HIGH ELEVATION LANDBIRD PROGRAM
ANNUAL REPORT FOR NOVA SCOTIA SPECIES AT RISK CONSERVATION FUND
2013-2014

Prepared by Holly Lightfoot

Project Title: Improved monitoring and conservation for the Bicknell's Thrush in Cape Breton

Background

With a total population of around (125,000 individuals), approximately 38% of all Bicknell's Thrush (or close to 50,000 individuals) breed in the "krummholtz" forests of Eastern Canada (Bredin and Whittam 2009, Campbell and Stewart 2012). A high elevation landscape, this habitat is typically dominated by coniferous forests that are often stunted in growth and chronically disturbed by various means (e.g. windthrows, ice and snow damage, fire, and insect outbreaks; Rimmer et al. 2001). On occasion this species will breed in coastal habitat where harsh maritime conditions allow dense spruce-fir stands to dominate (COSEWIC 2009). Further, in Canada and Maine Bicknell's Thrush have been detected in regenerating clear cuts (Ouellet 1993, Nixon et al. 2001, Connolly et al. 2002, Gardiner 2006, Chisholm 2008, McKinnon 2009) where forestry practices mimic natural disturbances, but typically on a much larger scale. Unfortunately, regenerating clearcuts are typically not left to re-grow but are instead subjected to pre-commercial thinning; a practice used to reduce stem density (by as much as 95%) for the benefit of remaining trees. Following thinning, Bicknell's Thrush are restricted to small unthinned patches typically along edges (Aubry et al. 2011).

A ten-year report summarizing monitoring efforts from 2002 to 2011 in the Maritimes (Campbell and Stewart 2012) suggest that unlike the southern breeding population which is relatively stable, Bicknell's Thrush in Cape Breton are declining at an inconsistent rate, with low overall abundance and high between-year variability (Campbell and Stewart 2012). These results are supported by data collected during the second Maritimes Breeding Bird Atlas (2006-2010) which show substantial range shrinkage with Bicknell's Thrush being detected in 39% fewer squares in northern New Brunswick and 32% fewer squares on Cape Breton compared to the first Maritimes Breeding Bird Atlas 1986-1990 (Erskine 1992).

In 2011 a greater effort was made to match regional sampling protocol with international sampling protocol and Bird Studies Canada technicians began sampling routes following the internationally adapted Mountain Birdwatch (MBW) 2.0 protocol. This protocol identified potential Bicknell's Thrush habitat (using a Bicknell's Thrush distribution model developed by the Vermont centre for Ecostudies 2008) and then selected routes using a Generalized Random Tessellation Stratified (GRTS) sampling design. This was expanded in 2012 with old HELP routes discontinued and only new MBW 2.0 routes surveyed

Project goals and objectives

The goal of this project is to establish an effective monitoring program for Bicknell's Thrush in Cape Breton, with the power to detect population change, and used to evaluate ongoing recovery efforts.

To accomplish this, the following objectives were identified:

- Conduct 2nd year of Bicknell's Thrush monitoring in non-industrial Bicknell's Thrush habitat using Mountain BirdWatch 2.0 Protocol (developed in partnership with the International Bicknell's Thrush Conservation Group, IBTCG; outlined as a key activity in the Plan; and, key to tracking success of Bicknell's Thrush recovery efforts).
- Work with partners to refine Bicknell's Thrush distributional model for Cape Breton to better capture potential Bicknell's Thrush habitat in industrial forest in order to design a statistically-robust monitoring program for all of Cape Breton (particularly in industrial forest where Bicknell's Thrush are not currently monitored).
- Develop a relationship with new forestry company, Stern Partners Inc. (Port Hawkesbury Paper), operating on land previously managed by NewPage. This relationship will be integral to future stewardship initiatives related to implementing Best Management Practices (BMPs) for Bicknell's Thrush (key activity in the Plan).

Project achievements and results - 2013

Bicknell's Thrush surveys

In 2013, point count surveys were conducted along 28 routes (13 in am, 15 in pm) on Cape Breton during the month of June (Figure 1). A total of 26 Bicknell's Thrush were detected on 10 of 28 routes on Cape Breton (Figure 1), and Bicknell's Thrush mean relative abundance on Cape Breton across all routes was 0.55 ± 0.01SE (am = 0.65 ± 0.01SE, pm = 0.45 ± 0.01SE; Figure 2). The mean probability of detecting a Bicknell's Thrush across all routes on Cape Breton is 0.20 ± 0.01SE (Figure 3). Similar to the 10 years of HELP data analysis we found no difference between probably of detection in the morning or evening.

Model refinement

In 2011 BSC followed the international monitoring scheme, sampling the top five routes that fell out of the GRTS model; all five were within industrial forest. However, no detections of BITH on these routes and poor detection BITH on previous surveys in Cape Breton's industrial forest led BSC to make several modifications to the international sampling scheme. In 2012 and 2013 only routes in non-industrial forests (e.g. Cape Breton Highlands National Park, Cape North, and

Meat Cove) were surveyed. However, this modification results in a large proportion of potential Bicknell's Thrush habitat going un-surveyed. As such further model refinement is required.

In 2013 technicians conducted surveys (point counts) in 7 industrial forest stands south of Cape Breton Highlands National Park. These stands were selected because they were of an age that might support Bicknell's Thrush (last harvested in 2001 and 2002) and in locations that fell within both the company's harvest license and the Bicknell's Thrush potential habitat (from the GRTS model; Figure 4). A total of twelve 10-min point counts (spaced 250 m apart) with playback were done in these stands, with Bicknell's Thrush detected on three (25%).

Best Management Practices

Two meetings involving Bird Studies Canada staff and representatives from Port Hawkesbury Paper were conducted in late fall of 2013 and March 2014. These meetings were highly successful with both partners agreeing to work together to establish Best Management Practices for forest birds at risk including Bicknell's Thrush. In 2013 no pre-commercial thinning was scheduled and as such no surveys were conducted. However, Port Hawkesbury Paper supplied BSC with information on sites that fell within their harvesting license, within the Bicknell's Thrush potential habitat model, that were approximately 10 to 15 years since last cut (age of trees preferred by Bicknell's Thrush). These stands were then surveyed by technicians in June 2013 with good results (results presented above) and all survey results were communicated with Port Hawkesbury Paper staff. Follow-up meetings for continued cooperation are planned prior to the 2014 spring season.

Recommendations for follow-up

Bicknell's Thrush surveys

Due to difficulties accessing sites, slightly fewer than anticipated routes were surveyed this year, despite the addition of evening surveys. Five routes were dropped due to unlikely long term access. Two of these routes were established on previously viable trails that have since become overgrown and are not maintained. The other three routes are very difficult to access due to their location near the center of the park. However, 4 new routes were established and surveyed in 2013 and additional locations were scouted. New routes will be developed on these trails prior to the upcoming field season. With the further addition of routes in industrial forests in spring of 2014 we will better be able to monitor Cape Bretons Bicknell's Thrush population in coming years.

Model refinement

The combination of Port Hawkesbury Paper "year since last cut" data and Bicknell's Thrush potential habitat data proved successful in predicting areas where Bicknell's Thrush were present in 2013. These results suggest this is a viable approach and new routes will be established using this combination of data for the spring 2014 survey season allowing for broader scale coverage in Cape Breton's industrial forest. Furthermore, adding "year since last cut" as an important variable will help to develop predictive models for other areas in the maritimes.

Best Management Practices

Continued cooperation between Bird Studies Canada and forestry companies operating in Cape Breton's Highlands is essential for efficient monitoring on the industrial landscape but also important for identifying location where pre-commercial thinning should be delayed. Although there was no pre-commercial thinning slated for 2013 it is likely that the company will undertake these practices in the coming years and detection of Bicknell's Thrush prior to thinning is an important mitigation technique. For example, Bird Studies Canada technicians conducted pre-commercial thinning surveys in 25 patches in northern New Brunswick in 2013. Bicknell's Thrush were detected in 10 stands and thinning in these areas was delayed until after the breeding season (Lightfoot in preparation).

Literature Cited

Aubry, Y., A. Desrochers, and G. Seutin. 2011. Response of Bicknell's Thrush (*Catharus bicknelli*) to boreal silviculture and forest stand edges: a radio-tracking study. Canadian Journal of Zoology 89: 474-482.

Bredin, K. and B. Whittam. 2009. Conserving the Bicknell's Thrush. Stewardship and Management Practices for Nova Scotia's High Elevation Forest. Unpublished report by Bird Studies Canada (Atlantic Region), Sackville, NB.

Campbell, G. and Stewart, B. 2012. High Elevation Landbird Program 10-year Report. Unpublished report by Bird Studies Canada (Atlantic Region), Sackville NB.

Chisholm, S. E., and M. L. Leonard. 2008. Effect of forest management on a rare habitat specialist, the Bicknell's Thrush (*Catharus bicknelli*) Canadian Journal of Zoology 86: 217- 223.

Connolly, V., G. Seutin, J-P. L. Savard, and G. Rompré. 2002. Habitat use by the Bicknell's Thrush in the Estrie region, Quebec. Wilson Bulletin 114: 333-341.

COSEWIC. 2009. Unsolicited update: COSEWIC status report on the Bicknell's Thrush Catharus bicknelli in Canada, v + 41pp. Submitted to the Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON.

Erskine, A.J. 1992. Atlas of Breeding Birds of the Maritime Provinces. Nimbus Publishing Limited and Nova Scotia Museum, Halifax, NS.

Gardiner, R. J. 2006. The long-term effects of pre-commercial thinning on Bicknell's Thrushes and four other high elevation songbirds in the New Brunswick highlands. B.Sc. Thesis, Mount Allison University, Sackville, NB.

Lightfoot, H. in preparation. High Elevation landbid Program, 2013 Report. Unpublished report by Bird Studies Canada (Atlantic Region), Sackville NB.

McKinnon, Emily. 2009. Bicknell's Thrush (*Catharus bicknelli*) in managed forests: nest-site selection, diet, and co-occurrence with Swainson's Thrush (*C. ustulatus*). M.Sc. Thesis, University of New Brunswick, Fredericton, NB.

Nixon, E. A., S. B. Holmes, and A.W. Diamond. 2001. Bicknell's Thrushes (*Catharus bicknelli*) in New Brunswick clear cuts: their habitat associations and co-occurrence with Swainson's Thrushes (*Catharus ustulatus*). Wilson Bulletin 113: 33-40.

Ouellet, H. 1993. Bicknell's Thrush: taxonomic status and distribution. Wilson Bulletin 105: 545-572.

Stewart, B. 2013. High Elevation Landbird Program 2012-2013 Report. Unpublished report by Bird Studies Canada (Atlantic Region), Sackville NB.

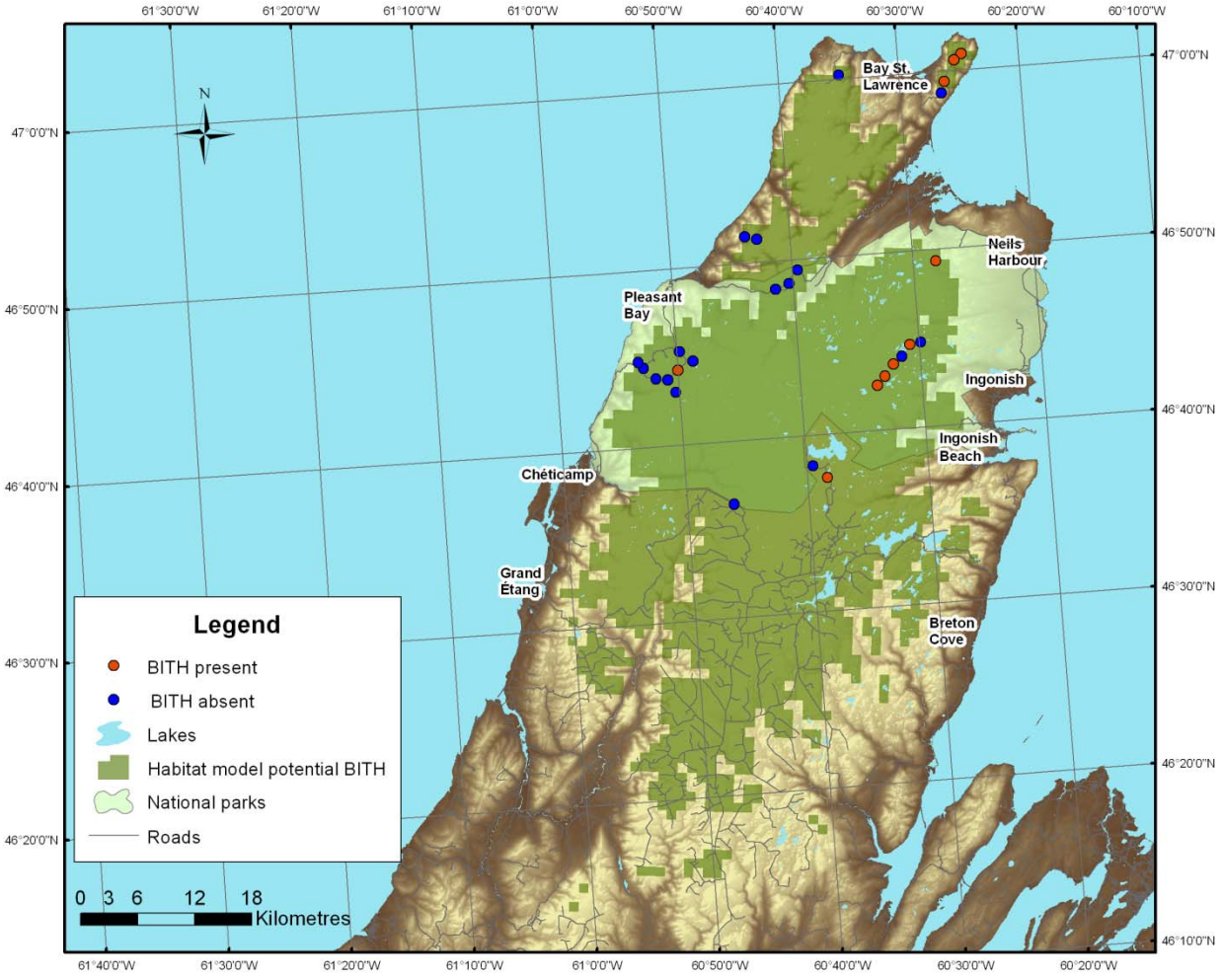

Figure 1. Cape Breton, showing potential Bicknell's Thrush habitat (dark green areas) and routes surveyed (red points where Bicknell's Thrush were detected, blue points where they were absent) in 2013.

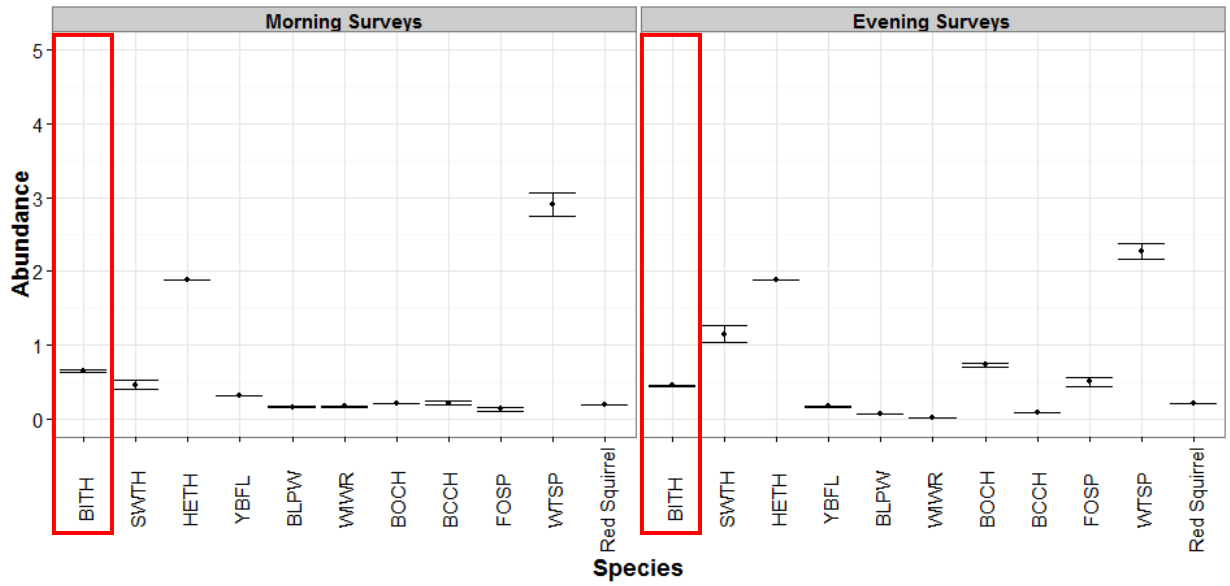

Figure 2. Predicted mean relative abundance (and standard error) of Bicknell's Thrush (BITH; outlined in red) and other high elevation species, on Cape Breton in 2013.

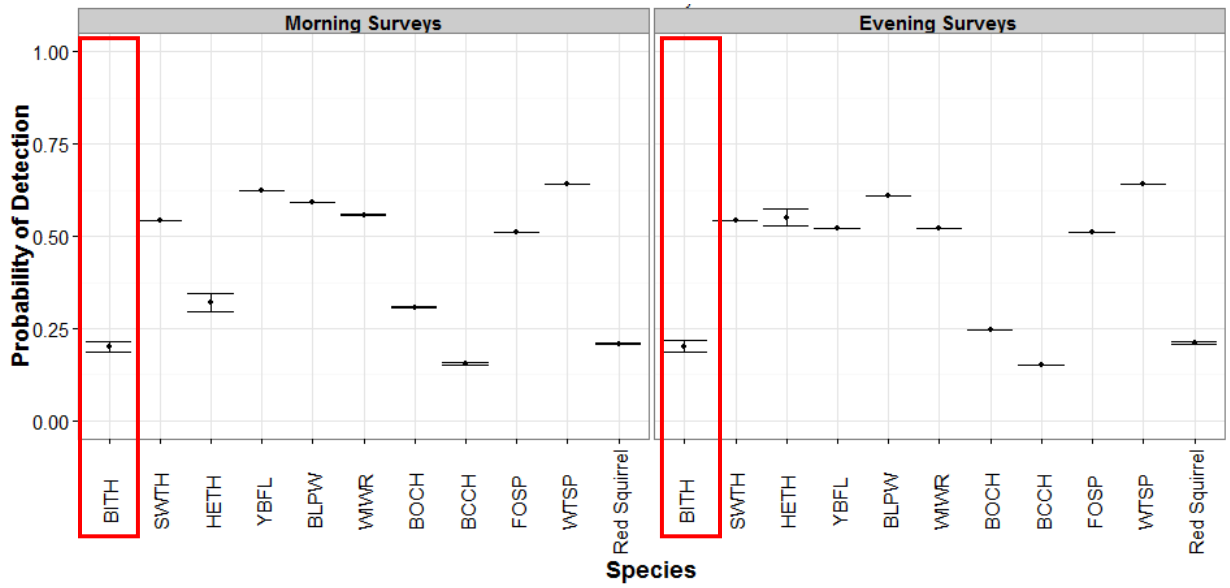

Figure 3. Mean probability of detection (and standard error) of species (including Bicknell's Thrush (BITH) in red), surveyed on Cape Breton in 2013.

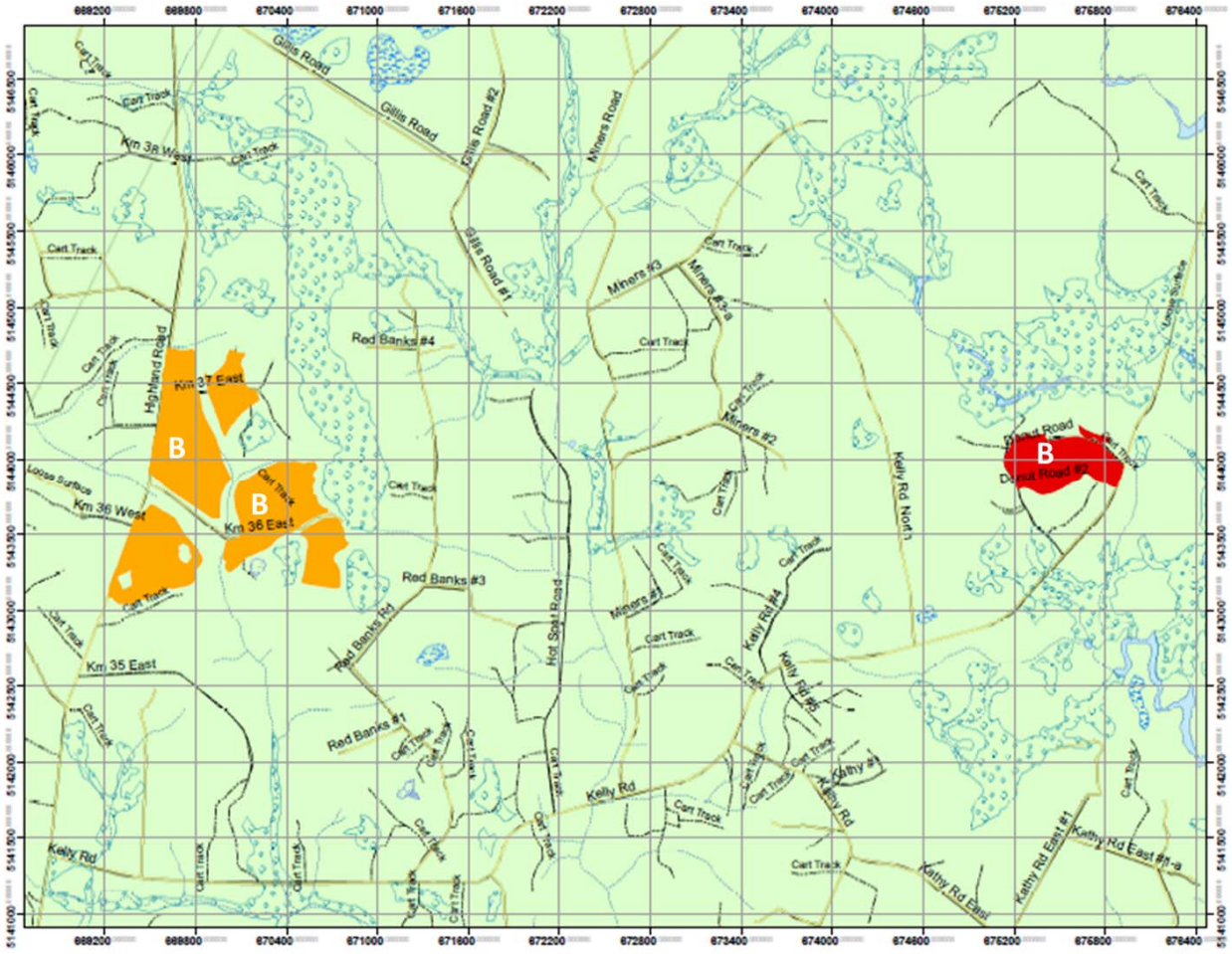

Figure 4. Stands surveyed for Bicknell's Thrush in Cape Breton's industrial forest. White "B" indicates stands were Bicknell's Thrush were detected.