Partnerships for Regional Invasive Species Management; Identification, Impact, Prevention & Control of Aquatic Invasive Species

Bv **Megan Pistolese Ecological Education Outreach Coordinator** for the SLELO PRISM p to Stop the Spread of Invasi The Nature Conservancy PRISN Protecting nature. Preserving life." **Partnership For Regional Invasive** Species Management

Today's Discussion

- What are invasive species and why do we care
- What are PRISM's
- How did PRISM's become established
- What do they do
- What is SLELO PRISM
- Our 5 year strategic plan (ED/RR/Cooperation/Information Management/ Control/ Restoration/ Education
- Priority Conservation Areas & Highly Probable Areas
- Prevention is key and ways to help
- SLELO Target and Watch Species
- Ways to get involved and where to learn more

What are Invasive Species and Why do we Care?

Invasive species are defined as any plant, animal, or micro-organism that causes harm or is likely to cause harm to the economy, environment and/or human health.

- Invasive species almost always out-compete, damage or displace <u>more valuable</u> native species.
- Invasive species are among the <u>most serious threats</u> to native species, habitats, whole ecosystems and public health.
- Invasive species are a factor in the decline of <u>49%</u> of all threatened or endangered species. (1)
- The economic impact of invasive species in the U.S. is estimated at <u>120 to 138 billion</u> <u>dollars annually.(1)</u>
- Invasive species reduce agricultural crop yields and increase agricultural expenses.
- Invasive species such as giant hogweed and the west Nile virus can cause serious human health problems.

PRISM's: A New Approach to Fight Invasive Species In New York State Turning Recommendations into Reality

2006 2003 PRISM's funding **Request for EPF** 2008 - 2011provided via the Task Force funding was 1st Four PRISM's NYS Environmental Established successful Established **Protection Fund** 2008 2005 2012-2013 Advisory Comm. T.F. Recommended Remaining & I.S. Council Four PRISM's to the state (DEC) a **Established PRISM Network** Established

"Teaming Up to Stop the Spread of Invasive Species"

Partnerships for Regional Invasive Species Management 2008

Finger Lakes

1st Four PRISM's : APIPP CRISP LIISMA SLELO

Western NY

2nd Four PRISM's: Western NY Finger Lakes Capital-Mohawk Lower Hudson

SLELO

Lower Hudson

LIISMA

CRISP

Capital-Mohawk

APIPP

PRISMS help to protect our beautiful places from the impacts of invasive species



SLELO PRISM 7 Strategic Goals

- **1. Prevention:** Prevent the introduction of new invasive species into the SLELO PRISM
- 2. Early Detection/ Rapid Response: Rapidly detect new and recent invaders and eliminate all individuals within a specific area (focused on PCAs and HPAs)
- **3. Cooperation:** Share resources, including funding personnel, equipment, information and expertise
- 4. Information Management: Collect, utilize and share information regarding surveys, infestations, control methods, monitoring and research
- 5. Control: Control populations of invasives using containment, suppression and eradication strategies
- 6. **Restoration:** Develop and implement effective restoration methods for areas that have been degraded by invasives
- 7. Education/Outreach: Increase public awareness and understanding of invasive species issues

SLELO PRISM 2012-2016 Strategic Plan Available at <u>www.sleloinvasives.org</u>

Prioritization of the SLELO PRISM

Priority Conservation Area's (PCA's): sites that are considered Ecologically important and or sites that are considered to have conservation value.

Some examples of PCA's include but are not limited to:

Tug Hill Plateau	150K acres of mixed forest
Chaumont Barrens	Alvar barren grassland
Salmon River Reservoir	2,660 acres of freshwater
Black Pond	526 acres of barrier beach/dune/marsh/wetland
Tug Hill Plateau	150,000 acres mixed forest

Highly Probable Areas (HPA's) : Areas in which the introduction or spread of invasive species is likely to occur.

Some examples of HPA'S include but are not limited to:

Trail Heads	Boat Launches
Ports/canal-ways	Campgrounds
Homogenous Vegetative Stands	Disturbed Areas (construction zones)
Parking Areas	Areas with low biodiversity
Fishing Access Sites	Aquatic areas with slow moving water

Control & Methods

Basic Levels of Control

- Eradication
- Containment
- Suppression

Control Methods

- Physical
- Mechanical
- Chemical application
 - Biological



GENERALISED INVASION CURVE SHOWING ACTIONS APPROPRIATE TO EACH STAGE

Version 1.0: 30 APR 2009



Guidance for invasive plant species management can be found in the Nature Conservancy's <u>Invasive Plant Management Decision Analysis Tool (IPMDAT</u>) at http://www.imapinvasives.org/IPMDAT_v1.1_06-30-11.pdf Or at http://www.imapinvasives.org/ipmdat.html

You can Help to Prevent the Introduction and Spread of Invasive Species

- Learn to identify invasive species
- Learn how invasives can be spread
- Take caution when participating in activities that could make you a vector of an invasive species introduction.



There are 50 thousand exotic species (non-native) in the US, and 4,300 of them are considered to be invasive species (known to cause harm to the economy, environment and/or human health).

SLELO Target Species List

Aquatic/Riparian Species

- Water Chestnut
- Eurasian Water Milfoil
- Hemimysis (bloody shrimp)

Other Target Species

 (Black/ Pale Swallow-wort, Giant Hogweed, Emerald Ash Borer, Japanese Stiltgrass, Wild Chervil, Leafy Spurge, Phragmites, Purple Loosestrife, Japanese Knotweed, Glossy Buckthorn)

SLELO Watch/Prevention Species List

Aquatic Species

- Didymo
- Hydrilla
- Starry Stonewort
- Silver, Big Head and Grass Carp
- New Zealand Mud Snail
- Asian Clam
- Water Soldier
- Rusty Crayfish

Other Target Species

(Mile-A-Minute Vine, Asian Long Horned Beetle, Hemlock Wooly Adelgid, Kudzu, Feral Swine Porcelain Berry)

TARGET SPECIES: Water Chestnut (Trapa natans)

Native Range/Introduction

Western Europe, Northeast Asia& Africa/ accidental cultivation

Ecological Threat

- This fast-growing, floating perennial forms large mats that <u>completely</u> <u>dominate surface waters</u>.
- Renders open waters <u>unavailable to</u> <u>recreation</u>.
- Shades out native aquatic vegetation.
 Reduces oxygen levels for fish and encourages sedimentation by restricting silt movement.
- Hard, pointy seeds can cause injury to feet.

Best Control:

Hand/ Mechanical Harvesting and Chemical application of 2,4-D and glyphosate (follow regulations.) Biological control agents are being explored (*Galerucella sbspp.*)



Because of the severity of its impacts, *T. natans* has been listed in federal regulations prohibiting its sale and transportation.

TARGET SPECIES: Eurasian Watermilfoil (Myriophyllum spicatum)

Native Range/ Introduction Eurasia/ Accidental

Ecological Threat:

- Grows monocultural stands that outcompete native plant species
- Reduces available aquatic habitat and biodiversity
- Can create "dead zones" where oxygen levels are low enough to suffocate aquatic wildlife (due to plant die off)
- Clogs water ways and impairs recreational activities
- Causes high recreation-oriented financial losses and lowered property values.

Best Control:

Hand-pulling; Bottom barrios; chemical application of *2,4-D and Fluridone* can be used with permit and under strict conditions; and Biological control.

Listed as a noxious or otherwise restricted plant in 17 states (in NYS Eurasian watermilfoil is classified as "prohibited").



4-5 Leaf whorls

9-21 feathery leaflet pairs that are limp when out of water

TARGET SPECIES: Hemimysis/Bloody Red Shrimp (Hemimysis anomala)

SWARN

Bloody red shrimp

shadow of a pier

swarm visible in the

Native Range/Introduction: Europe and western Asia/Ballast water

Ecological Impacts:

Currently, the impacts of Hemimysis are not well understood. However, because they eat tiny plants and animals such as plankton and insect larvae, there could be impacts on the native food chain. Specifically, food availability may be reduced for young native fishes.

Best Control:

Hemimysis invade canals, streams, lakes and reservoirs throughout Europe; therefore, they are considered a 'high risk' invader of inland lakes in the Great Lakes Region. To prevent their spread practice the <u>Clean, Drain, Dry protocol</u> when entering/leaving a new body of water.

WATCH/PREVENTION SPECIES: Didymo (Didymosphenia geminate)

Native Range/Introduction:

Northern Europe and parts of Northern North America/unknown

Ecological Threat:

- Forms large mats on bottoms of rivers, streams and lakes
- Destroys critical habitat for fish and their prey species and disturbs spawning areas
- Easily transported on the bottom of fishing waders and in boat ballast water

Best Control:

Prevention is the best control method. Anglers should clean/dry their equipment especially waders before entering/leaving a body of water.



Locations Confirmed by the DEC to Have Didymo:

- Batten Kill and one tributary (Washington County)
- Kayderosserras Creek (Saratoga County)
- East Branch Delaware River below Pepacton Reservoir (Delaware County)
- West Branch Delaware River below
 Cannonsville Reservoir (Delaware County)
- West Branch Delaware River below Delhi to Cannonsville Reservoir (Delaware County)
- Mainstem Delaware River (Delaware and Sullivan Counties)
- Mouth of Little Delaware River (Delaware County)
- Esopus Creek downstream of the Shandaken Portal (Ulster County)
- West Branch Croton River (Westchester County)

WATCH/PREVENTION SPECIES: Hydrilla (Hydrilla verticillata)

Native Range/Introduction

Indian subcontinent, Korea/Imported

Ecological Threat:

-Aggressively spreads and dominates native, beneficial, aquatic plants.

-Renders surface waters unusable for passive recreation and fishing.

-Winter dieback may reduce dissolved oxygen levels.

Best Control:

Mechanical harvesting and herbicide spraying are common control methods of controlling *Hydrilla*. Both are expensive and only moderately effective. Hydrilla has <u>4 or more</u> leaves per whorl and <u>visible serrated</u> <u>leaf margins</u> and tubers.

Look alike! Elodea has <u>3 leaves per whorl,</u> no serrations and no tubers.

WATCH/PREVENTION SPECIES: Starry Stonewort (Nitellopsis obtusa L.)

Native Range/ Introduction: Europe, Western Asia/ Ballast Water

Ecological Threat:

- Forms dense mats of vegetation, that reduce biodiversity
- Impedes movement of fish and other animals, and may decrease successful spawning activity of some fishes.
- Act as a substrate for zebra mussels
- Cause negative impacts on benthic dwellers

Best Control: Manual removal of plant and bulbs is possible but difficult. Herbicides can be used but requires permits.



WATCH/PREVENTION SPECIES: Silver, Big Head and Grass Carp (Ctenopharyngodon spp.)

Native Range/Introduction:

Asia/Intentional importation

Ecological Impacts:

- Impacts food web (Can consume 20% of body weight/day)
- Displaces native species
- Silver carp jump out of the water when startled and can injure boaters

Best Control:

Prevention of sale/transport of Asian Carp is the most effective method. Electric Barriers are being used in the Chicago Sanitary/Ship Canal to help slow the spread.

Video Clip: https://www.youtube.com/watch?v=rPeg1tbBt0A Note: eyes located in lower half of the head



Silver Carp

Bighead Carp

Grass Carp

WATCH/PREVENTION SPECIES: Water Soldier (Stratiotes aloides)

Native Range/Introduction: Europe and northwest Asia/Nursery trade

Ecological Impacts:

- Creates dense mats of vegetation that displace aquatic plants
- Alter surrounding water chemistry
- Hinder recreational activities
- The sharp serrated leaves can cause cuts on swimmers

Best Control:

Small infestations can be managed through hand pulls. Extreme care and protection should be used when removing plants.



WATCH/PREVENTION SPECIES: New Zealand Mud Snail (Potamopyrgus antipodarum)

Native Range/Introduction:

Mollusk native to New Zealand. Introduced to Great Lakes via ballast water of ships.

Ecological Impacts:

- Out-competes native snail species
- Reduces biodiversity
- Alters nutrient flows
- Damage piping of power and water facilities

Best Control:

Keep boats and equipment clean to help slow the spread. Biological control agents such as trematode parasites have shown positive results.



WATCH/PREVENTION SPECIES: Asian Clam (Corbicula fluminea)

Native Range/Introduction: Asia/Intentional importation

Impacts:

- Damages the water systems of electrical/nuclear power plants and industrial water systems
- Competes with native species for resources

Best Control:

Prevention of the transport of Asian clam is the most effective. Mollusks can be removed from piping through pressurized washing. Molluscicides and benthic barriers can be effective.



WATCH/PREVENTION SPECIES: Rusty Crayfish (Orconectes rusticus)

Native Range/Introduction:

This freshwater crayfish is thought to be native to the Ohio River Basin.

Ecological Impacts:

- Causes severe changes to the aquatic food chain.
- Displace native crayfish species
- Reduce aquatic plant diversity and abundance
- Reduces shelter and food for young game fish and aquatic invertebrates

Best Control:

Prevent the spread by purchasing native bait fish and throwing out bait in the trash. Do not dump left-over bait in the waterways.





For More Information and to Learn ways you can Help Visit the Following Websites



- New York Invasive Species Info: <u>www.nyis.info</u>
- Cornell Cooperative Extension: <u>http://cce.cornell.edu/</u>
- iMapinvasives : <u>www.imapinvasives.org/howitworks.html</u>

~SLELO PRISM Listserve Subscribe/unsubscribe: <u>cce-slelo-l-request@cornell.edu</u>