Anti-fouling Paints and Boat Bottom Maintenance

3.7 Best Management Practices: Recognizing Freshwater Invasive Animals

Invasive aquatic animals are problematic for many reasons:

- Round goby fish eat eggs of native fish, especially bass.
- Asian carp consume up to 40% of their body weight in food resources each day.
- Zebra mussels filter important plankton out of the water, disrupting the food chain.
- Zebra mussels reduce performance and efficiency by attaching to boat motors and hulls and their sharp shells are a human safety hazard by attaching to rocks, swim rafts and ladders.
- Filter feeders like zebra mussels increase wildlife exposure to organic pollutants like PCBs, and heavy metals (whose primary source is often antifouling boat bottom paints).
- Common carp degrade water quality by increasing nutrient concentrations and turbidity.

Some of the Aquatic Invasive Animals in New York State:

- Asian carp
- Zebra mussel
- Asian clam
- Northern snakehead fish
- Quagga mussel
- Round goby fish
- Rusty crayfish
- Spiny water flea
- Tench fish (new one)

Zebra Mussels:

- STRONGLY STRIPED, resembles a small clam.
- Fresh water foul.
- 1/8 inch to 2 inches wide.
- D-shaped shell (quagga mussel is rounder and not as strongly striped).
- Have threads at edge of shell hinge that are not found on native mussels (so do quagga mussels).
- Produce one million eggs each summer and live 2-5 years.
- Larvae attach to hard surfaces.
- Grow in clusters and can even colonize other animals.
- They starve the native populations by filtering and eating massive amounts of:
  - Zooplankton
  - Phytoplankton
  - Bacteria
  - Organic detritus
- Bioaccumulate toxins which are passed on to wildlife that eat the zebra mussels.
- Physical damage caused to boats:
  - Clog water systems used in boat:
    - Motors
    - Air conditioners
    - Heads
  - Encrust hulls
  - Clog propellers
- Can cause navigation buoys to sink
- Stench
- Create negative changes in the ecosystem along with the quagga mussels
- Create a great environment for Botulism E, which kills birds and fish.
- Concentrates the toxin from Botulism E (quagga mussels also do this).
- Creates conditions for eutrophication by causing native Cladophora algae populations to explode, die and decay which can lead to Botulism E organism accumulating in near shore habitats.

NOTE: Intoxication with Botulism toxin type E in humans is associated with the consumption of marine (salt or fresh) origin foods.

Asian Clam:

- Fresh water
- Withstand harsh environmental conditions
- Feed on phytoplankton
- One-inch long
- Live 1-4 yeas
- Clog water intake pipes
- Interfere with wastewater treatment plants
  - Biofouls of power plants
  - Alter bottom substrates

New Zealand Mud Snail:

- Reproduces parthenogenically.
- Can carpet a lake bottom or a streambed in a few years.
- 0.25” long.
- Feed on algae and detritus.
- Outcompete native insects and snails thus affecting fish food supply.
  - Very high reproduction.
  - Affect trout and salmon fisheries.
  - Spread primarily by anglers.

- Can survive up to TWENTY-FIVE DAYS outside a stream. Survive in things like:
  - Muddy chest waders.
  - Muddy wader boots.
  - Live wells.
  - Cooling systems.
- Spread by fish and waterfowl who pass them undigested.
- Tolerant of a wide temperature range.

Quagga Mussel:

- Spread by ballast water.
- 2 inches long, wide.
- Faint brownish stripes.
- Like shallow, warm water to deep, cold water.
- Reduces plants in cold temperatures.
- Powerplant biofouls.
- Clog water intake pipes.
- Outcompete native bivalves.
- Disrupt the food chain.
- Create a stench when washed up.
- Safety risk to divers and swimmers due to sharp shells.
- Reduces food for:
  - Alewives.
  - Salmon.
  - Whitefish.
  - Native mussels.
- The depth the quagga mussel lives at varies depending on the water temperature.
- The quagga mussel is not generally found near shore, in shallow water in lakes due to wave action.
- Mussel waste products lead to eutrophication.
- Quagga mussels accumulate pollutants in their tissues to levels almost 300,000 times greater than the concentrations in the environment.
- They provide an entry point for PCBS in the food chain.

Rusty Crayfish:

- NATIVE freshwater crustacean taking over other places than where it is native to.
- Rusty spot near middle of body.
- 4 inches long.
- Omnivorous.
- High production: one female can produce up to 575 eggs.
- Found in:
  - Lakes
  - Rivers
  - Ponds
  - Streams
- Degrade aquatic beds.
- Eat twice as much as local crustaceans.
- Feed heavily on bottom dwelling invertebrates thus reducing food sources for native larval fish and crustaceans.
- Outcompete native crustaceans for habitat.

Sea Lamprey:

- Predaceous fish.
- Can grow to 20 inches.
- Parasitic vampire, kills prey by creating large, bloody feeding holes.
- Live in the ocean and then return to fresh water to spawn.

NOTE: There is a subpopulation that lives in the Saint Lawrence river and in Lake Ontario year round.

- Can produce 60,000 eggs per year.
- Lake trout is a favorite food.
- Major negative impact on great lakes fisheries.

Tench Fish (new):

- Introduced for sport fishing.
- 32 inches long, can weigh more than 15 pounds.
- Red eyes and mucous layer over scales are identifiers.
- Preferred habitat:
  - Shallow, vegetated lakes and ponds.
  - Slow moving rivers.
  - Wetlands.
  - Rapid reproduction.
- Tolerant of a wide range of conditions.
- Outcompete native fish.
- Increase water turbidity.
- Increase periphyton which is the material growing on submerged surfaces in fresh water.
- Disrupt the food chain.
- Cause a decrease in water quality.

NOTE: New York residents should report Tench to Rob Williams at the St. Lawrence Eastern Lake Ontario Partnership for Regional Invasive Species Management at 315-387-3600 x7724 or rwilliams@tnc.org

Invasive Chinese Mitten Crab:

- In Hudson river estuary and Hudson river.
- Spread by live release and vessel ballast water.
- Lives in fresh water in North America but can also tolerate salt water.
- If no hair on the claws, NOT a mitten crab.
- No swimming legs.
- Can walk out of water to move upstream or around barriers.
- Can move several hundred miles from salt water.
- Spend most of their lives (2-5 years) in fresh water rivers then migrate to brackish or salt water to reproduce.
- Aggressive, may outcompete native blue crab in Hudson river.
- Burrowing behavior may threaten:
  - Stream banks
  - Earth dam stability
  - Promote erosion
  - Habitat loss
- Only freshwater crab in the Hudson river drainage.
- Claws are equal size.

    - White tips.
    - Hair.
- Shells up to 4 inches wide.
- Light brown to olive color.
- Eight sharp pointed walking legs.
- What to Do if you Catch a Chinese Mitten Crab.
    - Do not release it.
    - Freeze it (or preserve in alcohol if you cannot freeze it).
    - Note date and location caught.
    - Preferred if you can capture GPS coordinates or pinpoint on map.
    - Note how it was caught.
    - Take photo if possible.
    - Make a report within 48 hours of catch, if possible.
    - NYS prohibits possession or transport of live or DEAD mitten crabs.

Northern Snakehead Fish:

- Looks a bit similar to native bow fin (which has a shorter anal fin and a rounded tail fin).
- Predatory.
- Long and thin.
- Has a single fin running the length of its back.
- Flattened head.
- Brown with large, dark blotches.
- Large mouth with many teeth.
- Preferred habitat: stagnant shallow ponds and swamps.
- Can also live in canals, reservoirs, lakes, rivers.
- Spread though illegal use as bait.
- Has been transported as juveniles in water contained in compartments of boats.
- Can breathe AIR.
- Can survive DAYS out of water.
- Juveniles eat the same things that the natives need to eat:
    - Microscopic organisms.
    - Insect larvae.
    - Crustaceans.
- Adults eat:
    - Crustaceans.
    - Reptiles.
    - Mammals.
    - Small BIRDS.
- Once they are in an area, little can be done.

NOTE: How to prevent snakehead spread:

- Dispose of all bait in:
    - Trash cans.
    - At invasive disposal stations.
    - ABOVE the waterline on dry land.

NOTE: It is illegal to use snakehead fish as bait in NYS.

- What to do if you think you have caught a northern snakehead fish:
    - Do NOT release it!
    - Kill it immediately and freeze it.
    - If possible, take pictures of the fish.
        - Include close-ups of:
            - Mouth
            - Fins
            - Tail
    - Note where it was caught:
        - Water body, landmarks.
        - GPS coordinates.

Round Goby Fish:

- Discovered in Hudson River near Troy, NY.
- Afraid that it will spread to Lake Champlain basin via:
    - Richelieu River (Quebec)
    - Bait buckets
    - Champlain canal
- Can grow to 10 inches.
- Eats zebra mussels and insect larvae.
- Bottom dweller.
- Rapid spread.
- Spawn multiple times each season.
- Multiple competitive advantages.
- Displace native fish, eat their eggs and young.
- Take over habitat.
- Survive in poor quality water.
- Take over near shore spawning sites and aggressively prevent use by native species.
- Proficient bait thieves.

Spiny Water Flea:

- Very small so easy to miss.
- Large crustacean member of the zooplankton.
- 4 pairs of legs.
- Tails that are 70% of their length, 1-3 sets of small spines along it.
- Adults are ¼-5/8ths inch long.
- Negatively impact:
    - Native fish populations.
    - Aquatic habitats.
    - Sports fishing.
- NO successful method of control.
- Parthenogenesis in summer so do not need males to reproduce then.
- In ideal temperatures get a new generation in less than 2 weeks.
- Eggs overwinter.
- Eggs are transported long distances on boats and equipment so new generation will hatch and invade new habitats in spring.
- Prefer cold temperatures but can survive in warm temperatures.
- Prefer fresh water but can tolerate brackish water.
- Eat smaller, native zooplankton from the food chain therefore cause native fish declines like the alewife in the great lakes.
- Interfere with fishing because:
    - Spines catch on fishing line.
    - Clog fishing rod eyelets.

    - Damage reels.
- Introduced in ballast water.
- Spread by attaching to:
    - Fishing lines.
    - Downriggers.
    - Anchor ropes.
    - Fishing nets.
- Also spread in:
    - Bilge water.
    - Bait buckets.
    - Live wells.
    - Bottoms of canoes and kayaks.
- Prevention is the only cure.

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