

ANNUAL PROGRESS REPORT
Birds and Burns Network
Helena National Forest, Montana

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Purpose: This project is part of the Joint Fires Sciences Program (Proposal # 01-1-3-25, Saab, Kotliar, Block) investigating the effects of prescribed fire strategies to restore wildlife habitat in ponderosa pine forests of the interior west (www.rmrs.nau.edu/birdsnburns).

Partners: Partners include the U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Research Work Unit Numbers RMRS-4156, -4251, and -4852.

Preliminary Results: Four study units are located southwest of Helena, Montana in the Elkhorn Mountain range. Two units, Strawberry Treatment (ST) and Maupin Treatment (MT), are proposed for mechanical and prescribed fire treatments. Each of these units is paired with a control unit (Strawberry Control [SC] and Maupin Control [MC]) where no mechanical or prescribed fire treatments will occur. The overstory vegetation is dominated by a mixture of ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menzeisii*). Lodgepole pine (*Pinus contorta*) and aspen trees (*Populus tremuloides*) also make up a dominant part of the overstory vegetation at microsites. The understory vegetation varies. Some areas have little if any vegetation, other have a sparse grass covering dominated by bluebunch wheatgrass (*Pseudoroegneria spicatus*) and Idaho Fescue (*Festuca idahoensis*). The most common shrubs are snowberry (*Symphoricarpos albus*), Oregon grape (*Berberis repens*) and kinnickinnick (*Arctostaphylos uva-ursi*). The noxious weeds Dalmation toadflax (*Linaria dalmatica*) and spotted knapweed (*Centuarea maculosa*) occur in some areas.

In 2002, the vegetation was surveyed at 40 random points on the ST and MT units. In 2003, the vegetation was surveyed at 19 random points on the MC unit and 17 random points on the SC unit. This completed our vegetation sampling at all 76 random points prior to any treatments. In addition, the vegetation was also sampled at 23 nest point locations in 2003. In 2004, 33 woodpecker nests were located and monitored. Eight of the 2004 nests were in the same trees as in 2003 so no vegetation sampling will occur at these sites. Vegetation sampling is in progress for the remaining 25 nest locations monitored in 2004. Appendix 1 lists the common and scientific names of the woody vegetation recorded with the four study units during 2002 and 2003.

In 2004, we surveyed each of our 76 random points three times for birds. Forty-five different species were detected during bird surveys with a total of 2129 detections (Appendix 2). We detected Red-breasted nuthatches most often (361 times), followed by Red-tree Squirrels (317), Mountain Chickadees (186), then Dark-eyed Juncos (175). Appendix 2 lists all species detected in order of the number of detections.

To aid in finding woodpecker nests, we established a total of 41 transects systematically placed 200 m apart on the four study sites. Each transect was surveyed at least once. Most surveys included using a play-back device to increase the probability of encountering a woodpecker. Transects where woodpeckers were detected were repeatedly visited until the nest was found.

We monitored a total of 33 nests during the 2004 field season (Table 1). All nests were occupied by woodpeckers. No bluebird nests were found. We found four nests on the ST unit, one on the SC unit, nine on the MC unit and 19 on the MT units. Species for which nests were found include the Red-naped Sapsucker, Hairy Woodpecker, Downy Woodpecker, Northern Flicker, and the Northern Three-toed Woodpecker. Although aspen trees comprised a relatively small portion of each unit, all nests we found were in aspen trees or snags. We found no woodpeckers nesting in coniferous trees, although numerous chickadees and nuthatches were observed nesting in these trees.

Compared to the 2003 season (87 percent nest success), fewer nests successfully fledged at least one young in 2004 (76 percent success). Whereas all nest losses in 2003 were attributed to predation (3 of 23 nests), we only attributed two nest losses (of 33 nests monitored) to predation in 2004. By contrast, we attributed six total nest losses to inclement weather conditions in 2004. In 2003 the weather was overall much warmer and dryer in the Elkhorn Mountains. Cooler temperatures, frequent rains, and one large snow storm (6 to 8 inches of snow) likely all contributed to some of the nest failures we observed in 2004.

In addition to the weather, the impacts of predation on chicks within nests also seemed greater in 2004. Red-tree squirrel numbers were up significantly in 2004 and we observed a number of nests that lost chicks shortly after the cavity entrance had been enlarged by red-tree squirrels. In 2003 the average number of chicks fledged from successful nests ($n = 20$) was estimated to be 3.6. In 2004 this dropped to only 2.7 chicks per successful nest ($n = 25$). These numbers do not include nests that totally failed.

In contrast to the 2003 nest season where both nests failed, both Three-toed Woodpecker nests were successful in 2004 (Table 1). Three out of four Downy Woodpecker nests were successful in 2004 and 14 out of 16 Red-naped Sapsucker nests were successful. Out of four Northern Flicker nests only two were successful. Both of these successful nests had later start dates (June 7th and June 15th) than the two Northern Flicker nests that failed (May 23rd and May 29th). Finally, out of seven Hairy Woodpecker nests, only four successfully fledged at least one young.

Another major difference between the 2003 and 2004 nesting seasons was the starting date for Northern Flicker nests. For example, in 2003 the initial start dates (date for first egg laid) for all Northern Flicker nests ($n = 5$) ranged from May 9 to May 22 (mean = May 12). In 2004, however, the initial start dates for Northern Flicker nests ($n = 4$) ranged from May 23 to June 15 (mean = June 3). This was about a three and a half week difference between years.

Table 1. Number of nests monitored, and the number that successfully fledged at least one young, during the 2004 field season for each bird species on four study units in the Elkhorn Mountains on the Helena National Forest in Montana.

		Unit				All units combined
		MC ¹	MT	SC	ST	
Downy Woodpecker	Number of nests monitored	1	2	1	0	4
	Number of nests that successfully fledged young	1	2	0	0	3
Hairy Woodpecker	Number of nests monitored	2	4	0	1	7
	Number of nests that successfully fledged young	1	3	0	0	4
Northern Flicker	Number of nests monitored	0	3	0	1	4
	Number of nests that successfully fledged young	0	2	0	0	2
Red-naped Sapsucker	Number of nests monitored	5	9	0	2	16
	Number of nests that successfully fledged young	4	8	0	2	14
Northern Three-toed Woodpecker	Number of nests monitored	1	1	0	0	2
	Number of nests that successfully fledged young	1	1	0	0	2
Totals	Number of nests monitored	9	19	1	4	33
	Number of nests that successfully fledged young	7	16	0	2	25

¹ MC = Maupin control; MT = Maupin treatment; SC = Strawberry control; ST = Strawberry Treatment

Appendix 1. Common and scientific names of woody vegetation recorded within the Helena National Forest study units during the 2002-2003 field seasons.

Common name	Scientific name
Mountain Alder	<i>Alnus incana</i>
Western Serviceberry	<i>Amelanchier alnifolia</i>
Bearberry, Kinnikinnick	<i>Arctostaphylos uva-ursi</i>
Creeping Oregon grape	<i>Berberis repens</i>
Princes pine	<i>Chimaphila umbellifera</i>
Red-osier Dogwood	<i>Cornus stolonifera</i>
Common juniper	<i>Juniperus communis</i>
Rocky Mountain juniper	<i>Juniperus scopulorum</i>
Twinflower	<i>Linnaea borealis</i>
Lodgepole Pine	<i>Pinus contorta</i>
Ponderosa Pine	<i>Pinus ponderosa</i>
Quaking-aspen	<i>Populus tremuloides</i>
Common Chokecherry	<i>Prunus virginiana</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>
Bitterbrush	<i>Purshia tridentate</i>
Currant	<i>Ribes spp</i>
Wood's Rose	<i>Rosa woodsii</i>
Wild raspberry	<i>Rubus idaeus</i>
Thimbleberry	<i>Rubus parviflorus</i>
Scouler's Willow	<i>Salix scouleriana</i>
Buffaloberry	<i>Shepherdia Canadensis</i>
White Spirea	<i>Spirea betulifolia</i>
Common Snowberry	<i>Symphoricarpos albus</i>

Appendix 2. Total number of detections of bird species recorded on four study units during the 2004 season in the Elkhorn Mountains on the Helena National Forest. Species are arranged in decreasing order of the number of detections during points count surveys.

Bird species	Number of detections
Red-breasted Nuthatch	361
Red-tree Squirrel	317
Mountain Chickadee	186
Dark-eyed Junco	175
Yellow-rumped Warbler	159
Red Crossbill	131
Pine Siskin	105
Townsend's Solitaire	85
Ruby-crowned Kinglet	74
Western Tanager	62
Hermit Thrush	61
Common Raven	47
Chipping Sparrow	45
Warbling Vireo	40
American Robin	32
Clark's Nutcracker	32
Hairy Woodpecker	23
Cassin's Vireo	23
Gray Jay	21
Mourning Dove	16
Red-naped Sapsucker	16
Brown Creeper	12
Black-capped Chickadee	11
Dusky Flycatcher	11
White-breasted Nuthatch	11
Unknown woodpecker	10
Brown-headed Cowbird	8
Pileated Woodpecker	7
Evening Grosbeak	6
MacGillivray's Warbler	6
Mountain Bluebird	6
Northern Flicker	4
Unknown Empidonax	4
Hammond's Flycatcher	4
Orange-crowned Warbler	3
Vesper Sparrow	2
Three-toed Woodpecker	2
Downy Woodpecker	2
Lincoln Sparrow	2
Blue Grouse	1
Lazuli Bunting	1
Turkey Vulture	1
Olive-sided Flycatcher	1
Common Nighthawk	1
Cooper's Hawk	1
Total	2129