

A Concentration of Black-backed Woodpeckers in Thunder Bay District

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On 30 April 1998, a forest fire was reported southeast of Lake Nipigon, Thunder Bay District. This fire, which was named Fire 21, proved to be difficult to control, and burned for almost four months. It spread northwestward, jumped Highway 527 (the Armstrong Highway), and, before it was finally extinguished on 22 August, consumed 26,400 hectares of boreal forest (Figure 1). This area is rolling Canadian shield country, with upland mixed forests of jack pine (*Pinus banksiana*), white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), trembling aspen (*Populus tremuloides*), and white birch (*Betula papyrifera*); lower-lying areas support stands of black spruce (*Picea mariana*) and tamarack (*Larix laricina*). Over most of the burn area, including the hills, the coniferous species predominate. Much of the forest is second growth due to logging operations carried out here over the past century. Stands are of various ages, and there are a few recent clear cuts.

Travelling up Highway 527 from Thunder Bay towards Armstrong, one first encounters the burned area 139 km north of the Trans-Canada Highway, and then drives through it for the next 28 km. Blackened dead trees line both sides of the highway

(Figure 2). There are scattered small green skip patches with, around their edges, dead and dying conifers with rust-coloured needles, killed by the heat but not flame-burned.

On a visit to this area on 16 January 1999, I noticed evidence of much woodpecker activity: pale patches on the blackened tree trunks where bark had been chipped off, and tell-tale piles of bark chips on the snow below. Black-backed Woodpeckers (*Picoides arcticus*) were present every time I stopped to look and listen.

To get an idea of how many woodpeckers there were in the burn, and which species were present, Stan Phippen and I revisited the site on 31 January 1999. Starting at 0900h at the southern edge of the burn, we walked north along the highway counting woodpeckers. By the time darkness fell at 1800h, we had covered a 21 km stretch of the highway, and 75 percent of the burn.

Whenever we detected a woodpecker, we tried to identify it with binoculars. With a bit of patience we could usually see the bird from the road. If we could not spot it, we walked into the forest to find it; this was not too difficult since the snow depth was only about 60–70 cm. Most woodpeckers were detected by hearing them tapping on the tree

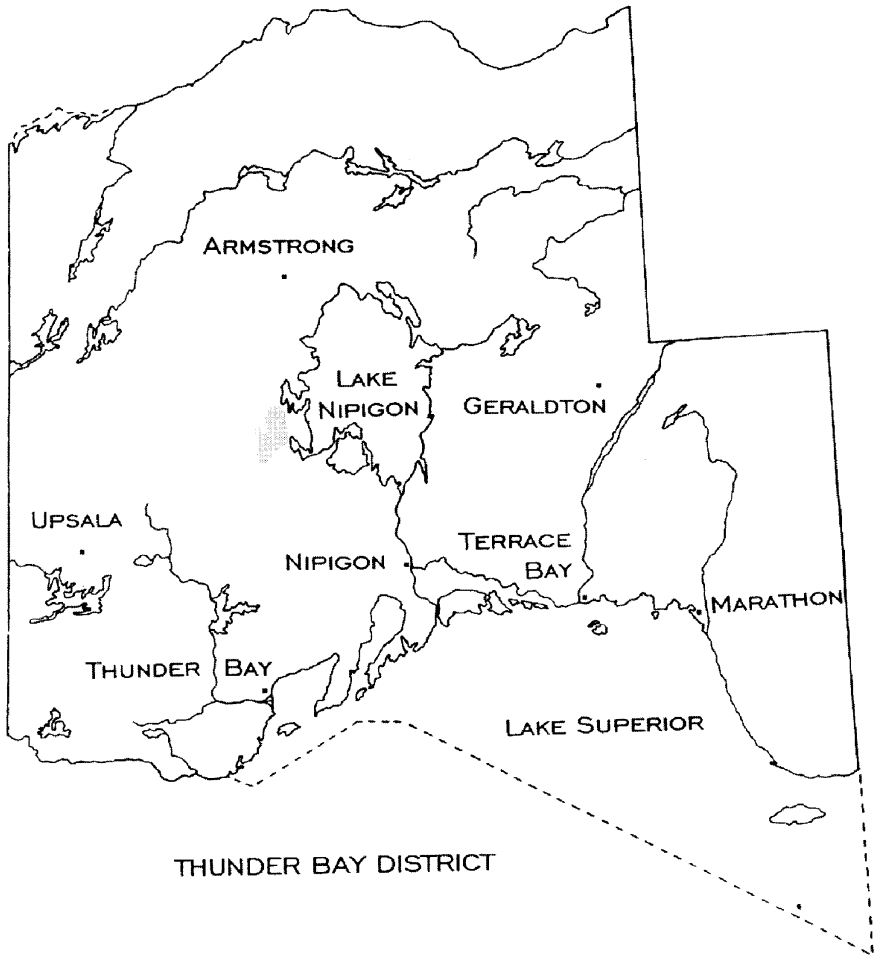


Figure 1: Location of Fire 21 is indicated by the grey area west of Lake Nipigon.

trunks as they fed; we could hear them tapping up to about 50 m off the road. Some birds were found when we heard their call notes, or were seen flying over. In addition, we counted 12 Black-backed Woodpeckers at greater distances which were drumming.

We counted a total of 191 wood-

peckers (Table 1), of which 161, or 84 percent, were Black-backed Woodpeckers (Figure 3). We were able to determine the sex of most of them by getting a look at the top of the head; they were split about 50/50 males/females. Sometimes up to four or more were visible simultaneously, but they were generally evenly dis-

persed along the entire route.

We wondered whether the Black-backed Woodpeckers might be more concentrated along the highway than away from it. To check this out, Al Harris and I returned to the area two weeks later on 14 February, and walked two transects perpendicular to the road. We counted 31 woodpeckers along a distance of 2 km, all Black-backed Woodpeckers, giving a density even higher than along the highway.

We then attempted to estimate how many Black-backed Woodpeckers were present in the entire burn, making a few assumptions based on what we had seen so far. We assumed that the forest type was homogeneous throughout the burn, and that the Black-backed Woodpeckers were evenly distributed throughout the burn area. We assumed that our linear counts detected all woodpeckers to 50 m on either side, for a total width of 100 m. We probably missed a few, which were made up for by the dozen or so that were drumming beyond 50 m. Assuming a minimum density of

0.77 woodpeckers/hectare (based on the highway total of 161 in an area measuring 21 km x 100 m), we calculated that the total wintering population of Black-backed Woodpeckers in Fire 21 was at least 20,328.

The woodpeckers were feeding primarily on dead jack pine and balsam fir trees. They would tap the trunk until they detected something in the wood, then they would drill a rectangular hole into the wood (Figure 4), and extract something.

What were they eating? I cut down a dead young balsam fir that a female Black-backed Woodpecker had been feeding on, and, splitting a short section of it open, found several white larvae measuring up to 1.7 cm in length (Figure 5). The larvae were at the ends of tortuous burrows extending up to several centimetres into the sapwood, the tunnels behind them packed with excelsior-like wood shavings (Figure 6). The entrance holes to the tunnels on the surface of the tree trunk were elliptical in shape, vertically oriented, and entered the wood at an oblique angle (Figure 7).

Species	January 1999	January 2000
Black-backed Woodpecker	161	15
Three-toed Woodpecker	2	2
Downy Woodpecker	10	4
Hairy Woodpecker	18	6
Pileated Woodpecker	0	2

Table 1: Comparison of woodpecker counts in Fire 21 in the first and second winters following the burn.



Figure 2: The predominantly coniferous forest in the burned area, 14 February 1999. Photo by *N.G. Escott*.



Figure 3: Male Black-backed Woodpecker in Fire 21 burn, 14 February 1999. Photo by *N.G. Escott*.

I kept the rest of the tree, a log measuring 4.4 m in length and 7 to 12 cm in diameter, at home in my screened front porch. Weather conditions in the porch were similar to the outdoors, except for the lack of wind and precipitation. Between 11 and 27 June 1999, at least two dozen White-spotted Sawyer Beetles (*Monochamus scutellatus*) (Figures 8 and 9) emerged from the tree. The exit holes were different from the larval entrance holes, being perfectly round, and perpendicular to the surface of the log. After all insects had emerged, I counted a total of 33 exit holes. No other insect species emerged from this log.

The White-spotted Sawyer Beetle is found from Newfoundland south to North Carolina, west to Minnesota, and northwestward to Alaska in the boreal forest biome (Wilson 1962). The adults are on the wing in the summer and are attracted to dying coniferous trees. They are particularly attracted to forest fire burns, but also lay eggs on trees that are dying for other reasons, such as those in flooded beaver ponds or recently cut log piles. The larvae burrow through the bark and eat out shallow flat galleries on the surface of the wood before burrowing into the trunk in the fall. They hibernate in the trunk, and depending on the latitude, may pupate the next spring, or continue feeding in the wood the next summer, in which case they would overwinter a second time in the tree, pupate the following spring, and emerge as an adult the next summer. This insect is reported to

have a 2-year life cycle from northern Minnesota northward (Wilson 1962), and may even take an additional year to mature in Alaska (Murphy and Lehnhausen 1998).

I wondered how many larvae remained in the burnt trees for a second winter. If there were still a significant number, the Black-backed Woodpeckers should stay through the summer and the succeeding winter. To check on this, Stan and I repeated our Highway 527 survey a year later, on 30 January 2000. This time we found only 15 Black-backed Woodpeckers, i.e., less than 10 percent of the previous year's total, and they were in the islands of live and dying trees; the tracts of blackened dead trees were deserted. Nesting pairs of Black-backed Woodpeckers were present in the summer of 1999 in Fire 21, but in low numbers, far fewer than the number of birds that had wintered there. On 18 April, I saw only nine Black-backed Woodpeckers, including three pairs, and on a visit in early August, I was able to find only three pairs. I kept the balsam fir log that I had cut down for an additional year, and no further sawyer beetles emerged. All these observations tended to support a one-year life cycle for *Monochamus scutellatus* in the Fire 21 burn.

Black-backed Woodpeckers are known to concentrate in recent burns (Dixon and Saab 2000), and large numbers have been counted on other occasions. For example, Rudolf Koes and Russ Tkachuk



Figure 4: Rectangular drill holes made by Black-backed Woodpeckers, Fire 21, 14 February 1999. Photo by N.G. Escott.

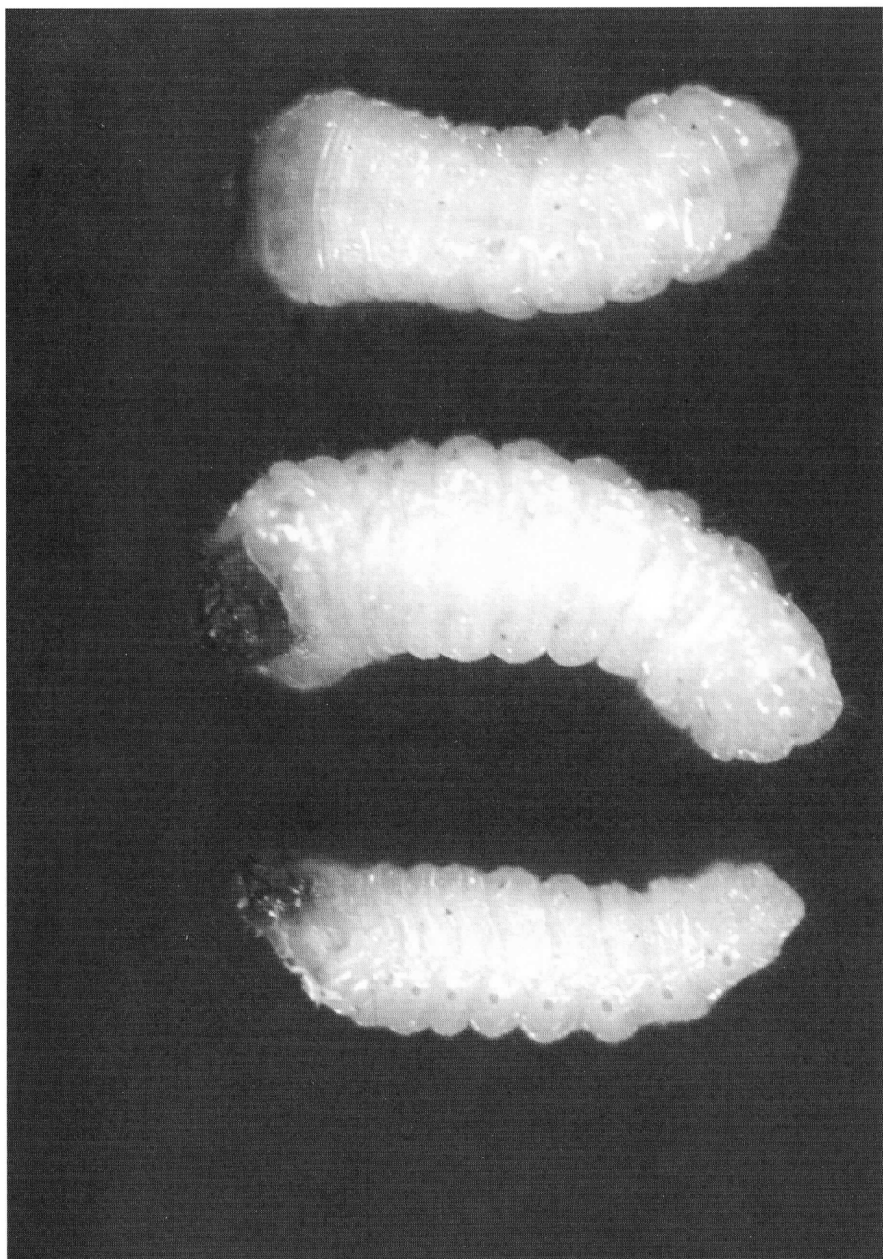


Figure 5: *Monochamus scutellatus* larvae extracted from burned balsam fir in Fire 21, February 1999. Photo by N.G. Escott.