REPORT

Freshwater Mussel Survey in the Farmington River for Proposed Bank Stabilization in Simsbury, Connecticut

prepared for

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September 2014

Part of the mussel survey area in the Farmington River, where bank stabilization is proposed.

INTRODUCTION

Biodrawversity LLC conducted a freshwater mussel survey in the Farmington River as part of the permitting for a bank stabilization project in Simsbury, Connecticut. The project is located just downstream of existing riprap, approximately 0.75 miles north of the Route 185 Bridge. The survey was intended to document the presence, distribution, and density of the state-listed and federally endangered species in areas that would be affected by riprap, to recommend a relocation plan if target species are found, and to identify a potential relocation site a safe distance away from the project area. Based on previous surveys in this area of the Farmington River, target species included Dwarf Wedgemussel (*Alasmidonta heterodon*), Eastern Pearlshell (*Margaritifera margaritifera*), and Eastern Pondmussel (*Ligumia nasuta*).

METHODS

The mussel survey was conducted on August 5, 2014, when water levels, water temperature, and water clarity were conducive for finding mussels with visual searches. The survey was conducted in all areas where the substrate might be affected by project-related construction, including a 50-meter upstream buffer and a 100-meter downstream buffer, for a total survey distance of approximately 300 meters (~950 feet) (Figure 1). Biologists also evaluated a potential relocation site 300 meters upstream from the project area. The site was selected because environmental conditions (flow, depth, and substrate) were similar to the project area, and a brief survey confirmed that mussels existed at the site. Two biologists spent one day searching for freshwater mussels at the sediment surface (visually) by snorkeling, and by excavating/sieving sediment to attempt to locate buried mussels. Biologists recorded the shell length, shell condition, microhabitat (depth, substrate), and location (using GPS) of every individual of each target species that is encountered, and took digital voucher photographs mussels and their habitat.

RESULTS

Of the three target species, only Eastern Pondmussel was found; a total of 22 live animals were found throughout the project area, with three additional animals found at the

Eastern Pondmussel (*Ligumia nasuta*) found during the survey.

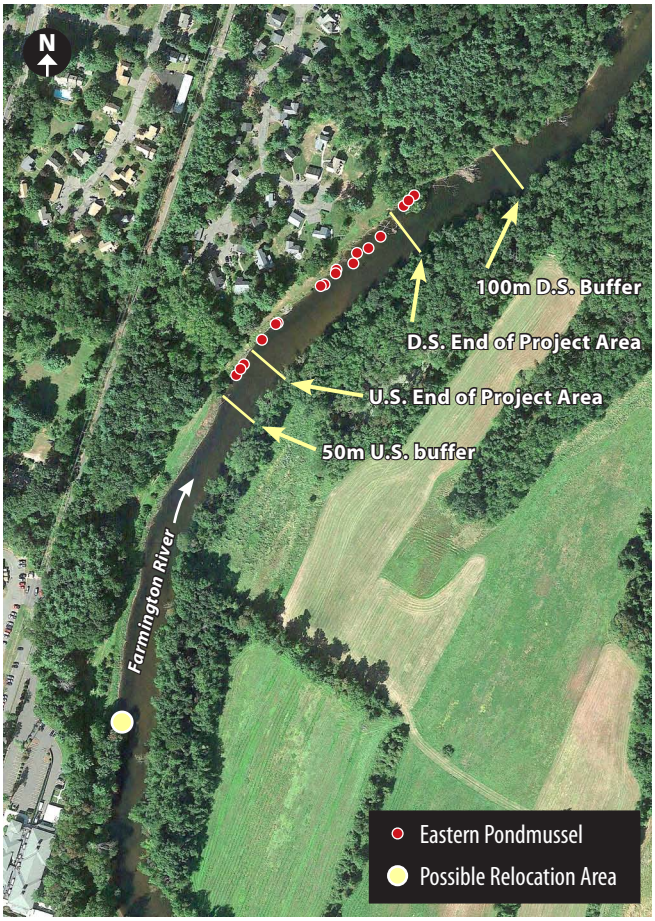

Figure 1. Farmington River, showing the upstream and downstream limits of proposed bank stabilization, the mussel survey area (from 50 m upstream to 100 m downstream), locations where Eastern Pondmussel were found, and the potential relocation site that was evaluated.

potential relocation site that was evaluated. Other mussel species found included Eastern Elliptio (*Elliptio complanata*), Eastern Lampmussel (*Lampsilis radiata*), and Triangle Floater (*Alasmidonta undulata*). The non-native Asian Clam (*Corbicula fluminea*) was also common.

Eastern Pondmussel ranged in length from 47.0 to 81.0 mm (mean = 68.1 mm), and most had light to moderate levels of shell erosion (Table 1). They were found at depths ranging from 0.5 to 4.0 feet, in all available substrate types (silt, sand, gravel, and cobble), often among woody debris and submerged aquatic vegetation.

Within the project area, prevalent habitat conditions included silt substrate, large amounts of woody debris, and patches of dense aquatic vegetation. Sand, gravel, and cobble increased away from the riverbank, and the center of the channel was mostly sand. The potential relocation site had less silt and woody debris, higher amounts of gravel, slightly stronger flows, and overall provided better mussel habitat than the project area.

CONCLUSION AND RECOMMENDATION

Although the federally endangered Dwarf Wedgemussel was found near this location in 2006, none were detected during this survey despite a much more intensive survey effort. Habitat was quite different between the two years. The extensive accumulation of woody debris observed in 2014 was not present in 2006; this debris also contributed to a significant increase in silt and stagnant conditions in the nearshore areas where Dwarf Wedgemussels were observed in 2006. Asian Clams were not observed in this section of the Farmington River in 2005 or 2006, but appear to now be well established.

Table 1. Location, shell length, and habitat data for the 22 Eastern Pondmussel found within the project area.

Species	Latitude	Longitude	Shell Length (mm)	Water Depth (ft)	Substrate
E. Pondmussel	41.85566	-72.80778	62.0	4.0	Gravel
E. Pondmussel	41.85595	-72.80747	81.0	1.5	Silt and Sand
E. Pondmussel	41.85594	-72.80749	74.0	0.5	Silt and Sand
E. Pondmussel	41.85592	-72.80753	56.0	2.0	Silt and Sand
E. Pondmussel	41.85559	-72.80791	65.0	2.0	Silt and Sand
E. Pondmussel	41.85556	-72.80799	62.0	2.0	SIlt, Dense Vegetation
E. Pondmussel	41.85547	-72.80805	78.0	2.5	Silt, Sand, Woody Debris
E. Pondmussel	41.85547	-72.80805	61.5	2.5	Silt, Sand, Woody Debris
E. Pondmussel	41.85541	-72.80822	75.0	3.0	Silt, Sand, Woody Debris
E. Pondmussel	41.85537	-72.80833	47.0	1.5	Silt, Cobble
E. Pondmussel	41.85531	-72.80833	76.0	2.5	Silt, Cobble
E. Pondmussel	41.85531	-72.80833	65.0	3.0	Silt, Woody Debris
E. Pondmussel	41.85532	-72.80838	81.0	1.5	Silt, Cobble
E. Pondmussel	41.85508	-72.80880	60.0	2.5	Silt, Sand, Gravel, Cobble
E. Pondmussel	41.85509	-72.80880	67.0	2.0	Silt and Cobble
E. Pondmussel	41.85497	-72.80889	80.0	3.0	Silt and Cobble
E. Pondmussel	41.85478	-72.80908	64.0	2.0	Silt and Cobble
E. Pondmussel	41.85470	-72.80917	76.0	1.5	Silt and Cobble
E. Pondmussel	41.85470	-72.80917	69.0	1.5	Silt and Cobble
E. Pondmussel	41.85470	-72.80917	62.0	1.5	Silt and Cobble
E. Pondmussel	41.85470	-72.80917	73.0	1.5	Silt and Cobble
E. Pondmussel	41.85473	-72.80914	65.0	2.0	Silt and Cobble

The Eastern Pondmussel is listed as Special Concern in Connecticut. The Connecticut Department of Energy and Environmental Protection (DEEP) requires relocation and monitoring for construction projects where this species has been documented. The following is standard procedure for this type of project:

- Within two weeks prior to construction, biologists will survey, collect, and relocate Eastern Pondmussels and other state-listed species (which may also include Dwarf Wedgemussel).
- The survey area should extend from 50 meters upstream from the upstream-most disturbance to 100 meters downstream from the downstream-most disturbance.
- Grids will be established with weighted lines to facilitate a systematic snorkel search of the entire area.
- Biologists will search for mussels at the surface of the sediment by snorkeling. In areas where target species are encountered and interstitial habitat seems promising, especially in areas within or near the direct footprint of construction, biologists will excavate and sieve sediment within 0.25m^2 quadrats, using a 6-mm screen to attempt to detect subsurface adults or juveniles.
- All target species encountered will be gathered and held underwater in a mesh bag. Each will be measured, photographed, and tagged using a numeric 3x5mm pennant tag affixed with super glue.
- After mussels have been tagged, they will be transported to the relocation site and placed into the substrate. The precise location of each animal will be recorded using GPS and permanent markers will be established on the stream bottom and bank to facilitate finding these animals at a later date.
- Relocated mussels will be checked one month and one year following relocation to monitor mortality, movement, or growth.
- Interim and final reports will be submitted as required by the Connecticut DEEP, and contractors will comply with other permit conditions.