

## Report of Collecting Activities

Walter G. Ellison

I am studying molecular geographic variation in Bicknell's and Gray-cheeked thrushes to determine whether genetic interchange is interrupted among distant populations of these highly migratory birds. In particular the subdivided distribution of Bicknell's Thrush, a bird limited to the upper elevations of mountains over much of its range, suggests the possibility of isolation of populations and the fixation of genetic differences among them via drift. However migration provides an avenue for sufficient gene flow to genetically homogenize populations. I intend to provide evidence that gene flow has been aided by migration or is of such recent vintage that Bicknell's Thrush populations represent a single management unit. To answer this question I am using molecular techniques including the polymerase chain reaction (PCR) and DNA cycle sequencing to identify mitochondrial DNA (mtDNA) haplotypes, and characterize their distribution among populations. Because my sample of Gray-cheeked Thrushes is small (n=5) I use these birds as an outgroup to allow ingroup comparison of Bicknell's Thrush sequences.

I capture birds lured to mist nets by playback of aggressive male vocalizations. I then remove 100  $\mu$ l of blood from the medial wing vein, and release the bird essentially unharmed. I extract DNA from each sample with a protocol employing LiCl and chloroform:isoamyl alcohol. I amplify targeted regions of mtDNA with PCR and sequence the resulting products with an Applied Biosystems automated sequencer. I analyze the resulting sequences with a sequence alignment program, the phylogenetic inference program PAUP, and the population genetic program AMOVA (analysis of molecular variance).

This work took place in Mount Mansfield State Forest from 2 to 6 June 1993, 26 July 1993, and from 1 to 3 June 1994. On these occasions I worked closely with fellow Bicknell's Thrush researcher Christopher C. Rimmer of the Vermont Institute of Natural Science, Woodstock, Vermont. I have samples from 11 birds on Mount Mansfield, four from 1993 and seven from 1994. I collected samples on Shrewsbury Peak, Mendon on 17 and 19 June 1993, and on 10 June 1994 capturing four birds in 1993 and one in 1994. I have several encounters with sampled birds in subsequent years indicating that birds suffer no ill effects from my sampling. I also possess samples from 14 birds in the Adirondacks, 11 from the White Mountains (10 from the Presidential Range), and 18 birds from the Catskills.

I have obtained 430 base pairs of sequence in the mtDNA control region (a.k.a. the D-loop) from 15 Bicknell's Thrushes and three Gray-cheeked Thrushes. I have identified nine haplotypes in Bicknell's Thrush, and two in Gray-cheeked Thrush. The shared haplotype in Gray-cheeked Thrush was found in a bird from central Labrador and another from the Northern Peninsula of Newfoundland. My data suggest no mtDNA basis for the current subspecific distinction between Newfoundland and eastern continental Gray-cheeked Thrushes. In Bicknell's Thrush there are two poorly differentiated groupings with broad geographic affinities. One group represents a series of haplotypes from the White Mountains (New Hampshire), the southern Green Mountains (Vermont), and the Catskill Mountains (southeastern New York). The second group consists of haplotypes from Mount Mansfield (Vermont) and the Adirondacks (northern New York). Gene flow appears to be high within these geographic groups, but I need to subject these preliminary data to population genetic analysis before I can make a more conclusive statement about putative gene flow.

Bicknell's Thrushes Sampled on Mount Mansfield and Shrewsbury Peak  
June 1993 and June 1994

Walter G. Ellison – Principal Investigator

1993

<u>Location</u>	<u>USFWS Band Number</u>	<u>Collection Date</u>
Mt. Mansfield	1471-4917	2 June
“ “	1161-17715	3 June
“ “	1161-17716	4 June
“ “	1161-17717	5 June
“ “	1161-17722	17 June
“ “	1161-17723	17 June
“ “	1161-17724	19 June
“ “	1161-17725	19 June

1994

Mt. Mansfield	1471-7932	1 June
“ “	1471-7921	1 June
“ “	1471-7901	2 June
“ “	1471-7916	2 June
“ “	1471-7937	2 June
“ “	1471-7904	3 June
“ “	1471-7938	3 June
“ “	1161-17742	10 June