Surveys and Monitoring for the Hiawatha National Forest: FY 2012 Progress Report

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Michigan Natural Features Inventory
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For:
Hiawatha National Forest

Grant/Agreement #09-CS-11091000-031

15 October 2012

Report Number 2012-13

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan Natural Features Inventory

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

Suggested Citation:

Cuthrell, D.L., M.R. Penskar, and Joelle L. Gehring. 2012. Surveys and Monitoring for the Hiawatha National Forest: FY 2012 Progress Report. Michigan Natural Features Inventory Report No. 2012-13, Lansing, MI. 8 pp. + appendices.

Cover photograph: Potential Lakeside daisy translocation site, Hiawatha National Forest, Acklund Road Fen, Mackinac County, MI, 31 August 2012. Inset photo: Hine's emerald dragonfly (*Somatochlora hineana*). Photos by Michael R. Penskar and David L. Cuthrell

MNFI Progress Report FY2012

List of projects selected in consultation with Hiawatha National Forest Staff:

1) Raptor Nest Checks and Productivity Surveys (East and West Units)
2) Hine's Emerald Dragonfly Site Visits/Counts (East Unit)
3) Dwarf Lake Iris Assessment in Wedens Bay Candidate RNA (West Unit)
4) Houghton's Goldenrod Status Assessment (East Unit)
5) Assessment of Proposed Sites for Lakeside Daisy Reintroduction (East Unit)
6) Niagara Habitat Monitoring - for rare snails and ferns and placement of data loggers (East Unit)
7) Mist-net Assessment of Bat Diversity in the Hiawatha National Forest (East and West Units)

1. Raptor Nest Checks and Productivity Surveys

Both the Red-shouldered Hawk (*Buteo lineatus*, state threatened) and Northern Goshawk (*Accipiter gentilis*, special concern) are Regional Forester Sensitive Species (RFSS) with many known nesting occurrences within the east and west units of the Hiawatha National Forest (HNF). During the 2012 surveys a total of 127 nests or old nesting territories (81 East, 46 West) were checked for breeding use with a subset of those (active or possibly active nests) visited a second time for nest productivity. Initial nesting surveys (conspecific call playbacks) were conducted during late April and early May 2012 with productivity surveys (using telescoping fiberglass pole and video camera to inspect nests) during mid June 2012 (14th – 23rd). All nesting information was provided to HNF at the completion of the surveys. During the initial survey a total of 17 active RSHA nests were located (6 West, 11 East), 3 NOGO (1 West, 2 East), and 4 RTHA (1 West, 3 East). Nest success is summarized below in table 1.

Table 1. 2012 Nesting Season Summary of nesting raptors in the Hiawatha National Forest.

RSHA	Active Nests	Successful Nests	Number of young	young/active	young/ successful	
	24	17	34	1.42	2.00	71% of nests successful
NOGO	4	3	7	1.75	2.33	75% of nests successful

2. Hine's Emerald Dragonfly (HED) Site Visits/Counts

Breeding site surveys and counts were conducted at 3 sites within the HNF in early August 2012. Known Hine's emerald dragonfly (*Somatochlora hineana*, state endangered, federally endangered) sites were field checked for presence of HED during the summer period when adults are active and most easily observed. Surveys were

conducted from August 6-8, 2012 and involved meandering thorough HED sites while carrying a handheld GPS unit. This allows one to create a track polygon of the path covered while surveying. In addition, every HED and other *Somatochlora* species were marked with a waypoint. These maps are included in **Appendix I.**

HED were found at 2 of the 3 sites (Table 2). Now that survey tracks have been established it may be easier to track the population levels at these sites. At a minimum, it was essential to re-visit these occurrences to help update the MNFI Biotics database as well as to inform the HNF. Maps are included in Appendix I.

Table 2. Sites surveyed for Hine's Emerald Dragonfly, August 2012 and survey results.

Site Name	Observer	Date	HED seen	Comments
Castle Rock Road	D. Cuthrell	06-Aug-12	2	Very dry in the area with just a small amount of water mostly along rivulet channels in fen
I-75 West Marl Fens	D. Cuthrell	07-Aug-12	0	Habitat still present but much of area overtaken by aggressive cattails.
Horseshoe Bay	D. Cuthrell	08-Aug-12	2	mostly males hover guarding pools of water throughout fen.

3. **Dwarf Lake Iris Assessment in Wedens Bay Candidate RNA**

Dwarf lake iris (*Iris lacustris*) is a federal and state threatened species endemic to the northern Great Lakes region. This globally rare RFSS ranges in an arc, following the Niagara Escarpment formation, from the tip of the Door Peninsula in Wisconsin through

the Michigan Straits region to the Bruce Peninsula in Ontario, Canada. During late May of 2012, surveys were conducted within and adjacent to the Wedens Bay Candidate Research Natural Area (cRNA) to assess the status of a significant dwarf lake iris occurrence, the westernmost known for the state along the Lake Michigan shoreline. During the *Iris lacustris* status assessment, a flora list was compiled to provide additional data for the RNA designation process. Systematic survey of the full extent of Wedens Bay with USFS staff resulted in the identification and mapping of numerous additional dwarf lake iris colonies, as shown in Appendix II, Map 1, indicating that the occurrence is more or less contiguous throughout the bay in close proximity to the shore. No additional rare species were identified during the three days of surveys. However, potential habit for such species as limestone oak fern (*Gymnocarpium robertianum*, state threatened) and calypso orchid (*Calypso bulbosa*, state threatened) was present and these RFSS species should continue to be sought.

4. Houghton's Goldenrod Status Assessment

Houghton's goldenrod (*Solidago houghtonii*) is a federal and state threatened species endemic to the northern Great Lakes region, primarily ranging from the Straits area in northern Michigan to southern Ontario where it occurs primarily on Manitoulin Island and the tip of the Bruce Peninsula in Georgian Bay. As a RFSS species it is well represented in the Hiawatha Forest, with populations occurring in both the West and East Units. In late August 2012, status assessments were conducted in sites delineated in the East Unit as identified by the St. Ignace Ranger District botanist. Preliminary review of the provided maps and specific locations indicated that based on the days allotted for the late season work (3 field days), it would not be possible to survey the 11 known

Houghton's goldenrod sites and accomplish the additional task of assessing two proposed Lakeside Daisy reintroduction sites within the Horseshoe Bay Wilderness tract. Thus prior to survey these sites and tasks were reviewed with the district botanist to determine primarily the priority sites for Houghton's goldenrod, with one day committed to assessing the proposed Lakeside daisy reintroduction areas.

Surveys were completed for 7 of the 11 delineated Houghton's goldenrod occurrences, as shown in Table 3. Colonies were not found despite survey at ATC North and ATC South, including one additional area where Stantech staff (encountered at the Castle Rock site during surveys) suggested additional survey south of the ATC South site. Potential habitat was clearly present in the aforementioned sites but only Ohio goldenrod was identified, and thus these sites should be re-assessed in the future. Houghton's goldenrod was abundant at Castle Rock, Horseshoe Bay North, Rabbitback Point, and particularly Horseshoe Bay South, the latter occurrence extending in abundant patches over virtually the entire area covered to the north, and it likely extends through the Bay, constituting one of the densest populations known for the species in Michigan. Maps for the seven sites covered, including survey routes and waypoints, are provided in Appendix III.

Table 3. Sites surveyed for Houghton's goldenrod, August 2012 and survey results.

Site Name	Observer	Date	HG Observed	Comments
ATC North	M. Penskar	29-Aug-12	None found	No HG identified despite careful survey; marl areas very drawn-down and dry. Only Ohio goldenrod observed
ATC South	M. Penskar	29-Aug-12	None found	No HG observed but good habitat found and thus the area should be re-surveyed and monitored
Castle Rock	M. Penskar	29-Aug-12	Locally abundant	HG abundant in site and in adjacent areas to east and south, and also found and mapped in powerline while accessing ATC North site
Horseshoe Bay East	M. Penskar	31-Aug-12	Small colonies observed in west region of fen	Partial survey, new HG colonies indentified during Lakeside daisy reintroduction site assessment in NW portion of Acklund Fen. Did not access areas on south side of Grosse Point peninsula
Horseshoe Bay North	M. Penskar	31-Aug-12	Patchy to abundant on lakeshore	Scattered to large colonies found along rocky to sandy lakeshore in known areas and beyond
Horseshoe Bay South	M. Penskar	30-Aug-12	Abundant throughout Bay	Continuous and abundant from south portion of Bay to extent of survey and likely extends through entire Bay; 100,000s of plants
Rabbitback Point	M. Penskar	28-Aug-12	Locally abundant	Abundant in fen beyond mapped polygon and continuous along lakeshore well north; more survey to south recommended

5. Assessment of proposed sites for Lakeside daisy reintroduction

A third task completed for late season surveys consisted of a site assessment of two potential reintroduction/translocation areas identified in the northern region of the Horseshoe Bay Wilderness Area. These open marly areas, also known to support populations of HED, contain microhabitats and edges or ecotones (see above) that floristically and ecologically emulate the habitat the species currently occupies adjacent to the only known Michigan site on Brevort Lake Road. Two discrete areas in the western region of this northern fen complex were delineated previously by USFS ranger district staff (S. Huebner) to meet the Forest Plan goal of establishing new colonies. The initial site assessment by S. Huebner was conducted September 30, 2009. On August 30, 2012 a survey was conducted to further assess the site and determine if potential microhabitats were present. Maps 1-2 in Appendix IV depict the survey routes conducted within the northern fen complex. A plant species list was compiled to augment the list prepared by Huebner, for further comparison with the known Lakeside daisy site. It was determined that suitable microhabitat does appear to occur within this complex, such at the ecotones at the edges of the open marl areas, as shown in the report cover page photo, and that the best such microtopography was observed in the southeasternmost of the two delineated sites. Also, while conducting surveys, hyssop-leaved fleabane (*Erigeron hyssopifolius* state threatened) was noted, which had been observed by S. Huebner, and new sites were also discovered in these areas for three additional RFSS species, butterwort (*Pinguicula vulgaris*, state special concern), Houghton's goldenrod (an extension of the Horseshoe Bay East occurrence), and black crowberry (*Empetrum nigrum*, state threatened).

6. Niagara Habitat Monitoring - for rare land snails and ferns and placement of data loggers

Vegetation monitoring, as outlined in Alternative 2 of the Niagara EIS, was initiated to develop the methodology needed to understand the changes that may occur in karst feature habitat due to vegetation management. Specifically, this monitoring was designed to address microhabitat conditions within karst feature habitat and how those conditions may be affected by vegetation management with respect to changes in light intensity, ground temperature, relative humidity, and moss cover between treated and untreated sites.

After reviewing the monitoring plan and the prescribed timber sales, sites were selected for sampling with the assistance of Steve Sjorgen and Stephanie Blumer (office) and Derek Huebner (field). Sampling plots were circular and 1/10 of an acre (11.3m radius) (James and Shugart 1970). Sampling included the collection of overall plot level and three 1m² plots along the cliff/boulder face where rare ferns typically would be growing or rare land snails were likely to occur (Figure 2). Overall plot level data, measurements focused on forest structure and species composition. Canopy heights for five canopy dominants were measured. Tree density and composition was measured in two categories tree (dbh $\geq$ 3.5 inches) and subcanopy (dbh < 3.5 inches). Other overall plot level measurements included percent canopy closure, plant species lists and coarse woody debris (CWD). Percent canopy closure was estimated along the cardinal directions from the plot center. Ocular tube readings of canopy conditions were taken at

paced intervals five times in each cardinal direction. The ratio of hits to misses in the ocular tube gave the percentage canopy cover for that plot. No analyses have been completed at this time but data has been summarized (Table 4).

To address the differences that may occur after the different treatments, we sampled at a total of 16 sites (8 Option 2, 8 Option 3). In conjunction with the sampling we placed data loggers at a total of 30 sites (8 reference sites, 8 Option 2, 8 Option 3, and 6 Control sites). Two data loggers were placed at each site at the plot center. One data logger placed at the top of the cliff or boulder recorded temperature and light intensity while a second data logger placed at the base recorded both temperature and relative humidity. All data loggers were placed in the field in July (17-31) and all were collected on August 9, 2012. Data has been offloaded from the devices and will be summarized and preliminary analysis will occur during the winter of 2012-12.

7. Mist-net Assessment of Bat Diversity in the Hiawatha National Forest

Understanding bat activity patterns in areas that hold potential for wind farm development will help inform wind developers and resource managers as to the risk of bat fatalities as well as inform the specific placement of turbines within a proposed project area. Due to the potential for bat fatalities at future wind energy facilities and the consequent need for careful planning, the Michigan Department of Natural Resources contracted The Michigan Natural Features Inventory (MNFI) to collect information on bat activity in the upper peninsula of Michigan (hereinafter "the Project Area").

Nine species of bats live in Michigan, including the five species that are most commonly killed at wind turbines. The nine Michigan species are eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), eastern pipistrelle (*Perimyotis subflavus*), big brown bat (*Eptesicus fuscus*), little brown bat (*Myotis lucifugus*), Indiana bat (*M. sodalis*), northern long-eared bat (*M. septentrionalis*), and evening bat (*Nycticeius humeralis*). With the exception of the Indiana bat and the evening bat, all of these species are likely to be detected in the central upper peninsula of Michigan. The eastern pipistrelle is listed as a species of "special concern" by MNFI. Furthermore, Michigan's Wildlife Action Plan labels this species, as well as the eastern red bat, hoary bat, silver-haired bat, and northern long-eared bat, as species of "greatest conservation need".

Some monitoring data have already been collected in the upper peninsula of Michigan using mobile acoustic bat surveys. These surveys involved the placement of bat acoustic detectors on vehicles and driving along transects through survey areas. We expanded this monitoring effort using a different method, mist-netting, that allows access to more remote areas and habitats.

Netting procedures followed the US Fish and Wildlife Service (USFWS) (2007) guidelines for netting of Indiana bats to determine the presence, or likely absence, of this species in an area. These procedures, as used in this study, are summarized as: 1) netting was conducted during the period of 28 July – 8 August 2012; 2) for each sampling location a net set of 2 triple-high mist nets were used (i.e. each pole set-up consisted of 3

12-meter wide, stacked mist nets for an effective height of 21 feet); 3) within a sampling location (i.e. net set), each triple-high net was at least 90 meters from its twin; 4) within a woodlot, net sets were spaced as far apart as possible, while still meeting requirements for high probability of capture (proximity to potential roost trees, within travel corridors, etc.); 5) nets were opened at dusk and monitored for at least 5 hours; 6) netting was not conducted on rainy nights (no excessively windy or cold nights were encountered during the netting period); and 7) nets were checked for bats as often as practicable (usually every 30 minutes), allowing for prompt processing of captured bats.

Each bat captured was initially identified to species or group via general appearance and verified by checking the individual's morphological characteristics with the field key contained in Baker (1983). The following data were recorded for each bat captured: species, gender, reproductive condition, stage of maturity, forearm length, ear length, tragus length, and weight. One individual bat escaped while field staff were extricating it from the net. A positive species identification based on field characteristics (size and coat color) of the individual was made before the escape, the bat was included in the tally of captures, though detailed information was not collected.

Due to the threat of white nose syndrome (WNS), Bat Conservation International WNS Summer Bat Survey Protocols (Tyburec 2010) were followed to avoid possible contamination of individual bats; however; no suspected evidence of WNS was found in any captured bat.

Thirty-two bats of four species were captured during mist-netting in the Project Area. In order of capture frequency, these were: northern long-eared myotis, eastern red bat, little brown bat, and big brown bat (Table 1). No Indiana or evening bats were netted in the Project Area. The result that neither species was captured in the area is consistent with the known historic occurrence of these species in the Project Area and is consistent with the conclusion that the Indiana bat and the evening bat are apparently absent from the sampled sites.

Literature Cited

Baker, R. H. 1983. Michigan Mammals. Michigan State University Press. East Lansing, Michigan.

James, F.C. and H.H. Shugart, Jr. 1970. A quantitative method of habitat description. Audubon Field Notes 24:727- 736.

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Tyburec, J. 2010. *White Nose Syndrome Summer Bat Sampling Protocols.* Bat Conservation International. Austin, Texas.

U.S. Fish and Wildlife Service (USFWS). 2007. *Indiana Bat (Myotis sodalis) Draft Recovery Plan: First Revision.* U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp.

Table 4. Summary of bat captures, by species, at each netting site, and associated natural community type within the HNF, 2012.

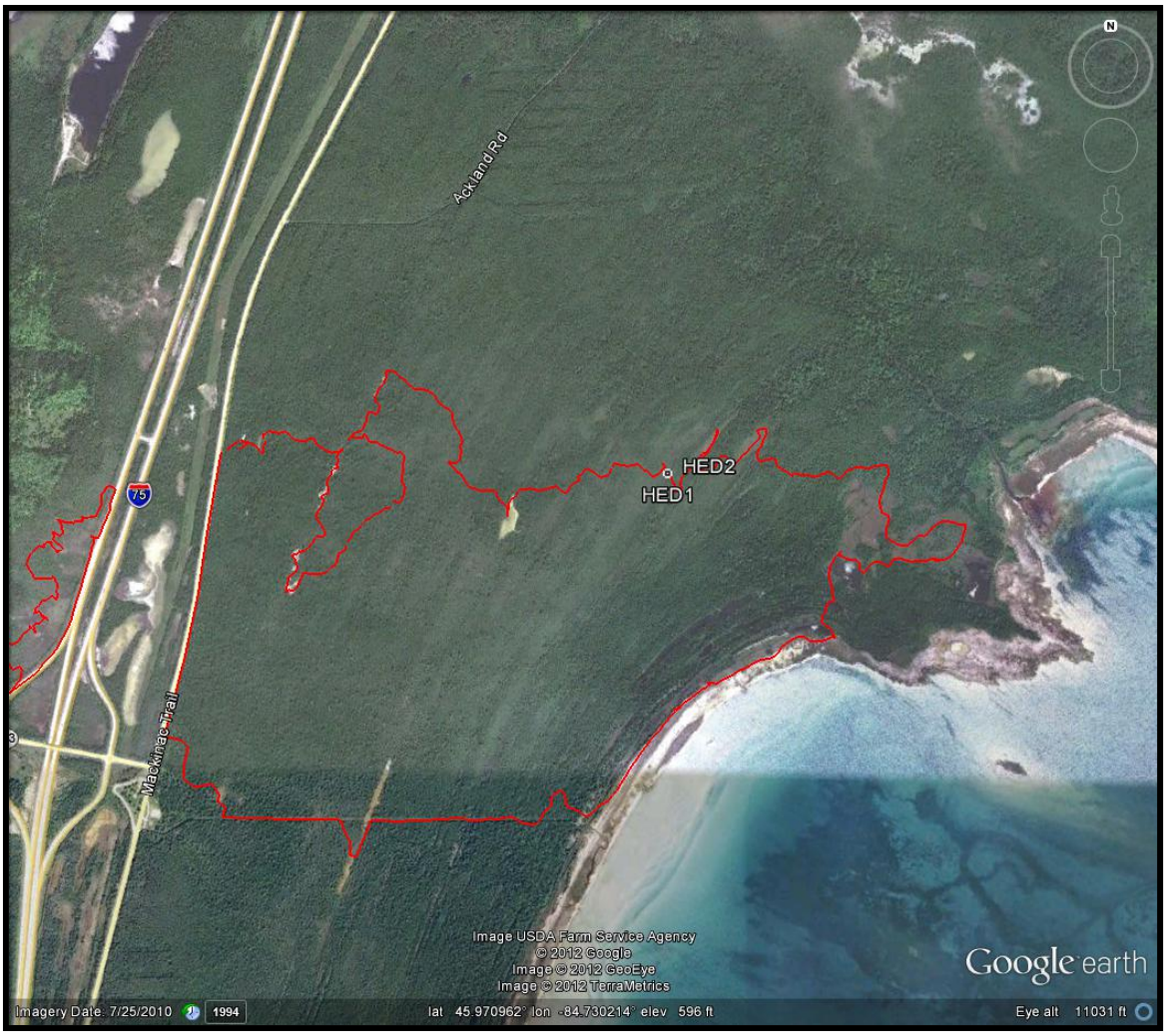
Sampling Point (lat, long)	Date of 1st net night	Date of 2nd Net Night	Michigan Natural Community	little brown bat	big brown bat	northern long-eared myotis	eastern red bat
N1 (45.903, -84.777)	7/28/12	7/29/21	Poor Conifer Swamp				
N2 (45.903, -84.777)	7/28/12	7/29/12	Poor Conifer Swamp				
N3 (46.127, -84.782)	7/30/12	7/31/12	Mesic Northern Forest	2			
N4 (46.127, -84.782)	7/30/12	7/31/12	Mesic Northern Forest				
N5 (46.172, -84.864)	8/1/12	8/2/12	Dry-mesic Northern Forest		1	5	1
N6 (46.172, -84.864)	8/1/12	8/2/12	Dry-mesic Northern Forest			3	4
N7 (46.047, -86.777)	8/3/12	8/4/21	Mature Pine Plantation	1		2	1
N8 (46.047, -86.777)	8/3/12	8/4/12	Mature Pine Plantation			2	
N9 (46.145, -86.808)	8/5/12	8/6/12	Mesic Northern Forest	2		5	1
N10 (46.145, -86.808)	8/5/12	8/6/12	Mesic Northern Forest			2	
			Totals =	**5**	**1**	**19**	**7**

Appendix I. Maps of the Hine's Emerald Dragonfly surveys 2012.

Map 1. Summerby Swamp HED locations and route taken on 6 August 2012.

Map 2. Route taken at the I-75 West Site, 7 August 2012, no HEDs seen.

Map 3. HED locations and route taken at the Acklund Road Site, 8 August 2012.



Appendix II. Maps of the Dwarf Lake Iris surveys 2012.

Map 1. Dwarf lake iris locations recorded during Wedens Bay surveys, May 28---2012.

Appendix III. Houghton's goldenrod surveys 2012.

Map 1. Houghton's goldenrod locations and route taken at Rabbitback Point August 28, 2012.

Map 2. Houghton's goldenrod locations and route taken at Castle Rock, August 29, 2012

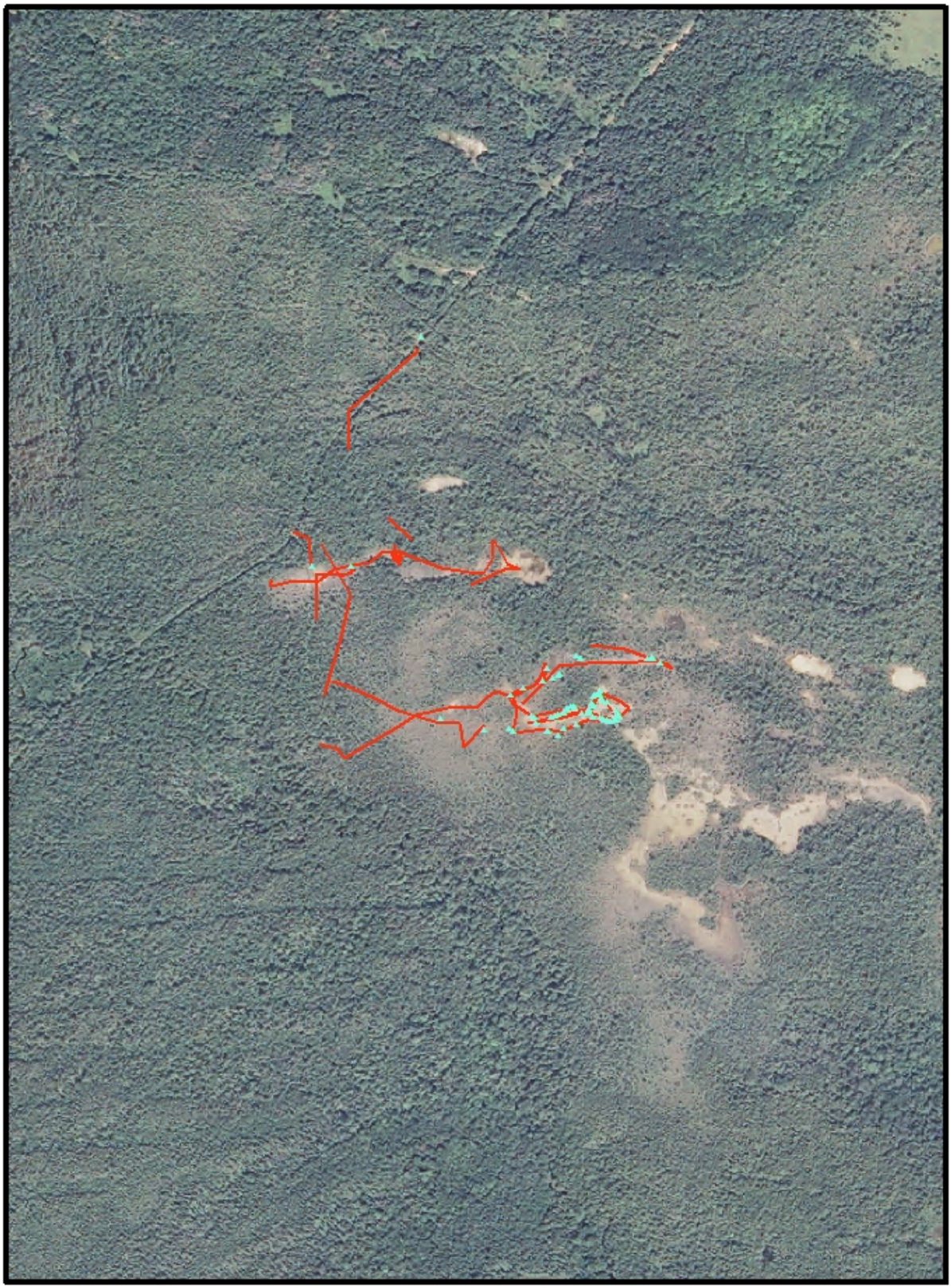
Map 3. Houghton's goldenrod locations and route taken at ATC North, August 29, 2012. No plants of this species were observed during the inventory.

Map 4. Houghton's goldenrod locations and route taken at ATC South, August 29, 2012, where no plants of this species were observed during the inventory.

Map 5. Houghton's goldenrod locations and route taken at Horseshoe Bay South, August 30, 2012.

Map 6. Houghton's goldenrod locations and route taken at Horseshoe Bay North, August 30, 2012.

Map 7. Houghton's goldenrod locations (embedded here with other points for black crowberry, butterwort, and potential microhabitats for Lakeside daisy introductions) and route taken at Horseshoe Bay East, August 31, 2012. [see comments under Map 2 in Appendix V]



Appendix IV. Maps of the Lakeside Daisy reintroduction site surveys 2012.

Map 1. Proposed reintroduction site 1, Horseshoe Bay Wilderness, August 30, 2012.

Map 2. Proposed reintroduction site 2, Horseshoe Bay Wilderness, August 30, 2012. Points include locations for Houghton's goldenrod (as part of Horseshoe Bay East occurrence), butterwort, black crowberry, and identified microhabitats for Lakeside Daisy plants.