

Gregarious gobies

by Chris Pennuto

Isn't it always more fun hanging out with your buddies than going it alone? According to an invasive fish, the round goby (*Neogobius melanostomus*), the answer is maybe. On-going research in the lab of GLC biologist, Dr. Chris Pennuto, is investigating whether that 'maybe' is a function of behavioral syndromes in that fish. The basic premise is that the fish constituting an invasion front, or the outer edge of a spatially-expanding population, behave more independently than fish in the core area, which has been colonized the longest. More independent behaviors might include high levels of aggression, greater risk-taking behavior, high exploratory

behavior, greater time outside of refugia, or simply avoiding members of the same species (conspecifics).

Dr. Pennuto, along with graduate and undergraduate students in his lab, videotape and analyze the behavior of gobies from core and invasion front areas. They compare such things as swimming frequency and duration and the time spent in the vicinity of conspecifics between fish from the different areas. Ultimately, a deeper understanding of behavior in this fish may lead to better management strategies to slow its expansion into new areas. Dr. Pennuto is looking for a



Two Lake Oneida test gobies chose close proximity to conspecifics, rather than spending time alone in the vacant half of the tank, during shoaling trials.

graduate and an undergraduate to join the effort in understanding the role of behavior in invasion biology. Contact him at pennutcm@buffalostate.edu for more info. •

180,000 gobies and counting

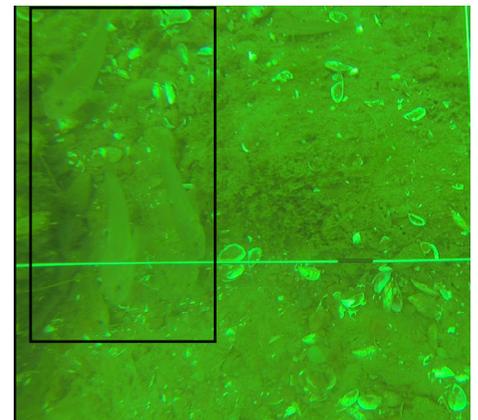
by Knut Mehler

This summer Chris Pennuto and Knut Mehler went out again to the lower Niagara River – joined by a new GLES student, Joe Budnarchuk – to count round gobies (*Neogobius melanostomus*) using an underwater video camera setup. The round goby is an aggressive invader and has become the most abundant benthic fish in the Niagara River. They not only prey on benthic invertebrates and fish eggs but have also become one of the most important prey items of the lake sturgeon (*Acipenser fulvescens*).

The objective of this study is to document the seasonal population density and biomass, nutrient content, and nearshore-offshore migration dynamics of round gobies in Lake

Ontario and the lower Niagara River. It also addresses the contribution of this fish to off-shore nutrient budget at the ecosystem scale and allows us to estimate the biomass that is available for higher trophic levels.

On average, we found 18 round gobies per m² in the lower Niagara River and near-shore areas of Lake Ontario during the summer months, translating into the incredible number of 180,000 fish per hectare. In contrast, almost no round gobies were found during the winter season, suggesting that the fish is migrating to deeper areas in Lake Ontario. Although the overwhelming numbers of round gobies in the lower Niagara River and Lake Ontario can negatively affect the benthic invertebrate community and other fish



A screenshot from underwater video recorded in the lower Niagara River. Several round gobies swim through the frame in the area highlighted with a box.

species, it might also be one of the secrets to why the ancient lake sturgeon is experiencing a comeback. •

A big year for GLES graduations

by Kelly Frothingham

Academic year 2016-2017 was the fourth year that the Great Lakes Ecosystem Science (GLES) MA and MS programs have been running and it was the biggest year yet for graduations. In May, the GLC celebrated six GLES MS students completing their programs, followed by one more MS and three GLES MA degree conferrals in August. Currently, 80% of the recent graduates are working in the environmental science field. Position titles for some of the 2017 GLES graduates include ecological planner, fish biologist, research support specialist, laboratory technician,

and environmental scientist. Graduates are working for agencies including Buffalo Niagara Waterkeeper, the US Fish and Wildlife Service, the Great Lakes Center, and NYS Department of Agriculture and Markets, as well as a local environmental engineering and science consulting firm and a biotech company.

Since the GLES programs started in 2013, a total of 15 students have graduated. 87% of those graduates are working in the environmental science field. •



GLES graduates Jo Johnson, Julie Berlinski, and Susan Daniel attending the May 2017 commencement celebration.