Aquatic Plant Harvesting Phosphorus Removal

J of Aquatic Plant Management
55:26-34

January 2017

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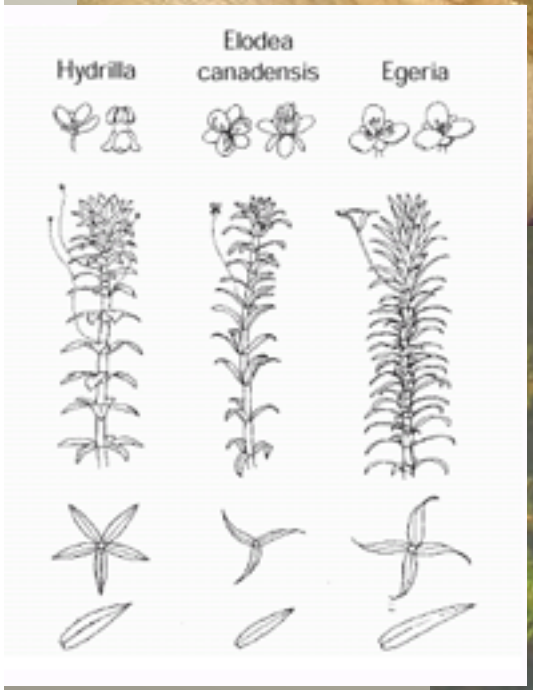
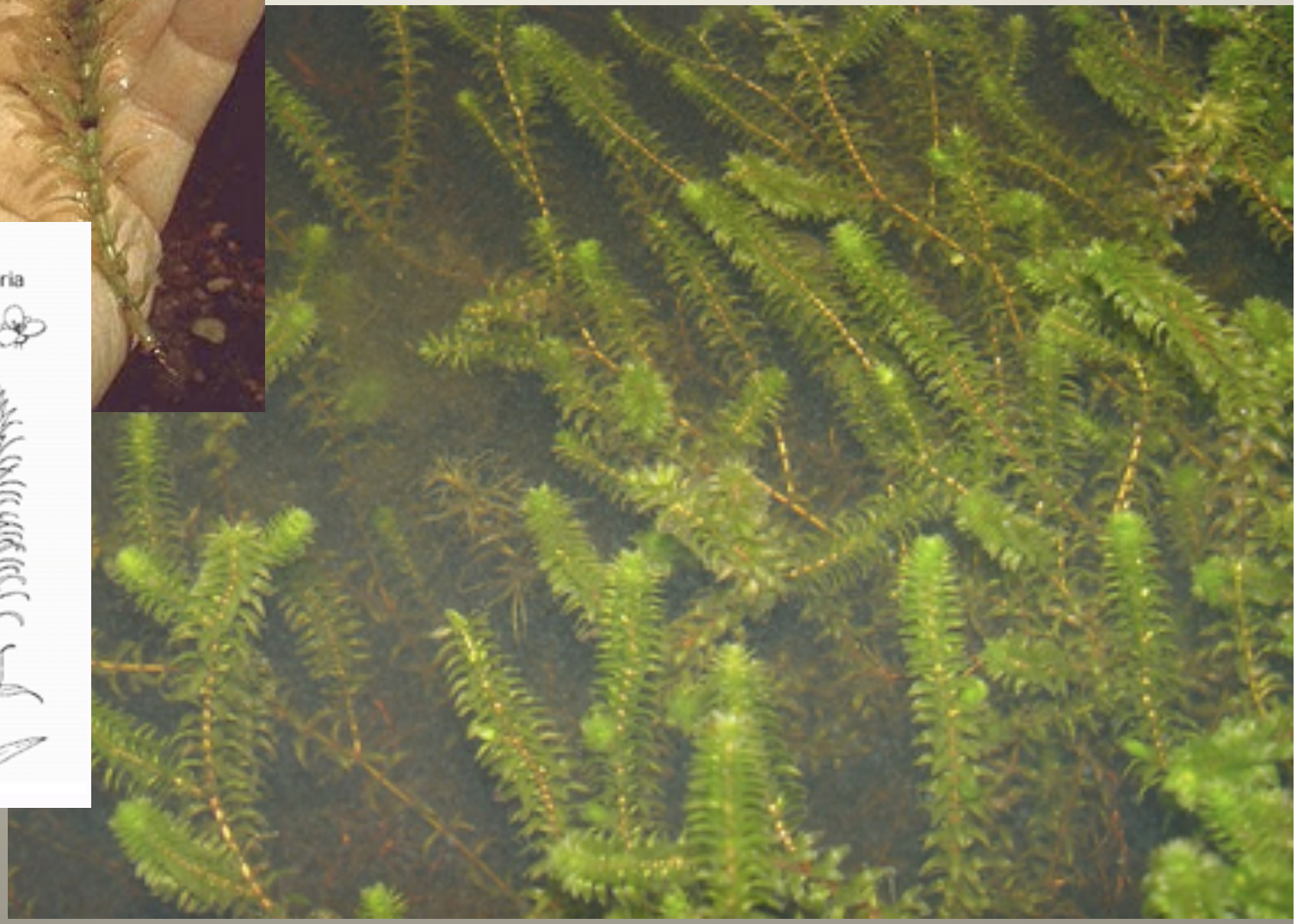
KEY POINTS

Casey Lake STUDY SITE

- Urban Lake of 2 acres in Minnesota
- Shallow depth maximum 4’
- Infested with Elodea & Hydrodictyon (water net)
- Options considered:
  - Alum-Cheaper but no nutrient removal
  - Watershed management (Slow, Expensive)
  - Harvesting best option

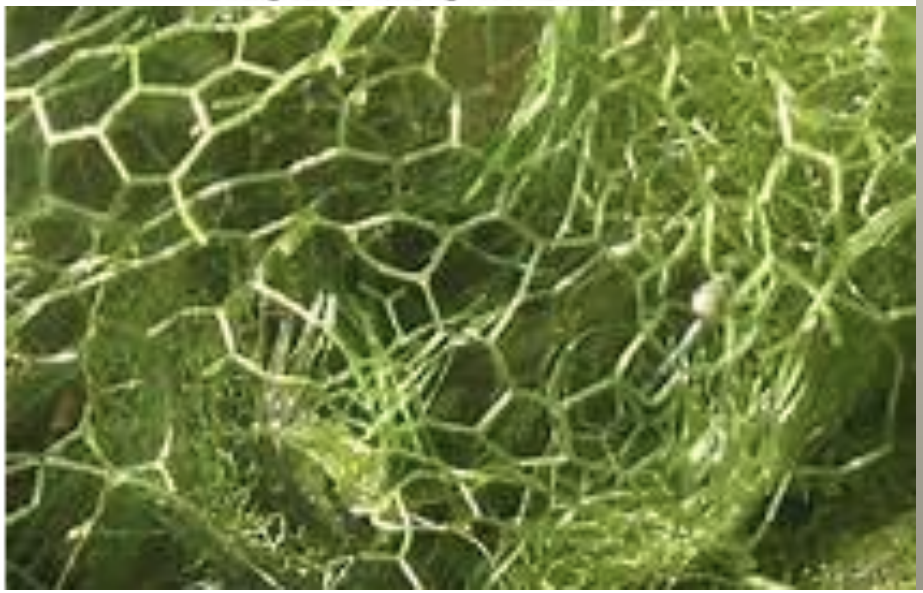
Elodea





Hydrodictyon

Hydrodictyon bloom



Casey Lake STUDY SITE

- Two Harvesting Efforts (July, August 2014)
- Total removal of 3600 kg of dry weight (8000 lbs or four tons)
- Total Phosphorus (TP) removal of 16.4 kg (36 lbs)
- Cost was $670 per kg (alum is $480 per kg but alum doesn't remove P it only sequesters the nutrient)

Key Points

- Watershed Mngmnt estimated at $2800 to $49,800 per kg
- Carp was removed
- Lakes are generally phytoplankton (algae) dominated or Macrophyte (aquatic weeds) dominated
- “Our main concern with herbicides is decaying plant material, lower 0_2 more TP in water column…”

Key Points

- Total P removed from Casey Lake at 53%
- Cost of Harvesting was $11K over 66 hours or roughly $167 per hour of labor costs
- Urban watersheds do not have enough land to collect nutrients limiting the efficacy of watershed management as a tool in cities.
- Repeated Treatments are needed to remove additional TP from system

Key Points

- Removal of Macrophytes changes system to Phytoplankton dominated lake:
  - This didn't happen in Casey lake* (carp removal?)
- Lower cutting depth recommended to reduce number of future cuttings
- Larger Scale Aquamarine Corp harvesting firm in Canada

Conclusions

- Study Slows Aquatic Harvesting accomplishes simultaneous management goals of TP nutrient removal and improved ecosystem
- Cost for TP with harvesting is substantially less than watershed management
- Urban Lakes with small watershed are unable to utilize land-based BMPs (Best Management Practices)