

# Henry W. Hanley Biological Field Station 2018-19



## 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 David Droney  
Professor Mark Deutschlander  
Professor Meghan Brown  
Associate Professor Brad Cosentino, Chair  
Assistant Professor Susan Cushman  
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 submit a Special Use Permit to the Steering Committee Chair with a description of planned activities. A copy of the permit application is included at the end of this report, and potential users can contact the Chair for a copy. 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.

## 2018-2019 Capital Improvements and Maintenance

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

**General maintenance** – Jim Norwalk, animal and plant technician in the Biology Department, carried out a number of maintenance activities during 2018-2019:

- Routine inspection of driveway condition, trails, and condition of the lab building
- Cleaned and organized lab space at the Richard Ryan Field Laboratory
- Cleaned landscaping tools
- Cleared and maintained mist net lanes
- Maintained lab supply stocks
- Compiled inventory of lab supplies
- Compiled a list of adjacent property owners for communication purposes
- Assisted with driving vans for laboratory excursions to Hanley

**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.



**Vegetation and trail maintenance** – A landscaping company was contracted clear trails and net lanes on the property that were created in 2017. A path around the southern old field was cleared so that vehicles can be driven directly to the woods and northern old field. The old fields are no longer being hayed as of 2019, and the steering committee will decide on how to manage them moving forward.



## 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 2018-2019 academic year:

### **Aquatic Biology (BIOL 238) – Prof. Meghan Brown (Biology)**

In the fall of 2018, Prof. Meghan Brown's class on Aquatic Biology conducted a lab activity to investigate variability in abiotic and biotic conditions among ponds. The lab activity engaged 25 students with field techniques to sample the ponds.



### **Vertebrate Biology (BIOL 234) – Prof. David Holtzman (Biology)**

Professor Holtzman's class took a field trip to have students sample the various habitats at Hanley for vertebrates, including forest, fields, and ponds. Students collected data on the distribution of salamanders under cover objects, such as logs, in the forest. Students also discovered the types of habitats used by fish, frogs, snakes, turtles, rodents. By censusing plywood boards, students were able to find garter snakes, voles, and mice.



### **Ecology (BIOL 225) – Prof. Brad Cosentino (Biology)**

Prof. Cosentino's Ecology class used the Hanley property in spring 2019 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.



### **Introduction to Hydrogeology (GEO 186) – Prof. Dave Finkelstein (Geoscience)**

GEO 186 used the chemistry of three ponds (1, 4, and 6), Burroughs Creek, and field station well water to document the evolution of surface water to groundwater. Students measured the infiltration rates around each pond and the well and characterized the alkalinity, conductivity, dissolved oxygen and pH. Students then used the infiltration rates and chemistry to calculate the residence time of groundwater and the time required for pond water to evolve and reach the conductivity of groundwater.

### **Aqueous and Environmental Geochemistry (GEO 280) – Prof. Dave Finkelstein (Geoscience)**

During the spring of 2019, GEO 280 taught by Professor David Finkelstein, utilized Hanley Preserve to spatially and temporally characterize the water chemistry from four ponds across the preserve (35, 31, 50, 11) and Burroughs Creek. The goal was to create a spatial frame from which to interpret water chemistry. Students mapped, at the meter scale, the subtleties of the topography of the central field to delineate local groundwater divides that are responsible for feeding waters to the south (to pond 11) and to the southeast (to pond 50) and then to Burroughs Creek. Students utilized field chemistry methods to augment water flow maps to fingerprint the components adding to the creek water.

**Birds in our Landscape (ENV 216) – Prof. Mark Deutschlander (Biology)**

Mark Deutschlander uses Hanley for courses focused on bird biology. In the Maymester of 2019, Prof. Deutschlander offered a new Environmental Studies (ENV 216) course entitled "Bird in Our Landscape." This course fulfills the scientific inquiry goal for the general curriculum and as a Natural Science core course for the Environmental Studies major. Prof. Deutschlander had 10 students enroll in the course, and took them on several field excursions to teach about local landscapes and the birds that breed in our region. Two trips were to the Hanley Wildlife Preserve to learn about breeding warblers, sparrows, orioles and other songbirds and waterfowl that breed on the property.



## Research

### Local adaptation of common milkweed –

In collaboration with over a dozen other institutions, Professor Cosentino is conducting a common-garden experiment to test for local adaptation in common milkweed (*Asclepias syriaca*). Milkweed seeds were collected from Hanley in Fall 2017 and stored along with seeds from other locations throughout the United States. Seeds from five varieties – the Hanley variety and varieties from four other locations – were planted in the greenhouse at HWS in early spring 2018.



Plants were then transplanted to the field at Hanley in summer 2018. Baseline measurements on stem height, node and leaf number, indices of herbivory, and other metrics were taken after the transplant, and follow-up measurements were made in summer 2019. Measurements made at similar plots at institutions across the country will allow the research group to compare the fitness of the home variety to varieties from other locations. This kind of common garden design allows one to test for genetic adaptation to local conditions. This project is being conducted through the Ecological Research as Education Network (<http://erenweb.org/>).



**Microclimatic variation among habitats** – Professor of Geoscience Neil Laird worked with two students during the NSF-funded Northeast Partnership for Atmospheric & Related Sciences (NEPARS) Research Experiences for Undergraduates (REU) program to examine microclimates connected to landscape variation in Hanley Preserve. Kristine Chen (Junior from Univ. of Oklahoma) and Adrianna Kremer (Junior from SUNY Brockport) worked with Dr. Laird to collect and analyze atmospheric measurements from three weather stations temporarily located at field, forest, and forest edge locations. In addition to atmospheric measurements, hemispherical fisheye photographs were collected to quantify forest foliage cover throughout the measurement periods. The research examined the influence of forest canopy and seasonal canopy transitions on microclimate conditions within the forest compared to the adjacent field. Additionally, the research quantified the diurnal variability of low-level moisture profiles at the forest and adjacent field sites, as well as explored contributing factors to this variability ranging from large-scale to local-scale weather conditions.



**A tale of two ponds: differences in food web structure and primary productivity of two neighboring ponds** – Under the supervision of Prof. Meghan Brown (Biology), Penelope Murphy completed a project for the HWS Honors Program based on fieldwork at Hanley Preserve. Ponds are hotspots for diversity that provide important habitat for wildlife. Penelope studied two neighboring ponds at Hanley. Despite the ponds' similar terrestrial surroundings, management strategies, and human construction the ponds differ in their appearance and trophic status—one is murky green because it supports abundant algal growth and the other is much less productive with visibility to its deepest depths. Penelope traced how the isotopes of carbon and nitrogen move among members of the pond communities to test the hypotheses that (1) the food webs of these ponds vary in their utilization of primary producers such as degrading leaves from trees, macrophytes, and algae and (2) energy flowed differently as it moved up the food web of the ponds to consumers of the primary producers and their predators. As expected, the consumer communities of both ponds exploited terrestrial-based carbon but differed in the dominant source of primary producers within the ponds. The less productive of the two ponds appeared to incorporate more carbon sources from the pond bottom into its food web. The more productive pond on the other hand, appeared to rely more heavily on carbon sources suspended in the water column such as algae. There were also differences at higher trophic positions, including the types of fish and their diets. This study adds to the growing body of work dedicated to understanding the factors which dictate primary productivity and energy flow of freshwater systems. This information is also valuable for informing ecosystem management strategies and conservation efforts.



## 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.

Chen, K.M., A.N. Kremer, and N.F. Laird. 2019. Differences in moisture profiles between field and forest microclimates. American Meteorological Society, Phoenix, AZ.

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.

Kremer, A.N., K.M. Chen, and N.F. Laird. 2019. Foliage influences on diurnal temperatures. American Meteorological Society, Phoenix, AZ.

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

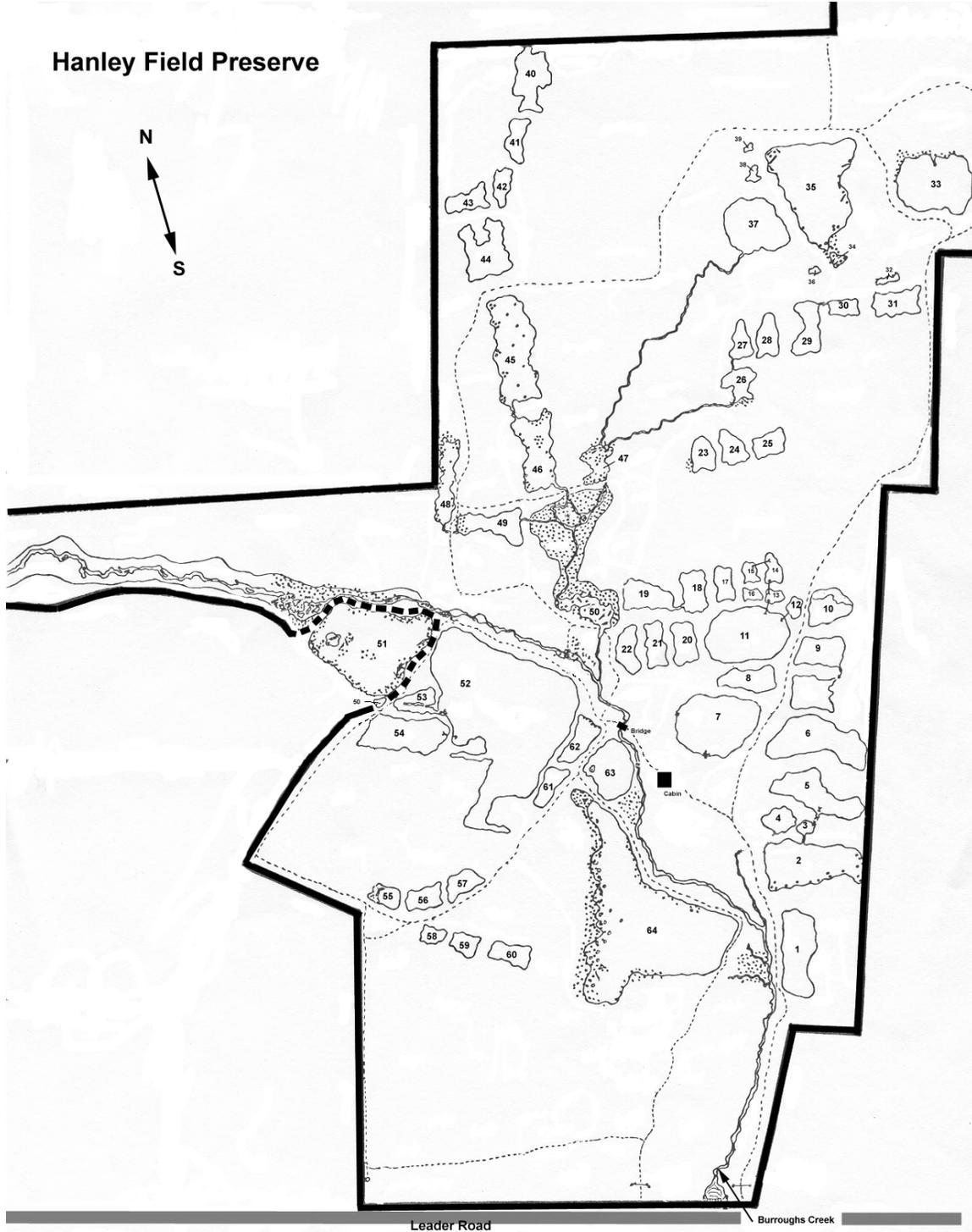
Schaffer, J., H. Simbliaris, B. Swete, and D.B. Finkelstein. 2015. Geochemical characterization of storm and till-derived surface waters in the Seneca Lake, NY watershed: HWS Student Research Symposium.

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



## Special Use Permit Application

**Directions:** Please fill out the information below and submit by email to the Chair of the Hanley Steering Committee (cosentino@hws.edu). Applications should be submitted annually at least one month before initiating your work. Only fill out parts 1 and 2 if you are renewing a previous permit and there are no new activities planned.

**Reporting policy:** All users of the Hanley Biological Field Station must provide a description of their work on the property annually by September 15. Minimum required materials include the title of the class or research project, the faculty member's name, and an abstract describing their work. Faculty are strongly encouraged to submit photos of their work along with the report.

### 1. Applicant information

Name:  
 Title:  
 Institution:           HWS  Other  
 Department:  
 Email address:  
 Office phone:

### 2. Type of activity

Is this application for a teaching or research activity?

Teaching   
 Course title:  
 Renewal of previous permit?  \*A new permit is required if new activities are planned.

Research   
 Research title:  
 Renewal of previous permit?  \*A new permit is required if new activities are planned.

### 3. Proposed activities

Objectives:

Project duration (indicate dates):

Proposed location(s):

Description of activities:

Equipment to be installed:

### 4. Collections

Species or materials to be collected:

Approximate number of specimens:

Disposition of specimens:

Required state or federal permits:



**Henry Hanley  
Biological Preserve**