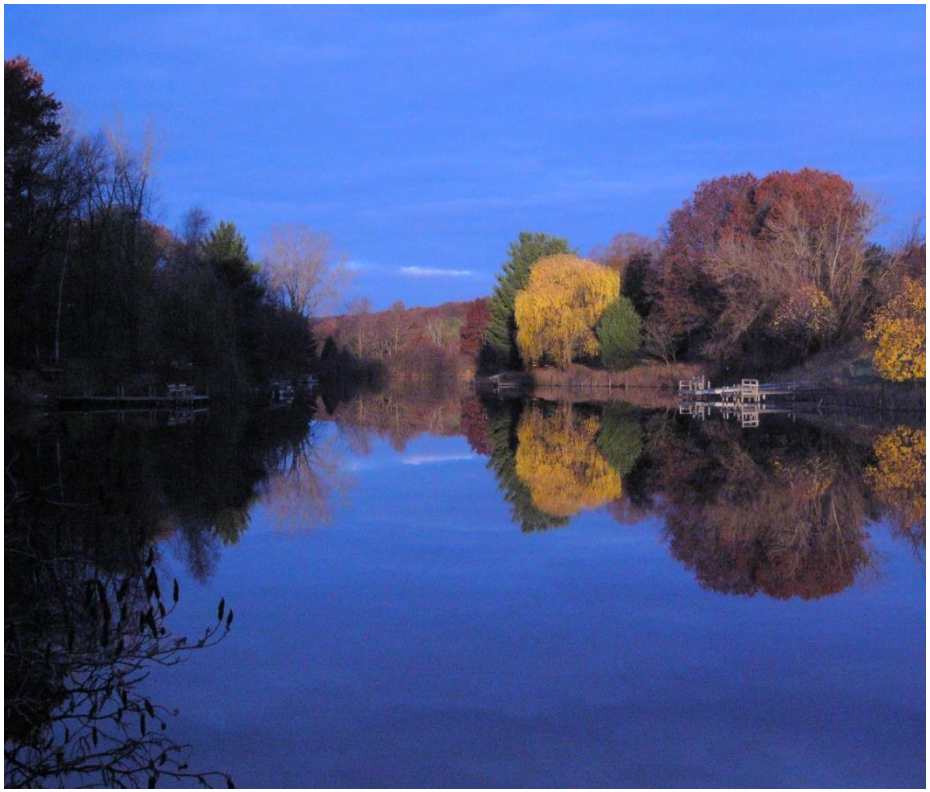
Peppermill Lake District – Lake Management Plan



About Peppermill Lake

Peppermill Lake is a spring-fed impoundment approximately 67 acres in size located in the southeast corner of Adams County in the Town of Jackson. It is a shallow lake with a trophic status ranging between mesotrophic to eutrophic. Supported in the past by 2 lake associations, popular support grew for the creation of a Lake District and in 2002, the Peppermill Lake Management District was formed.

Peppermill Lake has one public landing (owned by the Town) and one dam (owned by the County),

Peppermill lake is home to 17 aquatic plant varieties, turtles, blue gills, crappies, largemouth bass, northern pike, perch, and a robust Sandhill crane population.

About Peppermill Lake - continued

Peppermill Lake Milestones

1960's – Lake and subdivision established
1981 – Slow no-wake ordinance adopted by Town of Jackson
1992 – Aeration systems installed (in response to fish kills)
1998 – EWM identified
2002 – A full lake study was conducted
2002 – Lake District Established
2003 - First Annual Lake District Meeting
2005 – Lake Management Plan established
2006 – Critical Habitat Report developed
2007 – Bathymetric Map created
2008 – Lake Classification Report developed
2008 – AIS Grant awarded
2008 – Overhaul of winter aeration systems (in response to limited fish kill)
2009 - Pier installed at Public Landing

Lake Management Plan Overview

- Main Elements
  - Review Process
  - Aquatic Species Management
  - Water Quality
  - Dam Management
  - Shoreland Protection
  - Recreational Uses
  - Education

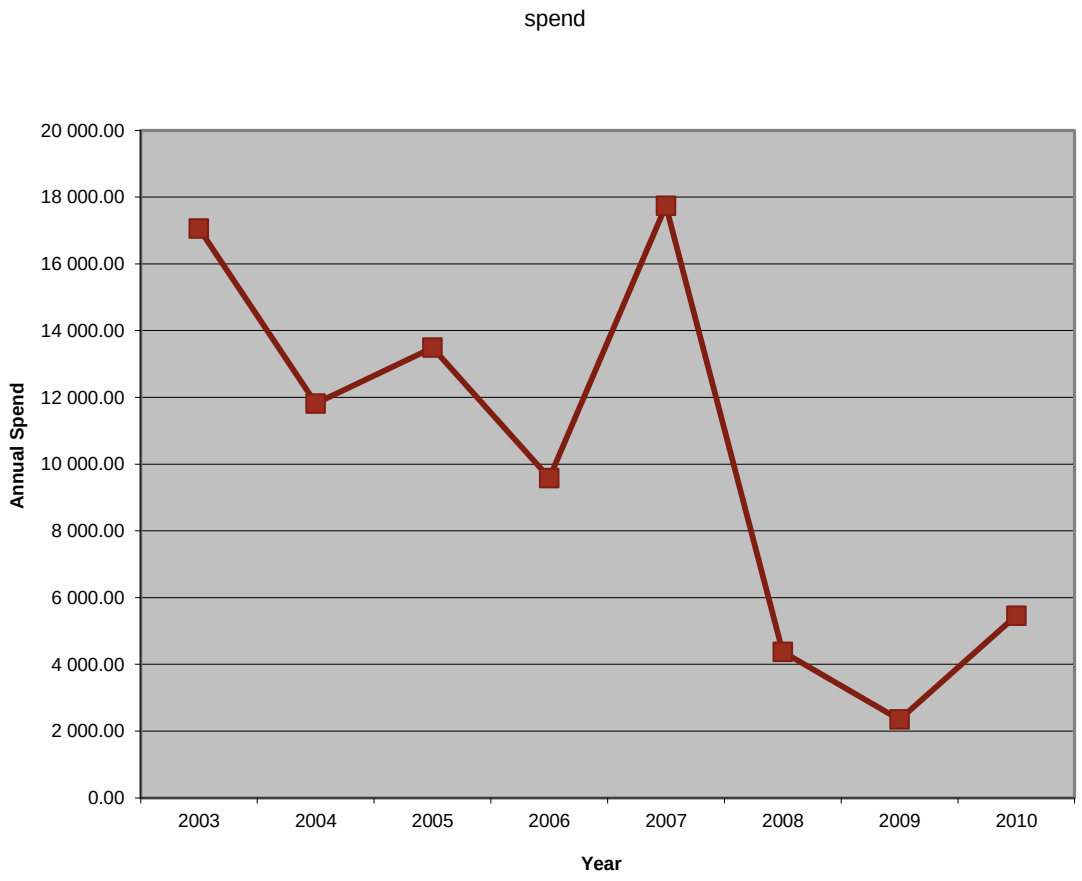
Plan Review Process

- Public meeting (advertised) soliciting citizen comment is held annually
- Lake District Board reviews all recommended changes
- Plan is reviewed at Lake District Annual Meeting for comment
- Plan is posted at LWCD website and at Peppermillake.com

Aquatic Species - EWM

- First detected in the late 1990's
- Chemical treatment began around 2000
- In 2005, mechanical harvesting was introduced
- In 2007, peak costs incurred
- Severe 2008 winter coupled with aerator failure resulted in significant decline in EWM population (replaced by Chara)
- Severe 2008-2009 winter continued trend
- Costs plummeted to a low in 2009
- Costs increased in 2010 as plants reestablished themselves
- Littoral zone covers most of lake bottom

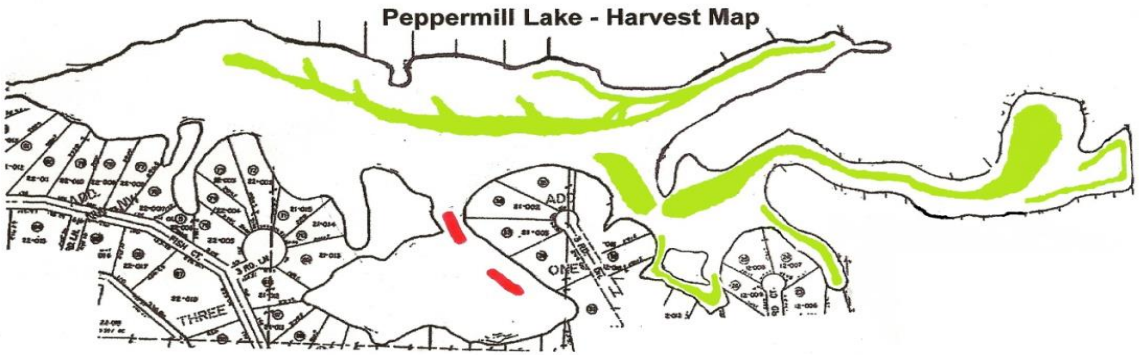
Plant Management Costs 2003-2009



Aquatic Species - Harvesting

Task	Criteria	Owner	When	Funding Source
Machine Harvest plants for navigational purposes and EWM Control		PLMD & Private Contractor	Ongoing	PLMD
	Early Spring up to the beginning of fragmentation – EWM only			
	July – Sept, Navigational channels and chara mounds only			
	5 Harvests- max			

Harvesting Map – w/proposed additions



Green = Areas approved in 2007

Red = Suggested areas to be added in 2011

Aquatic Species - continued

Task	Criteria	Owner	When	Funding
Chemical Treatment				
	Spot Treat in areas too shallow for harvesting	PLMD and Contractor	Annually, if needed	PLMD
Hand-Pulling	In shallow water areas	PLMD	Annually, if needed	PLMD

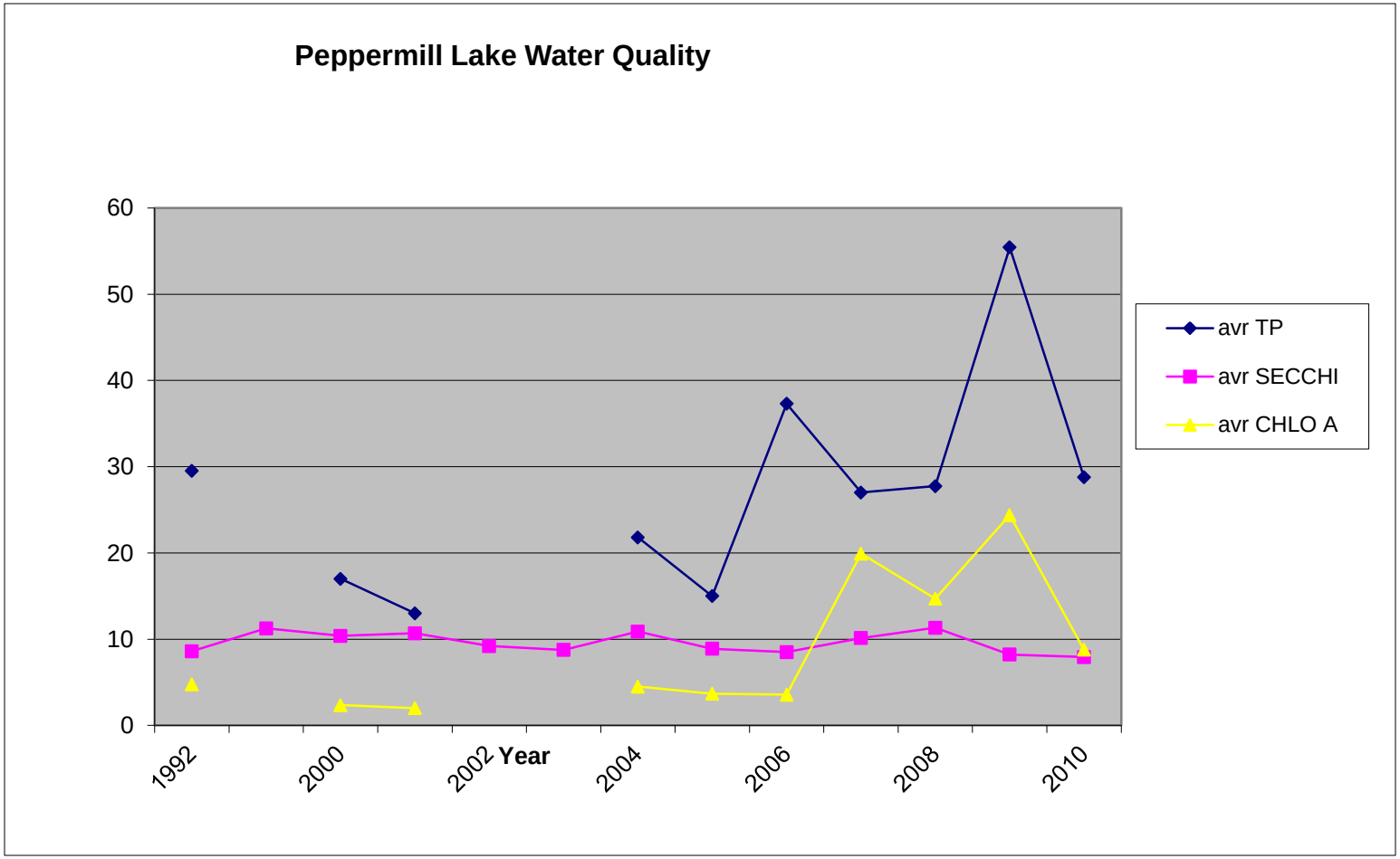
Aquatic Species - Monitoring

Task	Criteria	Owner	When	Funding
Monitor Harvesting		PLMD	Annually	PLMD
	PLMD Inspection of Harvests	PLMD	Per Harvest	
	Contractor to record poundage removed	Contractor	Per Harvest	
	Plants samples sent to lab for PH analysis	PLMD	Per Harvest	
	Plant samples sent to lab for DNA analysis	LWCD/PLMD	2011	DNR
Zebra Mussel Monitoring	Two Locations	PLMD	Ongoing	PLMD
Aquatic Plant Survey		LWCD/PLMD	2011	LWCD

Water Quality

- Lake Surface Watershed – 972 Acres
  - 53.4% woodlands
  - 36.2% residential
  - 6.9% water
  - 3.5% agricultural
- Groundwater watershed – 4715 acres
- As of 2002 Phosphorus and Nitrogen levels were at managable levels
- 75 riparian owners
  - Septic systems on east properties are oldest (30 plus years)
  - 2002 Chloride levels indicated minimal septic tank impact

Current Water Quality



Water Quality

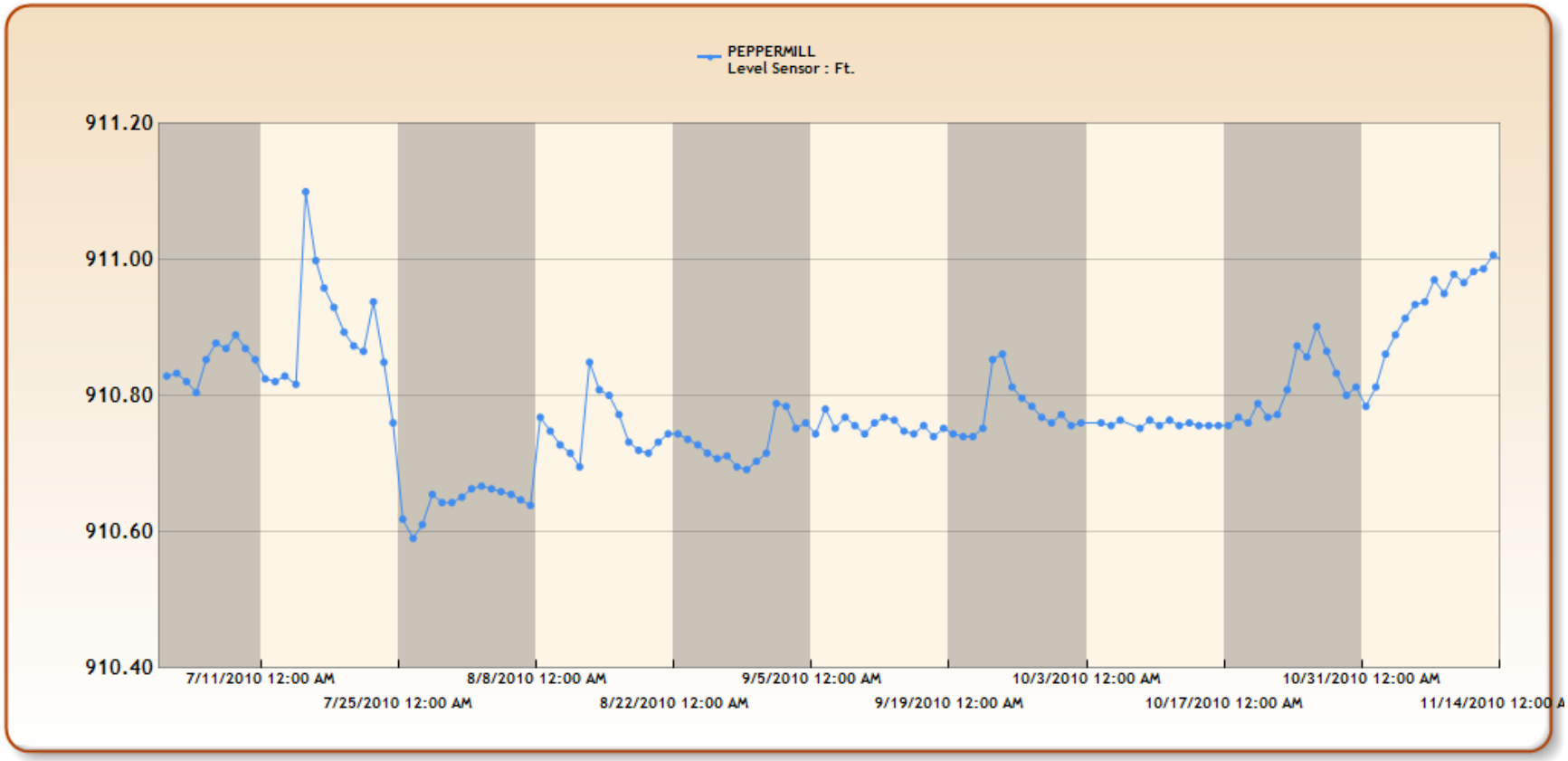
Task	Criteria	Owner	When	Funding
Monitor water for TP, Secchi, and Chlor A in East and West ends of lake	Add monitoring in So. Bay and North finger toward Fish Ave	PMLD/LWCD/DNR	Annually	PMLD/DNR
Model Phosphorus loading based on plant samples removed		PMLD/LWCD/DNR	Annually, after each harvest	PMLD/DNR
Harvest plants to limit nutrient release through decay		PMLD	Annually	PMLD
Work with Town and County on proper zoning uses		PMLD, Town, County	Annually	
Barley Bags for algae control		PMLD	Annually	PMLD
Place and monitor sediment monitoring pipes to determine sediment levels		PMLD	2011- ongoing	PMLD

Sedimentation ?

Dam Management

Task	Criteria	Owner	When	Funding
Dam Management				
	Annual Inspections per DNR standards	LWCD	Annually	County
	Operation and maintenance of Dam	LWCD	Weekly	County
	Emergency Action Plan	LWCD	2010	County
	Electrical Generation options	LWCD	2010-2011	County
Water Level Monitoring			2011 - Ongoing	
Seasonal recording of rain		LWCD	3X week	County
Electronic Monitoring of water level		LWCD	Daily	County
Install and monitor water level monitoring pipe in West half of lake aeration area.		PLMD	Seasonally – Monthly Ongoing	PLMD

Water Level (at Dam)
Example of LWCD Monitor output
7/1-11/14/2010



Shoreland Protection

In 2007, in conjunction with the County, several shoreline restoration projects were initiated and funded partially through grants which expire at the end of 2010.

Since then two significant pieces of legislation have passed, the Adams County Shoreland Protection Act, and the Wisconsin Act 9, banning the use of fertilizers. Both laws will have a significant impact on completing initiatives stated in the Lake Management Plan.

In 2005, Tree Drop program began with 2008 being the only year with fewer than 8 trees being felled.

Shoreland Protection

Task	Criteria	Owner	When	Funding
Inventory/map septic systems in PMLD		Cnty. Planning/Zoning	By 2014	State Law
Educate riparian owners on buffer/erosion mgmt		PMLD & LWCD	Ongoing	
Develop packet on best practices for owners and realtors		PMLD	Completed	
Educate on NR115		PMLD/LWCD	Ongoing	PMLD/LWCD
Post Critical Habitat Map at Landing		PMLD	2011	PMLD
Explore North Shore Conservancy		PMLD	Ongoing	

Recreational Uses

- In 1981 the Town of Jackson adopted a slow no-wake ordinance for Peppermill Lake.
- In the 1970's-1980's there were 4 fish kills, 1 in the late 1990's and one in 2008. Winter aeration began in 1992 and all systems were overhauled in 2008, adding a new system in the south bay.
- Mechanical harvesting for navigational purposes began in 2005.
- In 2002-2003 one fish stocking occurred (bass fingerlings).
- Tree drops began in 2005 as a means to augment fish habitat.
- Boat launch fee was established in 2008 by Town of Jackson.
- Boat launch pier installed in 2009 through boat launch fee funds.

Recreational Uses

Task	Criteria	Owner	When	Funding
Evaluate fish stocking based on DNR recommendation		PMLD	Ongoing	PMLD
Explore regulations regardng increasing bass size limit to 18”	Tie to Fish Survey	PMLD & LWCD	Ongoing	
Place trees within littoral zone for fish habitat		PMLD	Annually	PMLD
Conduct Fish Survey		LWCD & DNR	Completed	DNR
Aerator Operation		PMLD	Annually	PMLD
Conduct survey of lake users (compare to 2004)		PMLD	2011	PMLD

Education

- In conjunction with the Peppermill Lake Association, a new homeowners handbook was created containing information on best practices. Handbook was also delivered to local Realtors
- In 2008, through AIS grant assistance, a Clean Boats, Clean Water program was started. In 2008, 3 weekends were covered. In 2009 ***and 2010***, 10 weekends were covered. Part of this program included outreach to local schools.
- An AIS Grant help fund the CB/CW program in 2008-2010. The District decided at the 2010 annual meeting to provide funding to continue the program in 2011.
- Lake District Board continues to issue a quarterly newsletter and maintain a website, www.peppermillake.com
- Peppermill Lake is an active supporter of the Adams County Lake Alliance.

Education and Outreach

Task	Criteria	Owner	When	Funding
Clean Boats, Clean Water (2/mo May-September)		PMLD	2011	PMLD
Quarterly Newsletter		PMLD	Annually	PMLD
Website		PMLD	Annually	PMLD