 120 to 240 ha, Reynolds et al. 1991).

The northern goshawk foraging habitat relationship model was adjusted to include an additional structure requirement (>23 cm ba_wt_dbh, Table 26, R. Ralphs, personal communication, IPNFs, Coeur d'Alene, Idaho). Foraging habitat on the IPNFs (Table 27) could provide habitat for upwards to 166 pairs, assuming a northern goshawk requires 1758 ha for foraging (using an estimate of 1,758 ha for foraging and based on use of radio telemetry, Bright-Smith and Mannan 1994).

Table 28. Habitat estimates (ha) for the northern goshawk for the IPNFs by 4th Code Hydrologic Unit.

HUC	Nest	Pfa	Foraging
17010101			
17010103			
17010104		4,216	25,901
17010105	538	1,076	10,761
17010204			
17010213		584	9,929
17010214	593	2,964	20,745
17010215	1,804	9,623	40,297
17010216			
17010301	3,026	19,979	84,764
17010302	674		8,086
17010303	1,233	3,700	11,717
17010304	6,789	12,347	61,119
17010305	699	698	7,682
17010306			
17060308			
17060108			
17060306			
17060307			
17060308	1,041	2,082	12,496
Forest	16,201	57,007	292,251

A similar analysis using the northern goshawk wildlife habitat relationship models for nest site habitat, pfa and foraging (Table 26) but by 4th Code Hydrologic Unit (HUC) on the IPNFs is displayed in Table 28. Nest, pfa, and foraging habitat for the northern goshawk either by HUC or Ecological Subsection is abundant on the IPNFs.

Habitat Estimates—Black-backed Woodpecker

Black-backed woodpecker nest habitat was estimated by Ecological Subsection (Bailey 1996) (Table 29) and by 4th code HUC (Table 30) for the IPNFs. The black-backed woodpecker nest habitat relationship model estimates the amount of habitat with a snag => 12.7 cm/ha and less than five years since death. The literature suggests that snags remain a viable substrate for use by the black-backed woodpecker for at least five years as foraging habitat. It is assumed that the snag if of appropriate size could also serve as a nest cavity tree over a five year interval. The black-backed woodpecker is a primary cavity nester and excavates their own cavities most often

Table 29. Habitat estimates (ha) for the black-backed woodpecker for the IPNFs by Ecological Subsection (Bailey 1996).

Subsection	Nest	Foraging
M333Aa	39,713	14,183
M333Ab	121,096	50,986
M333Ac		
M333Ba	74,646	51,541
M333Be	9,978	2,494
M333Da	195,483	72,158
M333Db	127,487	59,336
M333Dd	35,095	17,548
M333De		
Forest	606,125	268,846

in dead or dying conifer trees (Short 1974, Raphael and White 1984, Weinhagen 1998, Martin and Eddie 1999).

Foraging habitat on the IPNFs by Ecological Subsection (Table 29) and 4th code HUC (Table 30) for the black-backed woodpecker was estimated by the amount of habitat with ≥ 64 snags/ha and ≥ 2.5 cm. Only lodgepole pine, larch and spruce snags less than five years since death were included in the estimate of foraging habitat.

The size of an area that describes a black-backed woodpecker territory varies from 72 ha to 124 ha (as cited in Dixon and Saab 2000 and in Hoyt 2000). The IPNFs provides foraging habitat for upwards to 2,168 to 3,734 pairs and higher amount of nesting habitats (Table 29 and Table 30).

Table 30. Habitat estimates (ha) for the black-backed woodpecker for the IPNFs by 4th Code Hydrologic Unit.

HUC	Nest	Foraging
17010101		
17010103		
17010104	74,090	46,983
17010105	27,979	18,831
17010204		
17010213	21,027	8,177
17010214	52,755	21,339
17010215		

Table 30 continued

17010216		
17010301	132,600	49,041
17010302	12,804	8,760
17010303	23,435	2,466
17010304	133,356	72,232
17010305	8,380	2,095
17010306		
17060308		
17060108		
17060306		
17060307		
17060308	24,992	3,644
Forest	606,125	268,846

Habitat Estimates—Flammulated Owl

Habitats for the flammulated owl on the IPNFs by Ecological Subsection (Bailey 1996) is summarized in Table 31 using the wildlife habitat relationship NRMEP (Table 17) model with three modifications (Table 26): 1) canopy coverage of 40-70%; 2) aspect of Southeast, South, Southwest, and West; and 3) a snag => 35 cm (R. Ralphs, personal communication, IPNFs, Coeur d'Alene, Idaho).

Table 31. Habitat estimates (ha) for the flammulated owl for the IPNFs by Ecological Subsection (Bailey 1996).

Subsection	Habitat
M333Aa	2,269
M333Ab	
M333Ac	
M333Ba	
M333Be	
M333Da	3,710
M333Db	1,762
M333Dd	
M333De	
Forest	7,795

Table 31. Habitat estimates (ha) for the flammulated owl for the IPNFs by 4th Code Hydrologic Unit.

HUC	Habitat
17010101	
17010103	
17010104	
17010105	
17010204	
17010213	584
17010214	1778
17010215	1,202
17010216	
17010301	1,209
17010302	674
17010303	616
17010304	1,234
17010305	
17010306	
17060308	
17060108	
17060306	
17060307	
17060308	520
Forest	7,795

Habitat by Ecological Subsection (Bailey 1996) for the flammulated owl on the IPNFs is displayed in Table 30. Given the small territory size [Linkhart et al. (1998) of 11.1 ± 1.9 ha in 1982 and 18.3 ± 5.1 ha in 1983], the IPNFs would provide habitat for upwards to 426 flammulated owl pairs. A similar analysis using the flammulated owl but by 4th Code Hydrologic Unit (HUC) on the IPNFs is displayed in Table 31.

Habitat Estimates—Pileated Woodpecker

The wildlife habitat relationships model for the Pileated woodpecker nest and winter foraging habitat (Table 26) estimates 7,795 ha for nest habitat and 291,651 ha for foraging habitat (Table 32 and Table 33) on the IPNFs.

In winter, most likely the critical period, the pileated woodpecker requires an area of 40 ha (Bonor 2001). In winter, the IPNFs may provide critical winter foraging habitat for upwards to

Table 32. Habitat estimates (ha) for the pileated woodpecker the IPNFs by Ecological Subsection (Bailey 1996).

Subsection	Habitat	
	Nest	Foraging
M333Aa	22,125	28,366
M333Ab	27,231	48,089
M333Ac		
M333Ba	8,886	23,697
M333Be	2,494	2,993
M333Da	70,520	121,865
M333Db	33,485	49,935
M333Dd	7,424	16,872
M333De		
Forest	172,833	291,651

Table 33. Habitat estimates (ha) for the pileated woodpecker for the IPNFs by 4th Code Hydrologic Unit.

HUC	Habitat	
	Nest	Foraging
17010101		
17010103		
17010104		16,263
17010105		11,299
17010204		
17010213	584	10,513
17010214	1778	29,637
17010215	1,202	54,732
17010216		
17010301	1,209	80,527
17010302	674	5,391
17010303	616	16,651
17010304	1,234	50,625
17010305		4,888
17010306		
17060308		
17060108		
17060306		

Table 33 continued

17060307		
17060308	520	11,454
Forest	7,795	291,651

7,291 pairs of pileated woodpeckers. A similar pattern in abundant nest and wintering habitat for the pileated woodpecker on the IPNFs is evident by HUCs (Table 33).

Amounts of habitat

Table 34 compares estimated amounts of habitat for the four species considered in this assessment based both on Redmond et al. (2001) and this conservation assessment. In both estimates—the independent University of Montana Spatial Analysis Laboratory—and this conservation assessment, habitat is very abundant across the Northern Region and the IPNFs. As described in the main text (see also Appendix 7 and Appendix 8), well distributed habitat (1982 rule, 219.19) is not an issue.

Table 34. Habitat estimates (ha) (Redmond et al. 2001, this assessment) for the goshawk, black-backed woodpecker, flammulated owl, and pileated woodpecker on the Idaho Panhandle National Forests.

	Goshawk	Black-backed woodpecker	Flammulated owl	Pileated woodpecker
Redmond et al. (2001)	869,940	775,172	275,606	849,612
IPNFs models	292,251	268,846	7,795	172,833

Table 34 compares habitat amounts for the four species as estimated by Redmond et al. (2001) and by the IPNFs habitat relationship models (Table 26). In both cases (one independent and one by the Forest Service), habitat is very abundant for each of the four species. The differences in the species-specific estimates (Redmond et al. 2001 and this assessment) summarized in Table 34 reflect use of satellite-based information versus FIA. Only FIA may be used to estimate variables such as tree size, number of canopy layers, and tree density in conjunction with methodology such as bootstrap (Appendix 2 and Appendix 3). Use of satellite imagery should

discuss possible errors (Beissinger and Westfall 1998) and or be limited to distinguishing forest and non-forest vegetation as in this conservation assessment.

Long-term viability and the sustainability of ecosystems reflect how ecological processes and native species interact (Figure 1, page 69) and form a "figure 8." The ecosystem cycle in Figure 8 represents a self-reinforcing system that maintains habitat within which species evolve and have depended upon for centuries to thousands of years.

The Idaho Panhandle National Forests will conduct an analysis of historic habitats and patterns in ecological processes that shape and sustain habitats important to wildlife (Haufler et al. 2002). This may result in loss of suitable habitat for the four species considered in this assessment in the short-term but will contribute to long-term sustainability (Representativeness, Redundancy and Resiliency) of their respective habitats, and therefore their long-term viability.