Winter Drawdown Proposal for Control of EWM in Long Trade Lake

Informational Meeting

Saturday, August 25, 2012

SEH

Recent Management Summary – Trade Lakes System

- Summer 2011 – Aquatic Plant Management Plan for Long Trade, Round, Little Trade, and Big Trade Lakes (Polk Co, assisted by SEH)
- Fall 2011 – AIS Established Infestation Control Grant awarded ($113,000.00 over 3-yrs)
- Spring 2012 – EWM management recommendations for Long Trade, Round, and Little Trade Lakes
- Spring/Early Summer 2012 – EWM chemical treatment on Round and Little Trade
  - Put on hold for Long Trade due to winter drawdown potential
- Summer 2012 – Winter Drawdown on Long Trade for EWM control Feasibility Study

Feasibility Study Results

- Winter Drawdown is a potentially effective and feasible EWM management tool for Long Trade Lake
- Public Input and Support a “must have” piece of planning
- Resource Professional Support a “must have” piece of planning
- A draft Winter Drawdown Plan has been established
- Presentation of that plan to determine final public and resource professional support (today)

Draft Winter Drawdown Plan

- Schedule
  - Implement a 3-ft winter drawdown in the fall of 2012
- Frequency
  - One-time initial event with monitoring of results to determine future use
- Dewatering
  - Begin around October 1 at a rate of no more than 2” a day
- Water Level Maintenance
  - Maintain at target winter drawdown level until spring ice out
- Refill
  - Begin refilling with ice out in the spring

Winter Drawdown Plan continued:

- Aeration
  - Install at least one surface aspirating aeration system on the south basin once ice is firm enough to do so (late December-January)
- Voluntary Bag Limits
  - Voluntary bag limits for ice fishing for panfish, bass, and northern pike
  - Temporary DNR Restrictions if possible
- Channel Maintenance
  - Remove obstructions from the channel between the mill pond and the main lake
- Chemical management of remaining EWM in summer following the drawdown

Monitoring and Inspection

- Well monitoring during drawdown
- Summer vegetation surveys after drawdown
- Water quality testing during and after drawdown
  - Dissolved oxygen
  - Total and dissolve phosphorus
  - Chlorophyll a (algae)
- Lake water level monitoring during entire drawdown time frame
- Outlet channel inspection
- Amphibian monitoring
- WDNR boom shocking fish survey
  - Maybe a northern pike survey

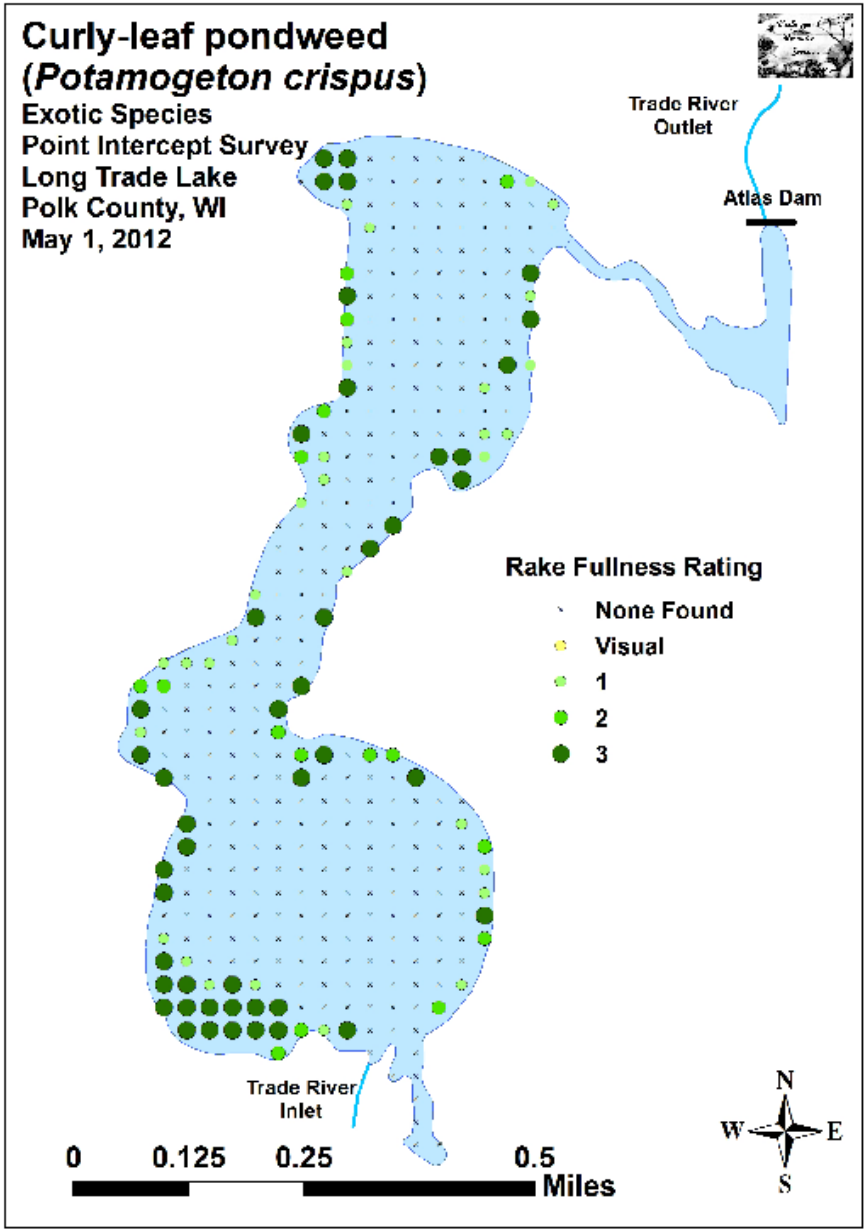
Long Trade Lake in Equilibrium?
09/30/2010

Curly-leaf pondweed

Curly-leaf pondweed covers two-thirds of the spring littoral zone

-Up to 7.5 ft of water

-37 acres



Eurasian water milfoil

Once CLP dies off, EWM covers two-thirds of the summer littoral zone

-Up to 5-ft of water

-25 acres

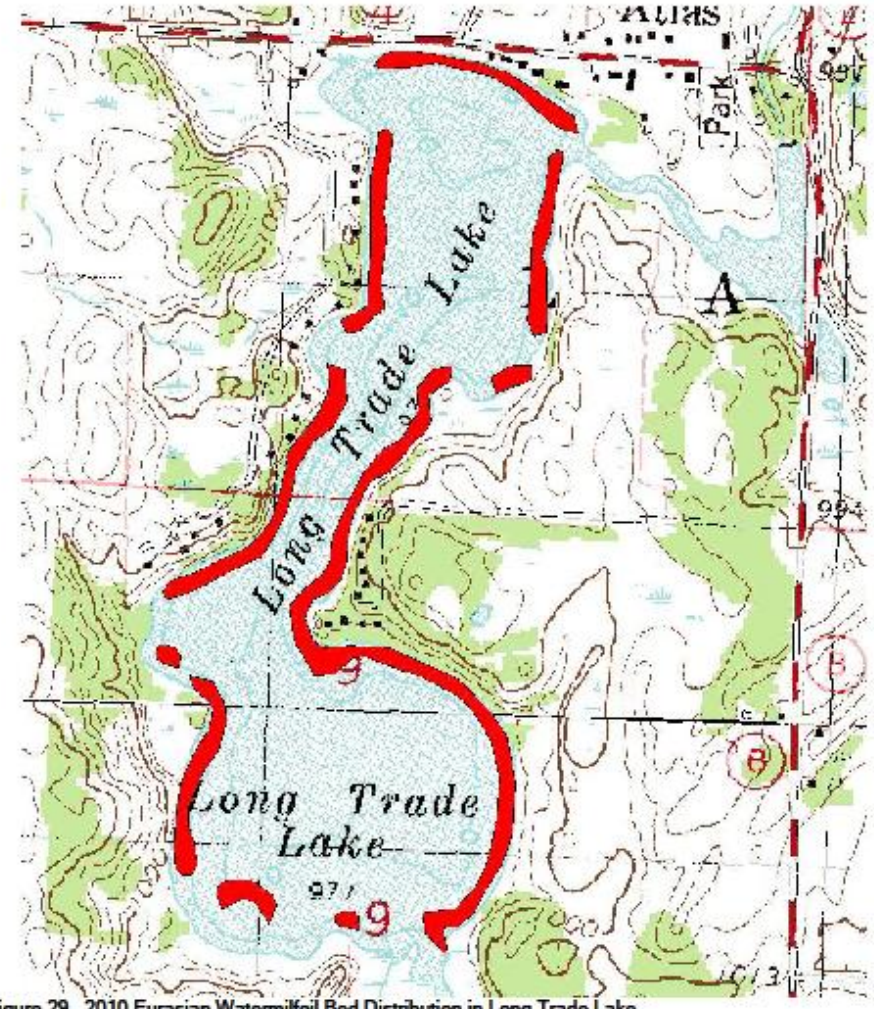
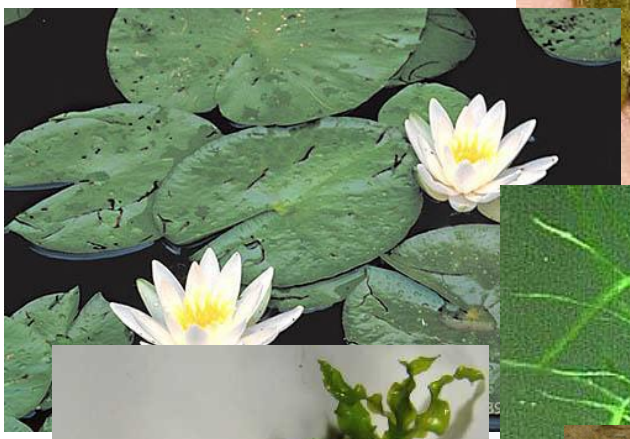


Figure 29. 2010 Eurasian Watermilfoil Bed Distribution in Long Trade Lake

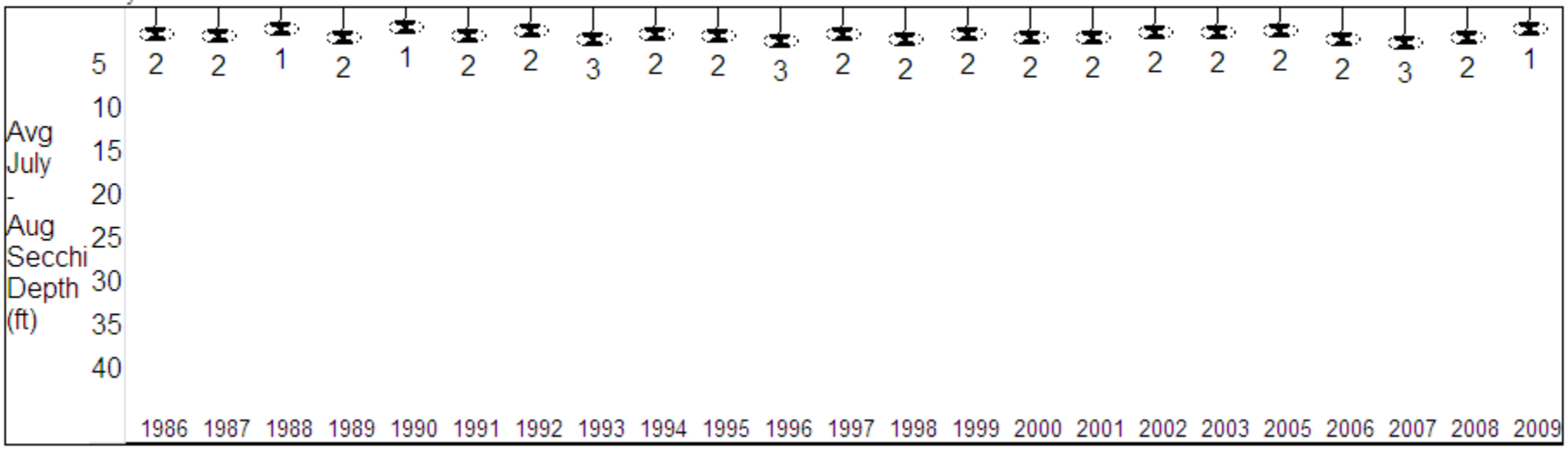
Few Other Plants

- Only 12 other species identified in 2006
  - Coontail (34%)
  - Common waterweed (13.5%)
  - White water lily (37%)
  - Bushy pondweed (<5%)
  - Clasping-leaf pondweed (<5%)
  - Flat-stem pondweed (<5%)
  - Soft stem bulrush (visual only)
  - Arrowhead (visual only)



Water Quality

Long Trade Lake
Polk County
Waterbody Number: 2640500



Past secchi averages in feet (July and August only).

Is it in Equilibrium? Sure. Is the current equilibrium satisfactory? Can something be done to change it? Maybe.

Why a Winter Drawdown?

- Potentially low cost, longer lasting, and effective means to control certain plant species
- May increase more desirable plant species
- May consolidate some sediments
- May improve the fishery
- May help to identify other issues like septic system failure
- May reduces herbicides needed to manage unwanted plant species
- Reduces human recreational impacts
- Lessens impacts on wildlife

- **How does it work?**
  - Exposes lake bottom to winter conditions
  - Freezing and drying of vascular plants and root structures causes plant death
  - Allows some draining of soft sediment
  - Concentrating fish species can cause greater predation and growth
  - Slow dewatering during the fall and refill in the spring allows movement of wildlife
  - Human lake use not as great in the winter

Is it All Good?

- **Everything has drawbacks and risks**
  - Can impact desirable plants, does not impact all undesirable plants
  - Negative impacts to “benthic” or bottom dwelling critters
  - Possible fishkills due to low dissolved oxygen under the ice
  - May impact northern pike spawning
  - Possible impacts to shallow wells
  - Impair winter recreation (primarily ice fishing)
  - Amphibians and reptiles could be affected
  - What if it can’t be filled up again
  - Extra water flow downstream during drawdown, less water downstream during refill
  - Too short, too wet, to early heavy snowfall, to warm of conditions can make it less effective
  - Could impact water quality following the drawdown

Winter vs. Summer Drawdown

- Less muck, smell, expansion of less desirable certain plants
- Freezing and drying kills plants better than drying alone
- Limited undesirable aesthetic changes to lake shore and lake bed
- Less human recreation impacts
- Less impact on spawning panfish and bass
- Wildlife not “stuck in the mud”
- Slow drawdown in the fall allows critters to move

Aquatic Plants

Plant Species	Common Name	Increase or Decrease
Potamogeton crispus	Curly-leaf pondweed	Increase
Myriophyllum spicatum	Eurasian water milfoil	Decrease
Ceratophyllum demersum	Coontail	Decrease
Elodea canadensis	Common waterweed	variable
Nymphaea odorata	White water lily	Decrease
Najas flexilis	Bushy pondweed	Increase
Potamogeton foliosis	Leafy pondweed	Increase
Potamogeton Richardsonii	Clasping-leaf pondweed	Increase
Potamogeton zosteriformis	Flat-stem pondweed	Increase
Scripus sp.	Softstem bullrush	increase

Decreases in EWM due to Winter Drawdown

- Beard, 1973; Crosson, 1990; Dunst and Nichols, 1979; Goldsby et al, 1978, Husley, 1958; Smith, 1971; Siver et al, 1981; Adamec and Husak, 2002; Wagner and Fatler, 2002
- Lake Wissota, Chippewa County; Alpine Lake, Waushara County; Marion Millpond, Waupaca County; Murphy Flowage, Rusk County, McDill Pond, Portage County; Montello Lake, Marquette County; Galway Lake, NY; Saratoga Lake, NY
- **EWM is effectively controlled with winter drawdown, but is not a one time, last forever solution. EWM can re-establish itself.**

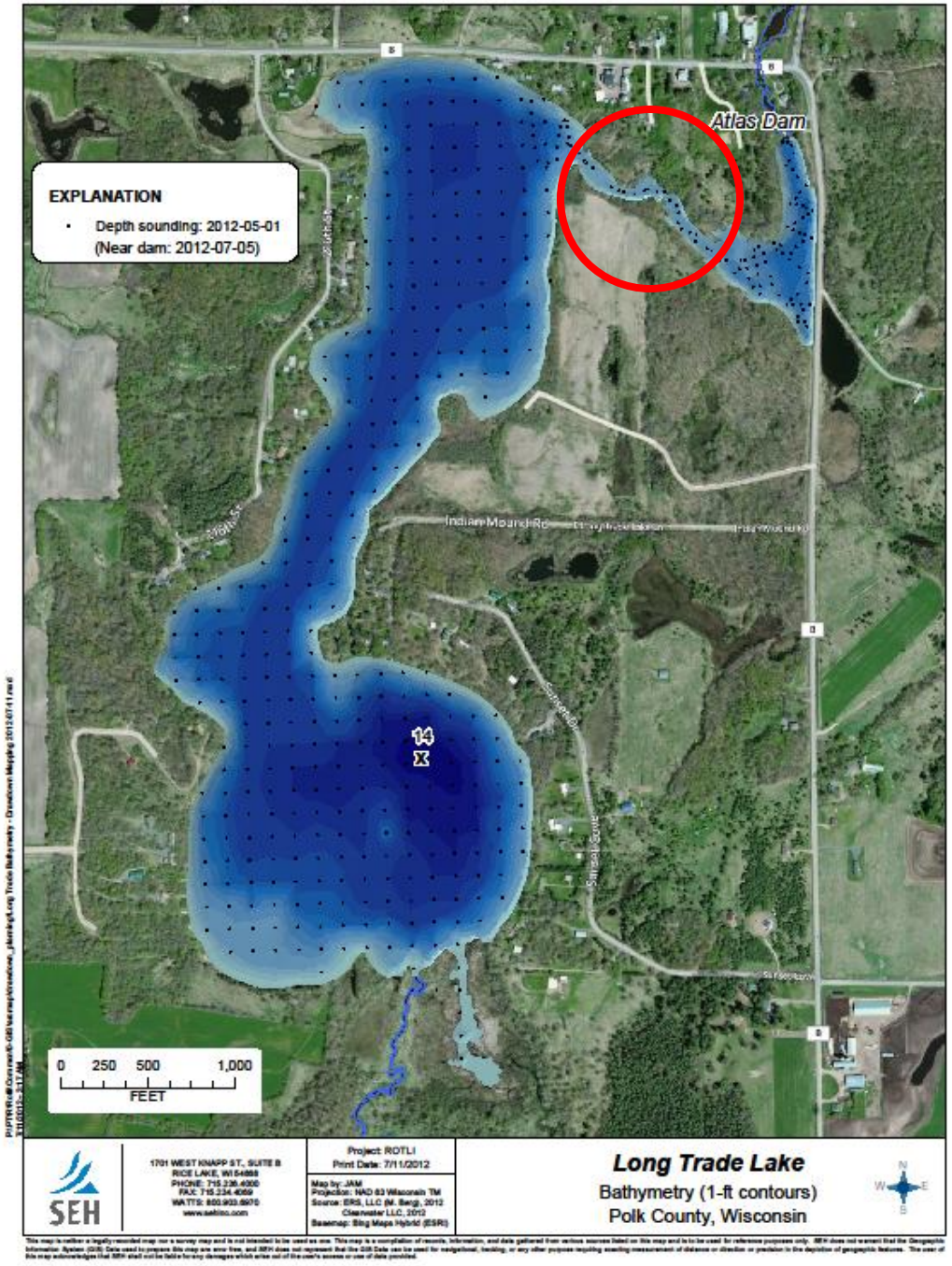
Dam Structure

DAM

Area of Control

1-ft bathymetric contours

Red Circle: Area where the channel is constricted



Area of Control

Surface area impacted by EWM (5-ft) = Maximum of 39 acres

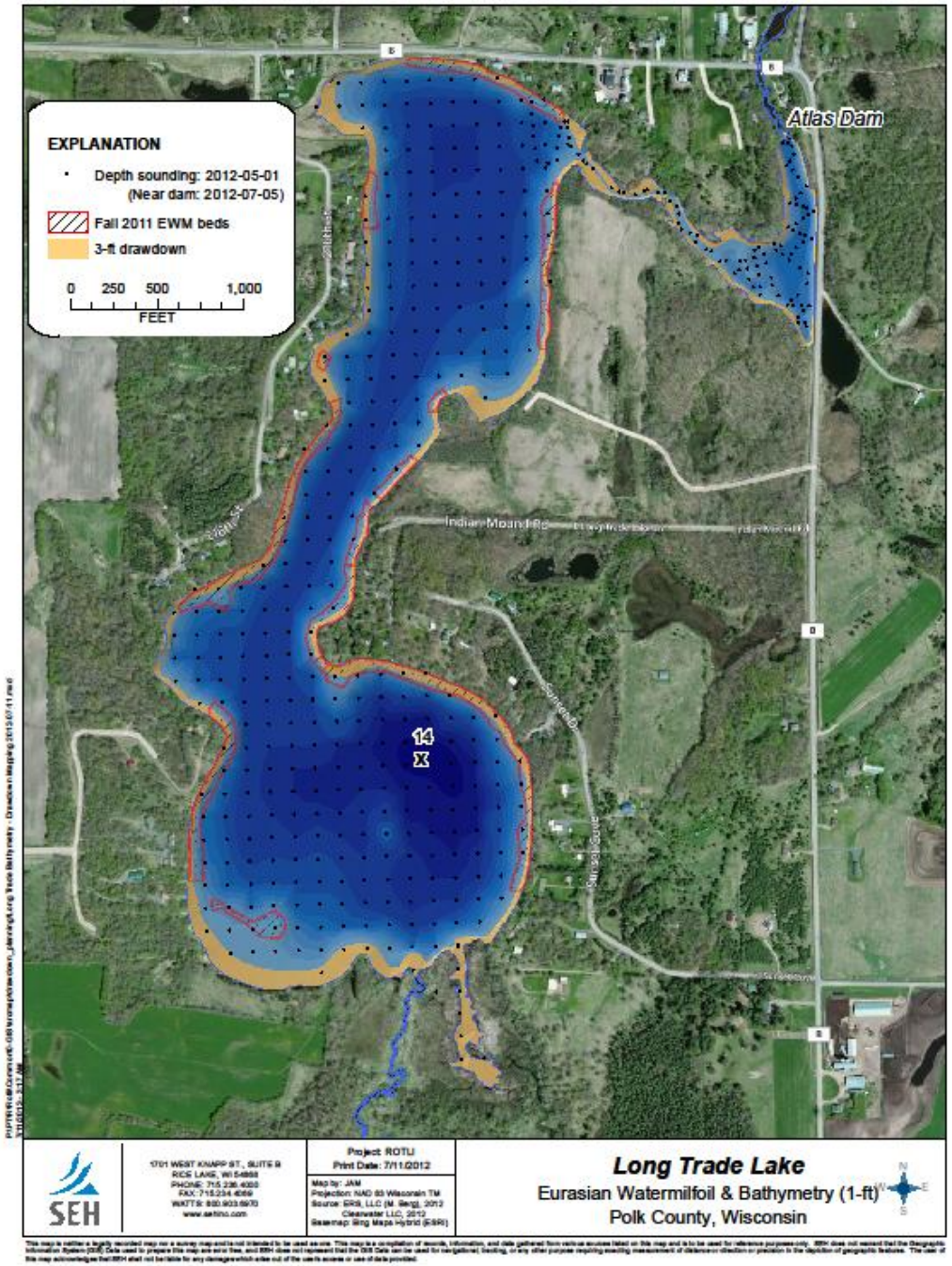
Approximate area impacted by a 3-ft winter drawdown: 18 to 29 acres

50-75% reduction in EWM

Leaves 10 to 18 acres left to manage

Based on maximum EWM growth

Real EWM growth 13-25 acres (varies each year)

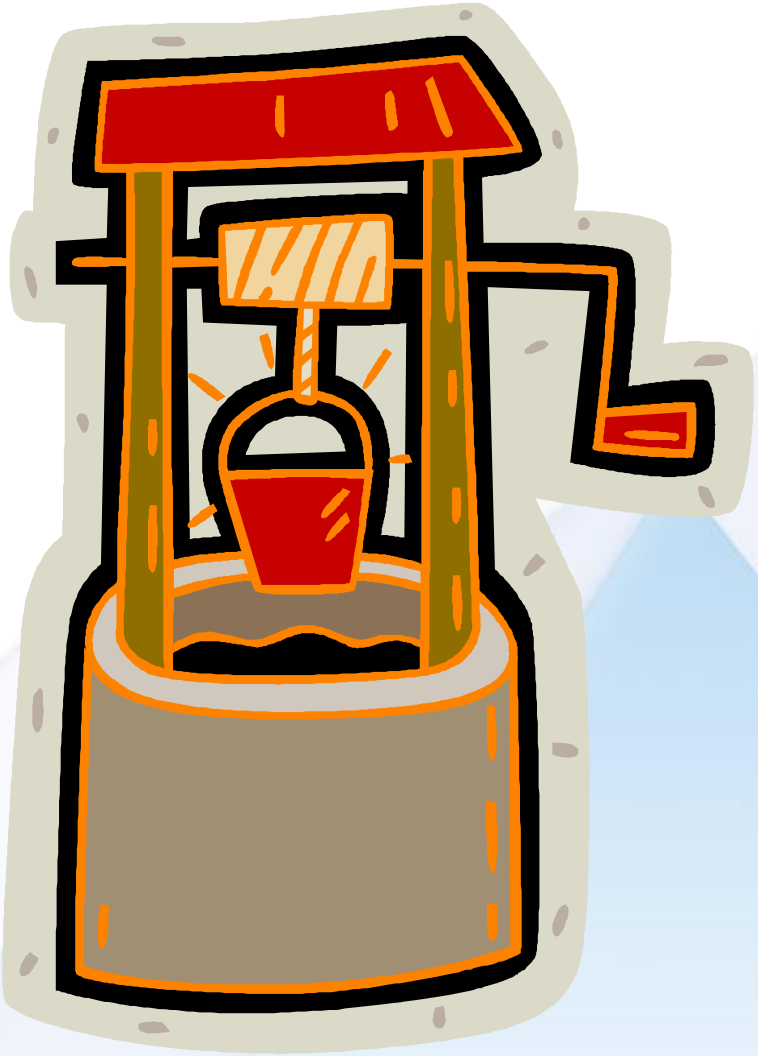


Hydrology (based on 2007 Polk Co. values)

- Approximately 16-17 cfs inflow to Long Trade Lake
- Drawdown of 3-ft removes 35 % of total volume of Long Trade Lake
  - Total Volume = 1,258 acre-feet
  - Drawdown Volume = 453 acre-feet
- Removing one 4” stoplogs at a time increases flow out of the lake by about 3.8 cfs
  - Two stoplogs increase flow out by about 10.6 cfs
  - Two logs means approximately 21.1 acre-feet/day
  - It would take approximately 22 days to draw down 3-ft at about 1.6 inches a day
- Refill (based on average flow) would take approx. 2 wks while maintaining 25% of the average flow

Private Wells

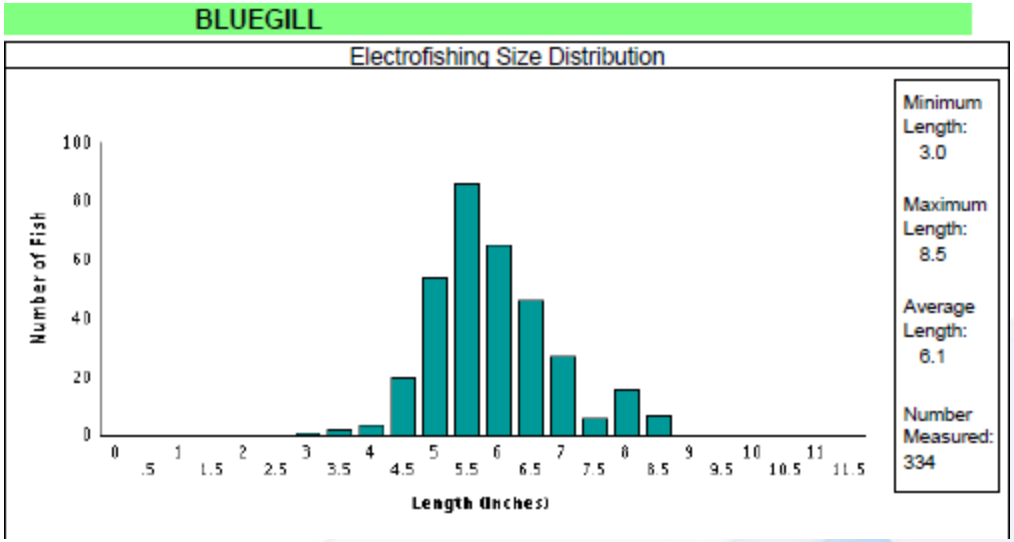
- Well-construction records show 27 wells in the platted sections (4 & 9of T36N, R18W) that could be affected by the drawdown
- There is an average head on these wells of 40 feet, with a minimum of 18 ft
- Private wells should not be impacted by a 3-ft drawdown

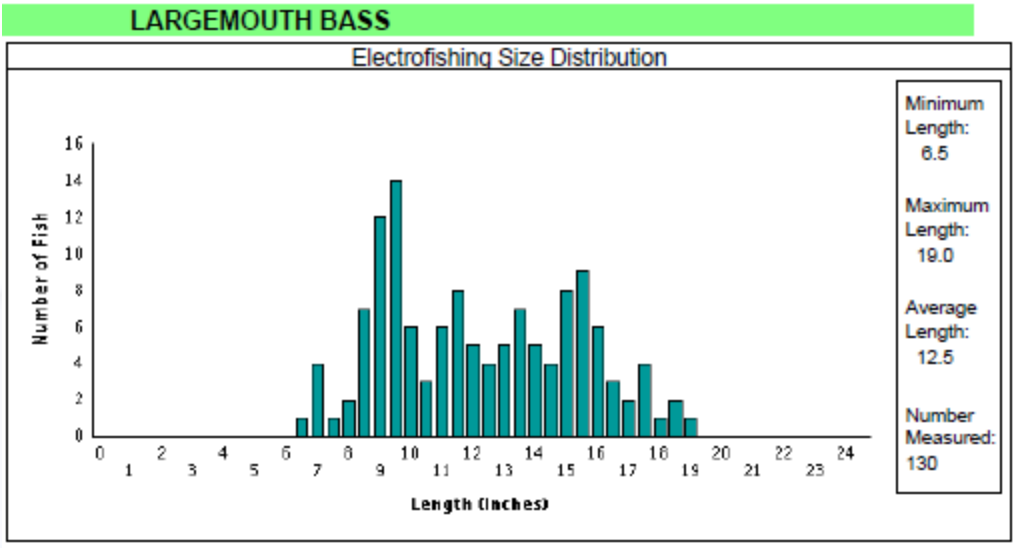


Fisheries Concerns

- Spawning
- Winter fishkill
- Over harvesting
- Reduced forage fish
- Larger predator fish
- Trapping/stranding

- WDNR Spring 2008 Boom Shocking Results





Spawning

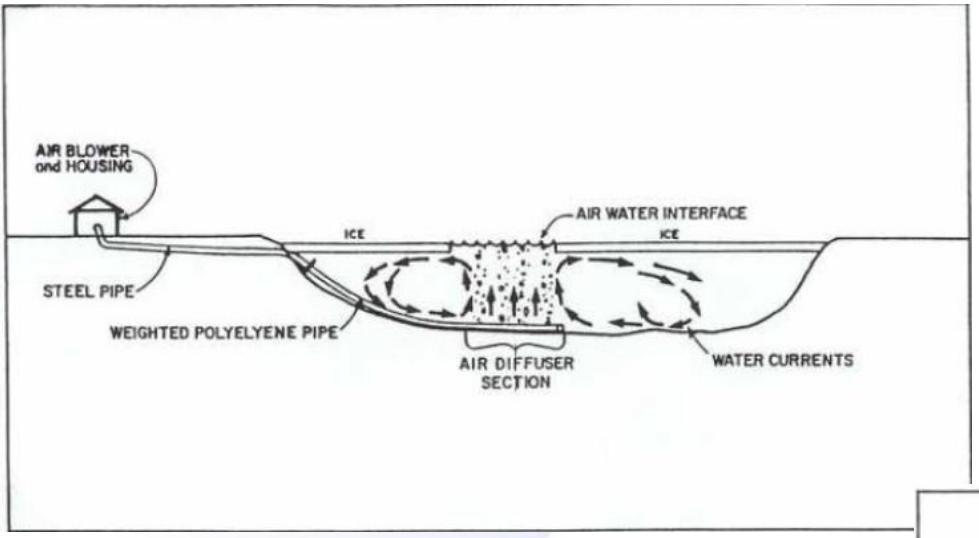
- Little impact to panfish spawning as the lake will be filled up again before they spawn
- Some vegetation will grow in the littoral zone (CLP if nothing else)
- Northern Pike might be impacted in the drawdown year as they spawn at ice out in shallows and weedy areas

Fishkills (reduced dissolved oxygen)

- Dependant on several conditions
  - Lake morphology: inlets and outlets, depth, springs, fertility
  - Weather: snow cover, duration of ice, fall turnover
- Volume
  - reduced by 35%
  - Fish concentrated in the remaining 65%
  - Need to maintain 2-5 mg/L of DO in water
- Trade River Inflow (16-17 cfs)
- Aeration
  - 17 lakes in Barron and Polk Counties in 2006)

Types of Aerators

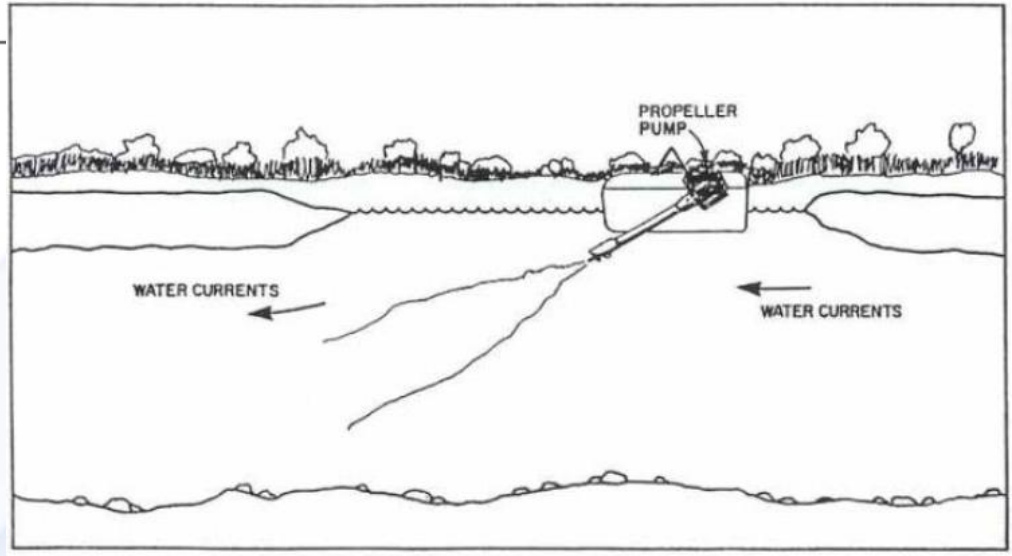
Compressed air aeration



-Intended to be more permanent
-Less labor intensive installation
-Only slows the loss of DO, does not replace or improve levels
-more practical for long-term operation
-not great for shallow lakes

Surface aspirating aeration

-not permanent, emergency
-more labor intensive to install
-install each winter
-More powerful
-able to replenish DO supply
-better suited for shallow lakes



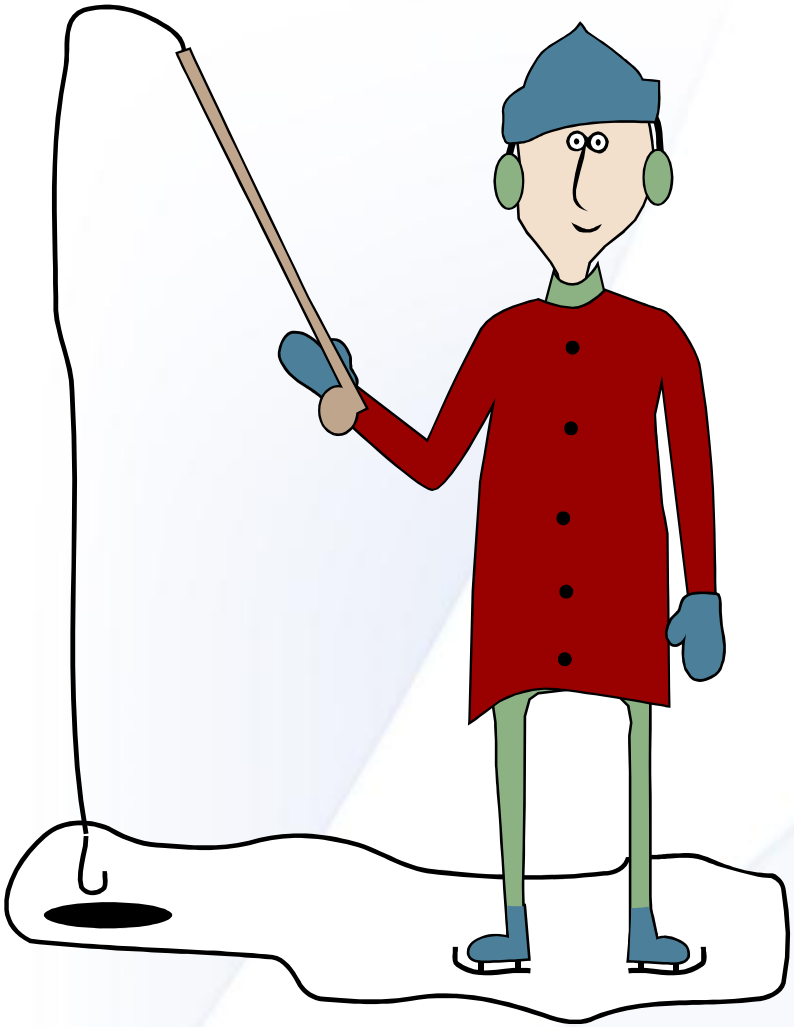
Installation

- At least one per 75 acres
- Installed in January, left in until ice out
- Must be removed
- In the deep hole in the south basin
- Maybe in the north basin (2nd unit)
- Requires barricading (WI Statute 167.26)
- $1500 - $2000 with barricade and power supply
- Monthly operating costs
- Needs a willing landowner

Operator Concerns – Local Support

- Who will do what:
  - purchasing, installation, operation, maintenance, removal (WDNR and/or Polk County assistance)
- Public land or willing landowner to site the device
- Liability issues for the owner/operator
- Dissolved oxygen monitoring
  - Before, during, and after installation
- Barricade maintenance
- Paying the electric bills

Overharvesting



- Enact a voluntary bag limit for the fish species of concern
- Can’t legally change the bag limit and enforce without DNR support
- May be possible to get DNR support
- Limited access anyway due to low water and open water

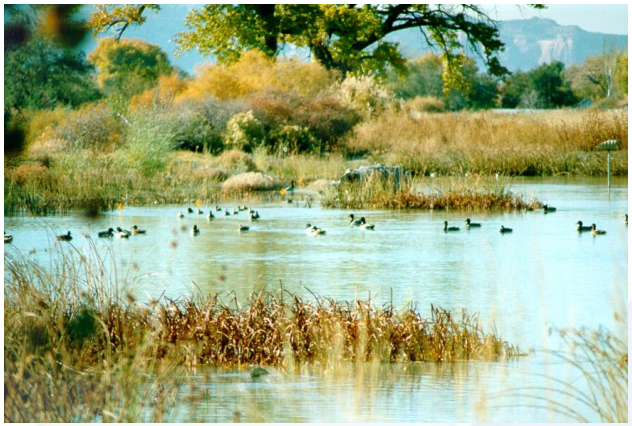
Predator Prey Relationship

- Drawdown is sometimes used as a fisheries management tool to reduce stunted panfish populations
- Game fish feed on pan fish that do not have as much shelter
- Remaining fish usually experience an increase in physical condition

- **Trapping in back bays should not be an issue**

Wetlands and Wildlife

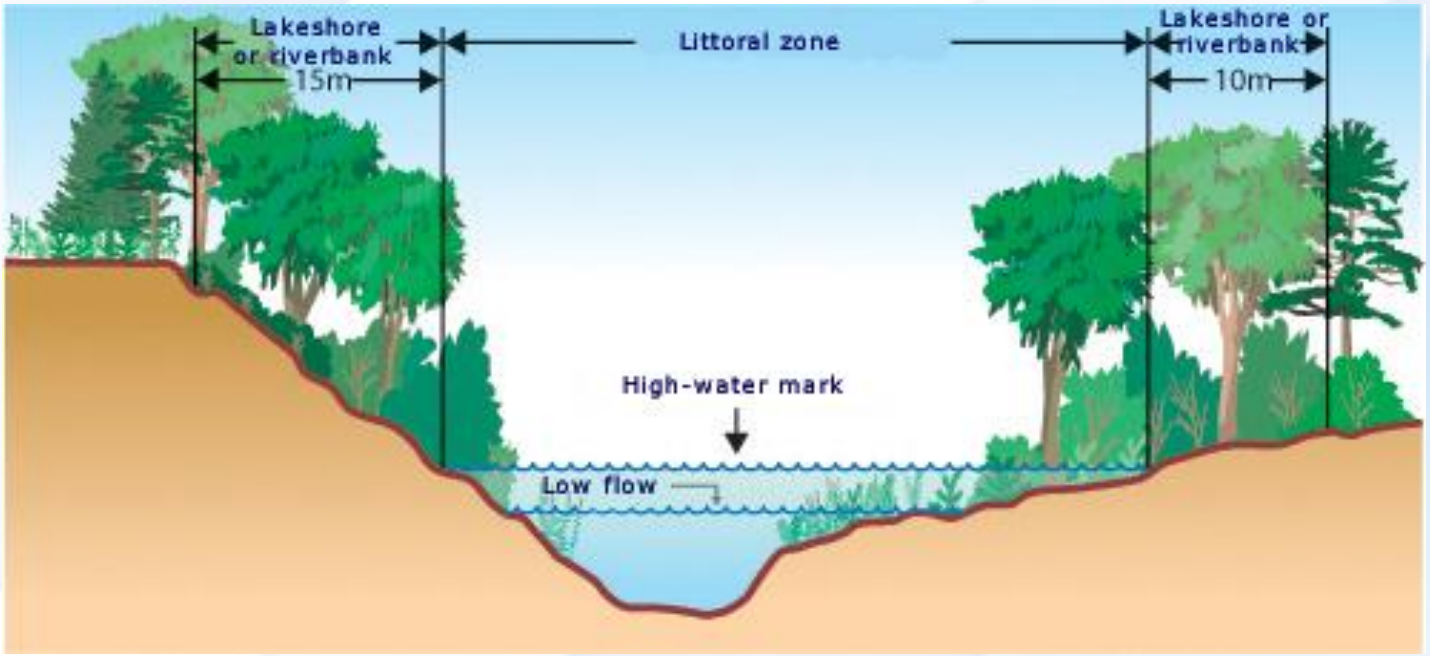
- Wetlands:
  - Winter drawdown can be expected to have little impact on dormant emergent plants
  - Most drawdown is temporary and do not generally have a detectable, widespread negative effect



- Wildlife:
  - More desirable plant growth could benefit desirable waterfowl
  - Amphibian and reptile impacts are mixed, but dependent on timing and duration of drawdown
    - More mobile, less impact
  - Drawing the water down late in the season and slowly over the course of several weeks lessons the impact
  - Furbearers expected to benefit from greater shoreline vegetation

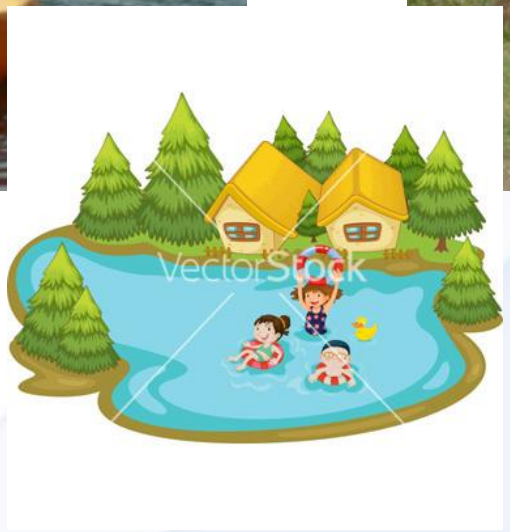
Benthic Organisms

- There will be a reduction of benthic (bottom dwelling) organisms
- Greater in shallow littoral zones than in steep zones
- In small scale drawdown, re-colonization by invertebrates is usually rapid



Recreational Use

- Conflicts are reduced because of the winter timeframe



Follow-up Herbicide Treatment

- Chemically treat the remaining EWM
  - Prevents re-colonization of EWM in drawdown area
  - 4-5 ft of water
  - Based on areas identified in fall bed mapping
    - Would have been 5.2 acres in 2012
  - Treated after CLP diminishes unless pre treatment survey shows it is present
    - Early to mid July
  - Treat using a systemic herbicide (kills the roots)
    - Triclopyr or 2,4-D
  - Expect a costs of $500 to $750 per acre treated
  - Pre and Post Management Plant Surveying

Benefits of Using Winter Drawdown on Long Trade Lake

- Provides for greater EWM management at less cost
- When combined with herbicides, would take out almost all the EWM
- May stimulate greater and faster growth of native emergent plant species and more desirable native pondweeds
- May benefit the fishery
- May improve the nearshore area for use by wildlife and people (changes the make-up)
- Reduces the amount of chemicals used
- It might impact CLP as well, late start for turion growth

Alternative Management Plans

- Herbicides Only
  - Timing may be restricted
  - Total treatment acres may be limited
  - May involve chemically treating areas of CLP and EWM at the same time
    - Two different herbicides (twice the cost)
  - Greater amount of chemical used depending on treatment area
  - Repeated chemical use in the same area
- Harvesting Only
  - Could harvest CLP and EWM since it is a fairly narrow band around the lake
    - Eliminates plant decay, but is only temporary

Costs Comparison

- **Winter Drawdown**
  - Purchase of aerator and barricade $2000
  - Operation costs
    - $180/month for 3 months
  - Chemically treat up to 10 acres of EWM in addition to the drawdown
    - $500-750 per acre
  - Requires approval by WDNR and Polk County Dam Operations
  - Permit applications
    - Drawdown (?) $500
    - Chemical App $20 + $25/acre
  - Manages almost all EWM
- **Herbicides Only**
  - Chemically treat the same or more total acres
    - Depends on limitations placed on the treatment
    - $500 – 750 per acre
  - Could double if CLP treatment is included
  - Requires WDNR approval
  - Permit applications
    - Chemical App $20 + $25/acre
- **Harvesting Only**
  - $400-500/acre, temporary

Things to Decide

- Do you want to try to make changes in Long Trade Lake or are you satisfied with the status quo?
- Do you support including winter drawdown as a management tool on Long Trade Lake?
- Do you feel the benefits of incorporating winter drawdown out weigh the drawbacks?
- What management alternatives do you want to incorporate on Long Trade Lake?

Things to Determine

- Are all these management alternatives grant eligible?
- Will the County and WDNR support the chosen management alternative?
- What are the final costs for an aeration unit?
- Who will install and operate the aeration unit?
- Other Questions?