NEW YORK
STATE OF
OPPORTUNITY

Department of
Environmental
Conservation

Responding to Positive eDNA Results: A Fisheries Management Agency Perspective

Objective:

- Promote ongoing dialogue to better understand the challenges and needs of our respective disciplines.

Context:

- Primarily invasive fishes and aquatic invertebrates in the Great Lakes Basin

What I am NOT saying:

- eDNA does not help inform decision makers about aquatic invasive species (AIS) and rare/elusive species.
- Agency responses to eDNA data alone are not merited.

What I am saying:

- eDNA is one of a suite of sampling tools that decision makers must evaluate to determine a course of action.
  - Negative eDNA results
  - Positive eDNA results – **Response warranted?**
    - False positive?
    - Confidence: protocols, QA/QC

Positive eDNA results (cont.)

- Living or dead organism(s)?
- How many? Sexually mature? Diploid or triploid (grass carp)?
- Origin of DNA (bird transfer from another water body; fish processor)

Positive eDNA results (cont.)

- Communications on results: when and to whom?
- Programmatic impacts resulting from taking action
- Potential political ramifications of not taking action

Positive eDNA - Response

- Tools available to fisheries management agencies (FMAs) to detect, control, and eradicate AIS are very limited.
  - Gear selectivity – round goby
  - Elusive/evasive nature of animals

Positive eDNA - Response

- In large aquatic ecosystems (i.e. Great Lakes), control/eradication of established AIS is “largely” unrealistic.
- Use of piscicides (e.g. rotenone) impractical/socially unacceptable

- Use of the term “rapid response” relative to positive eDNA detections and/or actual collections of AIS in large aquatic ecosystems creates unrealistic expectations for FMAs.
- In an era with increasing agency responsibilities and declining staff, large-scale responses to positive eDNA results are sometimes expected/demanded. In most cases, this results in an inefficient/ineffective use of agency staff time.

Orange County Snakehead: Coordination

DEC
- Emergency Determination from Commissioner
- Bureau of Fisheries and Office of Invasive Species Coordination lead
- Legal Affairs
- Permits
- Pesticides
- Division of Water
- Habitat (wetlands and chemical testing)
- Real Property
- Division of Operations
- Division of Law Enforcement

Town Officials

State and County Dept. of Health

Department of Transportation

Emergency Services

U.S. Fish and Wildlife Service

Orange County Snakeheads: Sequence of Events

May 29, initial call that a resident along Catlin Creek took 2 snakeheads from an in stream pond
May 30, DEC picked up fish and confirmed ID
Sampling (7 days of sampling using electrofishing and a variety of nets yielded no snakeheads until June 12)
During the period above temporary fish barriers put in place
NYS DEC collects northern snakehead June 12 in small pond
Week of June 23 fish weir installed at Rte 6 culvert
June 25: first letter sent to all known residents around Ridgebury Lake and Catlin Creek
June 26: picture sent to DEC of NSH from Ridgebury Lake (likely epicenter?)
July 8: Public Meeting
July: obtain emergency approval to treat with rotenone at label concentrations of 5ppm
July: register preferred rotenone pesticide (CFT Legumine) for use in NYS
July 21-30: Construct holding tanks for fish to be collected from Ridgebury Lake
July 29: Second letter to residents providing feedback from question and concerns
July 31 -Aug 1: Fish removed from Ridgbury Lake and transferred to holding tanks
August 5 and 6: treat Ridgbury Lake and Catlin Creek with CFT Legumine
August 5-8: collect and dispose of dead fish from Ridgebury Lake and Catlin Creek
August 5-18: monitor breakdown of rotenone in Ridgebury Lake and Catlin Creek
August 13: third letter to residents updating them on treatment
August 27: electrofished Catlin Creek and Ridgebury Lake in treatment area to test effectiveness of control
September 3: restocked fish back into Ridgebury Lake
Early December: Met with local residents and interested people to discuss summer treatment and restocking plans
Spring/summer/fall 2009: restock Ridgebury Lake

- FMAs need to do a better job informing scientists, agency administrators, elected officials and the public regarding “rational and reasonable” agency responses to positive eDNA testing/actual AIS collections in large water bodies.

What FMAs Need

- Standardized protocols for eDNA methodologies/reporting standards (similar to American Fisheries Society Blue Book?); guidance on how to interpret results; develop ranking scale for confidence?

Critical considerations for the application of environmental DNA methods to detect aquatic species

Caren S.Goldberg[1]* et al. Methods in Ecology and Evolution 2016, 7, 1299–1307 doi: 10.1111/2041-210X.12595

What FMAs Need

- Close collaboration/communication between eDNA researchers and FMAs (e.g. USFWS SOP)

Questions?