

Holistic Pond Management

A photograph of a pond with green lily pads and purple flowers in the foreground. The title 'Holistic Pond Management' is overlaid in yellow text at the top.

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So what does "holistic" mean, anyway?

"Concerned with the properties of whole systems....rather than with the properties of their constituent parts." Brewer, 1992

"When we try to pick out anything by itself, we find it hitched to everything else in the universe."

John Muir

Everything in nature is interconnected!









Virginia's two naturally occurring lakes



Lake Drummond



Mountain Lake



Ephemeral pond

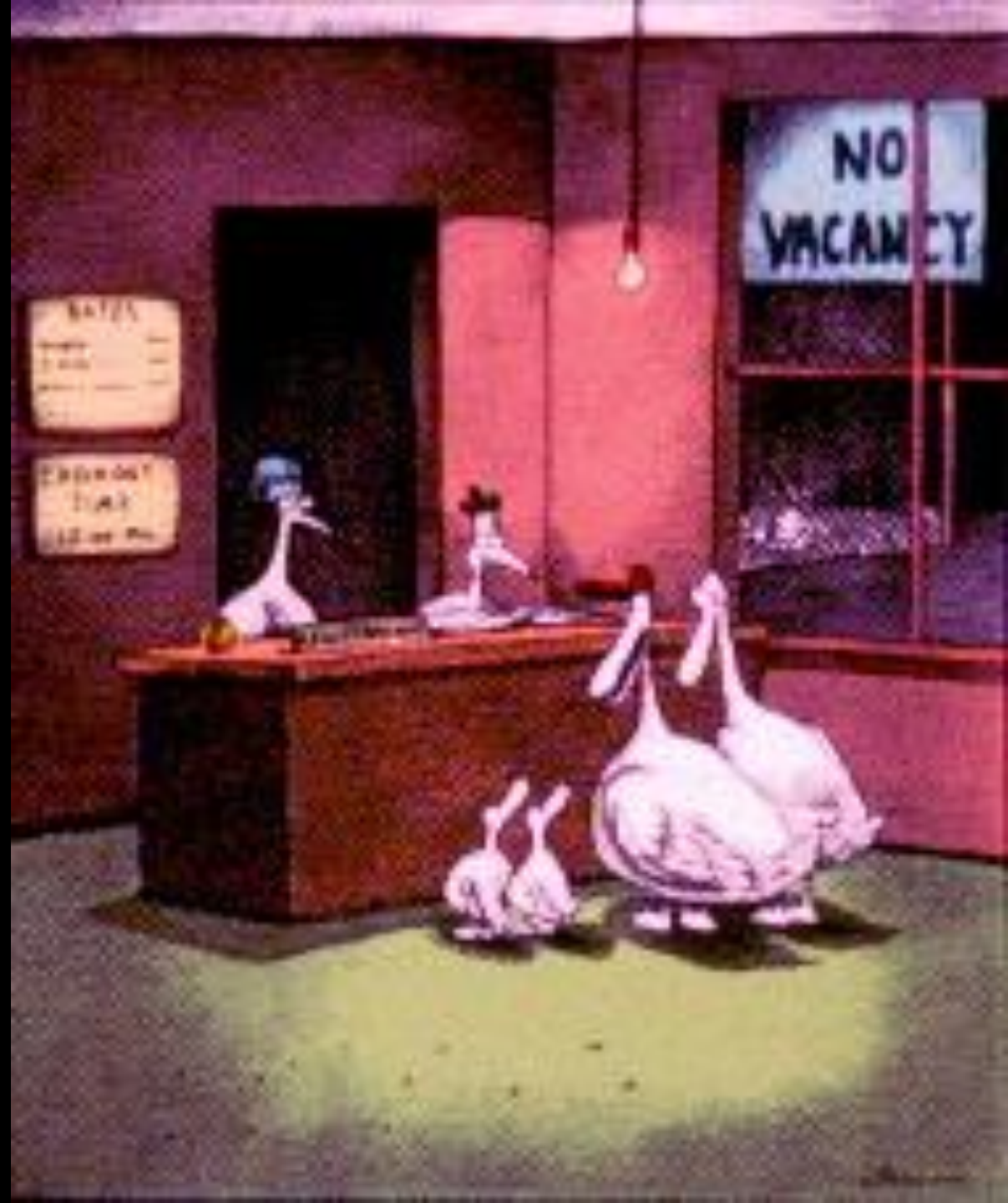
Virginia's other lakes







**“Sorry kids,
they’ve got a pond
but no habitat.”**



Holistic Pond Management

A photograph of a calm pond surrounded by dense green trees and vegetation. The water is still, reflecting the surrounding greenery and the sky. The scene is peaceful and natural.

Ecologically-based pond management solves problems, creates an self-sustaining system, and adds to our quality of life.

Holistic Pond Management

- Typical Problems
- Solutions
- Quality of Life



Holistic Pond Management

• *Typical Problems*

- Algal Blooms
- Silt Islands
- Bank Erosion
- Fish Kills



Algal Blooms













Silt Islands



Bank Erosion



Eroding Watersheds



Fish Kills

- Summer phenomenon
- Warm temperatures
- Post algal bloom
- Lack of oxygen



Holistic Pond Management

- Typical Problems
- **Solutions**
- Quality of Life



To win, you sometimes have to think outside the box (water)!



Holistic Pond Management

Solutions

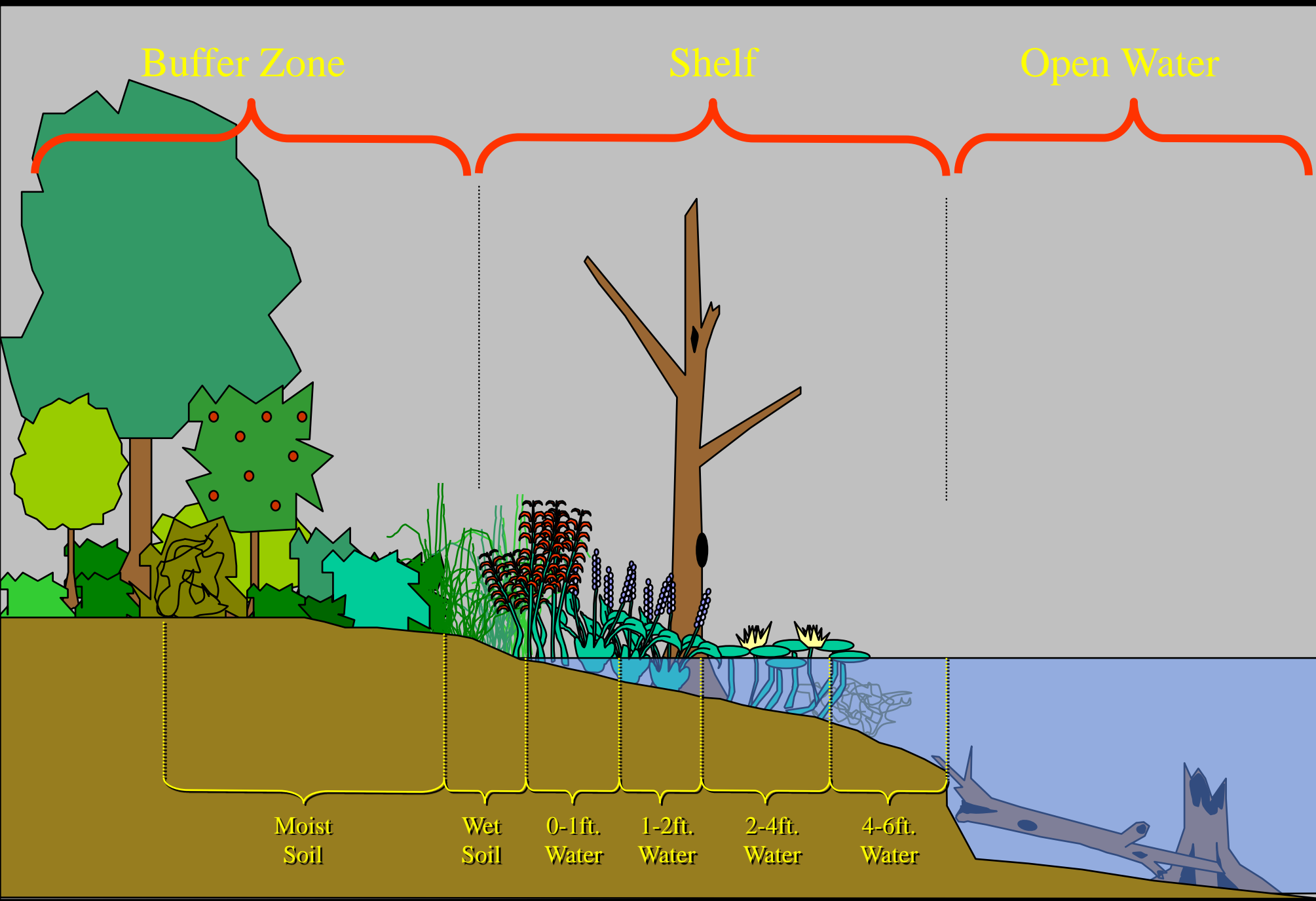
- Problems and Solutions are inter-related
- Model natural systems
- Land-Water Interface
- Diversity = Stability



How do we solve algal problems?

- Reduce nutrient input
- Create buffer zone
- Increase biological diversity







Buffer Zone











Biological Diversity!

*Add Wet/Moist
Soil Native Plants*

Cardinal Flower
Lobelia cardinalis



Trees



Sweetbay magnolia
Magnolia virginiana



Deciduous holly
Ilex decidua



Red buckeye – *Aesculus pavia*



River birch
Betula nigra



Red mulberry
Morus rubra

Shrubs

Buttonbush

Cephalanthus occidentalis



Shrubs



American elderberry
Sambucus nigra



Highbush blueberry
Vaccinium corymbosum



Possumhaw viburnum
Viburnum nudum



Chokeberry – *Aronia* spp.



Silky dogwood
Cornus amomum



More Shrubs



Eastern sweetshrub
Calycanthus floridus



Inkberry – *Ilex glabra*



Swamp rose
Rosa palustris



Sweetspire – *Itea virginica*



Spicebush – *Lindera benzoin*



Ninebark
Physocarpus opulifolius



Sweet pepperbush
Clethra alnifolia



Moist Soil Perennials



Virginia Bluebells
Mertensia virginica



Cardinal flower
Lobelia cardinalis



Great lobelia
Lobelia syphilitica



Obedient plant
Physostegia spp.



Blue mistflower
Conoclinium coelestinum



Spiderwort
Tradescantia
virginiana



Monkey flower *Mimulus ringens*



Swamp milkweed
Asclepias incarnata



Rose mallow
Hibiscus moscheutos



Turtlehead
Chelone glabra



Marsh blazing star
Liatris spicata



Southern blue flag (iris)
Iris virginica



Joepyeweed
Eupatorium purpureum

Native Grasses

Bushy Bluestem
Andropogon glomeratus





Little bluestem
Schizachyrium scoparium



River oats
Chasmanthium latifolium



Eastern gamagrass
Tripsacum dactyloides

Ferns



Cinnamon fern – *Osmunda cinnamomea*



Netted chain fern
Woodwardia areolata



Lady fern
Athyrium filix-femina



Royal fern
Osmunda regalis



Maidenhair fern
Adiantum pedatum

Sensitive fern
Onoclea sensibilis



Emergents

Pickerelweed
Pontederia cordata





Arrowhead/ Duck Potato;
Bulltongue Arrowhead
Sagittaria latifolia; *S. lancifolia*



Rushes – Genus *Eleocharis*/*Juncus*



Blunt spikerush – *E. obtusa*



Squarestem spikerush – *E. quadrangulata*



Soft rush – *J. effusus*

Sedges – Genus *Carex*



Fox sedge – *C. vulpinoidea*



Shallow sedge – *C. lurida*



Longhair sedge – *C. comosa*



Fringed sedge – *C. crinita*



Tussock sedge – *C. stricta*

Floating-leaf

White Water lily
Nymphaea odorata



American Pondweed

Potamogeton nodosus



Water Knotweed
Polygonum amphibum

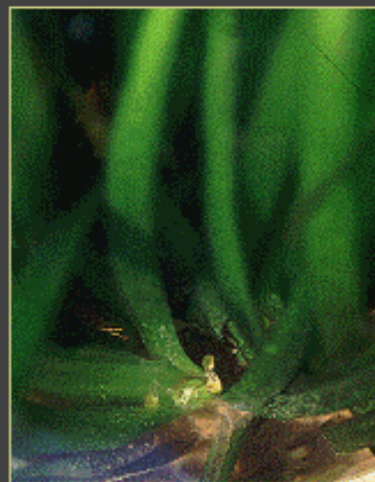
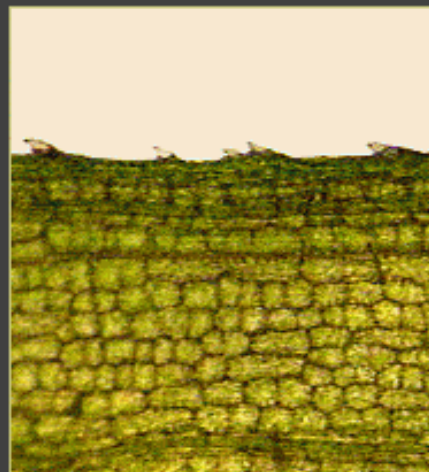
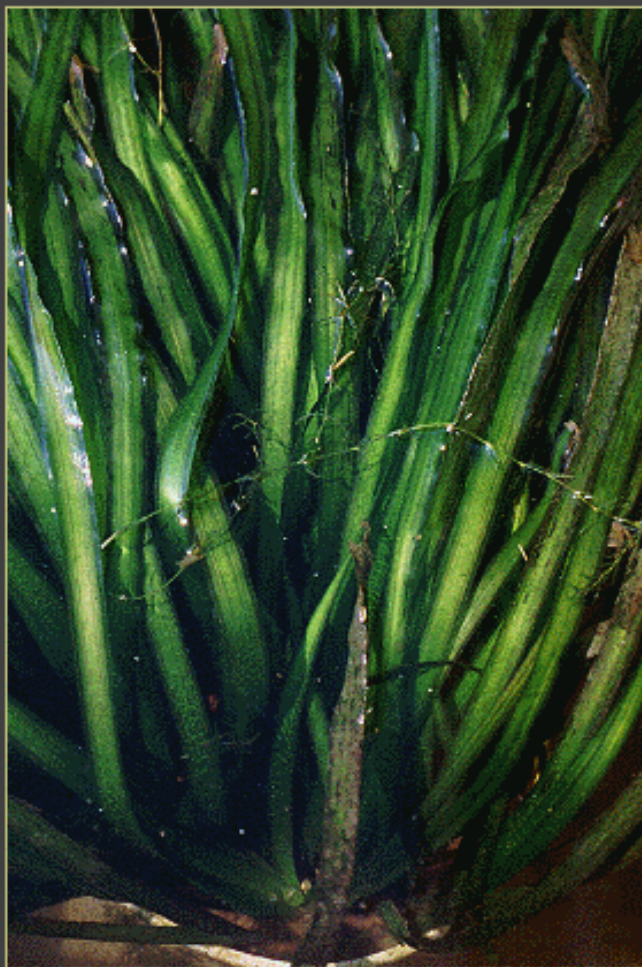




Submersed

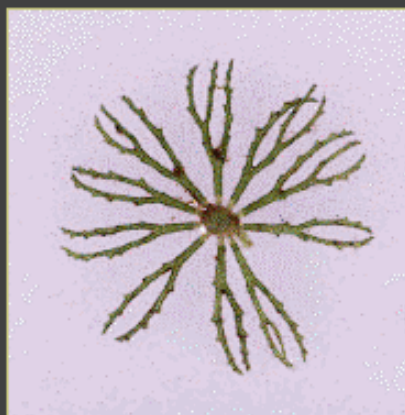
Wild Celery

Vallisneria americana

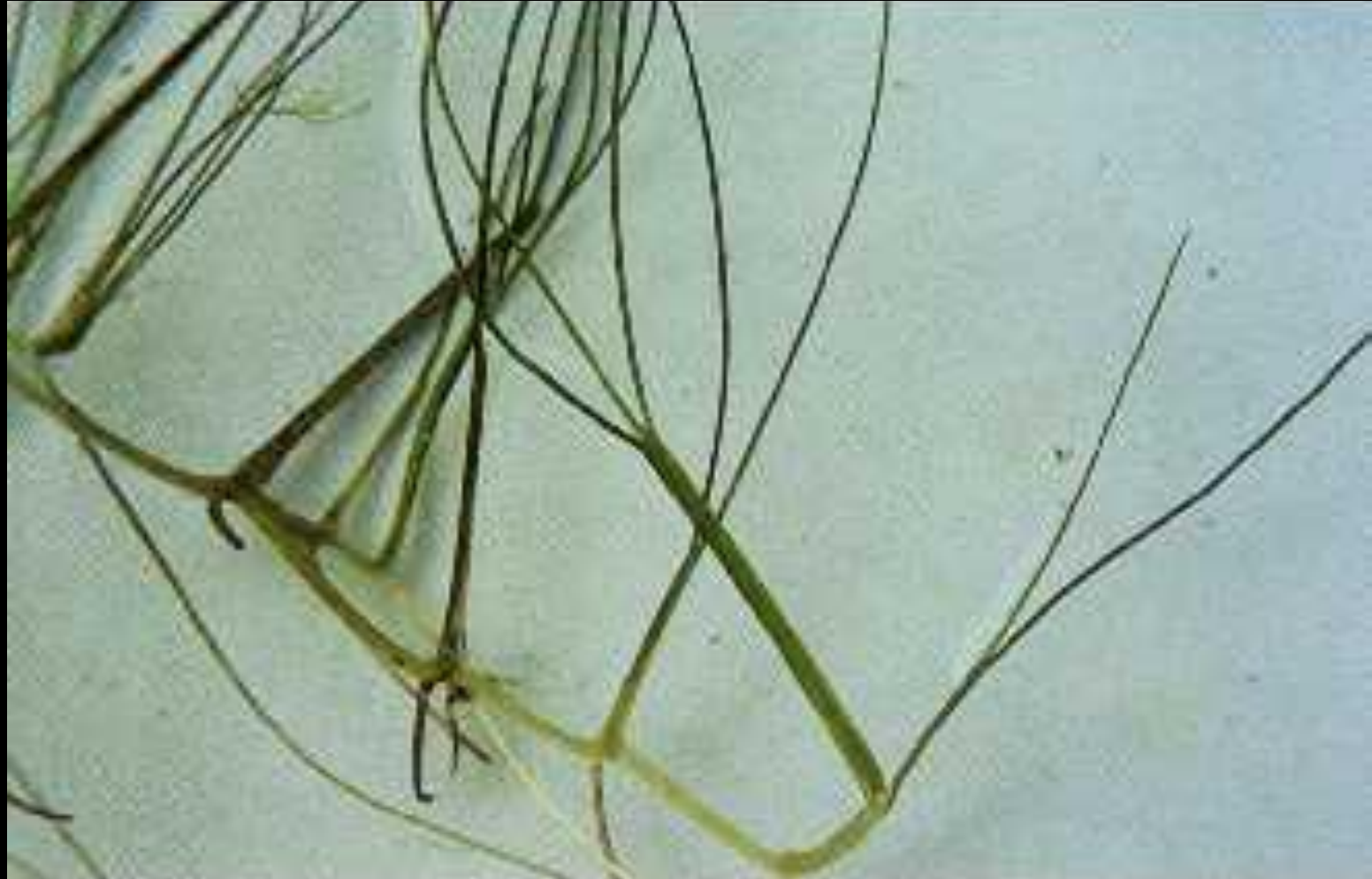


Coontail/Hornwort

Ceratophyllum demersum



Widgeongrass
Ruppia maritima







**How do we prevent
bank erosion?**





Rip Rap to the Rescue!



*The Future of Fountains
is Here, Right Now.*



Engineered Solution

Can we think of a better way?

Got buffer?



How do we
address fish kills?



Aeration?



How do we address fish kills?



Create vegetative buffer zone to reduce nutrients



Eliminate erosional run-off


By addressing other issues first!

Reduce waterfowl(ing) populations





A (not so kind) **Word About Ducks and Geese....**

A photograph of a pond with waterfowl and several bowls of feed on the grassy bank. The pond is in the background, with a small wooden structure in the water. The foreground is a grassy bank with several white and blue bowls of feed. The text "NO!" is overlaid in large yellow letters on the left side of the image.

NO!

Just say NO!

Do not feed waterfowl!

The Urban Waterfowl Problem Comes Home to Roost!





The new neighbors...



How do you keep unwanted geese from your pond?

Got
buffer?

Minimum
Width = 10'

Minimum
Height = 18"



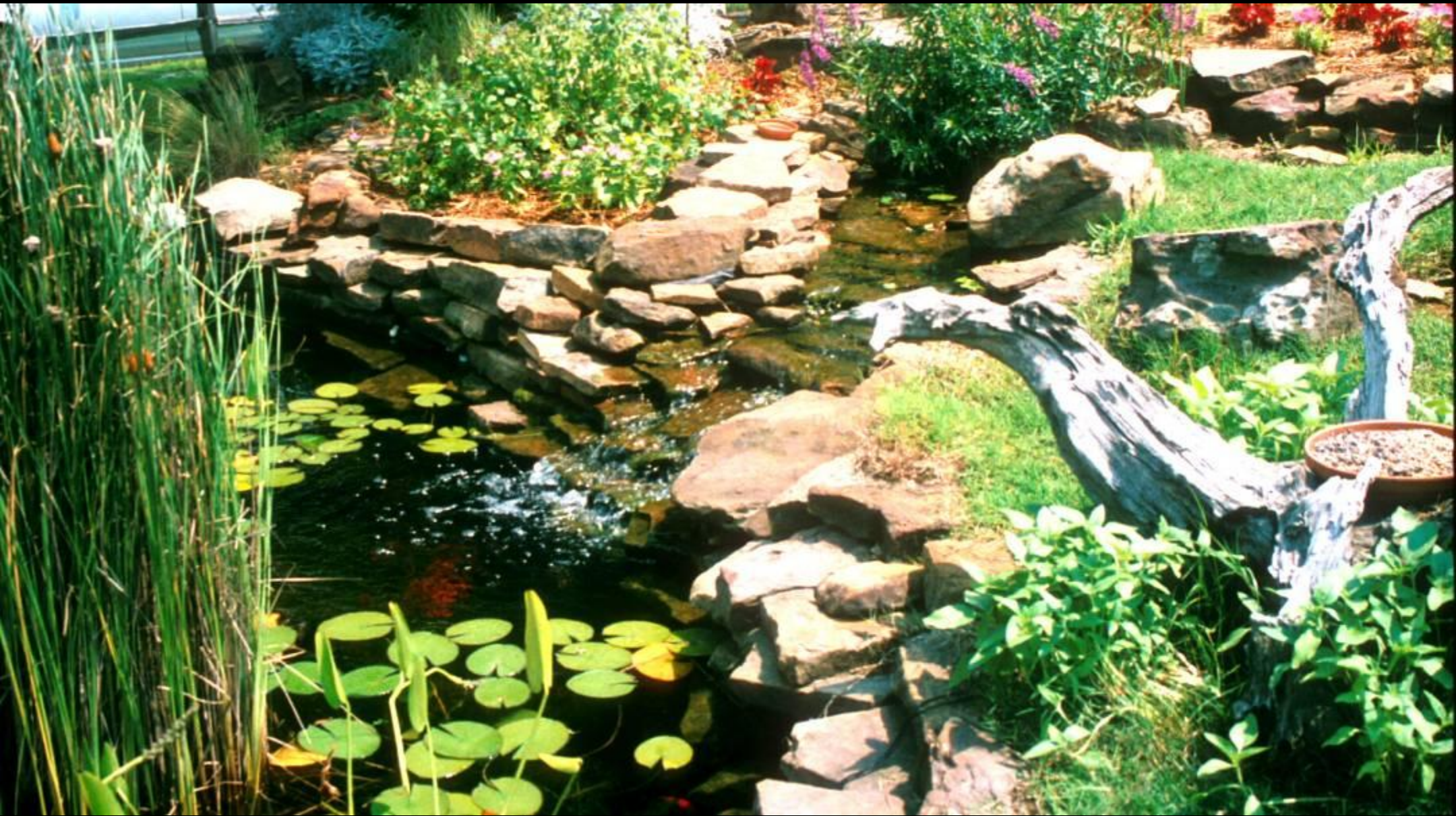
Holistic Pond Management

- Typical Problems
- Solutions
- Quality of Life





"I go to nature to be soothed and healed and to have my senses put in tune once again." J. Burroughs















**Water Attracts
Wildlife!**



Dragonfly larvae eat mosquito larvae. Adult dragonflies eat adult mosquitoes!



A close-up photograph of two frogs in a muddy, brown environment. The frogs are positioned side-by-side, facing forward. They have dark, mottled skin with lighter, yellowish-brown patches. Their eyes are large and prominent, with dark pupils and light-colored irises. The word "Predators" is written in a bold, yellow, sans-serif font in the top right corner of the image.

Predators

Amphibian populations are in deep trouble



Gray treefrog



Upland chorus frog



Cricket frog



Spring peeper



Jefferson salamander



Wood frog

Constructed ponds provide critical breeding habitat.

**Manage for
wild ducks!**

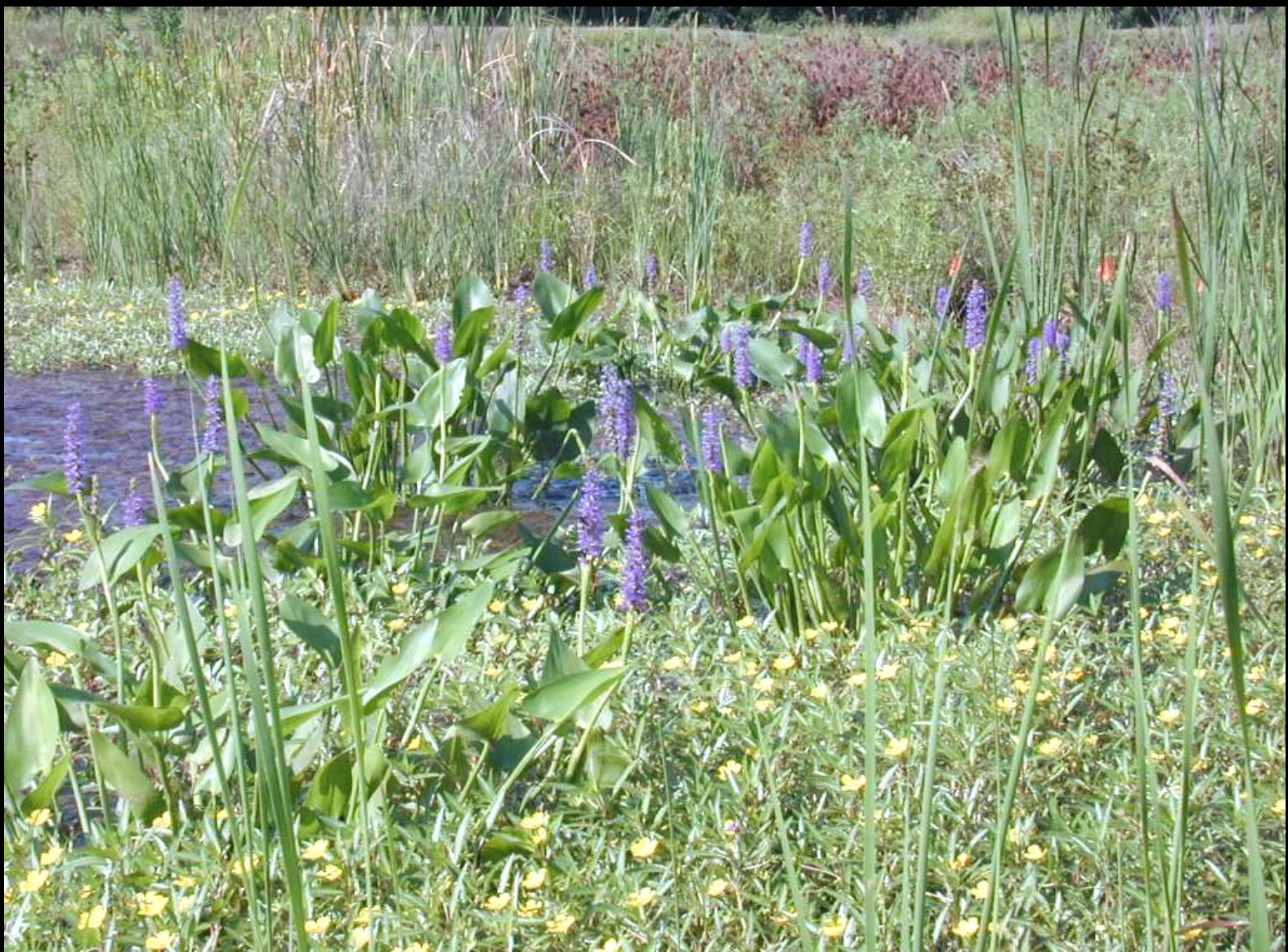




A landscape photograph showing a calm body of water, likely a reservoir or pond, in the middle ground. In the background, a bridge spans across the water. The right side of the image is lined with bare, leafless trees, suggesting a late autumn or winter setting. The foreground consists of a dry, grassy field. The sky is a clear, pale blue with some light, wispy clouds.

Why Settle for Sterile?

When You Can Have...



An aesthetically pleasing, living, breathing,
functional ecosystem!

Holistic Pond Management

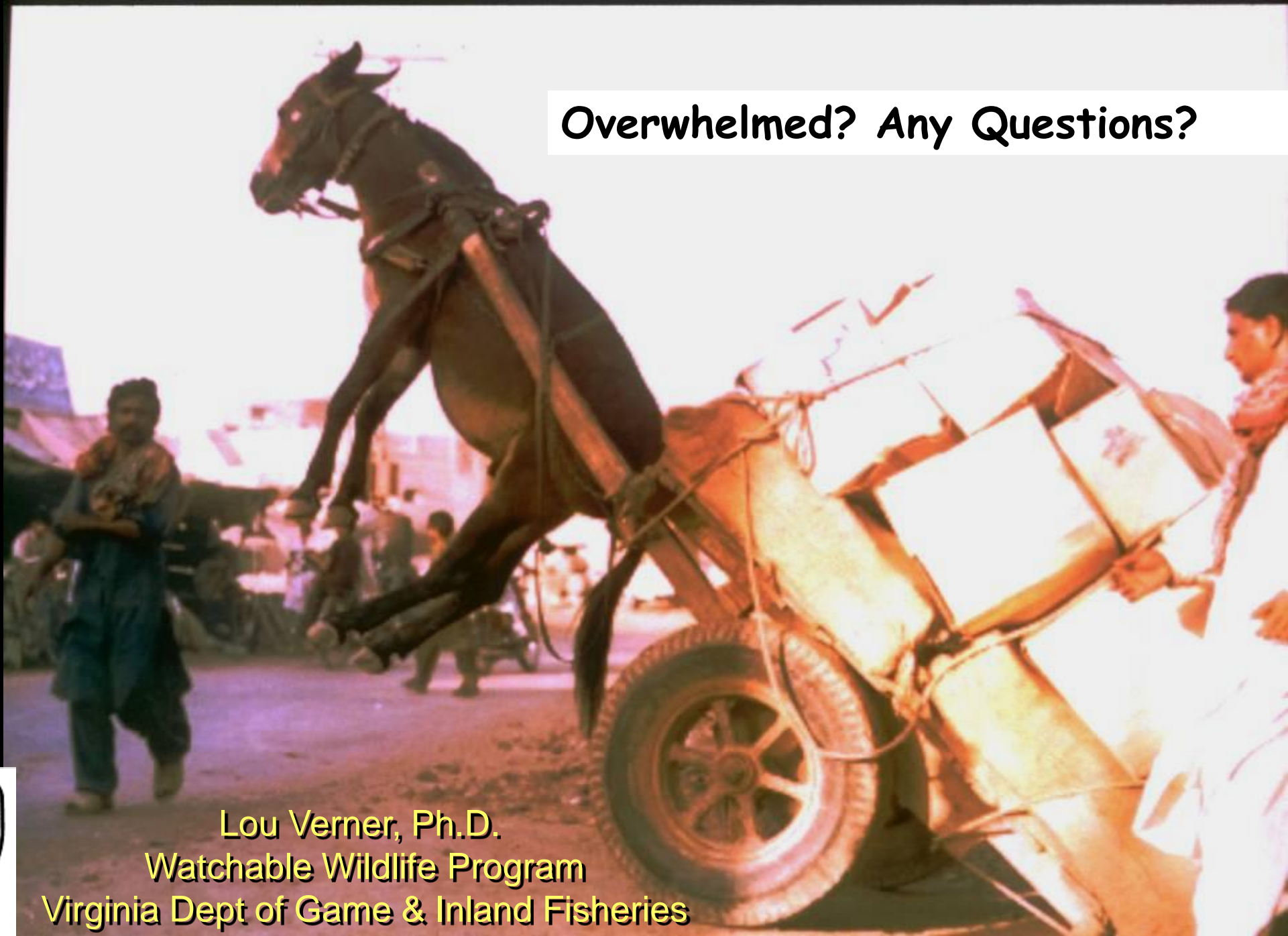


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Wetland & Pond Resources

- NRCS – Farm Pond Ecosystems
 - <http://www.mt.nrcs.usda.gov/technical/ecs/biology/technotes/biotechnoteMT26.html>
- NRCS – Backyard Ponds
 - <http://www.nrcs.usda.gov/feature/backyard/bkpond.html>
- USDA Ponds – Planning, Design, Construction
 - <http://www.in.nrcs.usda.gov/pdf%20files/PONDS.PDF>
- Wetland Planting Guide for the Northeastern United States
 - G.A. Thunhorst, 1993. Environmental Concern, Inc.
- Native Plants for Wildlife Habitat and Conservation
Landscaping – Chesapeake Bay Watershed
 - <http://www.nps.gov/plants/pubs/chesapeake/>

Overwhelmed? Any Questions?



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