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HABITAT USE BY  
THREE-TOED AND BLACK-BACKED WOODPECKERS,  
DESCHUTES NATIONAL FOREST, OREGON

by

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THE  
BIRD

## ABSTRACT

Patterns of habitat use for home ranges, foraging, nesting, and roosting, were described for three-toed (*Picoides tridactylus*) and black-backed (*Picoides arcticus*) woodpeckers on the Deschutes National Forest, Oregon, during April-September, 1986 and 1987. A severe mountain pine beetle epidemic had created an abundance of dead and dying trees, and an aggressive pest management and timber salvage program had created a patchwork of logged areas, primarily shelterwood cuts, on the study area.

All nests excavated by three-toed and black-backed woodpeckers were in portions of lodgepole pine (*Pinus contorta*) trees with heartrot. Evidently, both species require soft wood for excavating cavities, because of morphological adaptations associated with 3 toes on each foot. Habitat selection for mature and overmature forest stands, and against younger stands and logged areas, was documented for three-toed woodpeckers using 16 nests, 493 forage bouts, and 16 roosts, and for black-backed woodpeckers using 35 nests, 395 forage bouts, and 20 roosts. Home range sizes for 3 radio-tagged three-toed woodpeckers were 751, 351, and 131 acres (n=170, 352, and 131 locations, respectively). Home range sizes for 3 radio-tagged black-backed woodpeckers were 810, 303, and 178 acres (n= 124, 86 and 112 locations, respectively). Intra-specific home range overlap among both species appeared limited or nonexistent, except among paired individuals near the nest site. Inter-specific home range overlap was common between three-toed and black-backed woodpeckers and other *Picidae*.

Guidelines for management included establishing Management Areas which retain the characteristics of mature and overmature lodgepole pine or lodgepole pine-mixed conifer forest stands. Recommended sizes of Management Areas were 528 acres per pair of three-toed woodpeckers, at a minimum elevation of 4500 ft, and 956 acres per pair of black-backed woodpeckers, with some Areas at elevations less than 4500 ft. One Management Area could be designated for both species, if the respective habitat needs were met.

## SUMMARY

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### INTRODUCTION

Three-toed and black-backed woodpeckers are two of the least known species of woodpeckers in North America. They are sympatric over most of their North American range and both are nonmigratory residents on the east slope of the Cascade Mountain Range. The woodpeckers are associated with trees characterized by scaly or flaky bark, but differ in the species of trees with which they are associated; the three-toed woodpecker is more closely associated with spruce (*Picea* spp.), and the

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roosts were on the lower study area where only lodgepole pine forest type was available. Mean canopy closure at roost sites was 40%. Mean dbh of trees in the roost stand was 6.0 in. Mean basal area of roost stands was 115 ft<sup>2</sup>/acre. Lodgepole pine trees were used for 14 roosts. Mean dbh of roost trees was 11.0 in. Mean tree height was 65 ft.

### MANAGEMENT IMPLICATIONS

Mature and overmature forest stands have a high incidence of disease, decay and mortality. Trees with disease and decay are undesirable components of a managed forest, but were used by three-toed and black-backed woodpeckers for home range, nesting, roosting, and foraging habitat. Nests were excavated in trees with heartrot, roosts were in diseased portions of trees or decayed snags, and forage sites were in mature and overmature stands, which have abundant disease and decay, and consequently abundant wood-boring insects. Conversion to and maintenance of lodgepole pine and lodgepole pine-dominated mixed conifer stands in a young, vigorous condition may eliminate or severely restrict incidence of wood-boring insects and heartrot, leading to declines in populations of three-toed and black-backed woodpecker.

Acreage of mature and overmature lodgepole pine forest stands are declining throughout the Oregon Cascades, because these stands are the prime target of the mountain pine beetle. Stands which experience high mortality nonetheless provide habitat for three-toed and black-backed woodpeckers. Individual trees within a stand may remain standing 10, 15 or 20 years, thus providing a continuum of habitat. Treating these stands, by logging, immediately converts them to a vigorous ~~condition where incidence of death and decay is severely restricted,~~ thus potential nesting and foraging substrate is drastically reduced. Although in time, stands without treatment may be structurally similar to treated stands, the time to reach that condition differs significantly. Because stands without treatment continue to provide habitat over a longer time than treated stands, thus there is a shorter period when old growth lodgepole pine is absent or scarce on the Deschutes or other National Forests. Consequently, a larger population of woodpeckers may survive,

thereby increasing the potential for maintaining viable populations of both species.

Designation of the three-toed woodpecker as an Indicator Species for mature and old growth lodgepole pine appeared appropriate, but only at elevations greater than 4500 ft. Much of the pure lodgepole pine on the east slope of the Cascade Mountain Range in Oregon occurs at elevations less than 4500 ft. We recommended the black-backed woodpecker as an Indicator Species for mature and old growth lodgepole pine, instead of the three-toed woodpecker. Unlike the three-toed woodpecker, the black-backed woodpecker used a range of elevations coincident with lodgepole pine. Further, it responded to play-back recordings more frequently, over a longer time period, and with louder vocalizations than the three-toed woodpecker, thus may be more effectively monitored than the three-toed woodpecker.

Until more information is available, we believe the most effective method of insuring habitat for three-toed and black-backed woodpeckers is to exempt areas (i.e. Woodpecker Management Areas) from commercial or salvage timber management and place these areas under a special management strategy, which retains the characteristics of mature or overmature lodgepole pine habitat as long as possible, without treatment. Woodpecker Management Areas should be in lodgepole pine or lodgepole pine-dominated stands with the greatest probability of surviving the longest time, but if these stands no longer retain the characteristics of mature and overmature stands, or if the number of trees remaining is inadequate to support a pair of woodpeckers, then the designated Woodpecker Management Area should be relocated to a selected replacement. Replacement stands should be selected now, to provide the earliest possible replacement for declining Woodpecker Management Areas. Woodpecker Management Areas, and replacement areas, may be within areas ~~previously designated as protected, such as old-growth areas, Spotted Owl Habitat~~ Areas, winter recreation sites, Research Natural Areas, etc. Management Areas for each pair of three-toed woodpeckers should be 528 acres of lodgepole pine or mixed conifer forest in mature and overmature condition and at an elevation of 4500 ft or higher. Management Areas for each pair of black-backed woodpeckers should be 956 acres of lodgepole pine or lodgepole pine-dominated mixed conifer forest in mature and overmature condition. One Management Area of 956 acres, at an elevation of

4500 ft or higher, could be designated for 1 pair of both species. However, Management Areas for black-backed woodpeckers should not be restricted to elevations greater than 4500 ft because this species may be better adapted to conditions at lower elevations.

Black-backed woodpeckers are not currently assigned a special status (e.g. Indicator Species), thus designation of Woodpecker Management Areas may not be practical at this time. An alternative management strategy can be applied on a sale-by-sale basis. On each sale, habitat can be preserved for each pair of black-backed woodpeckers by removing 956 acres of inter-connected blocks of mature/overmature habitat from harvest. For example, if a sale area is 9500 acres of mature or overmature lodgepole pine-dominated habitat, management at 60% of potential would be for 6 pairs, or 6 areas of 950 acres each. The traditional approach for management of cavity-nesters at 60% of potential by retaining 60% of the snags and live replacement tree may be ineffective for black-backed and three-toed woodpeckers for two reasons. One - snags provide more than nesting habitat; snag retention at the 60% level is unlikely to occur in sufficient amounts to provide adequate feeding substrate for species dependent on wood-boring insects associated with trees with flaky/scaly bark. Two - this approach addresses a singular, albeit a key, component of the species' habitat. The interrelationships of an old growth, or mature/overmature ecosystem, and the species associated with it, are little known, but likely complex. Land managers do not, at this time, have the information necessary to manipulate habitat and insure these interrelationships will be maintained.

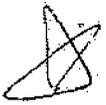
The figures for home range sizes and the amount of mature or overmature stands used by woodpeckers were estimated under conditions of abundant food supply. As the mountain pine beetle epidemic runs its course, and prey abundance declines, it is likely that the amount of area required to support a pair of three-toed or black-backed woodpecker will increase.

Three-toed and black-backed woodpeckers should be monitored to track changes in population levels as the mountain pine beetle epidemic runs its course and as the forest becomes increasingly managed, resulting in reduced levels of disease and decay. Survey routes to document number of woodpecker responses

NO harvest

2650

5700



950  
3900  
9500  
60%  
3900

should be monitored annually. Population levels of three-toed and black-backed woodpeckers prior to the mountain pine beetle epidemic were undocumented, thus the effects of the mountain pine beetle epidemic on population levels is unknown. A review of population irruptions by three-toed and black-backed woodpeckers in eastern North America suggested that numbers of black-backed woodpeckers increase with increasing prey abundance, but that populations of three-toed woodpeckers are much less responsive to changes in prey abundance. It is possible that numbers of black-backed woodpeckers increased as the density of mountain pine beetles increased on the Deschutes National Forest. Similarly, populations may decline as the epidemic runs its course and prey for the woodpeckers becomes scarcer. It may be difficult to distinguish between the effects of the epidemic, and of timber management to control the epidemic, on populations of black-backed and three-toed woodpeckers. Documenting breeding success in Management Areas may be an effective method of combatting public outcry if woodpecker populations decline on the Forest.

This study provides a preliminary data base on habitat use by three-toed and black-backed woodpeckers; it is intended as a springboard for other studies. The pioneering nature of the study required a limited time frame, geographic scope, and sample size. Consequently, management recommendations represent the best available information at this point in time, but are intended to evolve as more information becomes available. Additional research should be a priority for land managers. Research needs include: (1) information on habitat use in areas without a bark beetle epidemic, (2) estimates for home range sizes of individuals of both species under a range of conditions, (3) estimates for breeding home range sizes of both species, (4) information on flexibility of the species to adjust to managed forest habitat, (5) information on the relationship of habitat quality and fragmentation to home range size, and (6) information on juvenile dispersal.