Lower Wild and Scenic Delaware River Mini Grant Summary
Chinese Pond Mussel Survey

After the discovery of invasive Chinese pond mussel (CPM) in derelict aquaculture ponds located in Hunterdon County, New Jersey, the New Jersey Conservation Foundation conducted eradication efforts within the ponds that are hydrologically connected to the Wickecheoke Creek. In order to verify the eradication of this invasive species, the NJCF partnered with the eDNA lab at Rutgers University to develop a highly sensitive qPCR assay to detect the presence of CPM. Initial findings suggest that a population of Chinese pond mussel likely still exists within several of the ponds at this site. Concerns regarding the potential escape of this invasive species from these aquaculture ponds, paired with inconclusively positive samples that were collected from the Island Farm Weir at the confluence of the Raritan and Millstone rivers have initiated additional eDNA sampling in connected waterways.

In September of 2021, additional eDNA sampling was conducted along the outflowing Wickecheoke Creek, the Delaware-Raritan Canal, near the Island Farm Weir, and on the Duke Farms property (Map 1). While all but the aquaculture pond samples tested negative for CPM in September 2021, the timing of the survey was not optimal, given CPM are thought to be reproductively active in late spring through early summer and most likely to be picked up with an eDNA survey during that time period.

Rutgers and its partnering organizations (NJDEP, USFWS, NJCF) have conducted two further rounds of sampling (~75 samples each time, including field negative controls, across 22 locations) in late May and early July of 2022 to evaluate the extent of the spread of CPM to other connected waterways, if any. This fall the Rutgers eDNA lab will extract DNA from samples and analyze samples using the previously developed species-specific assay on a qPCR machine, using appropriate positive and negative controls.

The Chinese Pond Mussel survey was a multiagency collaboration. NJ Water Supply Authority provided experienced personnel to conduct water sampling, US Fish and Wildlife Service purchased the necessary sampling and testing equipment required for eDNA study and Rutgers and NJ Conservation Foundation donated staff time towards the project. NJDEP Fish and Wildlife funds, along with the mini grant provided by the Lower Wild and Scenic Delaware River Committee to the NJ State Park Service, allowed this project to move forward in a timely manner. Early detection of potential invasive species is imperative to help halt the spread of organisms. The professionalism and dedication of the all the partners have made this important ecological survey possible.

While the samples have been collected, Rutgers is unable to process the samples until late October to early November. Once the samples have been processed, we will provide follow up report to the Lower Wild and Scenic Delaware Committee for review. The NJ State Park Service, along with the partnering organizations on this project, thank the committee for it support and encouragement to uphold the ecological health of New Jersey’s waterways.

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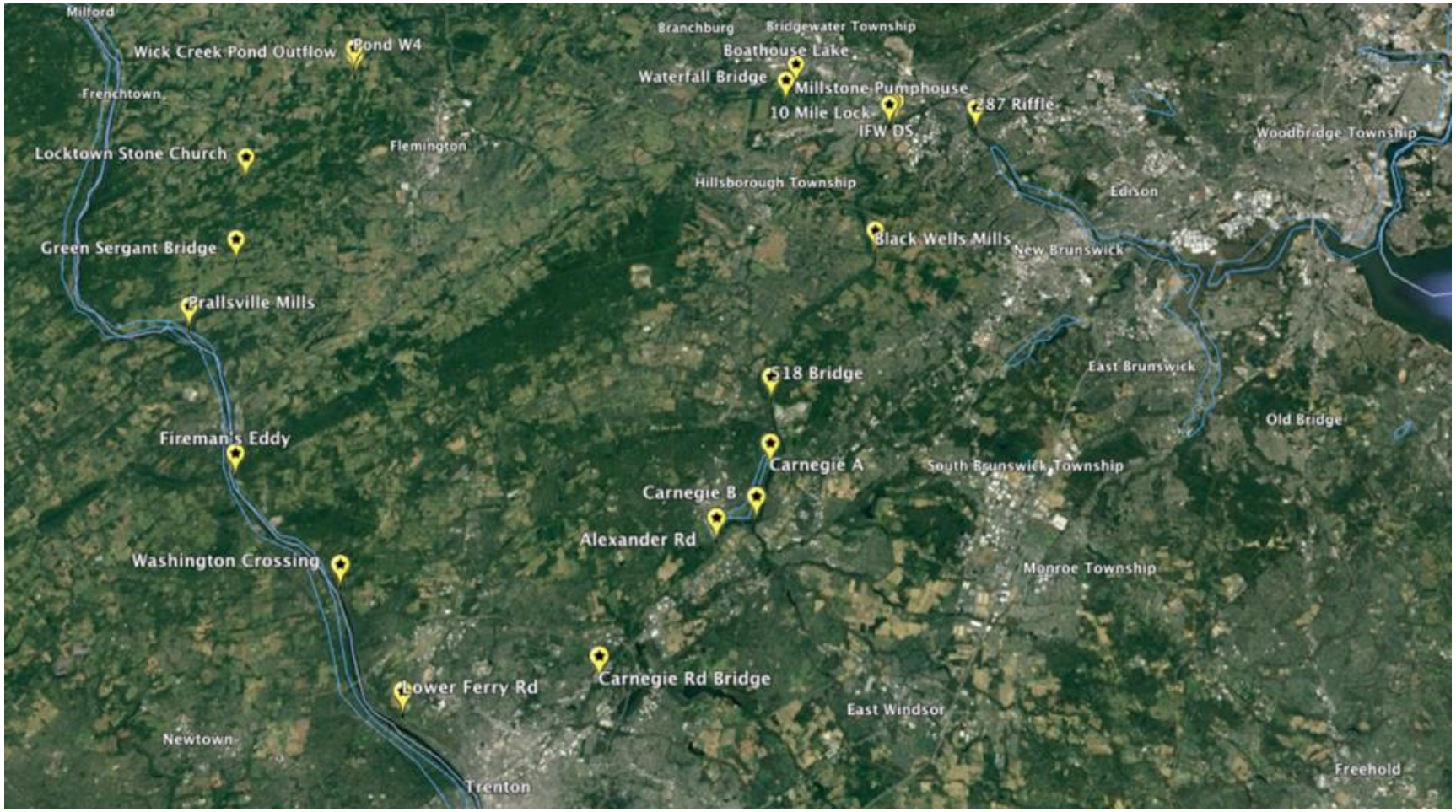

Map 1. CPM eDNA sampling locations (yellow markers), including sites along the Wickecheoke Creek, D&R canal, locations near the Island Farm Weir, and at the Duke Farms property.

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Location of Sample Sites:

Number	Location	Location Code	LAT	LONG	Notes
1	287 Riffle	RFL	40.542603	-74.514115	Near 287 riffle, behind apartments
2	Raritan Dowstream of IFW	RDI	40.542971	-74.565190	Off rocks downstream of IFW
3	Millstone Pumphouse	MPH	40.542208	-74.568016	Pumphouse on Millstone upstream of IFW
4	10 Mile Lock	TML	40.540685	-74.569109	Canal near gate that opens into Millstone
5	Black Wells Mills/ Canal Rd	BWC	40.475264	-74.572034	Near bridge over canal
6	RT 518 Bridge	RFB	40.399492	-74.627733	Canal, near RT 518 Bridge Parking Lot
7	Carnegie Lake A	CLA	40.368476	-74.624591	Carnegie lake near RT 27 Public Boat Launch
8	Carnegie Lake B	CLB	40.343552	-74.629830	Near Mapleton Rd Parking Lot, along trail.
9	Alexander Rd	ARC	40.332352	-74.651953	Near canal parking lot
10	Carnegie Road Bridge	CRB	40.267333	-74.710558	Carnegie Road Bridge near Extra Space storage.
11	Lower Ferry Road	LFR	40.244980	-74.819431	Lower Ferry Rd Bridge near Park Trail
12	Washington Crossing Bridge	WCB	40.296819	-74.867103	Bridge over canal near Nelson House
13	Fireman's Eddy Bridge	FEB	40.342161	-74.940510	Bridge over canal near trail parking lot.
14	Raritan Input Resevoir	RIR	40.550533	-74.636833	Area near input of Raritan River to Resevoir.
15	Large Waterfall Bridge	LWB	40.5492	-74.6362	Adjacent to bridge by large waterfall (outflow of resevoir)
16	Racoon Buffet Stream	RBS	40.558331	-74.631241	Mussel bed stream
17	Boat House Lake	BHL	40.558253	-74.630799	Lake near boathouse containing carp
18	Prallsville Mills	PVM	40.409346	-74.986316	Behind Prallsville Mills main building
19	Green Sergeant Bridge	GSB	40.443914	-74.966142	Wick near Green Sergeant Bridge
20	Locktown Stone Church	LSC	40.485809	-74.970619	Wick bridge near Locktown Stone Church
21	Wick Creek Outflow	WCO	40.543817	-74.914228	Creek outflow near bridge/ Allens Corner Rd
22	Pond W4	JEP	40.547671	-74.91563	Pond W4 (Last long pond near smaller ones) (Positive Control)

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NOVEMBER FOLLOW UP REPORT:

Rutgers has completed the eDNA analysis and has confirmed the presence of CPM within 3 (most likely 4) site in the sampling area. The partnership group will be reconvening to discuss next steps.

Location	LAT	LONG	CPM Detected in May?	CPM Detected in June/July?	Notes
287 Riffle	40.542603	-74.514115	N	N	Near 287 riffle, behind apartments
Raritan Dowstream of IFW	40.542971	-74.565190	Yes, 1/3 Samples	N	Off rocks downstream of IFW
Millstone Pumphouse	40.542208	-74.568016	N	N	Pumphouse on Millstone upstream of IFW
10 Mile Lock	40.540685	-74.569109	N	N	Canal near gate that opens into Millstone
Black Wells Mills/ Canal Rd	40.475264	-74.572034	N	N	Near bridge over canal
RT 518 Bridge	40.399492	-74.627733	N	N	Canal, near RT 518 Bridge Parking Lot
Carnegie Lake A	40.368476	-74.624591	N	N	Carnegie lake near RT 27 Public Boat Launch
Carnegie Lake B	40.343552	-74.629830	N	N	Near Mapleton Rd Parking Lot, along trail.
Alexander Rd	40.332352	-74.651953	N	N	Near canal parking lot
Carnegie Road Bridge	40.267333	-74.710558	N	N	Carnegie Road Bridge near Extra Space storage.
Lower Ferry Road	40.244980	-74.819431	N	N	Lower Ferry Rd Bridge near Park Trail
Washington Crossing Bridge	40.296819	-74.867103	N	N	Bridge over canal near Nelson House
Fireman's Eddy Bridge	40.342161	-74.940510	N	N	Bridge over canal near trail parking lot.
Raritan Input Resevoir	40.550533	-74.636833	N	N	Area near input of Raritan River to Resevoir.
Large Waterfall Bridge	40.5492	-74.6362	N	N	Adjacent to bridge by large waterfall (outflow of resev
Racoon Buffet Stream	40.558331	-74.631241	N	N	Mussel bed stream
Boat House Lake	40.558253	-74.630799	N	N	Lake near boathouse containing carp
Prallsville Mills	40.409346	-74.986316	N	N	Behind Prallsville Mills main building
Green Sergeant Bridge	40.443914	-74.966142	Yes, 3/3 Samples	N	Wick near Green Sergeant Bridge

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Locktown Stone Church	40.485809	-74.970619	Yes, 3/3 Samples	N	Wick bridge near Locktown Stone Church
Wick Creek Outflow	40.543817	-74.914228	N	N	Creek outflow near bridge/ Allens Corner Rd
Pond W4	40.547671	-74.91563	Yes, 3/3 Samples	Yes, 3/3 Samples	Pond W4 (Last long pond near smaller ones) (Positive