

Non-invasive Approach to River Otter Monitoring and Population Estimation in the Finger Lakes

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Summary of Proposed Work:

My original research objective for this internship with the Department of Environmental Conservation (DEC) was to develop a statistical model to predict river otter (*Lontra canadensis*) latrine site locations in the Finger Lakes region. River otters were once abundant in the region, but were nearly extirpated early in the 20th century from unregulated trapping and habitat loss. Between 1995 and 2000, approximately 300 otters were released throughout Western New York and the Finger Lakes region. Though the reintroduction was generally accepted as successful, there have been few published reports or systematic efforts documenting otter population status since the reintroduction.

Otters are difficult to observe directly due to their nocturnal activity, high mobility, and secretive behavior, and are most often detected at latrine sites, or areas that are frequently visited to scent mark (i.e., deposition of urine, feces and mucosal secretions) as a form of communication in this species. Because otters are difficult to monitor directly, a model to predict latrine site locations would be a valuable step towards an efficient population monitoring scheme.

Based on my preliminary findings of otter presence in the Finger Lakes, developing a predictive model would not have been feasible based on the small number of independent latrine sites found. Thus, my research objective changed accordingly. My goal with this internship remains to monitor the newly established otter population using non-invasive techniques to contribute to a better understanding of the population status in the Finger Lakes. My current objectives for this research are to: 1) estimate otter abundance in the Finger Lakes using non-invasive molecular techniques, and 2) monitor activity patterns at latrine sites using remote sensor cameras to identify temporal patterns in visitation. Abundance estimates will be established via DNA “finger printing” methods using non-invasive sampling of feces and mucosal secretions deposited at latrine sites. In addition, latrine sites will be monitored with cameras to identify periods of increased visitation so that future monitoring efforts may be targeted during these periods of high latrine activity.

Work Completed:

Between May and July 2012, I conducted otter latrine surveys in wetland complexes associated with the 11 Finger Lakes. I visually searched all undeveloped wetland communities by boat, canoe, or on foot. Otters were detected in wetlands associated with Honeoye, Canandaigua, and Cayuga Lakes and a total of 38 latrine sites was located and monitored throughout the summer. For 2 consecutive mornings each week, I collected scat and mucosal secretions from each latrine and immediately stored the samples at -20°C . Only fresh scats (within 24 hours) were collected to enhance the quality of DNA extractions. A total of 115 scat samples were collected between June and August.

Seven of the 38 latrine sites were monitored using Reconyx® PC800 camera traps. I placed cameras on trees adjacent to latrines and on artificial posts approximately 2.5 m from the ground. Cameras were deployed in June and were checked and maintained weekly. Cameras are currently active and have been checked every 3 weeks since September. Eighty-thousand images have been collected since June and all otter detections have been sorted by site.

Preliminary Results:

Otter Presence in the Finger Lakes

To assess the presence of otters in the Finger Lakes, I surveyed the undeveloped inlets (south end) and outlets (north end) of each Finger Lake via visual surveys (Fig. 1). Otters were detected in 3 of the 11 lakes: Honeoye Inlet, Canandaigua Inlet, and the Cayuga Outlet. These 3 locations were release sites during the restoration program; however, otters were not detected in the remaining 2 release sites on Hemlock and Skaneateles Lakes (Fig. 2).

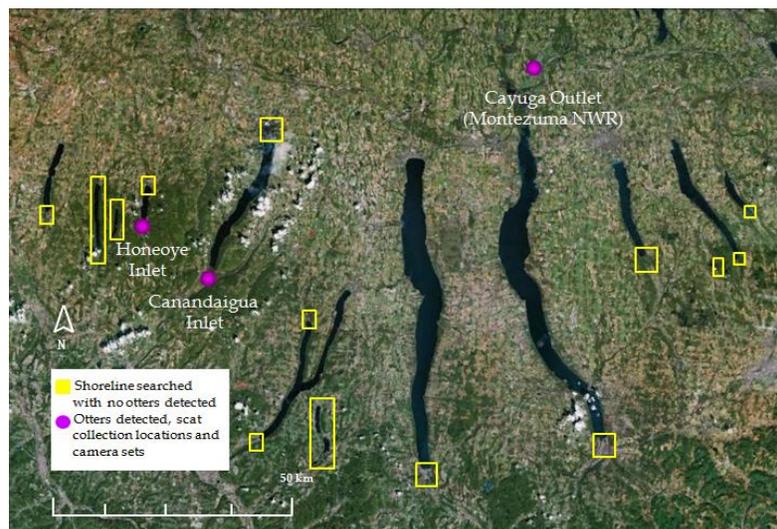


Figure 1. River otter survey locations in the Finger Lakes, NY.



Figure 2. River otter release site locations and number of otters released in the Finger Lakes during the restoration project between 1995 to 2000.

Abundance Estimation

One-hundred and fifteen scat samples were collected from June to August (Fig. 3). All scat samples are currently being stored at -20°C . Extractions using QIAmp® DNA Stool Mini Kits have begun for Honeoye Inlet samples. Protocols are being modified based on experimental trials with scats from Honeoye Lake and captive otters from the Seneca Zoo.

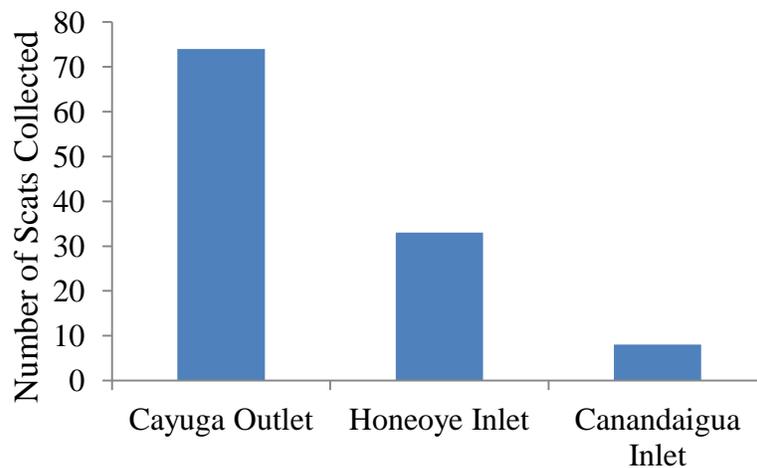


Figure 3. Scat samples collected from otter populations in three Finger Lakes from June to August 2012.

Activity Pattern Monitoring at Latrines

Camera data is currently being analyzed using a technique described by Harrison et al. (2010). Visitations will be analyzed by time of visit (nocturnal, diurnal, or crepuscular), visitation frequency by season, and group size.

Future Work:

I plan to re-survey the undeveloped wetlands associated with the 11 Finger Lakes in Summer 2013 and collect scat in areas where I detect otters. I will continue conducting DNA extractions and begin polymerase chain reaction (PCR) amplification in Spring 2013 and Fall 2013. Samples will be sent to the University of Rochester for sequencing. Population size will be determined by counting the number of unique genotypes and abundance will be estimated with closed population models in PROGRAM MARK. Cameras will continue to be deployed through the winter, spring, and summer of 2013 to identify temporal behavioral patterns and season variation in visitation and group size.

Acknowledgements:

I am appreciative of my advisor Dr. Brian Underwood and collaborators at Finger Lakes Community College for helping me make this past field season a success. Thank you to the Edna Bailey Sussman Foundation and council members for supporting this research. The Foundation will be acknowledged on all publications and presentations resulting from this research.

Photos (credited to Elaina Burns)



Shoreline surveys at Montezuma



Latrine site at Montezuma



Latrine site at Honeoye



Otter scat field collection



Fresh river otter scat with fish scales and bones



Otter scat collection



Camera set at latrine site



Two otters visit latrine



Photo of otter marking latrine site



Photo from a latrine camera with 4 otters



Photo of a hummock latrine site with visiting otter