

Henry W. Hanley Biological Field Station 2016-17



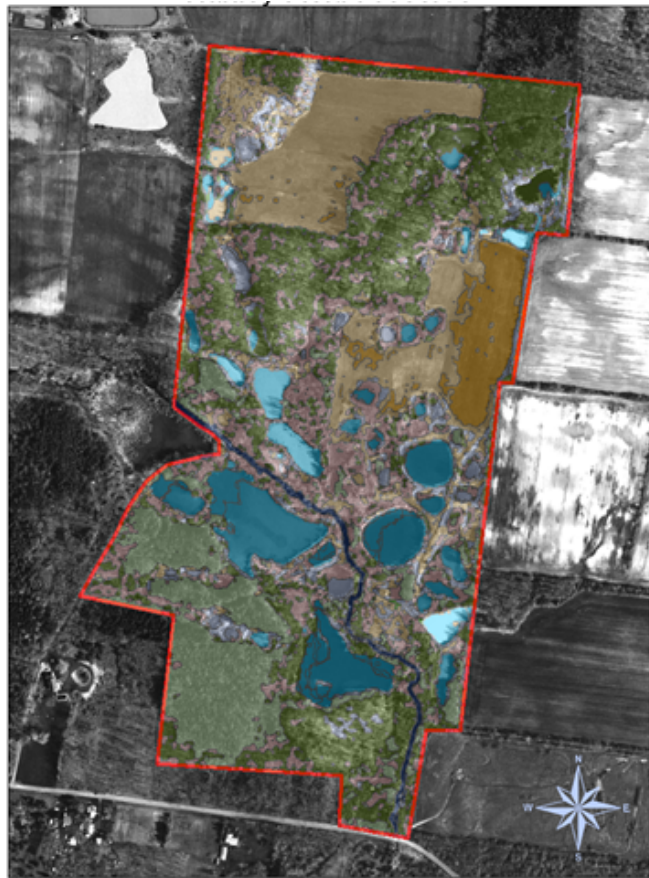
Annual Report

Prepared by Bradley Cosentino,
Chair, Hanley Preserve Steering Committee

Overview

The Henry W. Hanley Biological Field Station, the biological research station of Hobart & William Smith Colleges, has been dedicated to its mission of undergraduate education and student/faculty research for over 30 years. The field station was purchased in 1985 and is a place for faculty and students to discover the biological principles that shape our natural world. Students and faculty work together at the Hanley Preserve to conduct diverse scientific studies in botany, herpetology, ornithology, mammalogy, ecology, evolutionary biology, animal behavior, and geosciences.

Located in Fayette, NY near Cayuga Lake, the Preserve encompasses approximately 109 acres. It includes a diverse array of habitats, including mature deciduous forests, mixed deciduous/conifer forest, old fields in various stages of succession, a small stream that drains into Cayuga Lake (Burroughs Creek), and roughly 60 ponds of varying size. A small classroom building, *The Richard Ryan Field Laboratory*, an equipment storage building, and a rowboat and dock are also located on the property.



Hanley Biological Preserve Steering Committee

Professor Jim Ryan
Professor Elizabeth Newell
Professor David Droney
Professor Mark Deutschlander
Associate Professor Meghan Brown
Assistant Professor Susan Cushman
Assistant Professor Brad Cosentino, Chair
Assistant Professor Shannon Straub

Goals of the Hanley Preserve

The goals of the programs at the Hanley Biological Preserve are to:

- Advance the basic understanding about the structure, function and evolution of ecological systems and the organisms they contain.
- Enhance the general understanding of ecology by students by giving them hands-on field experiences.
- Train a new generation of biologists capable of addressing and solving complex environmental problems important to human societies.
- Provide a protected site for short and long term research projects requiring a field setting.

Accessing the Hanley Preserve

The main entrance is from Leader Road at the southeast corner of the property, just under 0.5 miles west of Route 89. There is a secured gate at the entrance.

Use Policy

The Henry W. Hanley Biological Field Station is a private area available to HWS faculty and staff for teaching and research. Faculty and staff wishing to use the facility should contact the Steering Committee Chair with a description of planned activities. Faculty and staff who use the facility are expected to provide an annual report of activities to the Steering Committee Chair.

The following activities are prohibited:

- Swimming
- Fishing, hunting, or trapping wildlife for recreation
- Firearms
- Camping for recreation
- Snowmobiles, motorbikes, or any other motor driven vehicles for recreation
- Horseback riding

No rocks, plants, or animal specimens should be collected without permission of the Steering Committee.

Visitors

Neighbors and other visitors are asked to contact the Steering Committee Chair by email or phone for permission to use the facility. Visitors are asked to stay on trails and to not disturb scientific equipment or research activities in progress.

2016-2017 Capital Improvements and Maintenance

Funds for capital improvements are provided by the generous support of donors to the Hanley Preserve.

Buildings & Roads – Buildings & Grounds oversees maintenance of the main road leading into the Preserve from the gate, the Richard Ryan Field Laboratory, and the lawn around the Laboratory. The lawn and grass roads are usually trimmed twice per month. Work was completed in summer 2017 to repair erosion on the main gravel road leading into the property.

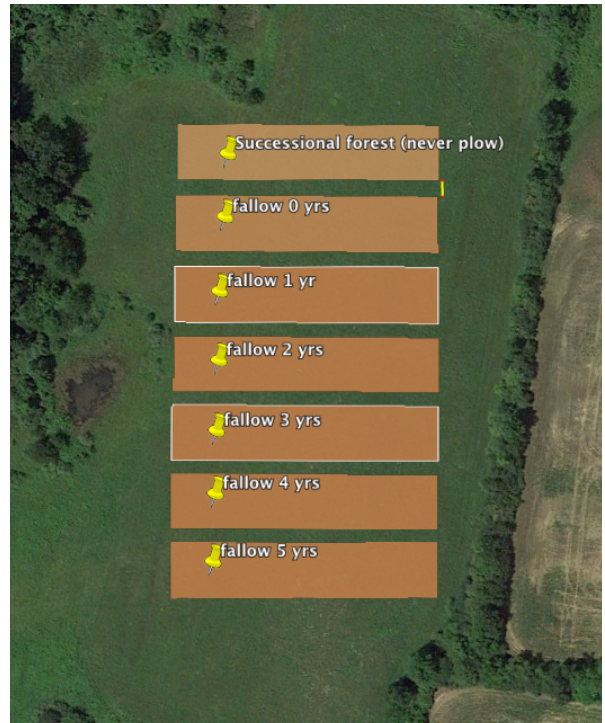


Vegetation and trail maintenance – A landscaping company was contracted to open up new trails on the property and to clear areas with dense invasive shrubs. The new trails will be used by Prof. Mark Deutschlander's ornithology class to set up mist nets for sampling birds. The cleared vegetation will also allow greater access to ponds for courses in Ecology, Conservation Biology, and Aquatic Biology.



Proposed activities for 2017-2018

The Hanley Steering Committee is considering initiating a long-term experiment on old field and forest succession on the southernmost field currently used to produce hay. The project would consist of plowing seven 15 x 75-m areas and then allowing succession of vegetation to proceed. Successional plots would then be plowed on a rotating basis once every five years, with one plot left in place that is never plowed. The successional plots would allow for a variety of student research projects and would be frequently used for laboratory exercises in courses related to ecology, conservation, and animal behavior.



Other improvements being discussed for 2017-2018 include 1) a formal use policy and reporting mechanism for teaching and research activities, 2) development of a website for the Hanley Preserve, and 3) creation of a network of trail cameras for use in teaching and research.

Teaching

Teaching continues to be the main focus of activity at the Hanley Preserve. The following faculty used the Hanley Biological Preserve as field sites for projects in their classes during the 2016-2017 academic year:

Behavioral Ecology (BIOL 227) and Evolution (BIOL 336) – Prof. David Droney (Biology)

The Hanley property is used many times throughout the semester for Behavioral Ecology (BIOL 227) and Evolution (BIOL 336). Projects have included multi-week studies of the behavioral ecology of decision-making in dragonflies (*Sympetrum*). Male *Sympetrum* defend access sites to ponds as a mating tactic (and have specialized structures that are used to grab females and other males by the head as a mating or aggressive behavior, see photo at right), and Hanley, with its many ponds, provides an excellent field site for this work. Some males, however, adopt an alternate tactic (satellite behavior) of intercepting females on their flights to lay eggs in the ponds rather than actively defending a territory. Students capture, observe and individually mark males with the objective of determining the rules males use to decide whether to be territorial or satellite.



Other projects involve the behavioral and evolutionary interactions of plants and animals from three different trophic levels (goldenrod, gall flies, which induce ‘tumor’ formation in goldenrod, and gall wasps, which attack gall flies while they are attacking goldenrods). Students conduct multi-week studies of the behavioral ecological aspects of the interactions and also measure natural selection coefficients in the wild. This work is adapted from ongoing research of Warren Abrahamson and colleagues at Bucknell University.

Hanley is also home to many insect species that can be studied by students during courses or as independent research. Some of these projects include the behavioral ecology of honeybee foraging on flowers. Specifically students test ideas from optimality models (e.g., the marginal value theorem) with the goal of understanding how natural selection shapes the acquisition and transport of energy (honeybees forage for themselves and for the hive).

Students also study behavioral ecology of mating behavior of milkweed beetles (*Tetraopes*). Milkweeds are plentiful at Hanley and produce toxic compounds that protect it from herbivory. However *Tetraopes* has overcome this defense and conducts all its activity (feeding and mating) on milkweeds. This system has been used in classes and in independent research.



Conservation Biology (BIOL 316) – Prof. Brad Cosentino (Biology)

Prof. Cosentino's Conservation Biology class used the Hanley property in spring 2017 to learn about mark-recapture methods used to estimate population size of wildlife. Students sampled a cover board array to survey for red-backed salamanders (*Plethodon cinereus*). Once individuals were captured, students learned how to measure the size and mass of individuals and to uniquely mark individuals with a fluorescent elastomer injected under the skin.



Research

Population dynamics of red-backed salamanders –

Professor Cosentino established a grid of wood cover boards in summer 2015 in the woods at Hanley to study long-term population dynamics of red-backed salamanders (*Plethodon cinereus*). The cover boards were surveyed for the first time in April 2016 and were resurveyed in April 2017 by Prof. Cosentino's Conservation Biology class. There were a total of 37 captures over the course of three sampling occasions, of which 15 individuals were recaptures. A total of 35



unique individuals have been captured and marked in the first two years of sampling. The cover boards will next be sampled in Spring 2018. Mark-recapture methods are being used to monitor population dynamics over time, salamander movements, and differential survival of two color morphs that are thought to be adapted to different thermal conditions.



Publications and Presentations from Hanley

Peer-reviewed publications

Cosentino, B.J. and D.C. Droney. 2016. Movement behaviour of woodland salamanders is repeatable and varies with forest age in a fragmented landscape. *Animal Behaviour* 121:137-146.

Droney, D.C. and M. Thaker. 2006. Factors influencing mating duration and male choice in the red milkweed beetle, *Tetraopes tetrophthalmus* (Forster) (Coleoptera Cerambycidae). *Ethology Ecology & Evolution* 18:173-183.

Technical reports (underline denotes student author)

Carr, M., D. Cass, H. Feige, S. Gurney, J. Janicki, B. Lehman, M. Palleschi, D. Woodrow, and C. Wright. 1985. A geological survey of the Henry W. Hanley Wildlife Reserve of Hobart and William Smith Colleges.

Fenlin, B., R. Bowser, A. Fantauzzo, D. Felicetti, S. Flickenger, W. Gotsch, J. Harwood, D. Hughes, C. Maciejewski, B. McCarthy, J. McDermott, V. Melrose, K. Miller, A. Puccio, K. Rockefeller, M. Salin, K. Schaeffer, C. Sorbero, V. Thomas, J. Throop, K. Todd, J. Zelazny, and J. Ryan. 1994. Ecological assessment of the Henry W. Hanley Biological Field Preserve.

Presentations (underline denotes student author)

Aruck, R. 2009. Using Zooplankton Abundance to Explore Trophic Cascades at HWS's Hanley Biological Preserve. Biology Student Research Symposium.

Bower, S., Everdyke, M., and Finkelstein, D.B. 2015. Characterizing the till-derived water chemistry in the Seneca Lake, NY (USA) watershed. Northeast Section of the Geological Society of America, Bretton Woods, New Hampshire.

Constantino, J., and D.B. Finkelstein. 2016. Do differences in the mineralogy of glacial tills in western New York control the observed differences in hyper-localized aqueous geochemistry of till-derived water? Annual Meeting of the Northeast Section of the Geological Society of America, Albany, NY.

Doebelin, D. and D.B. Finkelstein. 2016. The impact of drought on pond chemistries. HWS Student Research Symposium.

Finkelstein, D.B., Everdyke, M., and Bower, S. 2015. Controls on the chemical evolution of till-derived lakes in the Seneca Lake, NY (USA) watershed. Sixth International Limnogeology Congress, Reno, Nevada.

Finkelstein, D.B., J. Constantino, B. Swete, H. Simbliaris, J. Schaffer, J., 2016, Insights into the early chemical evolution of lakes in terrains dominated by unconsolidated sediments: Geochemical characterization of till-hosted surface waters in western NY. Annual Meeting of the Geological Society of America, Denver, CO.

Fisher, S. 2009. Using Zooplankton Size to Investigate Trophic Cascades in Hanley Ponds 7 and 11 at Hobart and William Smiths Colleges' Nature Preserve. HWS Senior Symposium Biology Student Research Symposium.

Rood, T. 2009. Historical and interdisciplinary linkages: Studying the past and present at Hanley Biological Field Preserve. Finger Lakes Research Conference 2007

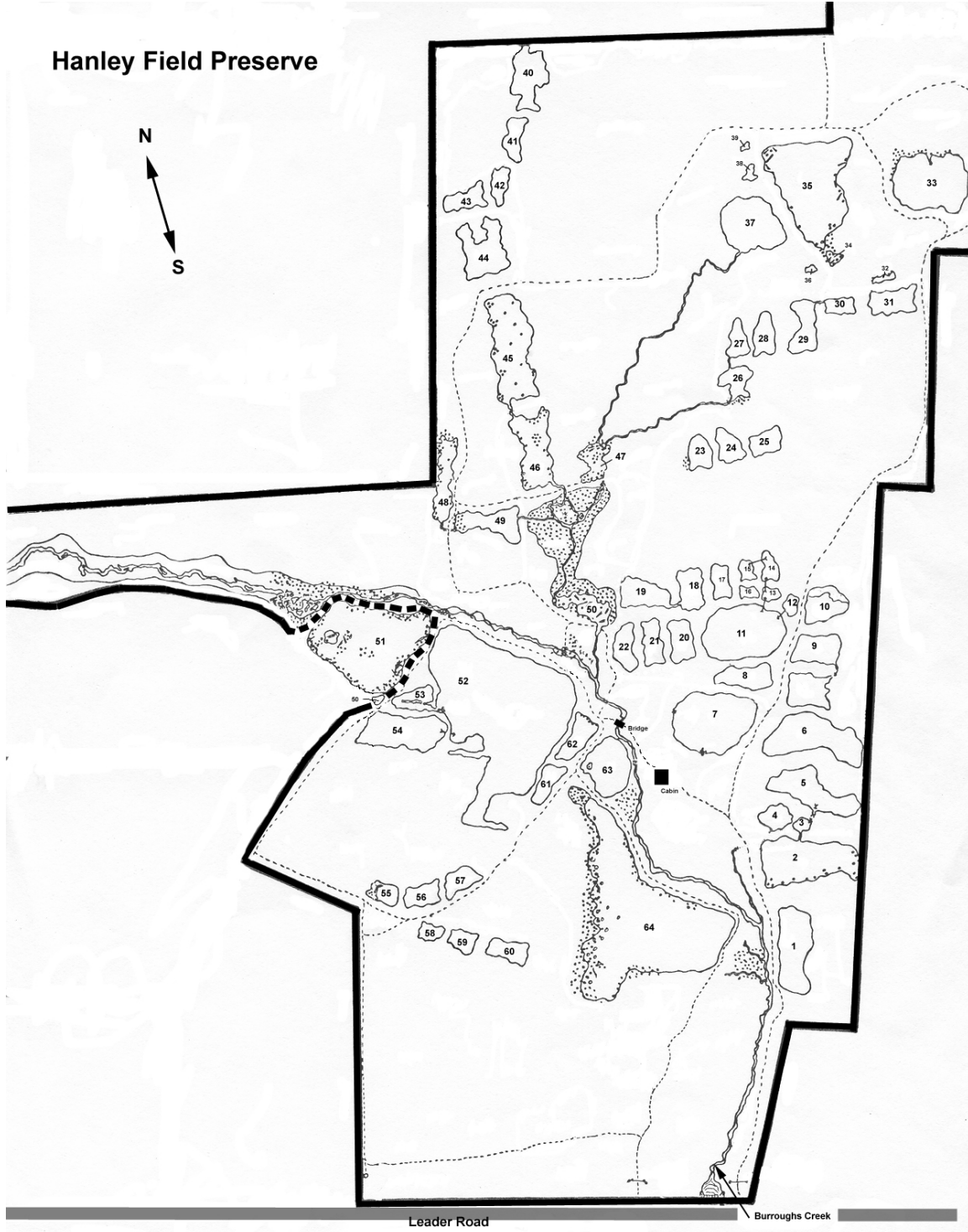
Schaffer, J., H. Simbliaris, B. Swete, and D.B. Finkelstein. 2015. Geochemical characterization of storm and till-derived surface waters in the Seneca Lake, NY watershed: HWS Student Research Symposium.

Yovaroff, M. 2010. Age Determination and Population Dynamics of Pumpkinseed Sunfish, *Lepomis gibbosus* at the Henry H. Hanley Biological Field Preserve. HWS Senior Symposium.

Maps of the Hanley Preserve



Hanley Field Preserve





**Henry Hanley
Biological Preserve**