

**2011 Pearly Mussel Surveys  
of Portions of  
the Catatonk Creek, Butternut Creek and Unadilla River**



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# 2011 Pearly Mussel Surveys of Portions of the Catatonk Creek, Butternut Creek and Unadilla River

Award Number 58053



Image from Strayer & Jirka, 1997

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## Executive Summary

We completed surveys for pearly mussels on portions of the Catatunk Creek, the Butternut Creek, and the Unadilla River in 2011. Financial considerations limited the scope of our surveys, but we made good use of techniques mastered in the surveys completed in the previous three years. We sought to determine the status of the Brook Floater (*Alasmidonta varicosa*) in the Catatunk and to see if we could find a nearby location for relocating the Brook Floaters during dam removal. We sought to determine the status of the four New York Susquehanna River Watershed pearly mussel species of greatest conservation need (SGCN), Elktoe (*Alasmidonta marginata*), Brook Floater (*A. varicosa*), Green floater (*Lasmigona subviridis*), and Yellow lampmussel (*Lampsilis cariosa*), in the Butternut Creek and the Unadilla River. Additionally, we looked under large flat rocks in the Butternut Creek and the Unadilla River for Hellbenders (*Cryptobranchus alleganiensis*).

### Key findings:

- Brook floaters persist in the Catatunk Creek, but there is no evidence of recent reproduction. Our cursory survey of nearby stream locations failed to identify a suitable location for relocating the mussels during dam removal.
- Dense and extensive pearly mussel beds exist in the Butternut Creek, but there is only one pearly mussel SGCN found there: the Yellow lampmussel.
- All four SGCN appear (Brook floater identification was tentative) in the Unadilla River, but tens of thousands of mussels have been killed in the last year.
  - A NYSDEC investigation into the cause was stymied by issues of jurisdiction: the Unadilla River forms the boundary between two NYSDEC regions.
- No Hellbenders were located.

### Recommendations:

- Proceed with the plan for removing the Spencer Lake dam protecting the pearly mussels immediately downstream of the dam by temporarily moving them to a refuge location.
- Protect the extensive Eastern elliptio (*Elliptio complanata*) beds in the Butternut Creek which can be used to repopulate New York Susquehanna River Watershed with Eastern elliptios once their larval hosts, American eels (*Anguilla rostrata*), are reintroduced to the watershed.
- Protect the Unadilla River from pearly mussel killing pollution.

## Background

There being no funding for writing this important report, it is terse and without full editing. We provide background regarding pearly mussels in the NY State section of the Susquehanna Watershed in Lord *et al.* (2011). The focus of our 2011 surveys was to provide a “quick look” at three lotic areas of interest: the Catatonk Creek, Butternut Creek and Unadilla River.

The Catatonk Creek, in Tioga County, held a population of threatened Brook floaters (*Alasmidonta varicosa*) a decade past (Strayer & Fetterman, 1999; NY Natural Heritage, 2011) just downstream of a Catatonk Creek dam being considered for removal (Nxxxxxxx Wxxxxxxx; UTM XXT xxxxxxE, xxxxxx; Curatolo, pers comm). Our focus was to determine if the population persisted and if nearby sites could serve as a temporary home for the Brook floaters.

The Unadilla River was preliminarily surveyed by a student of Lord’s (Maricle, 2011) in 2010. Maricle’s survey provided evidence of the persistence of three of the pearly mussel species of greatest conservation need (SGCN) in New York Susquehanna River Watershed rivers: the Elktoe (*Alasmidonta marginata*), Green floater (*Lasmigona subviridis*), and Yellow lampmussel (*Lampsilis cariosa*). Adding to interest in the Unadilla River was that it previously held Eastern hellbenders (*Cryptobranchus alleganiensis*) a species of special concern (NYSDEC, 2012; USCA, 2010). Our focus was to validate and expand upon the 2010 Unadilla River survey seeking to identify pearly mussel biodiversity hotspots.

The Butternut Creek is a major Unadilla River tributary reputed to be relatively pristine and considered a potential habitat for both pearly mussels of greatest conservation need and the Eastern hellbender (USCA, 2010).

## Methods and Rationale

To make the most of our financially constrained field time, we tailored methods refined in recent Susquehanna watershed surveys (Lord *et al.*, 2011) to each waterway and to our focus for that waterway.

In the Catatonk Creek, we devoted most of our time to careful accounting for the Brook floater population immediately downstream of the dam considered for removal. We first completed a careful examination of the Creek bottom using a combination of viewing buckets, mask and snorkel, and SCUBA as appropriate for the varying depths found in the Creek 400 m downstream of the dam. We then excavated 105 randomly chosen 0.10 m<sup>2</sup> quadrats to the depth that pearly mussels could burrow and survive, and we sieved the sediments through at 0.12 inch [3.05 mm] mesh screen to find small mussels. We noted all live mussels found and characterized the Creek bottom and shorelines of surveyed areas consistent with Lord *et al.* (2011). Following this intense survey at the dam site, we made cursory viewings of streams above and below our survey site to identify potential pearly mussel transfer refuge locations for possible dam modification work.

In the Butternut Creek, making use of facilitating clarity unusual for the New York Susquehanna River Watershed rivers, we casually surveyed extensive areas from our kayaks. We validated our kayak observations in four locations using viewing buckets, mask and snorkel,

and SCUBA as appropriate for the varying depths found in the Creek. We noted all live mussels found although in some sections we noted the mussels as too numerous to count and estimated their densities per square meter. In areas where we left our kayaks to search for mussels, we characterized the Creek bottom and shorelines of surveyed areas consistent with Lord *et al.* (2011). We used flashlights to search under large flat rocks for Hellbenders (*Cryptobranchus alleganiensis*).

In the Unadilla River, our searches were limited to viewing buckets, mask and snorkel, and SCUBA as appropriate for the varying depth and visibility found in the River. We sampled in 14 locations and used our kayaks to identify additional locations with significant numbers of dead pearly mussels. We determined the approximate timeframes for these deaths based on shell erosion and *aufwuchs* attached to the shells. In areas where we left our kayaks to search for mussels, we characterized the River bottom and shorelines of surveyed areas consistent with Lord *et al.* (2011). We used flashlights to search under large flat rocks for Hellbenders (*Cryptobranchus alleganiensis*).

Per methods found in Lord *et al.* (2011), we created ArcGIS files, documenting our findings, for submittal to the USC, NYSDEC, and New York Natural Heritage Foundation.

## Results

In the Catatonk Creek we found a modest population of brook floater (*A. varicosa*) although we found no evidence of recent reproduction (Table 1). Our cursory survey of accessible stream locations above and below the intense survey location did not produce an ideal location for temporary storage of the pearly mussels in the intense survey location.

Table 1. Live pearly mussels found in Catatonk Creek (Tioga County, NY) below XXXXXX dam in 2011 surveys.

Common Name	Scientific Name	Number Found
Brook floater	<i>Alasmidonta varicosa</i>	10
Eastern elliptio	<i>Elliptio complanata</i>	269
Eastern floater	<i>Pyganodon cataracta</i>	9
Squawfoot	<i>Strophitus undulatus</i>	135
Triangle floater	<i>Alasmidonta undulata</i>	38

In the Butternut Creek, we found sparse pearly mussel populations in the headwaters and, downstream, long reaches with dense pearly mussel populations (Figure 1). We encountered a few areas where silt obscured visibility and the pearly mussel populations became sparse. We found only one pearly mussel SGCN: the Yellow lampmussel (*Lam. cariosa*). Other pearly mussel species found alive include Eastern lampmussels (*Lam. radiata*), Eastern elliptios (*Elliptio complanata*) and Squawfoots (*Strophitus undulatus*). We found several recent dead Triangle floaters (*A. undulata*) although we never found a live animal. Approximately 69 % of the live mussels surveyed were Eastern elliptio (*E. complanata*). The Eastern elliptio were overall smaller and less eroded than Eastern elliptio animals collected elsewhere in New York Susquehanna River Watershed rivers. We found no Hellbenders (*Cryptobranchus alleganiensis*).

**Figure Redacted.**

Figure 1. Butternut Creek and Unadilla River areas searched for pearly mussels (black) in 2011 noting locations with live pearly mussels and pearly mussel Species of Greatest Conservation Need (SGCN) as determined by the New York State Department of Environmental Conservation (NYSDEC, 2010). Elktoe (*Alasmidonta marginata*) = orange circle, Brook floater (*A. varicosa*; tentative identification) = red circle, Green floater (*Lasmigona subviridis*) = blue circle, Yellow lampmussel (*Lampsilis cariosa*) = yellow circle and other pearly mussels = green.

In the Unadilla River, recent pearly mussel deaths were evident in a small reach in the headwaters and in an extensive reach from the Skaneateles Turnpike south to West Edmeston. We determined most of these deaths occurred in the previous twelve months. In South Edmeston, we found an additional dead population of pearly mussels which we determined had been dead longer than a year, probably killed in the year prior to the survey year. We requested enforcement attention to probable illegal dumping of organic wastes. We found three pearly mussel SGCN: the Yellow lampmussel (*Lam. cariosa*), the Elktoe (*A. marginata*), the Green floater (*Las. subviridis*) (Figure 1). We found no animals that were clearly Brook floater (*A. varicosa*) although we did find several possible Brook floater (*A. varicosa*) similar to those noted previously (Strayer & Fetterman, 1999; Lord *et al.* 2011). We found no Hellbenders (*Cryptobranchus alleganiensis*).

### Discussion

Removal of the Catatonk Creek dam poses a direct threat to the pearly mussel population in the intensely surveyed area below the dam. We are confident that we can identify a protecting location for temporary storage of the mussels if a decision is made to remove the dam. While moving involves risk for the population, there is potential benefit to the Brook floater (*A. varicosa*) population in the Catatonk Creek. There were few Brook floaters in the lower part of the surveyed area. The area immediately below XXXXXX Road held the Brook floater population. This area had wooded wetlands on both sides of the Catatonk Creek similar to other high quality pearly mussel beds in New York Susquehanna River Watershed rivers (Figure 2; Lord *et al.*, 2011). If the dam is removed and the stream restored, the stream would have protecting wetlands on both sides providing a hydraulic refuge as discussed in Lord *et al.* (2011).

**Figure Redacted.**

Figure 2. Imagery of the area of the Catatonk Creek, below the intersection of Xxxx Road and Xxxxxx Road, holding a population of Brook floater (*Alasmidonta varicosa*) delineating the wooded wetlands providing a hydraulic refuge for pearly mussels.

The Butternut Creek is a treasure. Most of the Creek areas we surveyed were protected with substantial buffers. The water is clear for most of the Creek's length. Some pearly mussel species thrive, but we did not find three of the four pearly mussel SGCN in the Butternut Creek. There could be any number of explanations. We suspect summer month water temperatures are not high enough to facilitate reproduction (Galbraith and Vaughn, 2011), but this is something that needs to be studied for each species. The cold water also apparently slows growth of Eastern elliptio (*E. complanata*). Given the superannuated Eastern elliptio population and its lack of reproduction in New York Susquehanna River Watershed rivers, this Butternut Creek population may serve as a source of reproductive material should American eels (*Anguilla rostrata*) be reintroduced to the New York Susquehanna River Watershed rivers. (See Lord *et al.*, 2011.)

Our Unadilla River survey provides the story of an opportunity missed. There have been at least two major losses of pearly mussels (estimated in the tens of thousands), including all SGCN species, in the last two years. Enforcement response has been slow and uncoordinated, apparently because the River forms the boundary between two NYSDEC regions which stymied enforcement of a problem that involves both sides of the River. It is unclear, at the time of this writing (five months after our initial report), whether illegal dumping has been completely stopped. There are still sizeable pearly mussel beds in the Unadilla River holding SGCN. The Unadilla River needs protections: buffers, strict enforcement of waste spreading regulations, and increased monitoring.

#### Acknowledgements

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