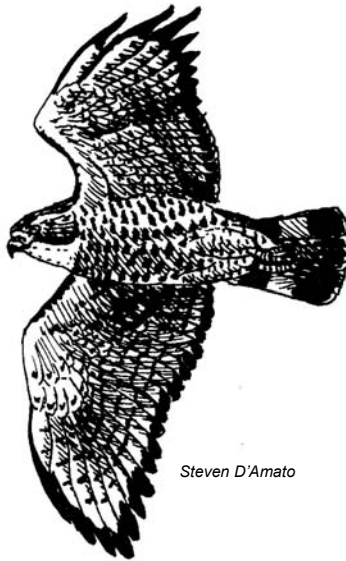


# New Brunswick Forest Hawk and Spring Woodpecker Survey

2004 Report



Steven D'Amato

April 2005

Saija Sirkkiä & Becky Whittam



**BIRD STUDIES**  
**ÉTUDES D'OISEAUX CANADA**

understand appreciate conserve  
comprendre apprécier conserver

Canadian co-partner of  
un partenaire canadien de



New  Nouveau  
Brunswick



## Table of Contents

Introduction.....	1
Methods.....	2
General.....	2
Survey Protocol.....	2
Results and Discussion - Hawks.....	2
Results and Discussion – Woodpeckers.....	5
Conclusions.....	7
Acknowledgements.....	7
Literature Cited.....	8

## Introduction

In 2004, the New Brunswick Forest Hawk and Spring Woodpecker Survey entered its third and final year. The survey is a cooperative project of Bird Studies Canada (BSC) and the New Brunswick Department of Natural Resources (NB-DNR). When the survey began in 2002, we hoped that it would become a long-term (i.e. 10-year+) survey capable of measuring trends in hawk (and secondarily woodpecker) populations.

Although all hawk species are of interest, the survey has focused primarily on those that rely on mature forest during the breeding season. Most notable are the Northern Goshawk, Broad-winged Hawk, Red-tailed Hawk, and Red-shouldered Hawk. The NB-DNR has established objectives for specific amounts of Old Hardwood Habitat (OHWH) to be maintained on Crown land through time, and both the Northern Goshawk and the Broad-winged Hawk have been identified by the NB-DNR as indicators of OHWH. Furthermore, the Red-tailed and Red-shouldered hawk are listed as "sensitive" and "may be at risk" by the NB-DNR, and the Red-shouldered Hawk is also listed as a Species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC); thus, obtaining new records of these rare species is of particular interest.

Woodpeckers often respond to the calls of hawks and owls by approaching and calling, allowing some species of woodpeckers to be surveyed during the hawk survey (Badzinski 2003). Furthermore, woodpeckers, especially Yellow-bellied Sapsuckers, are generally easier to detect in late April and early May compared with June, when Breeding Bird Surveys are done (Badzinski 2004). As a result, the hawk survey also gathers information on the distribution and abundance of woodpeckers in New Brunswick's forests. Northern Flicker, Pileated, Downy, Hairy and Black-backed woodpecker are all considered indicators of various types of forest (based on composition and development stages) by the NB-DNR; their population trends are therefore of interest to provincial forest managers (Whittam 2003).

This report provides results of the NB Forest Hawk and Spring Woodpecker survey from 2002 to 2004. Very few hawks have been detected through this survey; as a result, the hawk survey was officially "retired" in early 2005. The primary purpose of this report is

to provide volunteers with basic survey results from 2002 to 2004, and rationale for the survey's retirement.

## **Methods**

### **General**

Survey routes were randomly chosen in 2002 (see Whittam 2003 for details on how routes were selected and scouted). In 2004 we focused on filling routes that were previously run in 2002 and 2003. Volunteers were contacted via email or phone to determine if they were interested in participating in the survey again. In order to reduce the potential for observer bias, volunteers were requested to run the same routes as in past years. Volunteer packages containing an updated training manual and data sheets were mailed out to each volunteer.

### **Survey Protocol**

Volunteers were asked to complete their route once between the period of 18 May to 16 June, beginning just after sunrise. Each route consisted of a 15-km road transect, with stops every 1 km (for a total of 16 stops). At each stop, volunteers played a standardized CD track that consisted of 4 sets of 20-second Red-shouldered Hawk calls, separated by 40 seconds of silence. This was followed by two sets of Northern Goshawk vocalisations also separated by 40 second silences. A final 1 minute and 40 second silent listening period ended the playback. In 2002, Broad-winged Hawk vocalisations were used rather than Red-shouldered Hawk vocalisations. It was hoped that the change in 2003 would result in an increase in the number of responses from hawks and woodpeckers, and was based on preliminary field trials conducted by Scott Makepeace of the NB-DNR.

During the playback protocol, volunteers recorded all forest hawks (and, if they were confident, woodpeckers) seen or heard during each playback or listening period. Volunteers also recorded the distance (in categories: <200m, 200-500m, 500-1000m, and >1000m) and direction (N, NE, E, SE, S, SW, W, NW) to each bird when it was first seen or first began to call, and kept track of the time, odometer reading, noise level, and traffic at each stop. Volunteers also noted if they believed a bird to be the same individual as detected at a previous station. (Such "repeats" were excluded from analyses.)

In 2003 and 2004, volunteers were also asked to record observations of Blue Jays and Gray Jays. These species regularly respond to hawk vocalisations and have been designated as part of the DNR's suite of forest indicators.

## **Results and Discussion - Hawks**

A total of 31 routes were completed in 2004. This is less than the number of routes completed in 2002 (44) and in 2003 (37). In total, 56 survey routes were run in at least one of the three survey years. Twenty-one routes were surveyed in all three years, an additional 14 routes were run in two survey years, and 21 routes were run in a single year (mostly the first year). Distribution of routes between provincial Crown and private land

was roughly equal, with 13 provincial and 15 private land routes completed in 2004. Three routes were completed on federal land in 2004.

A total of 33 hawks of eleven species were detected in 2004, for a total of 1.06 hawks/route, compared to 0.95 hawks/route in 2003 and 1.39 hawks/route in 2002. In 2004, the American Kestrel was the most commonly observed hawk (or falcon, in this case), whereas in the 2003 survey, Red-tailed Hawk was the most commonly observed, followed by Broad-winged Hawk. In 2002, Northern Goshawk was the most common hawk detected. Very few other hawk species were detected.

Of those routes where hawks were detected in 2004, very few had the same species as were detected in earlier survey years. As suggested by Hart (2004), this presumably indicates that the survey is not detecting all hawks present in an area. Red-tailed and Red-shouldered hawks are known to be quite faithful to their nest sites and breeding territories (Crocoll 1994, Preston and Beane 1993), so one would expect these species to be detected on the same routes over multiple years.

Table 1 shows the number of hawks per route in years 2002-2004, and the frequency of occurrence (percent of routes with each species of hawk). In comparing these data it must be remembered that a change in the protocol was made in 2003 and any differences between 2002 data and data from 2003 or 2004 could be due to that change, rather than to an actual increase or decrease in the abundance of a particular species after 2002. Furthermore, due to small sample sizes, the survey does not have the power needed to determine whether any apparent “increases” or “decreases” are significant.

**Table 1.** Hawk detections, 2002-2004 (n = number of routes run).

Species	Hawks / route			Frequency of occurrence (% of routes with species)		
	2002 n=44	2003 n=37	2004 n=31	2002 n=44	2003 n=37	2004 n=31
American Kestrel	0.18	0.05	0.23	11	3	13
Bald Eagle	0.00	0.03	0.03	0	3	3
Broad-winged Hawk	0.27	0.19	0.10	20	19	6
Merlin	0.02	0.00	0.10	2	0	6
Northern Goshawk	0.30	0.08	0.06	11	8	6
Northern Harrier	0.05	0.00	0.06	5	0	3
Osprey	0.09	0.05	0.06	7	5	6
Red-shouldered Hawk	0.07	0.11	0.13	5	8	13
Red-tailed Hawk	0.25	0.38	0.13	23	24	10
Sharp-shinned Hawk	0.07	0.03	0.03	5	3	3
Turkey Vulture	0.05	0.00	0.00	5	0	0
Unknown	0.05	0.03	0.10	5	3	10

Interestingly, the number of Northern Goshawks and Broad-winged Hawks (two of the survey's main target species) appeared to decrease from 2002 to 2004. On the other hand, there was a slight increase in detections of Red-shouldered Hawks over this same time period. The change in survey protocol in 2003 (using Red-shouldered Hawk vocalizations for playback) may account for some of the observed changes, at least between 2002 and 2003. Other explanations may include natural variability in population density of these species, or changes in the seasonal timing of breeding and territorial behaviour which may influence species' responses to the playback protocol. In the case of Red-shouldered Hawk, the increase in detections seen from 2002 to 2004 may also be due to an increased ability of surveyors to recognize the vocalizations of the relatively rare Red-shouldered Hawk as the survey progressed each year. The detected numbers of Red-tailed Hawks was high in both 2002 and 2003, but decreased dramatically in 2004, with only 10% of routes detecting this species.

One of the objectives of the Hawk and Woodpecker Survey is to determine if land-ownership (ie. Provincial Crown land versus private land) affects the distribution or abundance of forest hawks. Table 2 shows the average number of hawks detected on private, provincial and federal land over the years 2002-2004 (calculated as "average of averages" by first calculating the average of detected birds of each species on each route over the three years, and then dividing the result with the number of surveyed routes on private, provincial and federal land).

**Table 2.** Average number of hawks detected on private, provincial and federal routes, using data from 2002-2004 (n = number of routes run).

Species	Mean hawks/route over 3 survey years		
	Private n=29	Provincial n=24	Federal n=3
American Kestrel	0.14	0.07	0.00
Bald Eagle	0.02	0.00	0.00
Broad-winged Hawk	0.10	0.15	0.22
Merlin	0.03	0.01	0.00
Northern Goshawk	0.16	0.06	0.00
Northern Harrier	0.03	0.01	0.00
Osprey	0.05	0.04	0.11
Red-shouldered Hawk	0.11	0.01	0.00
Red-tailed Hawk	0.17	0.19	0.00
Sharp-shinned Hawk	0.14	0.04	0.00
Turkey Vulture	0.01	0.01	0.00
Unknown	0.02	0.03	0.22

American Kestrels, Northern Goshawks, Red-shouldered Hawks and Sharp-shinned Hawks have apparently had more detections on privately owned routes, whereas Broad-winged Hawks and Ospreys have been detected in greater numbers on routes that are located on federally owned land. Because only three routes were situated on federal land,

and because the overall numbers of hawks detected are very small, a detailed comparison between the three landbases is not possible.

## Results and Discussion – Woodpeckers

As would be expected due to their higher population densities, woodpeckers were detected more frequently and in much higher numbers than were hawks. A greater emphasis was placed on asking volunteers to detect woodpeckers in 2003 and 2004 compared to 2002. This is reflected in the number of woodpeckers detected: in 2002, only 438 woodpeckers were detected, compared to 623 in 2003 and 636 in 2004. Woodpeckers were detected on all routes, although numbers and species detected varied greatly. By far the most abundant woodpecker in all three survey years was Yellow-bellied Sapsucker, while Northern Flicker was the second most abundant species. Hairy Woodpecker, Northern Flicker, and Yellow-bellied Sapsucker were found at more than half the routes, while Pileated and Downy Woodpecker were found on slightly less than half of all routes in all three survey years.

Table 3 compares the number of woodpeckers per route and the frequency of occurrence from 2002-2004. The frequency of occurrence of Northern Flicker and Yellow-bellied Sapsucker has increased through the survey years. The relative abundance of Yellow-bellied Sapsucker was also highest in 2004, at 5.29 birds/route (nearly 2 birds/route higher than in the previous two years).

In 2003 and 2004 volunteers were also asked to report Blue and Gray jays. Detections of both jay species increased in 2004 compared to the previous year, potentially due to an increased emphasis on collecting these data.

**Table 3.** Detections of woodpeckers and jays from NB Forest Hawk and Spring Woodpecker Survey, 2002-2004

Species	Birds/ route			Frequency of occurrence (% of routes with species)		
	2002 n=44	2003 n=37	2004 n=31	2002 n=44	2003 n=37	2004 n=31
Black-backed Woodpecker	0.05	0.03	0.13	5	3	10
Downy Woodpecker	0.75	0.78	1.19	30	46	45
Hairy Woodpecker	1.30	2.00	1.71	55	68	55
Northern Flicker	1.55	2.24	2.19	52	73	81
Pileated Woodpecker	0.48	0.86	0.87	30	51	39
Three-toed Woodpecker	0.00	0.08	0.00	0	3	0
Yellow-bellied Sapsucker	3.23	3.16	5.29	61	70	81
Unknown woodpecker	2.30	2.27	2.42	50	59	61
Blue Jay		3.73	4.10		76	87
Gray Jay		1.68	2.61		41	52

Table 4 shows the average number of woodpeckers and jays detected on private, provincial and federal land over the years 2002-2004 (calculated as “average of averages”, see page 5). Northern Flicker and Pileated Woodpecker were detected in higher numbers on routes on federal land, although it should be noted that only 3 federal routes were run, two of which were run only in 2004. Furthermore, one of the three federally situated routes was in Kouchibouguac National Park (the other two were in Base Gagetown). Large numbers of birds were detected in Kouchibouguac (20 woodpecker and 10 jay detections), likely because older forest such as that found in Kouchibouguac is likely more suitable for woodpeckers because of the higher availability of large snags for both nesting and foraging.

Hairy and Downy Woodpecker detections were highest on routes that were located on provincial and federal land compared with private land. Only Black-backed Woodpecker has been detected more on privately owned land, although the sample size in this case is very small (only 7 Black-backed Woodpeckers were detected during the three years of the survey). Blue Jays have been detected more on private routes, whereas Gray Jays have been detected more on provincial and federal routes.

**Table 4.** Average number of woodpeckers and jays detected on private, provincial and federal routes, 2002-2004.

Species	Mean woodpeckers & jays/route over 3 survey years		
	Private n=29	Provincial n=24	Federal n=3
Black-backed Woodpecker	0.05	0.04	0.00
Downy Woodpecker	0.41	0.76	0.89
Hairy Woodpecker	0.90	1.32	1.22
Northern Flicker	1.21	1.29	2.33
Pileated Woodpecker	0.51	0.40	0.78
Three-toed Woodpecker	0.00	0.04	0.00
Yellow-bellied Sapsucker	2.33	2.71	2.78
Unknown woodpecker	1.78	1.28	1.44
Blue Jay	2.14	1.04	1.89
Gray Jay	0.76	0.94	1.11

## **Conclusions**

When this survey was started in 2002, we hoped that it would become a long-term (i.e. 10-year+) survey capable of measuring trends in hawk populations. However, due to the relatively small numbers of hawks detected and with few routes having repeated hawk detections in survey years, the power of the survey to detect trends is extremely low. We would need to survey many more routes, conduct multiple surveys per year, or completely redesign the survey protocol to increase survey power to an adequate level. Bird Studies Canada's Atlantic Canada Management Committee therefore decided in early 2005 to retire the New Brunswick Forest Hawk and Spring Woodpecker Survey in order to focus efforts on more effective programs such as the Nocturnal Owl Survey and the upcoming second Maritimes Breeding Bird Atlas.

Although the survey appears to under-represent the number of hawks present along a route, it appears to be quite effective at detecting woodpeckers. Woodpeckers such as Pileated and Yellow-bellied Sapsucker are useful indicators of old forest habitat and have been identified as indicator species by the NB-DNR. These species have also been identified as sensitive forest indicators for Kejimikujik National Park (Stacier 2003). While monitoring woodpeckers is therefore very important, on a regional and provincial scale, the existing Breeding Bird Survey adequately monitors most woodpecker species (D. Busby, pers. comm.). There does not, therefore, appear to be any value to continuing the survey as a woodpecker monitoring tool.

Although we have decided to discontinue the survey in 2005, it has provided some valuable information over the last three years. Data are being shared with the NB DNR, and may be used to develop a hawk and/or woodpecker monitoring tool as part of the Second Maritimes Breeding Bird Atlas (set to begin in Spring 2006). The survey has also provided several occurrence records for rare species, such as the Red-shouldered Hawk, which will be shared with the Atlantic Canada Conservation Data Centre for improved tracking of this species in the province. The project has also increased our awareness of the demands of surveying and monitoring forest hawks.

## **Acknowledgements**

Funding and in-kind support for this project was provided by the New Brunswick Wildlife Trust Fund, the NB Department of Natural Resources and the Canadian Wildlife Service. Thanks to Jason Hudson for coordinating volunteers in 2003 and 2004, and to Ramsey Hart for managing the project in 2003. Greg Campbell provided comments on an earlier draft of this report. This survey would have not been possible without the help of many dedicated volunteers. They include: Todd Beach, Dan Beaudette, Joey Bernard, Laurel Bernard, Bob Blake, Valmond Bourque, Susan Bowes, Mike Boyd, Jan Brown, Jim Brown, Larry Calhoun, Greg Campbell, James Clifford, Jeff Cosgrove, Brian Cowan, Donna Crossland, Luc DeRoche, Sheena and Trent Dougan Mosher, Aaron Fraser, Margaret Gallant Doyle, Steve Gordon, Dedreic Grecian, Andre Hachey, Ramsey Hart, Kelly Honeyman, Tim Houlahan, Roger Jenkins, Joe Kennedy, Roy LaPointe, Jack

Lavender, Mike Lushington, Don MacDougall, Andrew MacInnis, Ken Macintosh, Alan Macleod, Terry MacMillan, Bruce Matson, Dorothy McFarlane, Pierrette Mercier, Gary Moore, James Mundle, Bill Nelson, Rod O'Connell, Julie Paquet, Nelson Poirier, Joyce Regan, Bernies Robichaud, Roland Robichaud, Martin Roncetti, Dwayne and Mary Sabine, Victor Savoie, Marco Scichilone, Julie Singleton, Andrew Stewart, Mike Sullivan, Larry Sweet, Cliff Thornley, Kevin Tutt, Leon Vietinghoff, Greg Watling, Pam Watters, Becky Whittam, and Steve Young.

## Literature Cited

- Badzinski, D. 2003. Red-shouldered Hawk and Spring Woodpecker Survey, 2002 Report. Unpublished report to the Ontario Ministry of Natural Resources Wildlife Assessment Program by Bird Studies Canada, Port Rowan, ON.
- Badzinski, D. 2004. Red-shouldered Hawk and Spring Woodpecker Survey, 2004 Report. Unpublished report to the Ontario Ministry of Natural Resources Wildlife Assessment Program by Bird Studies Canada, Port Rowan, ON.
- Crocoll, S. T. 1994. Red-shouldered Hawk (*Buteo lineatus*). In *The Birds of North America*, No. 107 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.
- Hart, R. 2004: New Brunswick Forest Hawk and Spring Woodpecker Survey, 2003 Report. Unpublished report by Bird Studies Canada, Atlantic Region, Sackville, NB.
- Preston, C. R. and R. D. Beane. 1993. Red-tailed Hawk (*Buteo jamaicensis*). In *The Birds of North America*, No. 52 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.
- Stacier, C. 2003: Presentation made to EMAN monitoring workshop, November 30 2003, Halifax, Nova Scotia. Available from: [cindy.staicer@dal.ca](mailto:cindy.staicer@dal.ca).
- Whittam, B. 2003: New Brunswick Forest Hawk and Spring Woodpecker Survey, 2002 Report. Unpublished report by Bird Studies Canada Atlantic Region, Sackville, NB.