

A large blue bird sculpture, possibly a heron or egret, stands on a wooden platform in a field of hydrilla. The background shows a line of trees and a fence. The text "Hydrilla in New Jersey An Emerging Threat" is overlaid in white serif font.

# Hydrilla in New Jersey An Emerging Threat

Photo: S. Kishbaugh

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# *Hydrilla verticillata*

- Common Names: Hydrilla, or water thyme
- One of the world's most invasive aquatic plants
- Two distinct bio-types
  - Monoecious
  - Dioecious
- Easily confused with native *Elodea*
- Can reach lengths up to 25 feet
  - Can grow ~1.0 foot per day!
    - Glomski and Netherland, 2011
- Reproduces by Fragmentation
  - Produces both turions and tubers
- Called the “perfect weed”



# Hydrilla “Not So” Fun Facts

- **Adapted to Grow in a Wide Variety of Habitats**

- Water Depths
- Bottom Substrates
- Flowing vs. Non-flowing Environments
- Tolerance to Salinity
  - 7 ppt in one step, or 12 ppt gradually (in lab); Haller 1974
- Low Light Tolerance
  - Can grow in 1% light

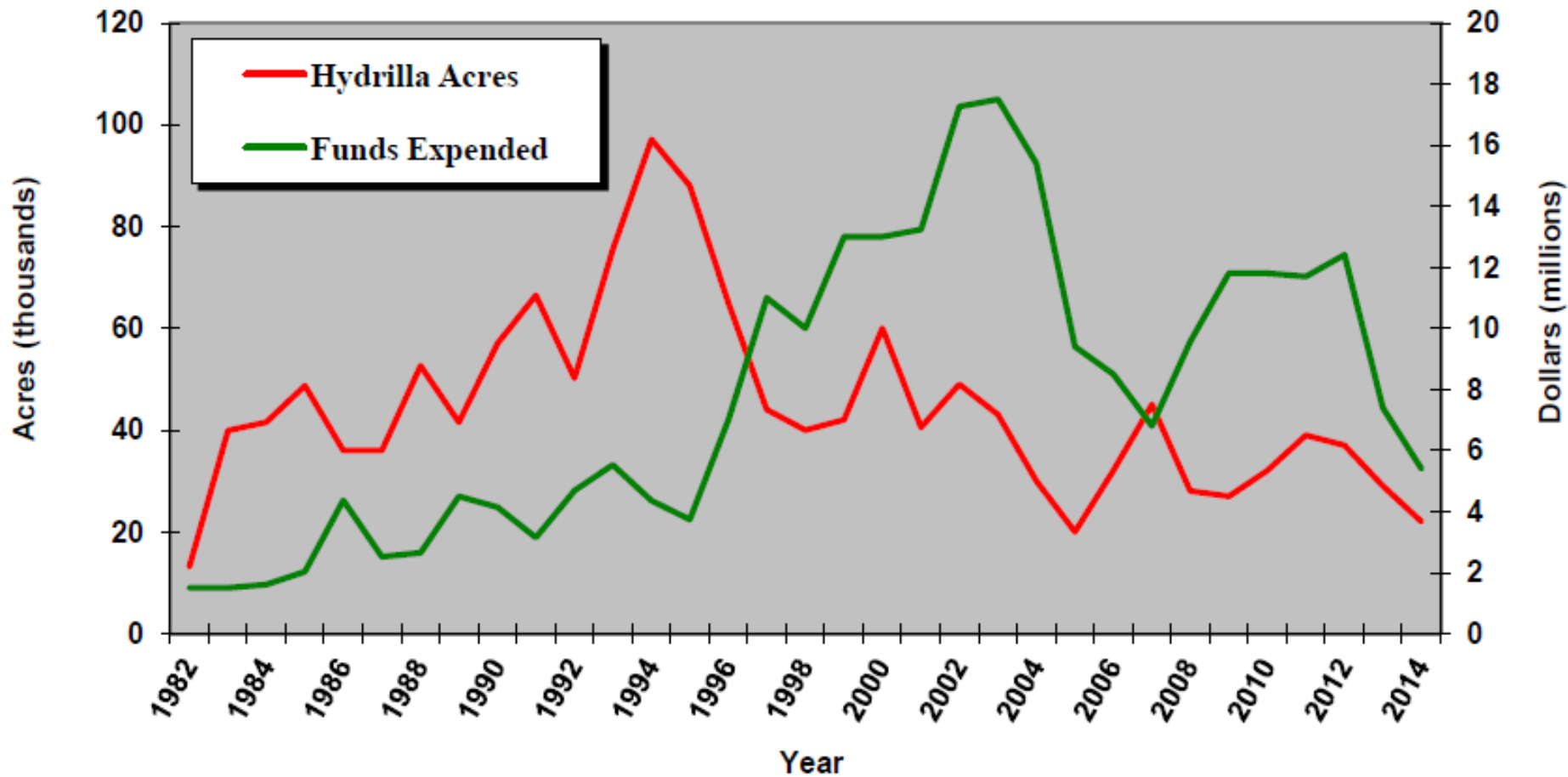
- **Ecological Impacts**

- Displace Native SAV
- Water Chemistry
- Zooplankton Community Alteration
- Fish Community Alteration

- **Recreational Impacts**

- Aesthetics, Fishing, Boat Movement, Property Values

**Figure 4: Acres Reported and Dollars Spent Managing Hydrilla in Florida Public Lakes and Rivers from 1982-2014.**



Source: Florida Fish and Wildlife Conservation Commission

# Hydrilla Taxonomy

- Long, slender branching stems
- Leaves are strap-like and pointed
  - Margins are serrated-visible w/naked eye
  - **Typically occur in whorls of 4 to 8**
- Overwintering Structures
  - **Turions**; spiny green, in leaf axils
  - **Tubers**; pale color, crescent shape
    - Produced under the sediment
    - Can remain viable for 2+ years



Photo: Bob Johnson

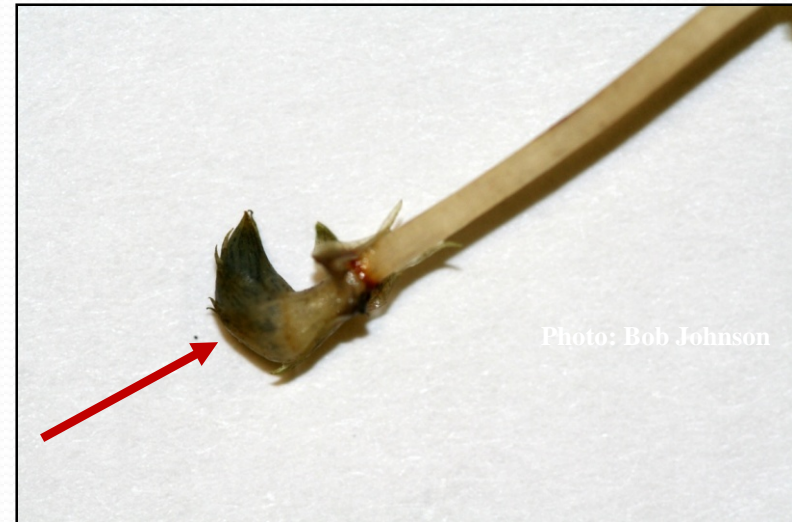
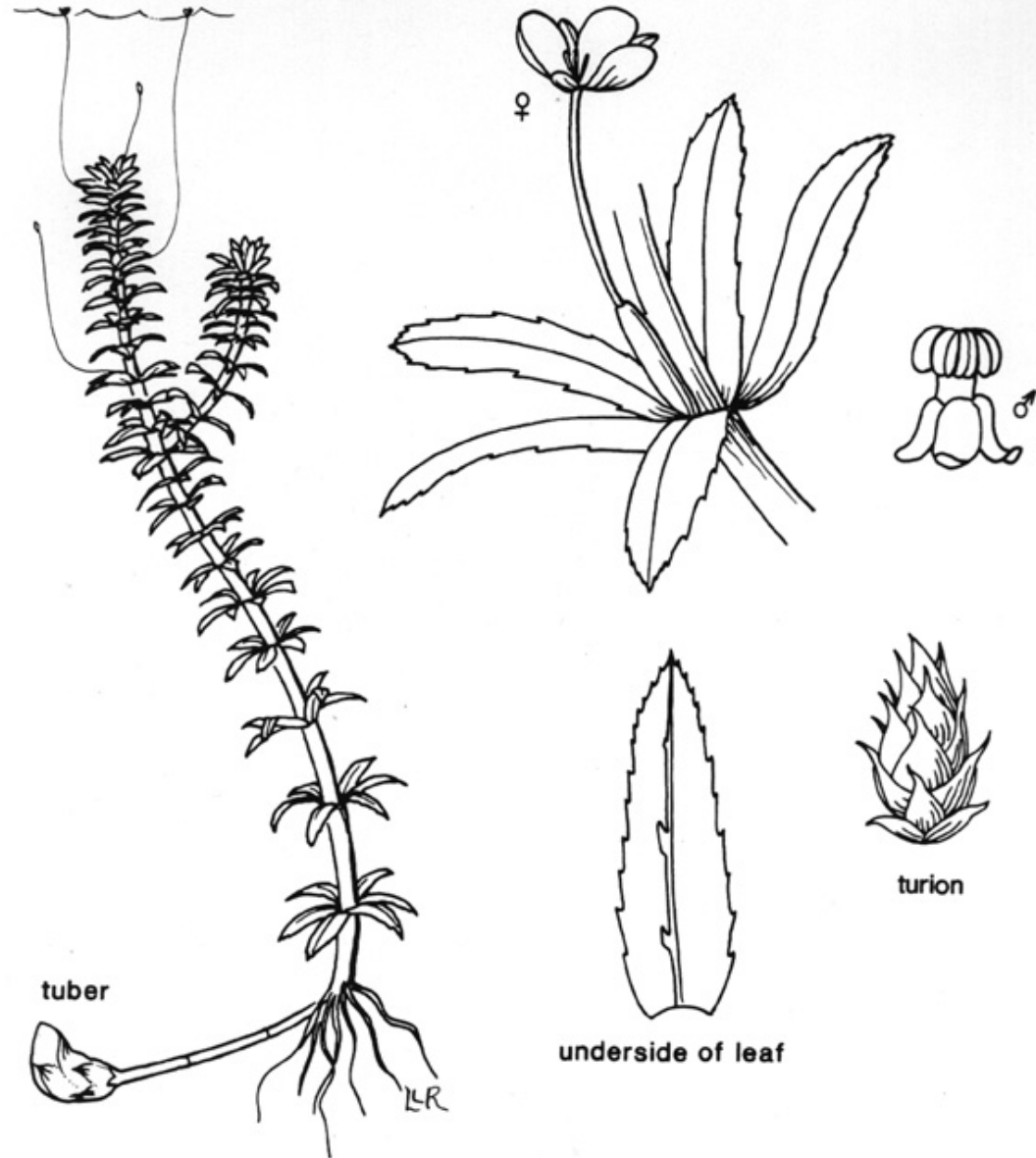


Photo: Bob Johnson

Tubers Present Management Challenges

# Hydrilla

## Taxonomy



*Hydrilla verticillata*  
Hydrilla

# Hydrilla Bio-types



- **Monoecious**

- US Range: Northern US (ME, CT, MA, NY, NJ)
  - Native Range: India
- Flowers: male and female flowers on same plant
- Habit: delicate; stems branch profusely at sediment (“Shag Carpet”)
- Leaves: delicate, translucent, 4-10 mm long, generally lack mid-rib

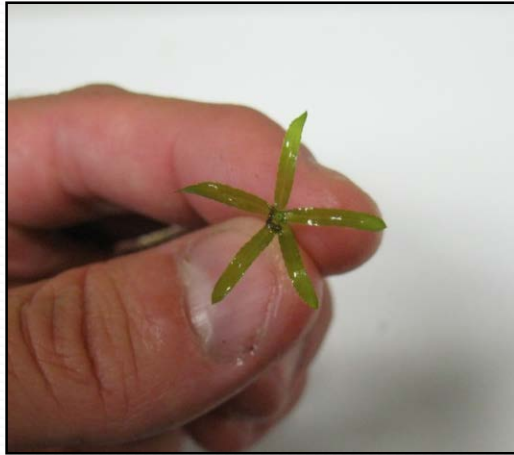
- **Dioecious**

- US Range: Southern US (FL, LA, TX)
  - Native Range: Korea
- Flowers: male and female flowers on different plants
- Habit: stems grow up from sediment and then branch profusely at water’s surface (similar to EWM)
- Leaves: robust, 6-20 mm long, pronounced midrib (sometimes reddish in color)





# Hydrilla Look-alikes



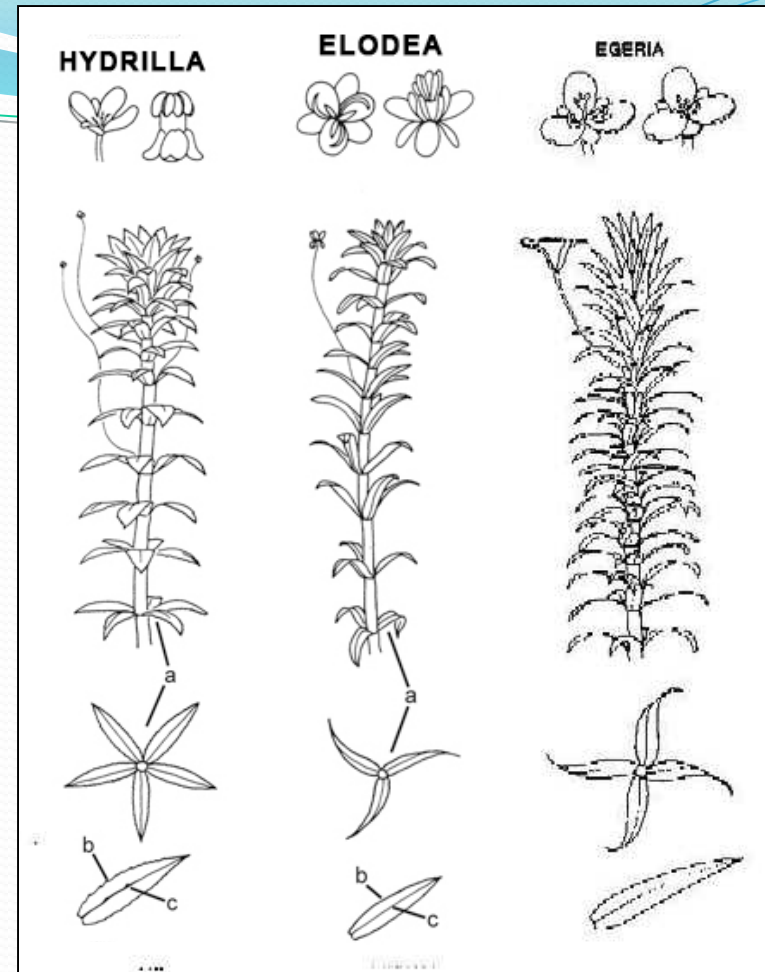
Hydrilla



Common waterweed



Egeria



4-8 whorls  
heavy serration

**Hydrilla**

3 whorls (only)  
fine serration

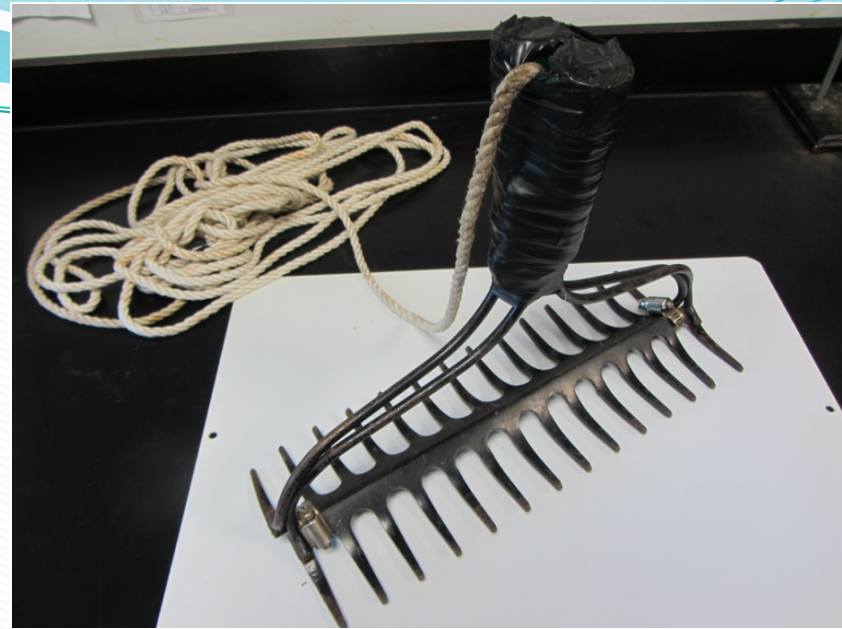
**Common Waterweed**

4-6 whorls  
very fine  
serration

**Egeria**

# Point Intercept Aquatic Plant Survey

- **Developed by ACOE**
  - Modified by Cornell University
  - Tweaked by ABI
- **Accepted Methodology by NYSDEC**
  - 50 meter grid; One site per littoral acre
  - One to Three tosses per site
    - More tosses reduces overall abundance, but increases chance of target detection
- **Assign Plant Mass Densities**
  - No plants, *Trace, Sparse, Medium, Dense*
  - Assigned to overall plants
    - Then assigned to each different plant
    - Data presented as a compendium of maps



Abundance	Abundance #	Dry Weight (g/m <sup>2</sup> )	Mean Weight (g/m <sup>2</sup> )	Description
No Plants (“0”)	0	0.0	0.0	Bare Rake
Trace (“T”)	1	~0.0001-0.9999	0.5	Finger-full
Sparse (“S”)	2	~1.0000-24.9999	13.0	Hand-full
Medium (“M”)	3	~25.0000-99.9999	62.5	Covers Rake
Dense (“D”)	4	~100.0000-400.0000+	250.0	Difficult to get plant mass into the boat



# Hydrilla in NJ and NY

## New Jersey

- Four Confirmed Sites
- Probably More

## New York

- Long Island
  - Several Sites
- Creamery Pond (Orange County)
- Cayuga Inlet (Ithaca)
- Erie Canal (Buffalo)
  - 15 mile stretch
- Broome County (Small Ponds)
- Croton River (Westchester County)



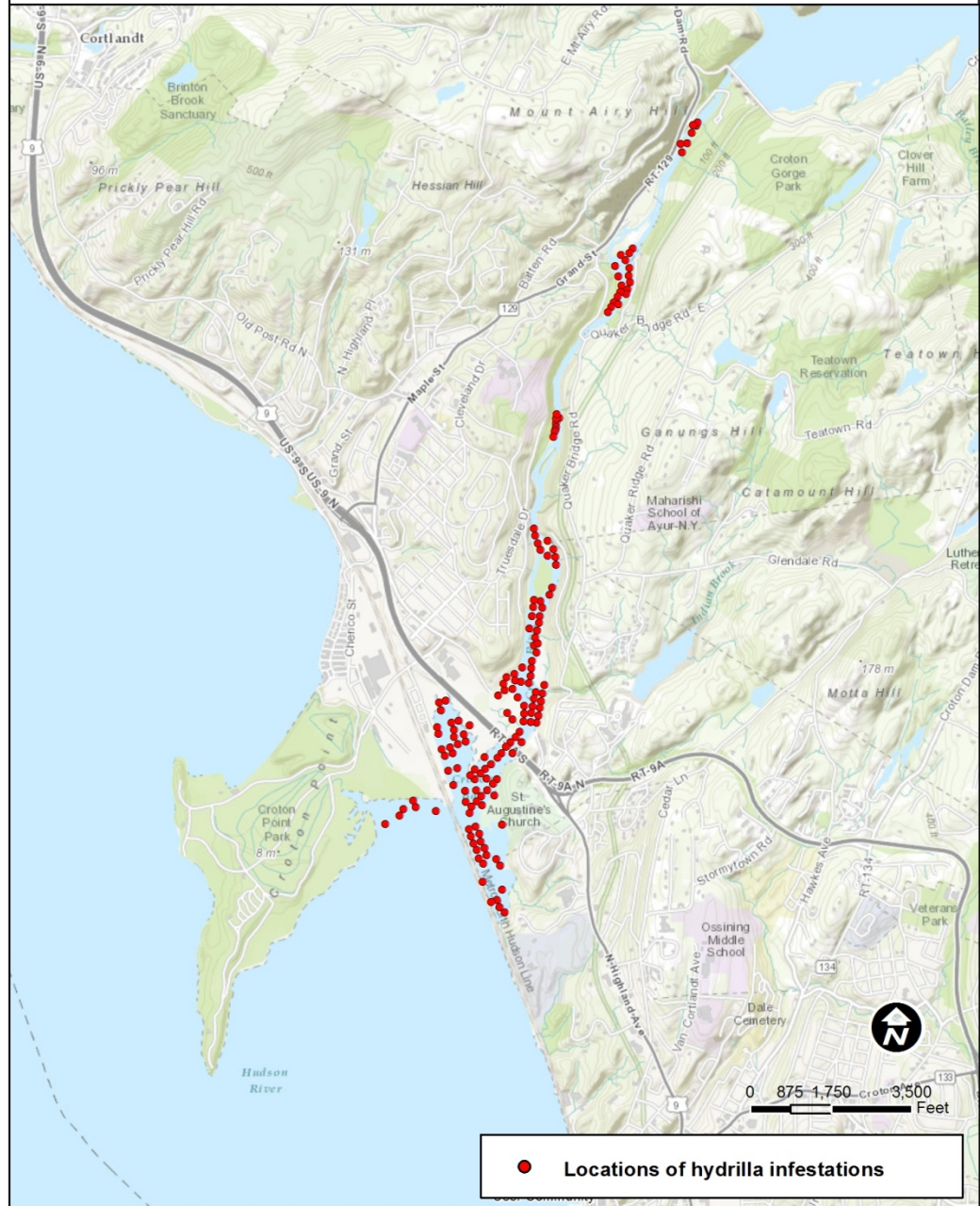
# Croton River



# Croton River Hydrilla Delineation: 2014

- Used Point-Intercept Methods to map the baseline hydrilla present in the river
- **Surveyed 354 GPS-referenced Sites**
  - 50 meter grid
  - 2 anchor tosses/site
  - Documented all submersed plants
- **Hydrilla occurred at 42.3% of Sites**
  - Most sites trace-sparse
  - Variety of Habitats
    - Water Flow
    - Bottom Substrate
    - Tidal

## Hydrilla (*Hydrilla verticillata*) Distribution



## Hydrilla Distribution July 2012

# Alcyon Lake

- Pittman, NJ
- 20 surface acres
- Dredged ~15 years ago
- Municipal Park-North
- Some Residences on East Shore

2012 Statewide Plant Survey (ABI)  
2014 Full Basin GPS-referenced  
Point Intercept Plant Survey



**Alcyon Lake  
Pittman, NJ**

# Hydrilla Control Options

## **Mechanical Harvesting**

- Not Recommended due to Fragment Spreading

## **Hand Pulling/Suction Harvesting**

- OK for Small Scale Infestations
- Fragment Spread a Concern
- Not Likely to Reduce Tubers in the Sediment

< 500 stems per acre

## **Benthic Barriers**

- OK for Small Scale Infestations
- Labor Intensive and Maintenance Needed

< 1 surface acre

## **Grass Carp Stocking**

- A Preferred Food Source for Grass Carp
- Permits Required; Outlet Structure Installation
- Possible Fish (and other Biota) Community Shifts

Using an Invasive Species to Control an Invasive Species!

## **Herbicide Use**

- Endothall (contact) and Fluridone (systemic)
- Permits Required
- Public Perception
- Water Use Restrictions

Might Require Multiple Year Treatments to Exhaust Tuber Bank



# As if We Need Another Reason to Dislike Hydrilla.....

## **Toxic Cyanobacteria** (Blue-green algae)

### *Aetokthonos hydrillicola*

- Discovered by Univ. of Georgia Researchers
  - Dr. Susan Wilde and Team
- Grows on hydrilla stems (only)

## **Avian Vacuolar Myelinopathy (AVM)**

- Discovered in 1990; neurological disease
- Since then, 160 bald eagles died from AVM
- Connection between cyanobacteria, hydrilla and AVM



Genus translates to: “eagle killer”  
species translates to: “lives on hydrilla”

**Cyano** → **Hydrilla** → **Coot** → **Bald Eagle**

In 2015, we plan to provide Dr. Wilde’s team with hydrilla samples from NJ to confirm *A. hydrillicola*



**Thank you!**