

September 27, 2021

Michael S. Rolband
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Dear Mike,

This letter constitutes my fifth quarterly report for work on RFP #01 – Mussel Introduction into an Urban Stream Environment. The project objective is to assess the potential of the restored stream channels to support freshwater mussels. Data on survivorship and growth of translocated and hatchery-raised mussels are being used to assess the viability of the restored streams for stocking a larger population. This report covers the period from July 1 to September 30, 2021.

Work during this quarter included surveys of translocated and hatchery-raised mussels in Snakeden and The Glade conducted on July 28 and September 15. The translocated (free-ranging) mussels were checked by locating their PIT tags. A subset of these were extracted from the stream bed to assess health and growth. The hatchery-raised mussels (Alewife Floaters) included Fall 2020 and Spring 2021 cohorts, which are kept within enclosures. These were checked for condition and measured for length. Preliminary findings are as follows:

Fate of translocated *Elliptio complanata* mussels collected from Bull Run: 100 adult *Elliptio complanata* mussels were tagged and released in Snakeden (50 individuals) and The Glade (2 sites, 25 individuals at each site) on November 11, 2020. Subsequent surveys detected 75, 81 and 67 individuals (February, April and July, respectively). Highest recovery was observed at the Glade #2 site (80%) and lowest recovery occurred at Snakeden (62%). During the April and July census, a subset of these individuals were retrieved and found to be in good condition. We observed small, but positive growth rates at all sites.

Site	# stocked	# recovered			Growth %
		24-Feb	28-Apr	28-Jul	
Glade #1	25	19	19	16	0.9%
Glade #2	25	11	21	20	0.4%
Snakeden	50	45	41	31	0.3%
Total	100	75	81	67	

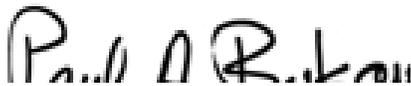
Survivorship and Growth of hatchery-raised *Utterbeckiana implicate*. Two cohorts of Alewife Floaters were stocked at the Reston sites. Sixty mussels were placed in enclosures at two sites in The Glade on November 11, 2020 (Fall cohort). An additional 60 individuals were stocked at The Glade and Snakeden (30 at each stream) on April 28, 2021 (Spring cohort). Among the Fall cohort, we observed high survivorship (~75% through April). No dead individuals were found; missing individuals were mostly enclosures which had been displaced or removed from the stream. Growth rates were low over winter and spring, but began to increase with the July census (see Table 2, below). Growth rates at the Reston sites were similar to those observed at our rural stream reference site (Kimages Creek), which ranged from <0.5% in winter-spring to 1-2% in summer. A large number of enclosures were lost in September after the passage of remnants from Hurricane Ida, which will preclude assessment of Fall growth rates.

Table 2. Cumulative growth rates of Fall (2020) and Spring (2021) cohorts of *Utterbeckiana* mussels stocked in restored Reston streams .

Date	Fall Cohort				Spring Cohort			
	Glade #1		Glade #2		Glade #1 & #2		Snakeden	
	Growth (%)	N	Growth (%)	N	Growth (%)	N	Growth (%)	N
2/24/2021	-0.1%	21	0.3%	26				
4/28/2021	0.2%	21	0.4%	25				
6/9/2021	0.8%	7	0.1%	17	0.0%	20	-0.6%	24
7/28/2021	1.1%	7	1.4%	9	0.8%	17	1.3%	17
9/15/2021	NA	1	1.9%	9	1.9%	4	NA	0

Activities during the next quarter will focus on continued monitoring of the translocated mussels and an analysis of food resource conditions at the restored and reference sites. I will provide a copy of this report to our Contracts office and you should receive a separate invoice. Please contact me if you have any questions.

Sincerely,



Paul A. Bukaveckas