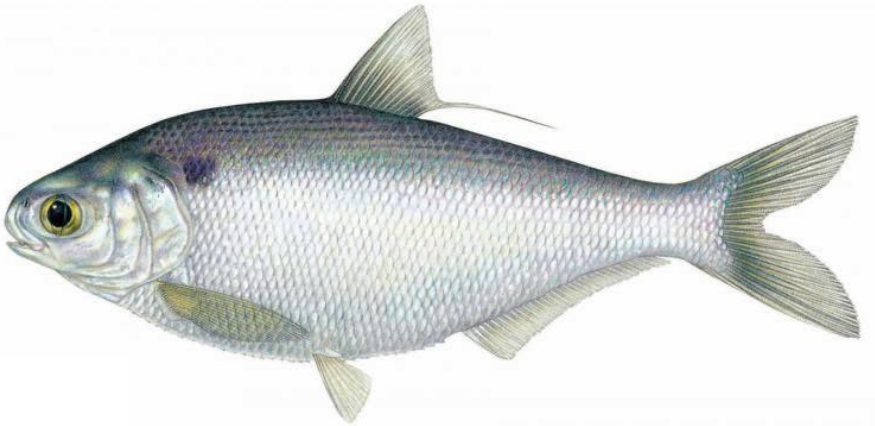
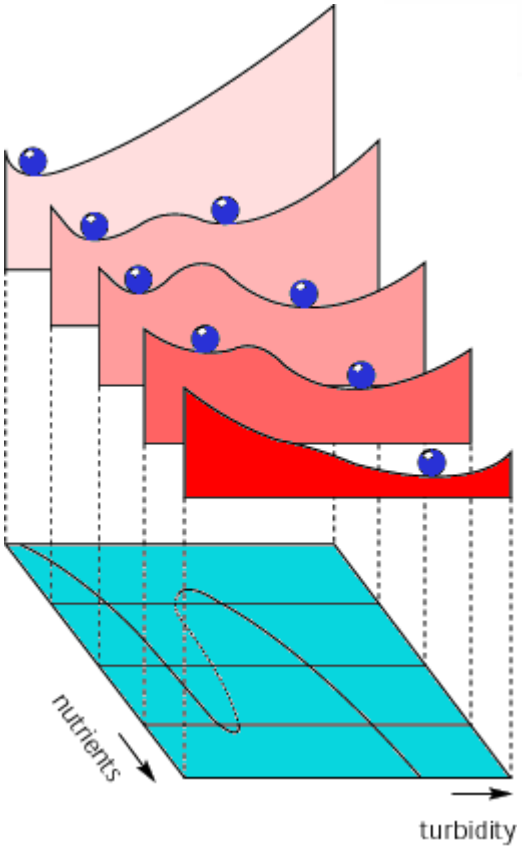
Carp, Shad, and the Marble



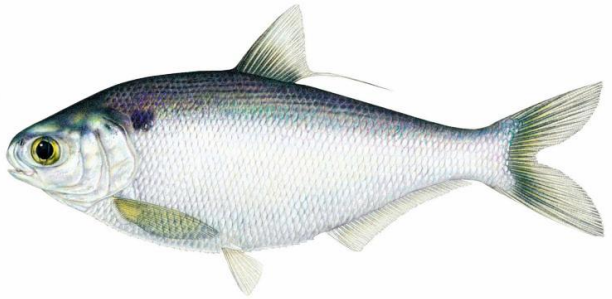


Carp notes

- Native to Eurasia
- Introduced into Wisconsin 1880's
- Cultured, stocked statewide in 1890s
- Acknowledged as a pest by 1900
- Does best in warm, turbid waters (*)
- Life history and behavior = perfect pest

Izaak Walton, 1653
" the Carp is the Queen of the Rivers, a stately, a good, and a very subtil fish..."

Shad Notes



- At northern edge of range
- Prefer warm water
- Omnivore with dietary shifts
- “top down” effect on fish and habitat (*)
- Typically associated with warm shallow waterbodies having soft substrates, high turbidity , and few predators

“Top –Down” Trophic cascade

Generally a shift in the energy of a system to a lower level(s)

The top level predator, either by decline (lake trout), or abundance (shad) , alter the pathway where energy ultimately resides as biomass.

Shad remove zooplankton as juveniles, encouraging phytoplankton (“green”condition)
Adults feed on benthic detritus, liberating phosphorous, encouraging algae. Abundant populations contribute nutrients (waste) and act as engines of disturbance that resuspends nutrients

Other fish experience lowered growth rates because the food source for their young is absent or the turbidity diminishes their habitat (vegetation) and thus their food. Turbid conditions disfavor sight feeding predators .

POP Quiz !

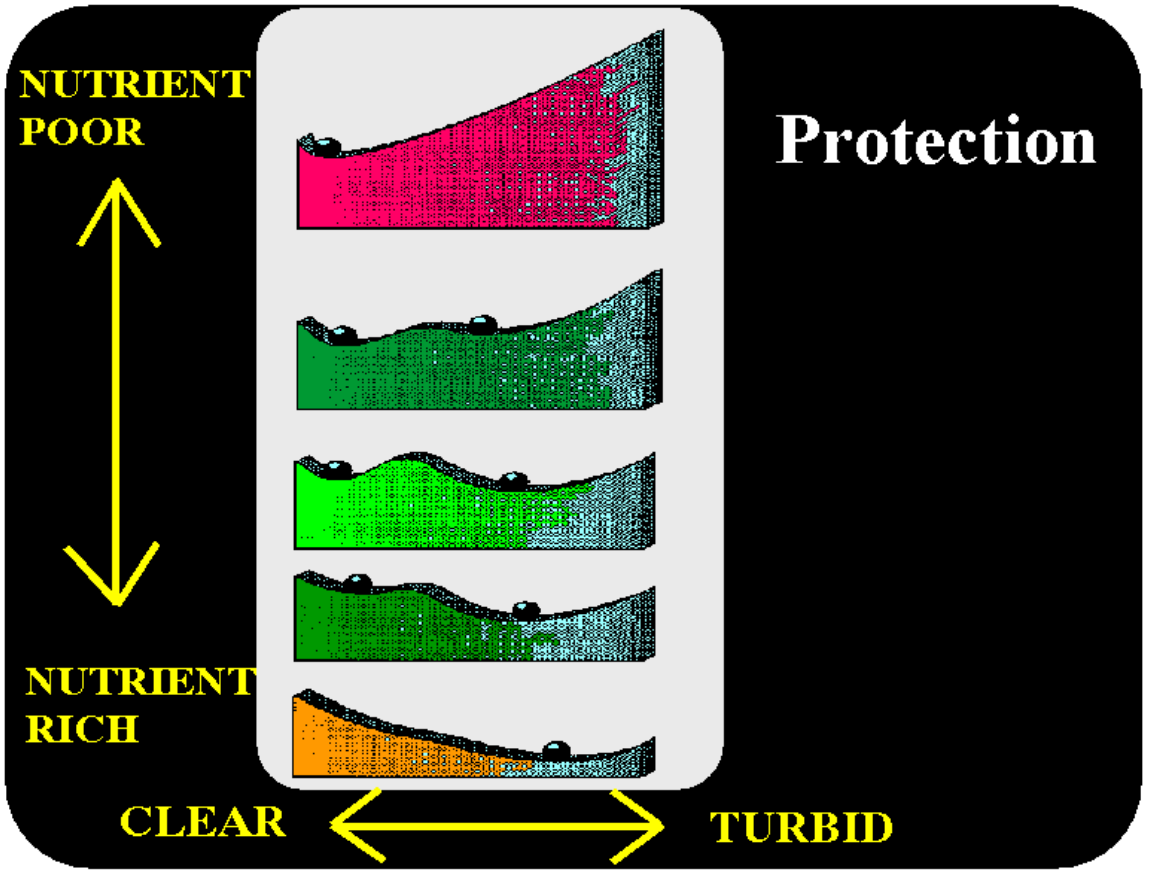
Q: What has happened to many water bodies since european settlement

+

Where’s that marble rolling ?

Shallow Lake Ecology

(From Scheffer et al. 1993)



Heracles battles the Hydra of Lerna

The 9 heads of carp

- ✓Long Lived
- ✓High reproductive capacity…..1,000,000 eggs per female
- ✓Long spawning season...April to August
- ✓Mobile ….invade and escape
- ✓Tolerant of degraded conditions (tough !)
- ✓Fast growth that negates predation
- ✓Spawns in “safe” conditions that enhance survival
- ✓Highly sensory, aware and learn quickly (avoidance)
- ✓Create their own reality...BIO-ENGINEERS

67 year old- Lake Wingra

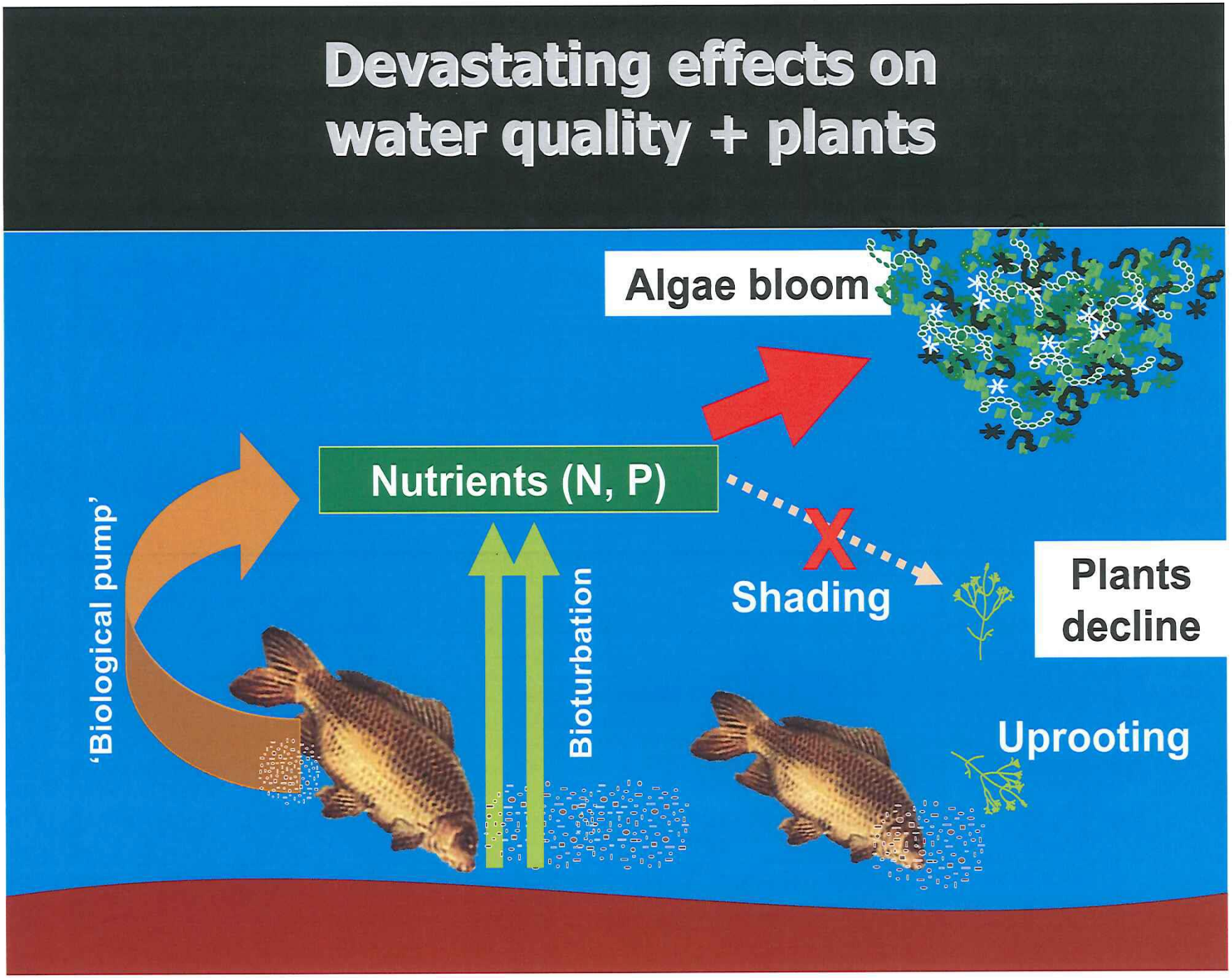
If given the chance, juveniles grow very fast

Biological Engineers

http://www.arkive.org/common-carp/cyprinus-carpio/video-ca08.html

http://www.arkive.org/common-carp/cyprinus-carpio/video-ca09a.html

Devastating effects on water quality + plants



Perseus with the Head of Medusa

Fighting the Gorgon...finding Achilles' heel

Accepted vulnerabilities:

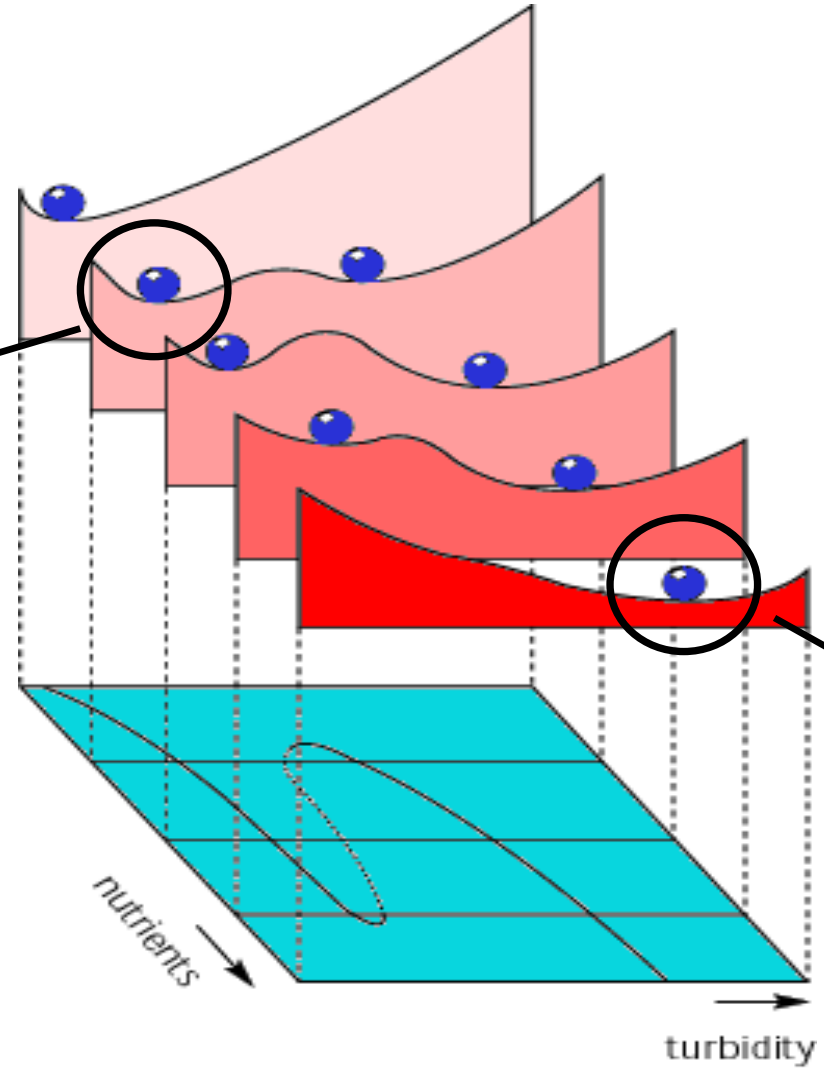
Propensity for winter aggregation that allows for seining...kind of

Movement into and out of spawning areas can allow blocking or trapping ….kind of

Can be effectively baited….kind of

Goal : carp biomass NTE 100 lbs / acre

< 100 lbs carp /acre



> 100 lbs carp /acre

Integrated Pest Management

all sizes, all areas, all times

Requires knowledge of abundance….how many ?
Requires an idea of age structure…how often are they a problem ?
Requires observation of movement …Where are the hot spots ?

Toolbox of control options

- Aeration
- Drawdown
- Blockages
- Chemical
- Winter seining
- Bait and trap
- Stocking

Nature is a fickle sort of thing

- requires long term commitment
- requires capacity
- requires monitoring