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## **Final report to Nova Scotia Species At Risk Conservation Fund**

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### **Tracking Nova Scotia's Bicknell's Thrush Population**

#### **Introduction**

The Bicknell's Thrush is one of the rarest songbirds in North America, with a global population of less than 100,000 individuals, a Canadian population of around 40,000 individuals, and a Nova Scotia population of probably fewer than 600 individuals (COSEWIC 2009). It was recently (November 2009) recommended for Threatened status by COSEWIC. It is listed as Vulnerable under the Nova Scotia Endangered Species Act. The species is at risk in Canada due to low numbers, patchy distribution, low reproductive potential, range-wide habitat pressure, and recent population declines.

Bird Studies Canada's High Elevation Landbird Program (HELP) has been monitoring Bicknell's Thrush in New Brunswick and Nova Scotia since 2002. Analysis of HELP data has indicated that, since HELP began in 2002, Bicknell's Thrush has undergone significant annual declines along 26 survey routes in Nova Scotia. The decline is occurring both within and outside of Cape Breton Highlands National Park. Population monitoring in the industrial forest, which makes up about 44% of Nova Scotia's Bicknell's Thrush habitat, is, however, hampered by the rapidly changing habitat as clearcuts regenerate, undergo pre-commercial thinning, and then mature. The International Bicknell's Thrush Conservation Group is launching a new, range-wide monitoring program for Bicknell's Thrush in 2010 with a randomized sampling scheme and an updated, highly scientific protocol for measuring occupancy and detectability of Bicknell's Thrush. This program is called "Mountain BirdWatch" (MBW), and it may eventually replace HELP as a means of monitoring Bicknell's Thrush in the Maritimes, Canada and Internationally. In addition, the random route selection employed by MBW (using GRTS, or Generalized Random Tesselation Stratified) may help facilitate monitoring Bicknell's Thrush in rapidly changing industrial forest habitat.

It is suspected that one of the major causes of Bicknell's Thrush population decline is loss of wintering habitat in the Caribbean (especially the Dominican Republic and Haiti). However, very little is known about the migration pathways and wintering regions of Nova Scotia-breeding Bicknell's Thrush. The recent development of geolocator technology small enough for songbirds makes obtaining this type of information feasible. Geolocators take consistent readings of daylight timing for up to two years. The recovered data is then interpreted to determine latitude and longitude of the individual bird for every day the logger was attached and exposed to suitable sunlight.

#### **Goal**

Our goal in this project was to continue to track population change of Bicknell's Thrush in Nova Scotia through continued and improved monitoring, and to begin to learn more about factors that might be contributing to the observed decline by tracking migration routes and over-wintering sites of Nova Scotia-breeding Bicknell's Thrush through the use of geolocator technology. These activities will allow accurate assessment of species status in the coming years, which will prove extremely valuable in the recovery planning process, especially since the species was recommended for Threatened designation by COSEWIC in November 2009.

## **Project Objectives**

1. Undertake eighth (2009) and ninth (2010) years of HELP surveys along 26 pre-determined, long-term (since 2002) routes in Nova Scotia. Analyze data to determine if declines are continuing both within Cape Breton Highlands National Park and outside the park, as well as in natural forest and in industrial forest.
2. Work with the International Bicknell's Thrush Conservation Group to develop a means of monitoring Bicknell's Thrush in ephemeral industrial habitat, within the context of the new, range-wide monitoring program (Mountain BirdWatch).
3. Deploy geolocators on up to 20 after-second-year male Bicknell's Thrushes captured at Cape North NS in June 2009, with recapture in June 2010 to download the geocator data and assess migration movements and wintering locations.

## **Work Completed**

1. We undertook the 8<sup>th</sup> and 9th years of monitoring through the High Elevation Landbird Program and produced reports on the 2009 results. 2010 results will be reported on during Fall/Winter 2010-2011.
2. The International Bicknell's Thrush Conservation Group met in September 2009 and discussed the launch of Mountain BirdWatch in June 2010. A series of teleconferences and email discussions followed, and a list of sites to be monitored across the species' range was developed. In Nova Scotia, this included only four survey routes which were mapped, scouted, and surveyed in June 2010. All four survey routes fell within industrial forest habitat (none within Cape Breton Highlands National Park).
3. We deployed geolocators on four birds in Nova Scotia in 2009, and 7 birds in Nova Scotia in 2010. Two geolocators were retrieved in 2010.

## **Results**

### **Objective 1: High Elevation Landbird Program**

Results of the 2009 High Elevation Landbird Program indicate that Bicknell's Thrush is continuing to decline in Nova Scotia along survey routes both within Cape Breton Highlands National Park (19% significant annual decline) and outside of the park (12% annually, but not significant). These declines were noted in the revised COSEWIC status report and contributed to the recommended change in status from Special Concern to Threatened. The results of HELP are outlined in the latest report, available online at <http://www.bsc-eoc.org/library/acbithreport.pdf>. Results of the 2010 surveys are not yet available but will be reported on in Fall/Winter 2010-11.

### **Objective 2: Mountain BirdWatch**

Four of the 109 International Mountain Birdwatch routes selected in Winter 2009-2010 fell in Nova Scotia, in the managed forest lands south of Cape Breton Highlands National Park. These four routes were mapped, scouted and surveyed by BSC staff and partners in June 2010. No Bicknell's Thrush were detected on any of these survey routes. Data will be pooled with that collected across the Bicknell's Thrush range, thereby contributing to the international monitoring program.

### **Objective 3: Geolocators**

We deployed four geolocators on after-second-year (ASY) male Bicknell's Thrush in Nova Scotia in June 2009 (and five in New Brunswick). Two were deployed at Cape North and two in Cape Breton Highlands National Park (Bog Trail and Benjie's Lake Trail). In 2010, we recaptured three of the four geolocated birds, two of which still had their harness and geocator attached. We removed the geocator and harness from these birds, downloaded the data, and sent the data to our partners in Vermont for analysis.

Also in 2010, we deployed five new geolocators at Cape North. Finally, two days were spent on St. Paul Island, during which time four Bicknell's Thrush were caught and two new geolocators deployed. It is interesting to note that this work on St. Paul Island confirms that Bicknell's Thrush are indeed found on this island as there have been questions in the past as to whether the island hosts Bicknell's or Gray-cheeked Thrush.

Preliminary analysis of data retrieved from geolocators suggests that the data may be somewhat difficult to interpret, as forest songbirds such as the Bicknell's Thrush spend a lot of time in the shade. Movements in and out of shade can mask the sunrise and sunset events required to map the bird's location. We are working with partners from the International Bicknell's Thrush Conservation Group and beyond (i.e. Smithsonian Institute) to help solve this issue, and we hope to have some preliminary maps from the Nova Scotia geolocators by Winter 2010-11.

### **Assessment of achievements/lessons learned**

We have successfully implemented our project goals. The results of the High Elevation Landbird Program indicate that the Bicknell's Thrush continues to decline in Nova Scotia. Our data contributed to the Threatened status recommendation made by COSEWIC in November 2009. In terms of Mountain Birdwatch, four routes will not be enough to obtain population trends for Nova Scotia (which is not the goal of MBW) but these routes will contribute data to the Canadian and North American-wide monitoring program. The challenge of monitoring Bicknell's Thrush in industrial forest is not yet fully resolved; while the design of MBW allows the area of inference for results to include the entire range of the species, any changes in Nova Scotia and in particular, on industrial forest in Nova Scotia would take additional route selection (i.e. additional sampling within Bicknell's Thrush habitat in Nova Scotia) and many years of surveys to detect.

The effectiveness of geocator technology in tracking migratory movements of Bicknell's Thrush remains to be seen. Retrieving two units from Nova Scotia should be considered a great success, given the difficulties associated with catching the birds (two years in a row) and finding the geocator still attached. In 2010 we improved the design of the harness used to deploy the geolocators to avoid the units falling off the birds as apparently occurred in some cases (including one in Nova Scotia) with the 2009 birds.

### **Recommendations for follow-up**

It is important to continue monitoring this species in order to determine if our work and that of the International Bicknell's Thrush Conservation Group is having a positive impact. Whether the monitoring continues through the High Elevation Landbird Program or Mountain BirdWatch remains to be decided. Regardless, it is important to continue monitoring within protected areas (Cape Breton Highlands National Park) as well as in the industrial forest land south of the park, which, if MBW is chosen as the means of monitoring into the future, would necessitate sampling more habitat (i.e. creating more routes) in Nova Scotia. This is easily possible using the GRTS system already developed for MBW, but would require funding and personnel (potentially volunteers) to map, scout and survey the routes each year. It would also be extremely valuable (though logistically difficult) to conduct some surveys during the breeding season in the Pollets Cove/Aspy Fault provincial wilderness area, which contains about 10% of the Bicknell's Thrush range of habitat in Nova Scotia. Some of this area has been surveyed through the Maritimes Breeding Bird Atlas, but a strict focus on Bicknell's Thrush was not the goal. MBW routes would not fall in the Pollets Cove/Aspy Fault area because there are no roads or trails (which are required for accessing the routes annually).

An additional year of targeted field work is required in 2011 to retrieve the seven geolocators that were deployed on Nova Scotia birds in 2010. In particular, an expedition to St. Paul Island to retrieve the geolocators deployed at that site is warranted. This expedition should be planned to occur over 5-7 days so that the entire island could be searched for Bicknell's and/or Gray-cheeked Thrush. While we did confirm that Bicknell's Thrush are present on St. Paul Island, there is still the possibility that Gray-cheeked Thrush are also present elsewhere where we did not search, especially given the 2010 findings

of the Maritimes Breeding Bird Atlas showing Gray-cheeked Thrush breeding on coastal islands off Nova Scotia's Atlantic coast.

#### **Reports/publications related to our Species At Risk Conservation Fund grant:**

COSEWIC 2010. Update COSEWIC status report on the Bicknell's Thrush (*Catharus bicknelli*). Committee on the Status of Endangered Wildlife in Canada, Ottawa. (Authored by Aubry, Y., S. Paradis, J. Hart, K. McFarland, C. Rimmer, J. Paquet and B. Whittam.)

Hart, J.A., C. C. Rimmer, R. Dettmers, and R. Whittam, E. McKinnon and K. McFarland. 2010. A Conservation Action Plan for Bicknell's Thrush (*Catharus bicknelli*). International Bicknell's Thrush Conservation Group, July 2010. Available at: <http://www.bicknellsthrush.org/pdf/conservationactionplan.pdf>

Whittam, B. and Campbell, G. 2010. High Elevation Landbird Program 2009 report. Unpublished report by Bird Studies Canada (Atlantic Region), Sackville, NB. 18 pp. Available at: <http://www.bsc-eoc.org/library/acbithreport.pdf>

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