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2016 Asian Clam Lake-Wide Survey: Final Report

September 29, 2016

Year 2016 marked the fifth year of the lake-wide survey to identify any new locations of invasive Asian clams (*Corbicula fluminea*) in Lake George. Asian clams were first discovered in Lake George in 2010, and considerable effort and cost have gone into aggressive efforts to eradicate and/or control this invasive species. Left unchecked, Asian clams can reproduce exponentially and cause negative ecological and recreational impacts to a waterbody. The Lake George Asian Clam Task Force was created to address this threat, consisting of agencies, nonprofits, and municipal leadership around the Lake George watershed.



2016 Lake-Wide Survey Methods

The LGPC conducts the organization of this survey, which had the benefit of 40 people who signed up to participate. Participants ranged from agency and nonprofit staff to private individuals with an interest in the lake. The survey work includes sieving (like panning for gold) through all sandy areas throughout the shoreline of Lake George to find any new populations of this invasive mollusk. If any clams are found which appear to possibly be Asian clam, they are brought to the Darrin Freshwater Institute for confirmation.

Four boats were utilized in this year's effort (Commission Tritoon, Commission Staff Whaler, LGPC Marine Patrol, and Lake George Waterkeeper Boat). The shoreline was divided up into sections that are assigned to each boat, and it was the responsibility of the boat's captain each day to survey that area of shore. When a sandy area was identified (preferred habitat), the survey crew on the boat entered the water and took several sieves depending upon the size of the site. Small sites might only require as few as 20 sieves, while large delta areas can include as many as 500 or more sieves.

This year's survey was planned for five days (Monday, August 29th – Friday, September 2nd). However, the survey was completed in just four days this year, and the Friday survey day was not needed.

Key Findings

This year's lake-wide survey identified two new locations of Asian clams in Lake George, expansion of several existing sites, and an increase in density at almost all established locations (anecdotally noted by long-time survey crew members). However, following the survey another new site was reported and

confirmed by another individual at the site of Edmunds Brook delta, just north of the Juliana Motel. This brings the total to three new Asian clam sites identified in 2016, and an overall total number of sites at 19. As follow-up to the new discoveries, several Asian clam task force members conducted more detailed surveys of the two sites identified in the lake-wide survey. The Sand Pebble Cove site was surveyed on September 21, and the Hague site was surveyed on September 22. The purpose of these follow-up visits was to determine the overall extent of the infestation and to help determine whether these sites would be good candidates for eradication-level treatments using benthic mats.

Key Findings Include:

1. New Site #1: Sand Pebble Cove, Lake George – This site is a small sandy area approximately 0.8 miles south of the nearest known Asian clam site just south of Paulist Fathers. This site exhibited anywhere from zero up to 16 clams per sieve, primarily around and under a stake dock in the middle of the sandy area. The sandy site consists of two stake docks and two crib docks, and the clams were found to be present in an area among the docks along approximately 200 feet of shoreline.
 - a. Determination: Treatment effectiveness would be limited due to presence of crib docks and stake docks. No treatment recommended by surveyors and by full Task Force.
2. New Site #2: Cape Cod Village, Hague – Asian clams were discovered just north of Jenkins Brook delta in Hague, at Cape Cod Village and the docks just to the north. Populations were fairly high at the northern part of the identified site, and very sparse at Cape Cod Village beach itself. No clams were discovered on the Jenkins Brook delta as of yet. Densities per sieve ranged from zero up to almost 20, with the densest locations at the stake dock just south of the Darrin property.
 - a. Determination: Treatment effectiveness would also be limited at this location due to the relatively large size of the affected area and the presence of several docks in the affected area.
3. New Site #3: South side of Edmunds Brook delta, north of Juliana Motel, Lake George – The Commission received a call from a local resident about a new population of Asian clams on the south side of the Edmunds Brook delta while doing other work. The clams are primarily located on the north side of a large crib dock on the south side of the delta. Follow-up activity will take place in early October to confirm densities and extent.
 - a. Determination: Similar to the two other sites, the presence of the crib dock and the inability to lay benthic mats effectively eliminates this site as one that can be successfully eradicated.
4. Densities and Expansion of Existing Sites – It was noted by all experienced Asian clam survey members that most or all existing sites have both expanded in their range and in their densities. There was no comprehensive survey or methodology that was conducted to confirm this as of yet, but anecdotally it was noted to be shown very clearly at most of the previously known 16 sites. Members of the Task Force have discussed conducting density surveys at several of the known sites in early October, but nothing has been planned as of yet.

Next Steps

With the addition of the three newly identified Asian clam sites in Lake George, the total number of known sites has been raised to 19. Combining all of the known area of lake-bottom that contains the invasive Asian

clam in Lake George as of this report, it appears that the total area exceeds 100 acres. Given that Asian clam control and eradication efforts cost upwards of \$80,000 per acre, the cost of treating Asian clam affected areas lake-wide is cost-prohibitive and logistically beyond the current ability to successfully manage. Funds spent to date on research, control and eradication efforts well exceeds \$2 million since the discovery of this invasive species in 2010. The remaining funding for all Asian clam control and research efforts at the time of the writing of this report is approximately only \$80,000. Additional funds could be sought for highly targeted efforts, but the significant early funds raised to attempt eradication have been largely spent. The control efforts from a percentage basis have been highly effective (96-100% mortality in most cases), but wherever even a small population of clams remain, they tend to repopulate quickly.

Research into a possible natural control vector (Chaetogaster worm) discovered by scientists at the Darrin Freshwater Institute in Bolton are promising, but much more work is needed to learn about this species and its effects on Asian clam populations. Work is ongoing at DFWI to follow-up on early research into this species, and funding these efforts is a top priority for the Task Force. Research has also been conducted by DFWI on topics including Asian clam reproduction, transport, settling and growth rates, and work continues on these efforts today.

Asian clams appear to be highly affected by cold winters, and Lake George was fortunate to have very long and cold winters in 2013/2014 and 2014/2015. Resultantly, populations of clams in known areas were knocked down to relatively low densities. However, with the warm winter of 2015/2016, the existing populations did not experience the large-scale die-off of the previous two winters, and thusly the populations have grown and expanded in the known sites to densities higher than ever seen before on Lake George. While there has been no discrete scientific study to quantify the effects of the cold winters (difficult to do given all other factors present in mortality rates), the coldness of winters is accepted as a major factor in the mortality of the clams between the years.

At a recent meeting of the Lake George Asian Clam Task Force, all members agreed that we will continue the current path of conducting targeted research on Asian clams, and continue the lake-wide survey to monitor for new sites. If new sites are discovered that are determined to be high probability of eradication (i.e. not close to another known site, no docks or other impediments to good benthic mat coverage), the Task Force will decide whether to expend the financial resources to attempt eradication.

The Commission would like to thank everyone who has participated in this lake-wide survey effort, as it is critical to helping ensure identification and potential management of this invasive species on Lake George. We also thank the many involved funding organizations and agencies for providing the necessary resources to address this threat to the best of our abilities.

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Known 2010 -2015 sites in black. New sites found during 2016 lake-wide survey in red.