

2015 Nova Scotia Habitat Conservation Fund.

Final report on activities.

Dr. Philip D. Taylor, Department of Biology, Acadia University, Wolfville, NS.

1) Project Goals and Objectives

With population declines observed in neotropical long-distance migratory birds, considerable effort is now being made to understand how demographic parameters vary across the full life cycle of these species. For migratory passerines, one of the most poorly known time periods is that between fledging and the initial stages of migration. Examinations of dispersal routes, habitat choices, differences between age-classes and species, selective pressures, and other qualitative aspects of the post-breeding period become important contributions towards increasing our knowledge of the population limitations of migrant songbirds

Our two main goals are to determine the scope and scale of post breeding movements of a long distance neotropical migrant (Blackpoll Warbler) and a related short-distance migrant (Yellow-rumped Warbler) using automated radio-telemetry, and to establish a marked population of Blackpoll Warblers on Bon Portage and Seal Islands to see how decisions made during the post-breeding period influence subsequent survival and reproduction. These goals stem from work done by our lab in 2014, where we tagged post-breeding Blackpoll Warblers on Bon Portage Island to determine how extensively they range away from their breeding grounds, and what habitat types and regions they are exploiting during this life stage.

Our 2015 objectives were:

- 1) Radio tag and track, throughout Nova Scotia, the Maritimes and the Gulf of Maine, 25 individuals each of Blackpoll Warbler and Yellow-rumped Warbler (15 young; 10 adults) from each of Borgles and Seal and Bon Portage (BP) Islands, during the month between cessation of breeding and initiation of migration (August-Sept), to compare movements between species, age-class, and islands.
- 2) For a subset of individuals tracked, determine where, and what habitats are being used by individuals during the post-breeding period.
- 3) Search for individuals tagged last year on Bon Portage Island to determine their fate.
- 4) Band Blackpoll Warblers on both Seal and BP with unique colour combinations and radio-tag a subset of those individuals.
- 5) Quantify reproductive output of breeding Blackpoll Warblers by observing marked individuals throughout the breeding period and finding their nests.

- 6) Continue objective 4 over a five-year period to calculate apparent survival for this species and determine the effect of carrying a VHF radio transmitter, as well as ascertaining the fates of a sufficiently large number of radio-tagged individuals, that we may link decisions made (e.g. the timing and extent of movements; the habitats visited) to subsequent survival and reproductive success.

2) An outline of the work completed

Mark-recapture

Work began in late May on Bon Portage and continued until July 31. During that time frame all resident Blackpoll Warblers were constantly monitored to determine territory occupancy, pairing status, and reproductive output via nest finding. All birds were re-sighted for bands and any un-banded birds were captured and colour banded. During that time period we colour banded 27 adults out of a likely 34 adults, and found 19 out of a likely 25 nests. Four radio-tagged birds from 2014 returned, 3 males and 1 female. One male and the female both successfully raised broods while the other two males disappeared shortly after arriving in late May. All nestlings originating from the nests found were banded for a total of 41 birds. The following habitat characteristics were recorded for nest locations: percent cover, percent living, percent conifer vs. deciduous, canopy height. As well, nest data was recorded; nest height, nest cover, substrate species, distance to trunk, and distance to edge.

During the first 2 weeks of June, we went to Seal Island to target net and colour band the resident Blackpoll Warblers. A total of 39 birds were captured and colour banded, all but one a male, using targeted playback.

Radio tagging and tracking

During the month of August, we caught and radio tagged resident Blackpoll Warblers and Yellow-rumped (Myrtle) Warbler on three different islands; Seal, Bon Portage and Borgles. See Table 1 for number and type of individual tagged.

Table 1. Number of individuals of specified species and age class radio tagged in August 2015 on three NS islands.

Species and Age	Bon Portage	Seal	Borgles	Total
BLPW – HY	20	14	8	42
BLPW – AHY	8	9	2	19
MYWA – HY	3	13	0	16
MYWA - AHY	0	1	3	4

Tagged individuals on Bon Portage were monitored by a local array of VHF radio receivers each bearing 2-3 Omni directional antennas setup around the island. Location can be inferred through triangulation of the tag signal using the slight time differential between the tags pulse detections at each antenna and receiver. The vegetation composition of the island was

mapped this year using remote-sensing techniques, and thus for these birds, thus local habitat use can be inferred.

On Seal and Borgles Island, tagged birds were monitored by VHF receivers connected to 9-element Yagi antennas. These antennas allow for presence/absence information over the scale of each island, and enable departure flight time, speed and direction to be calculated.

All tagged birds were monitored on a regional scale by the Motus VHF telemetry array. In the Nova Scotia/New Brunswick/Gulf of Maine region there were ~ 98 receivers active during the end of August and through September (Figure 1). These are primarily located in coastal areas, but we intentionally installed receivers inland from our coastal banding sites to detect if birds use inland habitats during that time period.



Figure 1. Map of VHF receivers in the Maritime and the Gulf of Maine regions.

3) Results

Data processing has just begun, and therefore we do not have any results yet from the tagged birds. A cursory look at the tracks reveal an impressive array of movements away from the breeding locations prior to migration.

4) Assessment of achievements and lessons learned, measured against the project goals and objectives

The success in meeting our proposed goals and objectives was varied.

For the first goal, of determining the scope and scale of post breeding movements of a long distance neotropical migrant (Blackpoll Warbler) and a related short-distance migrant (Yellow-rumped Warbler) using automated radio-telemetry, we only partially succeeded. As shown in the Table 1, we did not tag the desired numbers of Yellow-rumped Warblers. Our

sample size is likely too small for a rigorous comparison between the two species and across age-classes, however it should be large enough for us to infer some trends in the scale of movements of hatch year Yellow-rumped Warblers, as well as a comparison between hatch birds of both species on Seal Island. For Blackpoll Warblers, we tagged a sufficient number of both individuals of both age-classes, and we have sufficient local movement data from BP to analyze fine-scale habitat choices, as well as mapping region scale post-breeding movements. Next year we will attempt to repeat the same study. Tagging of Yellow-rumped Warblers will need to begin in July when adults are still territorial and can be specifically targeted. We will also refine our local array of VHF receivers to more accurately determine the fine-scale habitats that are being used on the island.

For the second goal, to establish a marked population of Blackpoll Warblers on Bon Portage and Seal Islands to see how decisions made during the post-breeding period influence subsequent survival and reproduction, we were highly successful. More than 80% of the entire population of Blackpoll Warblers on Bon Portage Island during the 2015 breeding season was colour banded and the desired sample size of radio tagged birds was met. On Seal Island, 135 individuals were colour-banded with an appropriate subset radio-tagged. Further, individuals that were radio-tagged in 2014 did return to BP, and they were monitored to determine their reproductive output and behavior. Due to our success in capturing a large sample on both islands, and the nature of the project (5-year study), the same approach will be used in 2016.