Rare Species Surveys of the U.S. Geological Survey Great Lakes Science Center, Hammond Bay Biological Station, Millersburg, Michigan

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Cover photograph by David L. Cuthrell (Shoreline with Houghton's goldenrod [*Solidago houghtonii*]), 18 September 2014.

INTRODUCTION

In summer 2014, Michigan Natural Features Inventory (MNFI) contracted with Sanderson Stewart to conduct surveys for threatened, endangered, and special concern (TES) plants and animals at the United States Geological Survey's Hammond Bay Biological Station (HBBS) near Millersburg, Presque Isle County, Michigan. These surveys were focused on habitats within a project footprint zone associated with the repair, replacement, and complete renovation of the HBBS Wet Lab Facility. (Figure 1). Following a review of the MNFI natural heritage database (MNFI 2014), MNFI staff defined survey targets and implemented surveys on 18 September 2014.

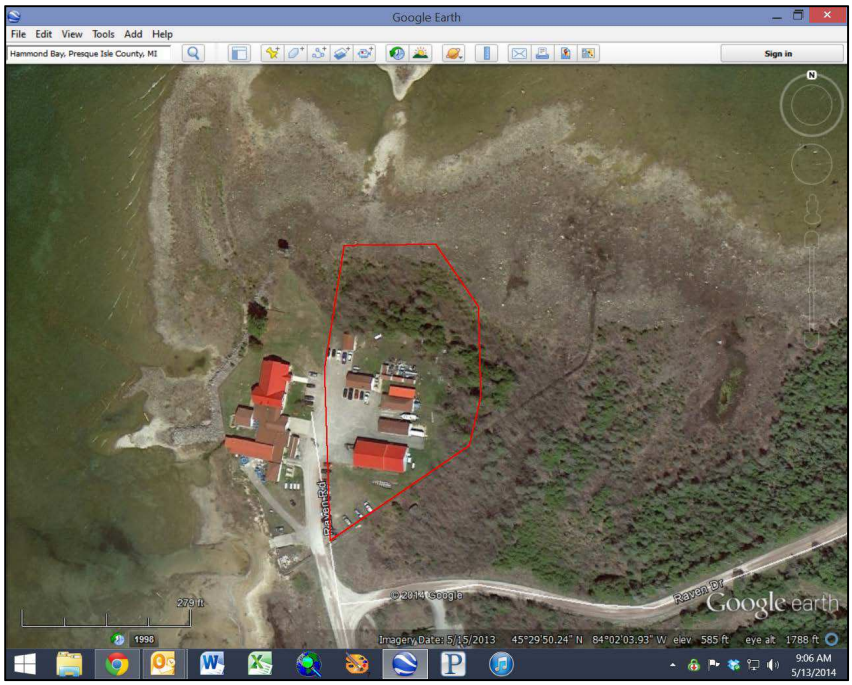

Figure 1. Hammond Bay Biological Station (HBBS) and project footprint zone (red line).

METHODS

Rare Plant Surveys

MNFI conducted meander surveys on 18 September 2014 to document the presence of threatened, endangered, and special concern (TES) vascular plant species within the footprint area, targeting species likely to occur in coastal areas including the federally and state threatened Houghton's goldenrod (*Solidago houghtonii*), the federally and state threatened Pitcher's thistle (*Cirsium pitcheri*), and the state threatened Lake Huron Tansy (*Tanacetum bipinnatum* [*T. huronense*]). We also documented all non-listed vascular plant taxa identified in the field.

Rare Animal Surveys

Three rare animals were the focus of animal surveys: the state special concern Bald Eagle (*Haliaeetus leucocephalus*), the state threatened Lake Huron locust (*Trimerotropis huroniana*) and the state special concern and federal candidate Eastern Massasauga rattlesnake (*Sistrurus catenatus catenatus*).

Bald Eagle nest surveys were conducted by two observers scanning all the trees in the footprint area for stick nests. Meander visual surveys for Eastern Massasauga surveys were conducted throughout the construction footprint area. Lake Huron locusts are only found on sandy, dunes along the Great Lakes shorelines (Rabe 1999). Surveys for this species consisted of meandering through the proposed project footprint area, focusing specifically on any sand dunes, sandy spits, or other areas with exposed sands.

FINDINGS

Rare Plant Surveys

Surveys documented the presence of one protected species, the federally and state threatened Houghton's goldenrod (*Solidago houghtonii*) (Figure 2). The species was locally common on raw, exposed sand, gravel, and cobble above the marsh zone along the Lake Huron shoreline. Population densities were relatively low (estimated <0.1 plants/m^2) in the relatively well-vegetated inland cobble zone and increased in wetter, less vegetated substrates shoreward, with densities estimated to exceed 10 plants/m^2 (or even 100 plants/m^2 where seedlings were abundant) locally (Figure 3). These plants are part of a larger population first documented in 1979 that extends along the Lake Huron shoreline at least 1 mi WSW from HBBS, and presumably continues along the shoreline E of HBBS where surveys have not been conducted.

Two other listed vascular plant taxa, the federally and state threatened Pitcher's thistle (*Cirsium pitcheri*) and the state threatened Lake Huron tansy (*Tanacetum bipinnatum* [*T. huronense*]) have also been reported from the vicinity of HBBS, although neither species was documented during the meander surveys. Both species prefer open dunes and sand beaches, habitats which primarily occur S and W of HBBS outside the project zone. No other federal or state listed vascular plants were observed within the project zone. A Floristic Quality Assessment (Reznicek et al. 2014) including a list of vascular plant species is included in the Appendix.

Figure 2. Houghton's goldenrod (*Solidago houghtonii*) at HBBS. This species can be distinguished from the more common Ohio goldenrod (*S. ohioensis*), also present at the site, by its larger rays and scabrous-hispidulous pedicels (not shown).

Figure 3. Habitat occupied by Houghton's goldenrod within and adjacent to project footprint zone. Yellow-hatched area (est. <0.1 plants/m^2). Blue-hatched area (est. >10 plants/m^2).

Rare Animal Surveys

Surveys were conducted on 18 September 2014 and no rare animals were observed during the visit. Specific to the Bald Eagle, no trees were even large enough to potentially support an eagle nest (Figures 4 and 5) and so there will be no impact to this species in the proposed project area.

Figure 4. View of project area from the shoreline looking to the northwest.

Figure 5. View of the project area from the shoreline looking west (note lack of large diameter trees).

As for the Eastern Massasauga, no individuals were seen and no habitat exists within the zone surveyed. For the Lake Huron locust, no sand features are present within the zone surveyed (Figures 6 and 7), and therefore no habitat is available for this species here. Our findings suggest that the proposed project will likely have no significant impact on any of the three rare animals mentioned above.

Figure 6. View of project area near the shoreline looking out into Lake Huron (note the lack of any suitable sandy areas).

Figure 7. View of project area near the shoreline looking northeast (note the lack of any suitable sandy areas).

ACKNOWLEDGEMENTS

This project was supported by an agreement with Sanderson Stewart.

We especially thank Carol Lee-Roark of Sanderson Stewart for providing us project site maps, assistance with site access, and overall assistance with this project.

Additionally, we thank Mike Sanders, Rebecca Rogers, Ed Schools, Sue Ridge, Nancy Toben, and Brian Klatt for providing administrative support.

LITERATURE CITED

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Reznicek, A.A., M.R. Penskar, B.S. Walters, and B.S. Slaughter. 2014. Michigan Floristic Quality Assessment Database. Herbarium, University of Michigan, Ann Arbor, MI and Michigan Natural Features Inventory, Michigan State University, Lansing, MI. (http://michiganflora.net/home.aspx).

Appendix

Hammond Bay Biological Station

09/18/2014

Hammond Bay BS
Ocqueoc
Presque Isle
MI
USA

FQA DB Region:	Michigan
FQA DB Publication Year:	2014
FQA DB Description:	Reznicek, A.A., M.R. Penskar, B.S. Walters, and B.S. Slaughter. 2014. Michigan Floristic Quality Assessment Database. Herbarium, University of Michigan, Ann Arbor, MI and Michigan Natural Features Inventory, Michigan State University, Lansing, MI. http://michiganflora.net
Pracitioner:	Brad Slaughter, Dave Cuthrell
Latitude:	45.4975
Longitude:	-84.0361
Weather Notes:	
Duration Notes:	
Community Type Notes:	limestone cobble shore, sand and gravel beach, Great Lakes marsh, northern shrub thicket, boreal forest
Other Notes:	Also noted: Viola sp.
Private/Public:	Private

Conservatism-Based Metrics:

Total Mean C:	4.4
Native Mean C:	5
Total FQI:	41.3
Native FQI:	43.9
Adjusted FQI:	46.8
% C value 0:	14.8
% C value 1-3:	30.7
% C value 4-6:	26.1
% C value 7-10:	28.4
Native Tree Mean C:	3.1
Native Shrub Mean C:	4.9
Native Herbaceous Mean C:	5.4

Species Richness:		
Total Species:	88	
Native Species:	77	87.50%
Non-native Species:	11	12.50%
Species Wetness:		
Mean Wetness:	-1.3	
Native Mean Wetness:	-1.8	
Physiognomy Metrics:		
Tree:	10	11.40%
Shrub:	16	18.20%
Vine:	3	3.40%
Forb:	40	45.50%
Grass:	11	12.50%
Sedge:	7	8%
Rush:	0	0%
Fern:	1	1.10%
Bryophyte:	0	0%
Duration Metrics:		
Annual:	3	3.40%
Perennial:	82	93.20%
Biennial:	3	3.40%
Native Annual:	2	2.30%
Native Perennial:	74	84.10%
Native Biennial:	1	1.10%

Species:

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Abies balsamea	Pinaceae	ABIBAL	native	3	0	tree	perennial	balsam fir
Achillea millefolium	Asteraceae	ACHMIL	native	1	3	forb	perennial	yarrow
Agrostis gigantea	Poaceae	AGRGIG	non-native	0	-3	grass	perennial	redtop
Alnus incana; a. rugosa	Betulaceae	ALNINC	native	5	-3	shrub	perennial	speckled alder
Anemone canadensis	Ranunculaceae	ANECAN	native	4	-3	forb	perennial	canada anemone

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Arctostaphylos uva-ursi	Ericaceae	ARCUVA	native	8	5	shrub	perennial	bearberry
Betula papyrifera	Betulaceae	BETPAP	native	2	3	tree	perennial	paper birch
Calamagrostis canadensis	Poaceae	CALCAN	native	3	-5	grass	perennial	blue-joint
Calamagrostis stricta; c. inexpansa; c. lacustris	Poaceae	CALSTR	native	10	-3	grass	perennial	narrow-leaved reedgrass
Calystegia sepium	Convolvulaceae	CALSEP	native	2	0	vine	perennial	hedge bindweed
Carex buxbaumii	Cyperaceae	CXBUXB	native	10	-5	sedge	perennial	sedge
Carex crawei	Cyperaceae	CXCRAE	native	10	-3	sedge	perennial	sedge
Carex interior	Cyperaceae	CXINTE	native	3	-5	sedge	perennial	sedge
Carex stricta	Cyperaceae	CXSTRI	native	4	-5	sedge	perennial	sedge
Cirsium arvense	Asteraceae	CIRARV	non-native	0	3	forb	perennial	canada thistle
Cladium mariscoides	Cyperaceae	CLAMAR	native	10	-5	sedge	perennial	twig-rush
Clinopodium vulgare	Lamiaceae	CLIVUL	native	3	5	forb	perennial	wild-basil
Comandra umbellata	Santalaceae	COMUMB	native	5	3	forb	perennial	bastard-toadflax
Cornus sericea; c. stolonifera	Cornaceae	CORSER	native	2	-3	shrub	perennial	red-osier
Danthonia spicata	Poaceae	DANSPI	native	4	5	grass	perennial	poverty grass; oatgrass
Dasiphora fruticosa; potentilla f.	Rosaceae	DASFRU	native	8	-3	shrub	perennial	shrubby cinquefoil
Daucus carota	Apiaceae	DAUCAR	non-native	0	5	forb	biennial	queen-annes-lace
Deschampsia cespitosa	Poaceae	DESCES	native	9	-3	grass	perennial	hair grass
Dichanthelium lindheimeri; panicum l.	Poaceae	DICLID	native	8	-5	grass	perennial	panic grass
Elymus repens; agropyron r.	Poaceae	ELYREP	non-native	0	3	grass	perennial	quack grass
Epilobium coloratum	Onagraceae	EPICOL	native	3	-5	forb	perennial	cinnamon willow-herb
Equisetum arvense	Equisetaceae	EQUARV	native	0	0	fern	perennial	common horsetail
Erucastrum gallicum	Brassicaceae	ERUGAL	non-native	0	3	forb	annual	dog mustard
Eupatorium perfoliatum	Asteraceae	EUPPER	native	4	-3	forb	perennial	boneset
Fragaria virginiana	Rosaceae	FRAVIR	native	2	3	forb	perennial	wild strawberry
Fraxinus pennsylvanica	Oleaceae	FRAPEN	native	2	-3	tree	perennial	red ash
Gentianopsis virgata; g. procera	Gentianaceae	GENVIR	native	8	-5	forb	annual	small fringed gentian
Hieracium piloselloides	Asteraceae	HIEPIS	non-native	0	5	forb	perennial	king devil
Hypericum kalmianum	Hypericaceae	HYPKAL	native	10	-3	shrub	perennial	kalms st. johns-wort
Impatiens capensis	Balsaminaceae	IMPCAP	native	2	-3	forb	annual	spotted touch-me-not
Iris versicolor	Iridaceae	IRIVER	native	5	-5	forb	perennial	wild blue flag
Juncus balticus	Juncaceae	JUNBAL	native	4	-5	forb	perennial	rush
Juncus brevicaudatus	Juncaceae	JUNBRE	native	8	-5	forb	perennial	rush
Juniperus communis	Cupressaceae	JUNCOI	native	4	3	shrub	perennial	common or ground juniper
Larix laricina	Pinaceae	LARLAR	native	5	-3	tree	perennial	tamarack

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Lathyrus palustris	Fabaceae	LATPAL	native	7	-3	vine	perennial	marsh pea
Lobelia kalmii	Campanulaceae	LOBKAL	native	10	-5	forb	perennial	bog lobelia
Lycopus americanus	Lamiaceae	LYCAME	native	2	-5	forb	perennial	common water horehound
Maianthemum stellatum; smilacina s.	Convallariaceae	MAISTE	native	5	0	forb	perennial	starry false solomon-seal
Melilotus albus	Fabaceae	MELALB	non-native	0	3	forb	biennial	white sweet-clover
Mentha spicata	Lamiaceae	MENSPI	non-native	0	-3	forb	perennial	spearmint
Muhlenbergia glomerata	Poaceae	MUHGLO	native	10	-5	grass	perennial	marsh wild-timothy
Myrica gale	Myricaceae	MYRGAL	native	6	-5	shrub	perennial	sweet gale
Oenothera oakesiana	Onagraceae	OENOAK	native	7	5	forb	biennial	evening-primrose
Packera paupercula; senecio p.; senecio plattensis	Asteraceae	PACPAU	native	3	0	forb	perennial	balsam ragwort
Parnassia glauca	Parnassiaceae	PARGLA	native	8	-5	forb	perennial	grass-of-parnassus
Persicaria amphibia; polygonum a.	Polygonaceae	PERAMP	native	6	-5	forb	perennial	water smartweed
Phleum pratense	Poaceae	PHLPRA	non-native	0	3	grass	perennial	timothy
Physocarpus opulifolius	Rosaceae	PHYOPU	native	4	-3	shrub	perennial	ninebark
Picea glauca	Pinaceae	PICGLA	native	3	3	tree	perennial	white spruce
Pinus resinosa	Pinaceae	PINRES	native	6	3	tree	perennial	red pine
Pinus strobus	Pinaceae	PINSTR	native	3	3	tree	perennial	white pine
Plantago lanceolata	Plantaginaceae	PLALAN	non-native	0	3	forb	perennial	english plantain
Poa compressa	Poaceae	POACOM	non-native	0	3	grass	perennial	canada bluegrass
Populus balsamifera	Salicaceae	POPBAL	native	2	-3	tree	perennial	balsam poplar
Populus tremuloides	Salicaceae	POPTRE	native	1	0	tree	perennial	quaking aspen
Potentilla anserina	Rosaceae	POTANS	native	5	-3	forb	perennial	silverweed
Prenanthes racemosa	Asteraceae	PRERAC	native	8	-3	forb	perennial	glaucous white lettuce
Primula mistassinica	Primulaceae	PRIMIS	native	10	-3	forb	perennial	birds-eye primrose
Prunella vulgaris	Lamiaceae	PRUVUL	native	0	0	forb	perennial	self-heal
Pyrola asarifolia	Ericaceae	PYRASA	native	8	-3	forb	perennial	pink pyrola
Rhynchospora capillacea	Cyperaceae	RHYCAL	native	10	-5	sedge	perennial	beak-rush
Ribes americanum	Grossulariaceae	RIBAME	native	6	-3	shrub	perennial	wild black currant
Rosa acicularis	Rosaceae	ROSACI	native	4	3	shrub	perennial	wild rose
Rubus strigosus	Rosaceae	RUBSTR	native	2	0	shrub	perennial	wild red raspberry
Salix bebbiana	Salicaceae	SALBEB	native	1	-3	shrub	perennial	bebbs willow
Salix exigua	Salicaceae	SALEXI	native	1	-3	shrub	perennial	sandbar willow
Salix myricoides	Salicaceae	SALMYR	native	9	-3	shrub	perennial	blueleaf willow
Salix petiolaris	Salicaceae	SALPET	native	1	-3	shrub	perennial	slender willow
Schizachyrium scoparium; andropogon s.	Poaceae	SCHSCO	native	5	3	grass	perennial	little bluestem

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Schoenoplectus pungens; scirpus americanus	Cyperaceae	SCHPUN	native	5	-5	sedge	perennial	threesquare
Shepherdia canadensis	Elaeagnaceae	SHECAN	native	7	5	shrub	perennial	soapberry
Solidago altissima	Asteraceae	SOLALT	native	1	3	forb	perennial	tall goldenrod
Solidago houghtonii	Asteraceae	SOLHOU	native	10	-5	forb	perennial	houghtons goldenrod
Solidago ohioensis	Asteraceae	SOLOHI	native	8	-5	forb	perennial	ohio goldenrod
Spiranthes cernua	Orchidaceae	SPICER	native	4	-3	forb	perennial	nodding ladies-tresses
Symphyotrichum lanceolatum; aster l.	Asteraceae	SYMLAN	native	2	-3	forb	perennial	panicled aster
Symphyotrichum lateriflorum; aster l.	Asteraceae	SYMLAT	native	2	0	forb	perennial	calico aster
Symphyotrichum puniceum; aster p.	Asteraceae	SYMPUN	native	5	-5	forb	perennial	swamp aster
Thalictrum dasycarpum	Ranunculaceae	THADAS	native	3	-3	forb	perennial	purple meadow-rue
Thuja occidentalis	Cupressaceae	THUOCC	native	4	-3	tree	perennial	arbor vitae
Triglochin maritima	Juncaginaceae	TRIMAR	native	8	-5	forb	perennial	common bog arrow-grass
Vitis riparia	Vitaceae	VITRIP	native	3	0	vine	perennial	river-bank grape