Investigating the Relationship Between Invasive and Native Mussels in the Lower Grasse River

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Project Team

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Save the River (STR) - Component #3

- John Peach, Lauren Eggleston, Patricia Shulenburg, Kendall Hathaway, Diane Leonard, and Education Committee

Saint Regis Mohawk Tribe (SRMT) - Components #1 and #2

- Jessica Jock (Co-PI), Jay Wilkins, and Colby Bowman

New York State Museum (NYSM) - Components #1 and #2

- Dr. Denise Mayer (Co-PI) and Kathleen Presti

Mussel Populations

Native freshwater mussel (unionid) populations were historically abundant and species rich in the St. Lawrence River and Great Lakes

Since the introduction of invasive mussels (dreissenids) around 1990, native mussel populations have dramatically declined.

Refugia in tributaries of the St. Lawrence River

Tributaries provide refuge for native mussels (unionids) from invasive mussels (dreissenids)

Tend to have specific characteristics: shallow, protected waters; warmer temperatures and low flow; presence of emergent and submerged aquatic vegetation; soft, deep sediment (particularly silt substrates).
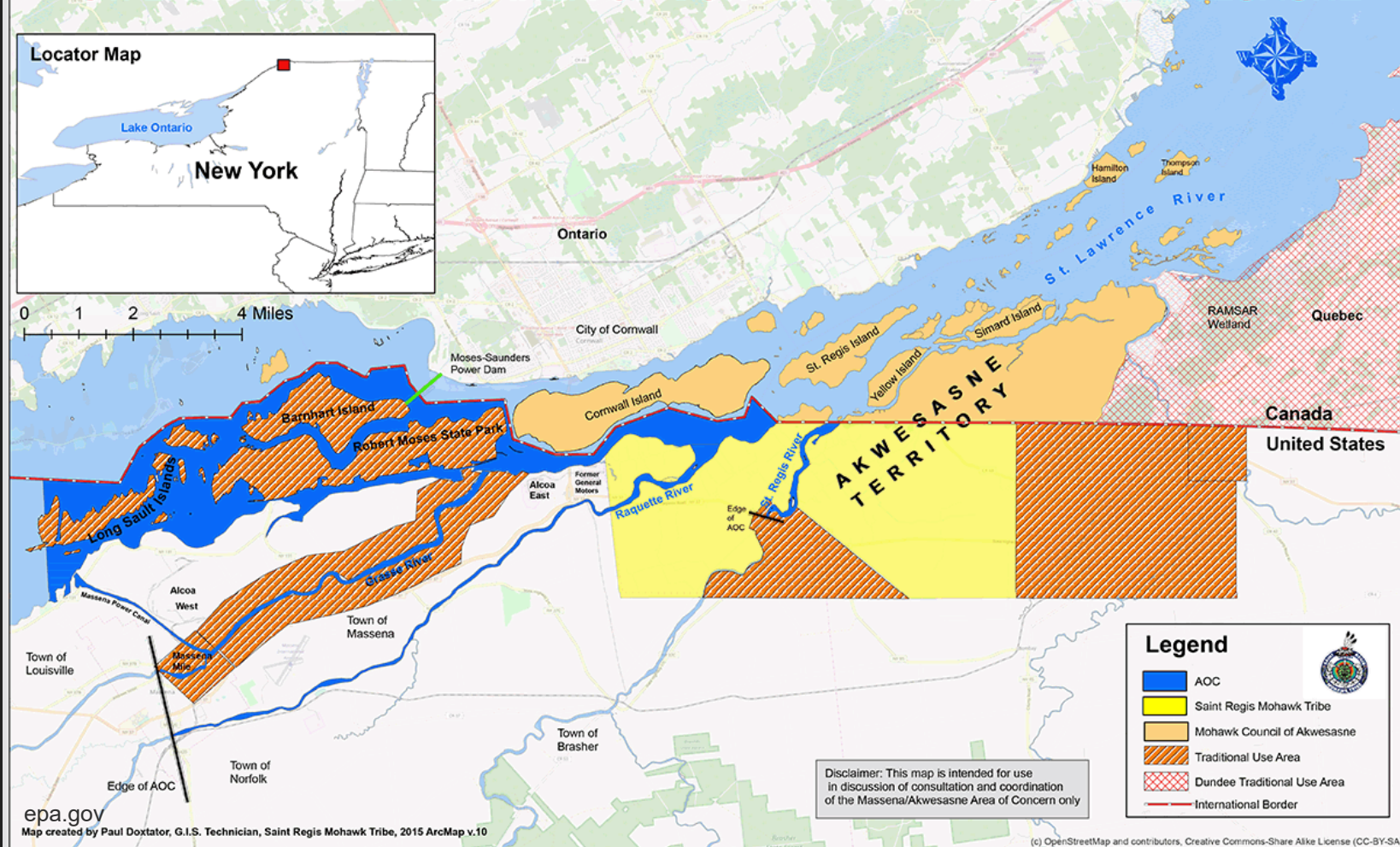
-Zanatta et al., 2015, Bossenbroek et al., 2018

St. Lawrence River Area of Concern at Massena/Akwesasne

ST. LAWRENCE RIVER AREA OF CONCERN AT MASSENA/AKWESASNE

Locator Map

Lake Ontario

New York

0   1   2   4 Miles

Ontario

City of Cornwall

Cornwall

St. Lawrence River

Hamilton Island

Thompson Island

RAMSAR Wetland

Quebec

Moses-Saunders Power Dam

Barnhart Island

Robert Moses State Park

Long Sault Islands

Cornwall Island

St. Regis Island

Yellow Island

Simard Island

AKWESASNE TERRITORY

Canada

United States

Alcoa East

Former General Motors

Raquette River

St. Regis River

Edge of AOC

Massena Power Canal

Alcoa West

Grasse River

Town of Massena

Massena Mile

Town of Louisville

Town of Norfolk

Town of Brasher

Edge of AOC

Legend

AOC

Saint Regis Mohawk Tribe

Mohawk Council of Akwesasne

Traditional Use Area

Dundee Traditional Use Area

International Border

Disclaimer: This map is intended for use
in discussion of consultation and coordination
of the Massena/Akwesasne Area of Concern only

epa.gov

Map created by Paul Doxtator, G.I.S. Technician, Saint Regis Mohawk Tribe, 2015 ArcMap v.10

Grasse River Superfund Project

Capping and dredging, altering river bottom and sediment substrate

Remedy footprint 305-acres over 7.2 river miles (~400 acres). Approximately 75% of the lower Grasse River affected.

How does remedy substrate alterations affect unionid abilities to burrow and self-clean from dreissends?

Study Questions

Does the existing lower Grasse River habitat function as a refuge for unionids from aquatic invasive species of the St. Lawrence environ?

If the substrate in lower grasse River is suitable to function as a natural biocontrol measure for unionid self-cleaning of dreissenids, what can we learn from this refugia system?

Are there other tributaries with confluence to the St. Lawrence River that demonstrate similar unionid and dreissenid co-existence and self-cleaning behaviour?

Are dreissenids recolonizing on adult unionid mussels in remediated and non-remediated areas the same?

Based on findings - how does information inform future restoration and management decisions?

Component #3

Objective 4; Public Education and Outreach

Experiential Learning

How are these data collected?

What can we learn from these data?

Publications

Trifold - Grade 8+

1. Dreissenids and Unionids are not the same.
2. How to help native mussels, how to be aware of and stop the spread of invasive mussels.

Publications

Booklet - Grade 5+

1. Invasive and native mussels are different.
2. Familiarize students with the history of mussels and humans
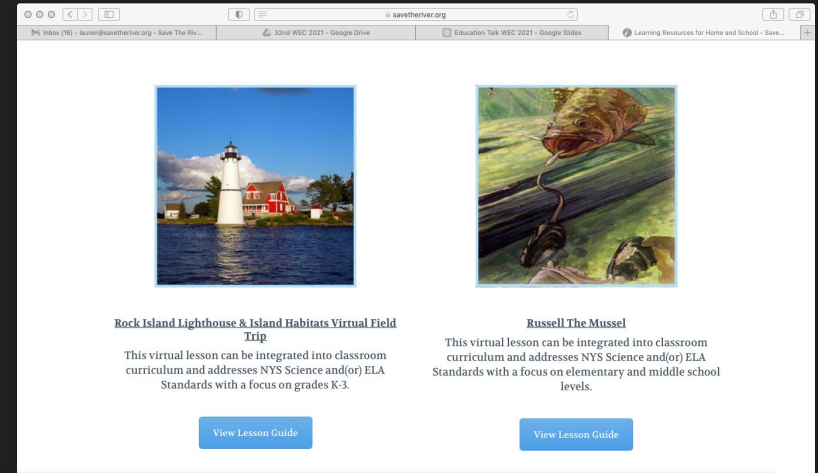3. Empower youth to care for their waterways

Virtual Learning

Adapt to pandemic learning styles
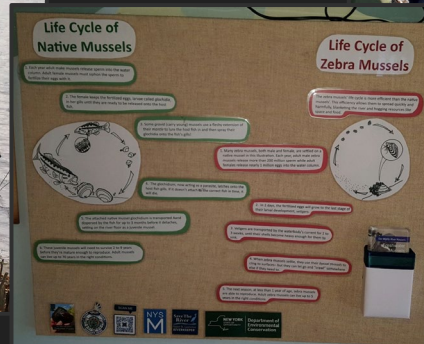
Story time for younger audiences

Resources for students to explore beyond the initial lesson.
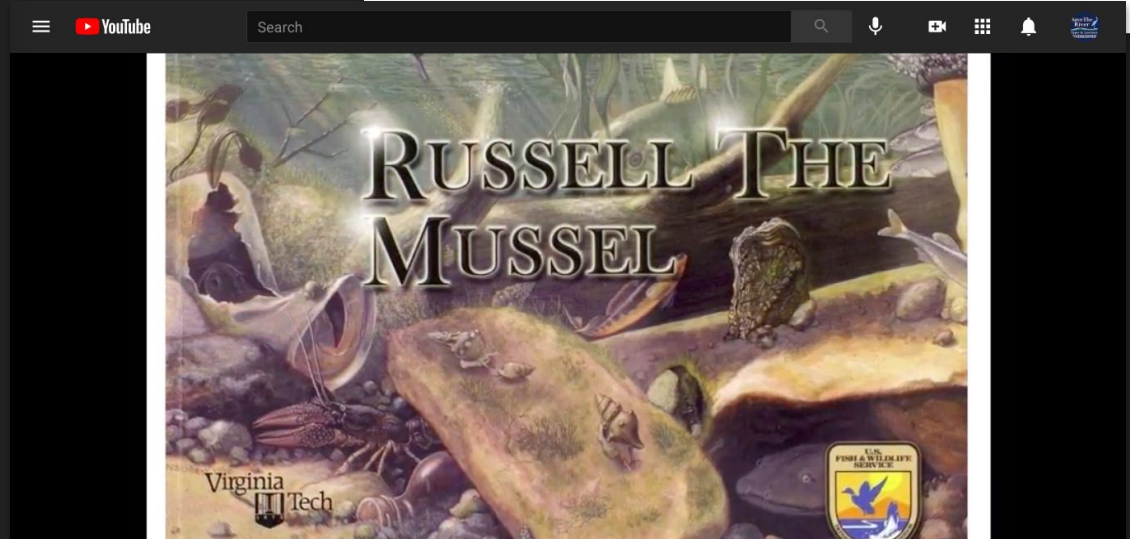
Community partnerships

Reaching schools, libraries, non-profit organizations, state agencies, Zoo New York.

Covering a large geographic area.

What's next?

Back in the classroom and exploring on field trips!

Experiential learning: having students and community members involved in hands-on experiences.

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