



Department of  
Environmental  
Conservation

# Evaluation of Hydrilla Control Options for Croton River System



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# NYS distribution of hydrilla

Orange County/Hudson River basin

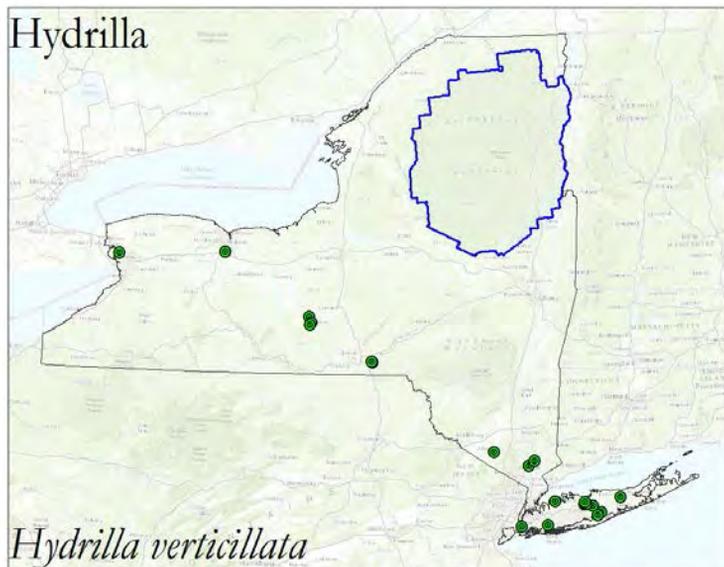
Long Island/Atlantic Ocean-LI Sound / NYC

Cayuga Inlet/Great Lakes basin

Erie Canal/Tonawanda Creek

Broome County

Rochester

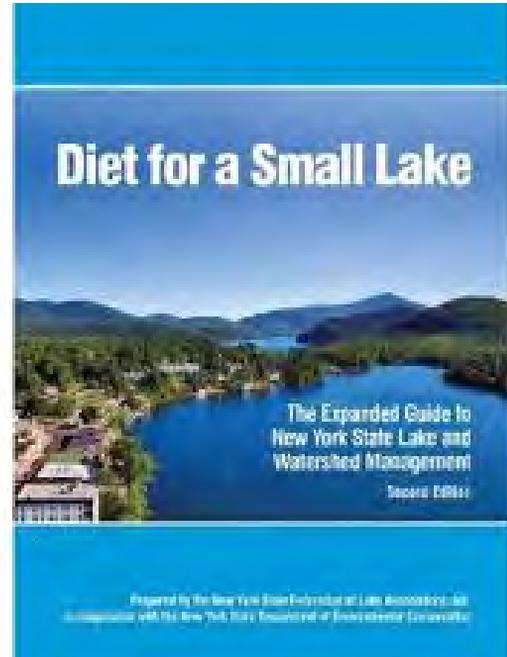


# Shopping List of Lake Management Actions

Management actions discussed in detail in [Diet for a Small Lake](#)

Available on NYSDEC website (<http://www.dec.ny.gov/chemical/82123.html>)

Chapter 6 discusses each topic in detail



# Specific Issues in the Croton River (System)

## Logistics

- No dam or ability to contain grass carp
- Very short retention time influences choice of herbicide options
- Varying densities of plant
- Varying habitats
- Need to protect wild celery
- Potential impact to fisheries resources?

## Location location location

- Public water supply at head of infestation
- The Hudson River
- Tidal influence

## Other

- Appetite for starting down a long eradication (control) pathway
- Permitting issues
- Management costs
- Monitoring costs



# What is the goal?

- *Eradication* - total destruction and removal of the infestation;
- *Control* - active measures to suppress the AIS;
- *Containment* - actions taken to limit the further distribution of the AIS into other waterbodies;
- *Watch* – observation of the AIS, its spread and the occurrence of adverse impacts resulting from the introduction;
- *Mitigation* – actions taken to minimize any adverse impacts caused by the AIS infestation;
- *Restoration* – returning environmental conditions to what existed before the AIS infestation occurred

# Summary of NYS Hydrilla Control Actions to Date

## Herbicides- contact (endothall) and systemic (fluridone)

- Komeen (copper): Creamery Pond- 2008
- Endothall: Cayuga Inlet system- 2011-2015, Erie Canal- 2014-2015
- Fluridone: Creamery Pond- 2008, Cayuga Inlet system- 2012-2015

## Grass carp

- Creamery Pond- 2010, 2015
- Frost Mill Pond- 2009

## Hand harvesting

- Cayuga Inlet- 2011
- Cayuga Lake- 2013, 2014-15?

## Benthic barriers

- Cayuga Lake- 2013
- New Croton Reservoir- 2015



# Do Nothing Option

Principle- Let Nature or Apathy Work

Pros- (No)\$, May Take Advantage of Normal Cyclical Patterns

Cons- Problem May Become More Difficult to Manage

Permits- None

Costs- Pay Later

Viability for Hydrilla- potential great risk of explosive growth- not preferred option

Verdict for Croton- not a good choice if goal is to protect Hudson and prevent spread



# Hand / Suction Harvesting

Principle- Pluck (nudge) 'em out, one at a time (and bag 'em)

Pros- Can be cheap, target individual plants or plant species, combine with suction harvesting, good IPM technique

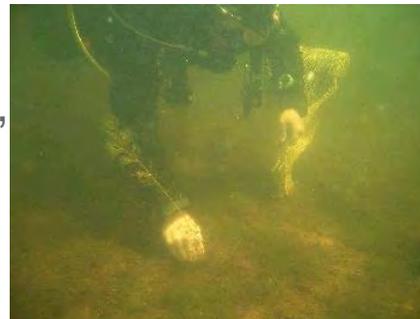
Cons- Labor intensive, difficult and costly > 1000 ft<sup>2</sup> or deep water, spread fragments

Permits- Only if large scale (ECL Article 15, Article 24)- suction permits akin to dredging

Costs- Labor only to \$100-500/ac (suction = \$5-10k/ac)

Viability for Hydrilla- may be good technique for small plots if tuber removed

Verdict for Croton- potential as follow up but not primary strategy due to size of infestation and difficulty in extracting tuber



# Benthic Barriers

Principle- Smother 'em

Pros- Focus on use impacted areas, can move to different areas, variable time options

Cons- Difficult in deep water, limited to small areas, potential ecological impacts, not species specific

Permits- Some DEC regions- only If large scale (ECL Article 15, Article 24), USACE if navigable water

Costs- \$100/ac + Labor to \$10-30k/ac

Viability for Hydrilla- all plants can be controlled if barrier placed as plants emerge

Verdict for Croton- not viable due to size of infestation, habitat and flow



# Aquatic Herbicides

Principle- Chemically wipe out weeds by contact or impact to growth pattern

Pros- Short to long term control, some selectivity, local or lakewide control, usually effective

Cons- Non-target impacts, controversial, some limits on use, time delays, plan /monitoring required

Permits- DEC ECL Article 15/Part 327, Article 17/SPDES General Permit, Article 24)

Costs- \$300-1500/ac

Viability for Hydrilla- Several herbicides effective at impacting hydrilla

Verdict for Croton- likely most viable option



# Grass Carp

Principle- Stock weed eating fish

Pros- Perceived “natural”, less expensive, long-term control, mostly invisible control

Cons- Non-native fish, non-target control, risk of algal blooms/ plant eradication / escape, habitat alteration, hard to remove, EIS required

Permits- DEC Stocking Permit (ECL Article 11)

Costs- \$50-300/ac

Implications for Hydrilla- preferred plant; good for containment or management

Verdict for Croton- not viable in River or Bay- can't contain (possible for Reservoir)



# Other options and why they're not....

## Cutting or Harvesting

- Creates fragments for new plant growth
- Does not remove tubers or interrupt germination cycle

## Shading (chemical colorants)

- Non-selective, non-localized
- Little evidence of control

## Herbivorous insects

- None cultivated for hydrilla control
- Delayed response- no immediate action

## Drawdown

- Tuber appears to be resistant to freezing and desiccation
- Likely significant impact to benthos

## Dredging

- Limited at best to localized areas
- May be too coarse to prevent tuber spread
- Croton infestations too widespread to consider



# IPM = Integrated Plant Management

Principle- Combining two or more management techniques

Pros- ^ likelihood of long-term control, 1-2 punch, favorably viewed as more comprehensive, can combine local and large scale management

Cons- Must make sure techniques are compatible, side effects could multiply

Permits- Varied

Costs- Varied

Verdict for Croton- could combine hand-harvesting with herbicides



Figure 6. Par Pond after drawdown



# NYS Peer Review Process

Initiated in 2012 to guide NYS decisions in Cayuga Inlet

External peer reviewers represent USACE, University of Florida, North Carolina State, and Mississippi State/USDA

Reviewers evaluate management options and provide recommendations to NYS/local task forces

Process expanded to include Erie Canal / Tonawanda Creek in 2014 and Croton system in 2015



# 2015 Peer Reviewer Recommendations

New Croton Reservoir- spot treatment of Nautique or other copper herbicides

Croton River- injection treatments of fluridone or endothall (most likely from base of dam downstream)

Croton Bay- no option recommended

