Half Moon Lake Conservancy

Strategic Plan

Our Mission:
Preserving the water quality and scenic natural beauty of Half Moon Lake.

September 2007

Board of Directors (2007)

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Introduction

The Half Moon Lake Conservancy (Conservancy) was incorporated in 2003. The organization formed with the following purposes in mind: to preserve, maintain and enhance ecological integrity of the lands and waters of Half Moon Lake; to protect agricultural and wooded lands, environmental corridors, wildlife habitat and open space areas surrounding Half Moon Lake; to acquire and hold property for the purposes stated above; and to educate the public and elected officials to support sustainable patterns of development.

This strategic plan further elaborates these purposes by establishing priorities and a course of action for the future. The Half Moon Lake Conservancy Board of Directors invites you to participate in the process to preserve the water quality and natural beauty of Half Moon Lake.

Half Moon Lake Conservancy Mission

Preserving the water quality and scenic natural beauty of Half Moon Lake.

Operating / Guiding Principles

Our work is for future generations of Half Moon Lake residents and lake-users.

We work in cooperation with the Half Moon Lake District and other partner organizations.

We appreciate the clean water and natural beauty we currently enjoy at Half Moon Lake.

We seek exclusively voluntary participation from landowners by offering education and land preservation tools and encouraging water quality practices.

We believe in proactive, positive participation in government decision-making processes.

We acknowledge and seek the wisdom and guidance of experienced conservation organizations such as the Deer Lake Conservancy.

Half Moon Lake Conservancy Management Goals

Goal: Watershed characteristics protect and maintain Half Moon Lake water quality.

Objective: Monitor land use changes, and discourage those that will negatively impact Half Moon Lake water quality.

Objective: Work effectively to influence local and state decisions that impact Half Moon Lake water quality.

Objective: Protect critical parcels of land in the Half Moon Lake watershed.

Goal: Water quality practices reduce pollutant loading from the watershed.

Objective: Maximize wetland restorations in the watershed.

Objective: Promote the preservation and restoration of natural vegetation along the Half Moon Lake shoreline.

Goal: Half Moon Lake residents understand and support lake management activities.

Objective: Increase lake residents' understanding of the connection between watershed activities and lake water quality.

Objective: Inform lake residents about Half Moon Lake Conservancy land protection priorities and rationale.

Objective: Increase lake resident awareness and support of Half Moon Lake Conservancy water quality and land protection efforts.

Goal: The Half Moon Lake Conservancy maintains a vital board to address management issues.

Objective: Increase board knowledge of water quality and land protection tools.

Assessing Needs and Identifying Problems

Half Moon Lake maintains clear water and moderate shoreline development when compared to other nearby lakes. The scenic natural beauty of the lake is enhanced by undeveloped wetlands along the lake and Tamarack Bay. An appreciation of these qualities motivates the desire to preserve them. The discussion below provides a better understanding of the lake and surrounding area and the changes that threaten the lake. This understanding will aid in targeting efforts toward lake protection.

A variety of studies and plans were available as background information for the preparation of this plan. Those specific to Half Moon Lake are summarized in Appendix A.

Half Moon Lake

Half Moon Lake has a surface area of 579 acres and a maximum depth of 60 feet. Harder Creek flows into the lake at its north end and exits near the middle of the southwest shore. Tamarack Creek flows into the boggy Tamarack Bay that connects with the lake near the swimming beach.

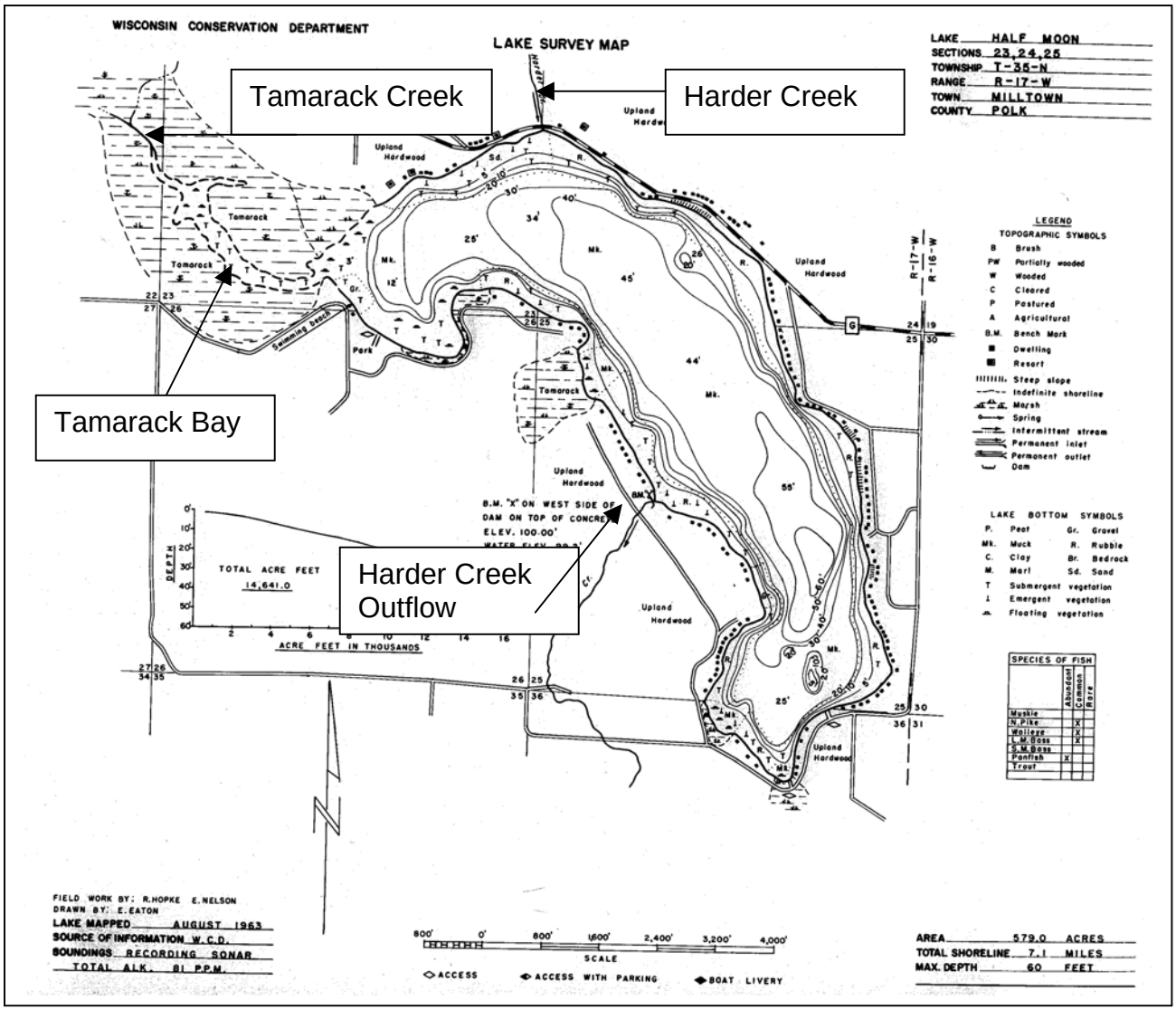

Figure 1. Map of Half Moon Lake

Water Quality

Half Moon Lake is a mesotrophic lake with moderate fertility. Trophic status describes the degree of nutrient enrichment of a lake. Lakes with high nutrient levels are considered eutrophic lakes. Eutrophic lakes have low light transparency, high phosphorus concentrations, and high levels of algae growth (as measured by chlorophyll a levels). Mesotrophic lakes enjoy moderate nutrient levels and good water clarity.

Lake Self-Help Monitoring Results

Volunteers began collecting Secchi depths in Half Moon Lake beginning in 1994. Secchi depths measure water clarity. The Secchi depth is the depth at which a black and white disk lowered into the water is no longer visible. Greater Secchi depths occur with higher water clarity. Water clarity as demonstrated by Secchi disc readings fluctuates over time with changes in rainfall patterns and temperature. Trends in Secchi readings are easier to judge by comparing results with similar nearby lakes.

Results of average Secchi depth readings for Half Moon Lake and two nearby lakes are shown in Figure 2 below. Breaks in the lines indicate where data is missing. Half Moon Lake's water clarity fluctuates similarly to nearby Balsam and Deer Lake, but is consistently greater than these other water bodies. This high water clarity points to the need for maintenance rather than drastic improvement in lake water quality.

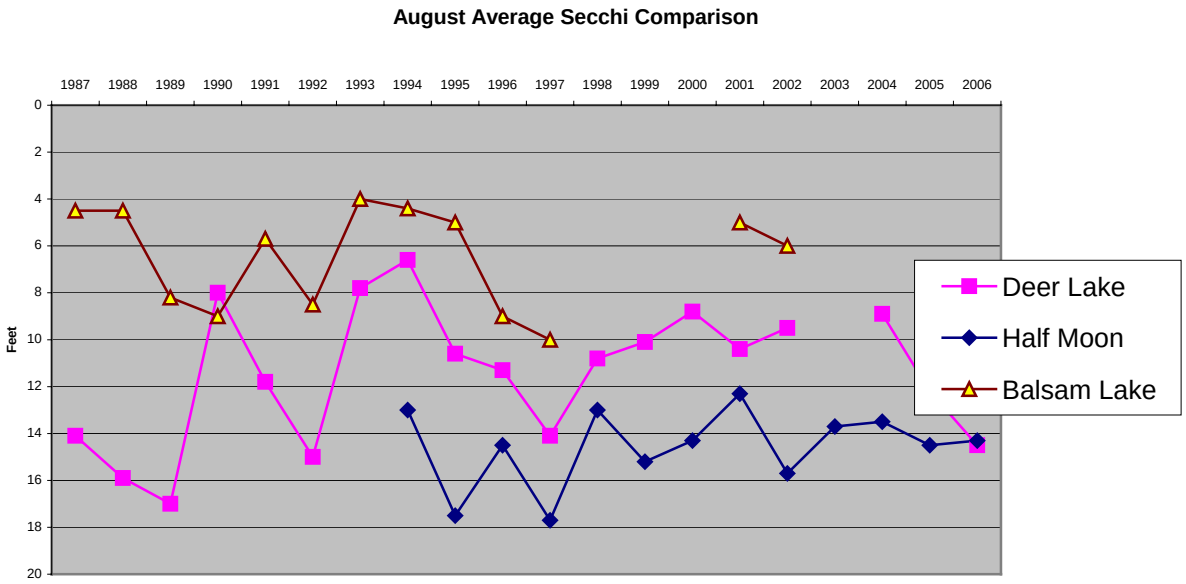

Figure 2. Water Clarity Compared to Nearby Lakes

Watershed Description and Impacts

Half Moon Lake water clarity is determined in large part by the watershed or land area that drains to the lake. The watershed of Half Moon Lake includes about 5,100 acres and extends about 3 ½ miles north of the lake.

Phosphorus is the pollutant that most influences the clarity of Half Moon Lake because it is the limited ingredient for algae growth in the lake. Phosphorus is found dissolved in runoff water and carried in soil particles that erode from bare soil. Phosphorus runoff is determined by how land is used in the lake's watershed, along with watershed soils and topography.

Runoff Quality and Quantity Matter

When a watershed is maintained in natural vegetation, there is less runoff of pollutants that impact the lake. Soil erosion is reduced when there is good vegetative cover. Water flow is slowed by tall vegetation, and forest groundcovers and fallen leaves allow runoff water to soak in. In summary, anything that reduces soil erosion and/or the amount of runoff water flowing from a portion of the watershed reduces pollution to the lake.

Beneficial watershed practices

- Establishing buffers of natural vegetation along the shoreline (slow runoff flow, absorb runoff water)
- Using proper construction site erosion control practices (reduce soil erosion)
- Restoring wetlands (slow runoff flow, absorb runoff water)
- Farming with minimum tillage practices (reduce soil erosion)
- Preserving wetland and stream buffers (slow runoff flow, absorb runoff water)

Detrimental watershed practices

- Increases in pavement (increases runoff flow)
- Increases in roof area (increases runoff flow)
- Draining wetlands (increases runoff flow)
- Unprotected construction sites (increases soil erosion)
- Development of natural lands (increases runoff flow and soil erosion)

Current Watershed Land Cover

Half Moon Lake's watershed is illustrated in Figure 3. The watershed is over 79 percent natural areas of forest, wetland, and grassland. As described above, these land covers deliver low amounts of runoff and phosphorus to the lake. The rest of the watershed is used for agricultural and residential purposes. Agricultural and residential land tend to contribute greater amounts of phosphorus in runoff.

The watershed of Half Moon Lake is divided according to how directly surface runoff flows to the lake in Figure 3. In some areas large ponds and extensive wetland areas capture runoff water and overflow only in periods of very high water. These "high retention areas" trap significant quantities of sediment and nutrients. Additional areas on the map are "internally drained." Groundwater flows from these areas underground to the lake, but surface water does not flow to the lake. It is the "direct drainage" area (outlined in red) that contributes the greatest amount of runoff and carry the greatest per acre quantity of pollutants to the lake.

Land cover is frequently used to estimate pollutant loading to lakes. A summary of land cover for the Half Moon Lake watershed is included in Table 1. Varying degrees of soil erosion and rainwater runoff result in different loading rates of phosphorus per acre. The following land uses are most likely to generate pollutants to Half Moon Lake: farmsteads, crop fields, and residential land. Phosphorus loading rates appropriate to the land characteristics are used to provide a general estimate of phosphorus loading for the Half Moon Lake watershed. Results are summarized in Table 2. Estimating the quantities of pollutant loading from specific sites within the Half Moon Lake watershed was outside of the scope of this plan.

Pollutant loading estimates in Table 2 are very general. A per acre phosphorus loading for a given land cover is estimated. Actual loading rates may vary because of how the land is managed and whether runoff is delivered directly into the lake. For example, phosphorus loading rates for cropland vary greatly depending upon the type of crop grown, slope, soil type, and distance from flowing water. Wetlands present around Harder and Tamarack Creek likely absorb some pollutants from the upper reaches of the watershed.

Land use changes from more natural to more developed land cover could have significant negative impacts on Half Moon Lake water quality. A fifty percent increase in residential uses on land currently in forestland and grasslands throughout the watershed is estimated to result in a 58 percent increase in watershed phosphorus loading. **If conservation practices are not put in place to encourage infiltration of runoff water and to buffer flow to streams and wetlands, water quality in Half Moon Lake will decrease as development increases in the watershed.**

Table 1. Half Moon Lake Land Cover

Land Cover Type	Acres High Retention	Percentage of High Retention	Acres Direct Drainage	Percentage of Direct Drainage	Total Watershed Acres	Percentage of Total Acres
Commercial	33.1	1.9	0	0	33.1	.6
Row crops	325.7	18.3	311.9	9.4	637.6	12.5
Farmstead	33.1	1.9	37.2	1.1	70.3	1.4
Forest	875.4	49.2	1,841.7	55.4	2717.1	53.3
Grassland	79.1	4.4	348.6	10.5	427.7	8.4
Barren	41.3	2.3	141.7	4.3	183	3.6
Open Water	143.7	8.1	0	0	143.7	2.8
Residential	33.6	1.9	229.7	6.9	263.3	5.2
Wetland	214.6	12.1	412.1	12.4	626.7	12.3
TOTAL	**1779.6**		**3322.3**		**5102**	

Table 2. Half Moon Lake Estimated Phosphorus Loading

Land Cover Type	Acres High Retention	P Loading Rate High Retention[1]	P Load High Retention	Acres Direct Drainage	P Loading Rate (lbs/acre/year)[2]	P Load Direct Drainage	Total Load (lbs/year)
Commercial	33.1	.88	29.1	0	na	0	29.1
Row crops	325.7	.44	143.3	311.9	.88	274.5	417.8
Farmstead	33.1	.27	8.9	37.2	.53	19.7	28.6
Forest	875.4	.04	35.0	1,841.7	.08	147.3	182.3
Grassland	79.1	.05	4.0	348.6	.10	34.9	38.9
Barren	41.3	.44	18.2	141.7	.88	124.7	142.9
Open Water	143.7	0	0	580.7	0	0	0
Residential	33.6	.27	9.1	229.7	.53	121.7	130.8
Wetland	214.6	.05	10.7	412.1	.09	37.1	47.8
TOTAL	**1779.6**		**258.3**	**3,903.6**		**759.9**	

[1] Phosphorus loading rates of high retention areas are assumed to be half that of direct drainage areas. More detailed analysis of water flow would be required to estimate more accurately.

[2] From Grindstone Lake Phosphorus Model. 2000. Most likely phosphorus loading by land use and watershed location.

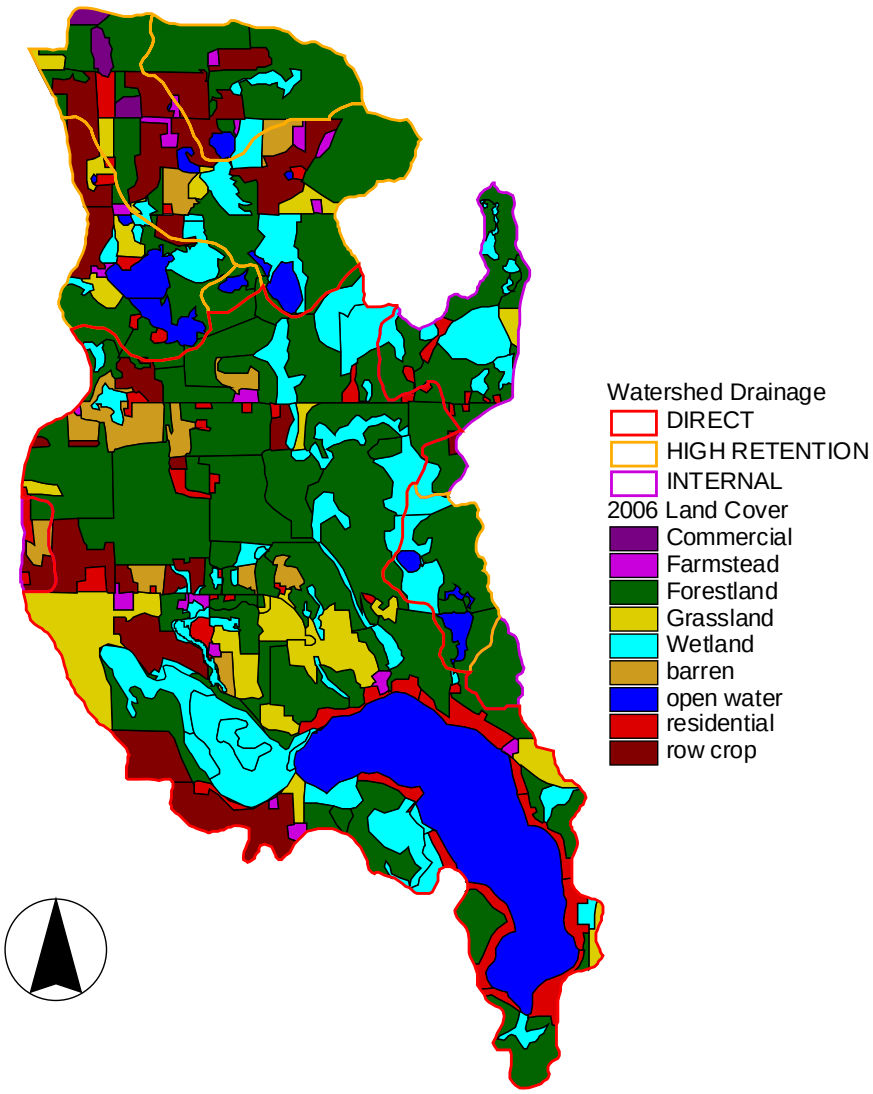

Figure 3. Half Moon Lake Watershed 2006 Land Cover

Land Cover Descriptions

Commercial = land used for commercial purposes.
Commercial land cover generally has relatively high rates of runoff because impervious surfaces such as rooftops and parking lots do not allow water to infiltrate into the soil. Parking lots tend to generate high concentrations of pollutants from vehicle traffic. These pollutants include sediment, oil and grease, nitrogen, and phosphorus along with other chemicals.

Cropfield = land used to grow agricultural crops.
Phosphorus loading rates depend upon soil erosion, and timing and amount of fertilizer and manure applications. Row crops like corn and soybeans generally result in less crop residue to cover the soil and therefore generate greater soil erosion. Hay crops result in lower soil erosion because the soil is covered. Steep slopes increase soil erosion. Winter spreading of manure increases the likelihood of phosphorus loading from the watershed.

Farmstead = farm buildings, driveways, animal feeding, and parking areas.
Farmsteads have relatively high amounts of impervious surfaces and concentrations of pollutants.

Forest = undeveloped land covered by tree canopy. Forest may or may not be used for timber production.
Forest lands generally have low rates of phosphorus delivery to lakes because forest soils are usually covered by vegetation and fallen leaves and therefore, absorb rainfall and reduce runoff water. Water quality problems sometime result during logging operations from forest road construction, stream crossings, and slopes left bare after clear cutting.

Grasslands = undeveloped lands covered by grasses, not generally in agricultural production.
Grasslands tend to have very low rates of phosphorus loading because of good soil cover and lack of fertilization.

Open Water = ponds and small lakes included in the larger Half Moon Lake watershed.
Some of the watershed area may, in fact, drain to these smaller water bodies so that runoff water doesn't reach Half Moon Lake.

Residential = lands developed or clearly planned for residential development.
Residential lands have relatively high rates of pollutant loading – especially those properties where development is dense (with high percentages of impervious surfaces such as roof tops and parking areas) and runoff flows directly to the lake. Lawns do not slow runoff flow because of short stems of grasses.

Wetlands =areas inundated with water for a significant portion of the growing season.
Wetlands tend to have low rates of pollutant loading and may, in fact, absorb pollutants and runoff from other land uses.

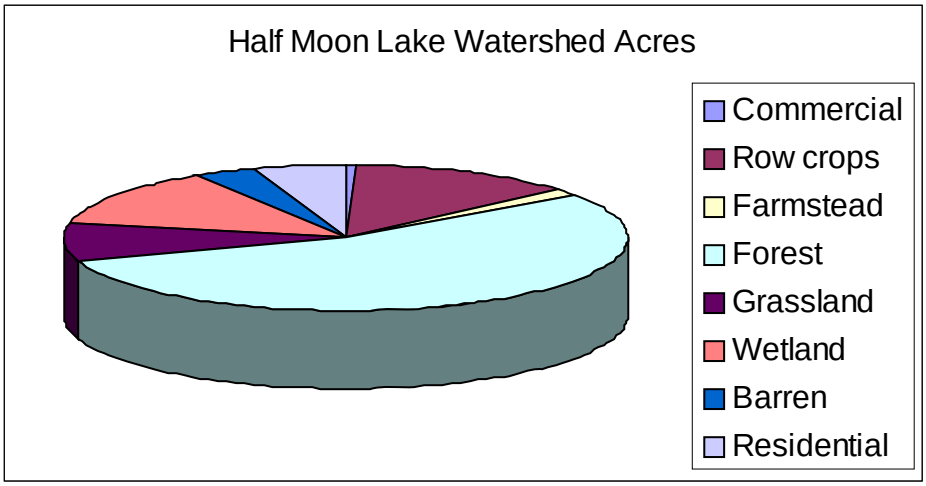

Figure 4. Half Moon Lake Watershed Acres

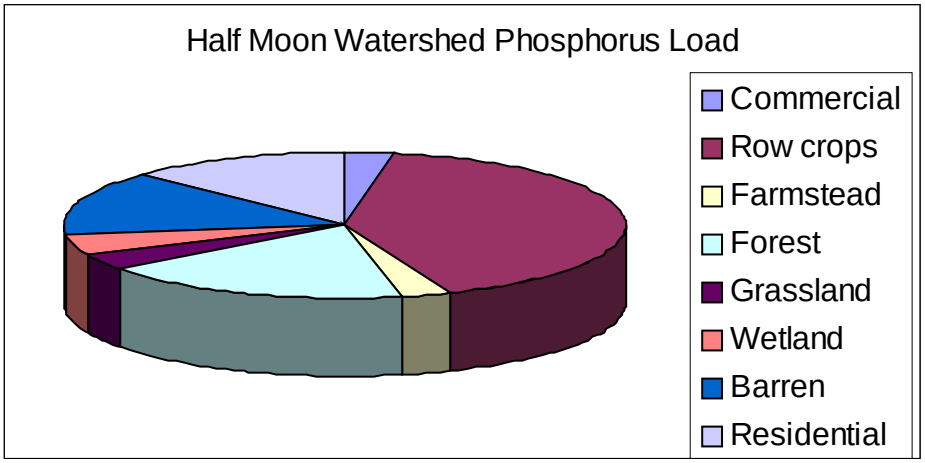

Figure 5. Half Moon Phosphorus Load

Half Moon Lake Watershed Study

The Half Moon Lake District commissioned a lake study with the help of a Department of Natural Resources grant in the early 1990's. The District hired Barr Engineering to complete the study. The watershed was divided into subwatersheds for the purpose of the study. Of all the subwatersheds, Harder Creek was estimated to deliver the highest amount of phosphorus to Half Moon Lake (39%) followed by Tamarack Creek (19%) then by the area that drains directly to the lake (12%). Septic systems were estimated to contribute approximately 4% of the total phosphorus load to Half Moon Lake. Additional phosphorus comes from the lake bottom sediments, rainwater, and groundwater.

Phosphorus Loading to Half Moon Lake

Harder Creek – 39 %

Tamarack Creek – 19 %

Direct Drainage (waterfront) – 12 %

Septic Systems – 4%

*Barr Engineering. 1994.

Recommendations *related to potential work of the Half Moon Lake Conservancy* include:

- Protect the lake from changes in watershed management
- Protect and preserve wetland areas in the shoreland and watershed areas
- Conduct a public information and education program
- Protect wetlands through involvement in government permitting programs and encouraging wetland restoration

Recommendations specific to Harder Creek

- Buffer strip easements – especially in agricultural areas next to the stream or lake
- Land purchase – the plan identifies 500 – 1000 acres along Harder Creek for potential purchase, but does not prioritize specific parcels or parcel characteristics

Population Dynamics

Half Moon Lake and its watershed are located in central Polk County, Wisconsin in the Town of Milltown. Polk County is located just north of the Twin Cities Metropolitan Area designated by the U.S. Census and just over a one hour drive from the Cities. The Twin Cities population contributes to the growth of the numbers of seasonal and permanent homes in the Half Moon Lake watershed.

The Town of Milltown has experienced steady population growth since 1970 with an increase in the growth rate from 1995 to 2005 as illustrated in Figure 6. In this time period, the population of the Town of Milltown grew by 25 percent, just above the overall growth rate for Polk County during the same period.

Population records include only permanent residents and do not reflect increases in residential development for seasonal housing. Most seasonal housing is concentrated around waterfront. Half Moon Lake has 309 parcels.[3] Of the residences, over 90 percent are occupied only seasonally. The percentage of residences occupied seasonally is quite high throughout the Town of Milltown with seasonally occupied housing making up 43% of the housing units. Countywide, about 20 percent of the housing units are occupied seasonally for recreational use.[4]

Records of new septic permits capture the amount of residential development occurring in the watershed. Figure 7 illustrates this construction from 2000 through 2005 in the Town of Milltown. In this time period, a total of 89 homes were constructed with a new septic system in the Town of Milltown. Some of the construction was outside of the Half Moon Lake watershed area. Construction has slowed in recent years, following national trends, but rural housing demand close to the Minneapolis St. Paul Metropolitan area is likely to rebound and impact Half Moon Lake water quality in the future.

[3] Polk County Treasurer's Office. Personal Communication. September 11, 2007.
[4] U.S. Census. 2000.

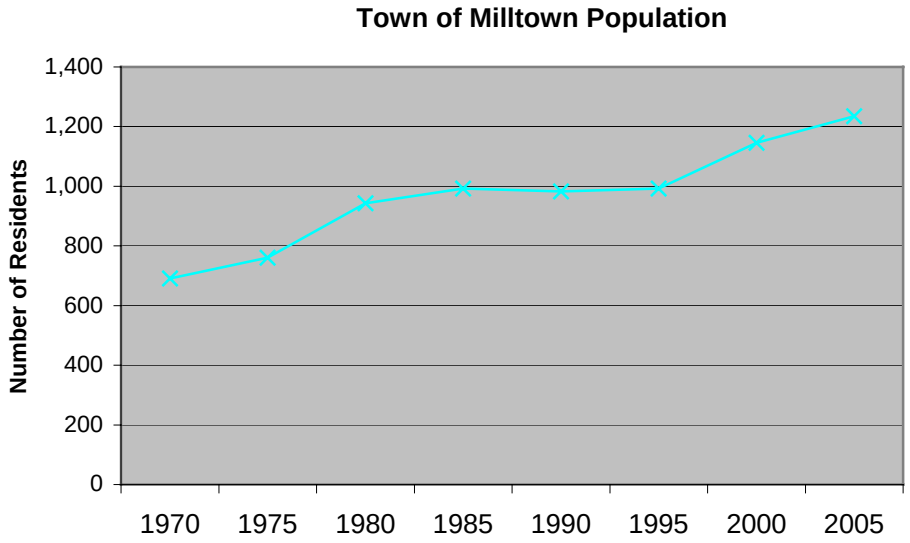

Figure 6. Half Moon Lake Area Population Change

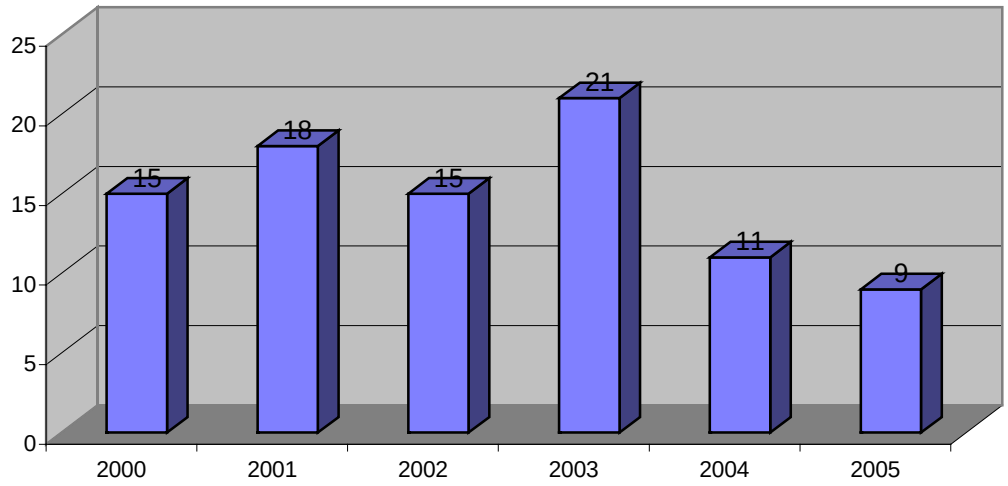

Figure 7. New Septic Permits: Town of Milltown

Balsam Branch Priority Watershed Project

The Balsam Branch Priority Watershed Project was a project of the Polk County Land and Water Resources Department supported by state Department of Natural Resources (DNR) and Department of Agriculture, Trade, and Consumer Protection (DATCP) funding. Discussion of the watershed project is included here because of the importance of watershed management for lake water quality.

The Balsam Branch Priority Watershed Project provided an opportunity to identify and address sources of watershed pollution entering Half Moon Lake. The project plan examined the sources of nonpoint pollution in the watershed and guided the implementation of pollution control measures. Funding was available for installation of water quality conservation best management practices from 1996 – 2006. The watershed plan established an in-lake summer phosphorus concentration goal of 22 ug/l. A total phosphorus reduction of 17.8 percent was needed to reach the in-lake phosphorus goal.[5] A nutrient load reduction of thirty percent from the watershed would exceed this total phosphorus reduction goal.

Additional Half Moon Lake objectives from the watershed project:

- Reduce nutrient loading from existing and future lakeshore development
- Reduce sediment and phosphorus loading to improve wetland and grassland habitat and water quality.
- Consider in-lake restoration measures.
- Restore wetlands and protect existing wetlands.

Watershed Project Results

Conservation best management practices installed through the Balsam Branch Priority Watershed project through the end of 2006 are illustrated in Figure 8. The state/county share of practice installation amounted to $109,352. For the whole project area (the entire 110 square mile Balsam Branch watershed), $811,234 was provided. Conservation best management practices were aimed at reducing runoff from agricultural areas and improving habitat and reducing runoff from waterfront property.

Shoreline Habitat Restorations

Six shoreline habitat restorations were installed along the shoreline amounting to 14,892 square feet. Approximately 70% of the lake lot, 35 feet back is restored to native plantings. This protects the shoreline, increases the infiltration of runoff and nutrients, and provides habitat for wildlife.

[5] Nonpoint Source Control Plan for the Balsam Branch Priority Watershed Project. Wisconsin Department of Natural Resources, et. al. April. 1995.

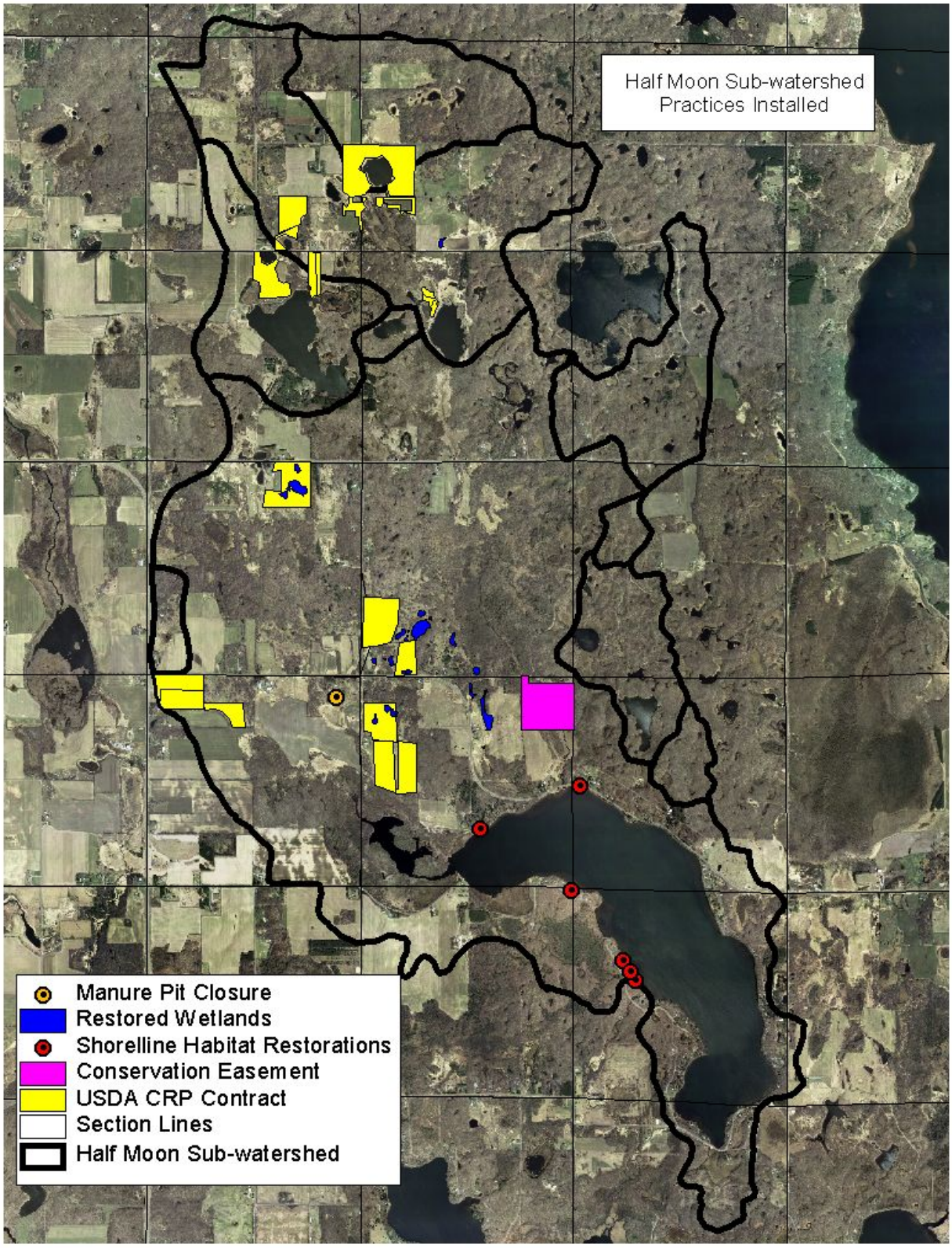

Figure 8. Conservation Practice Installation Through 2006

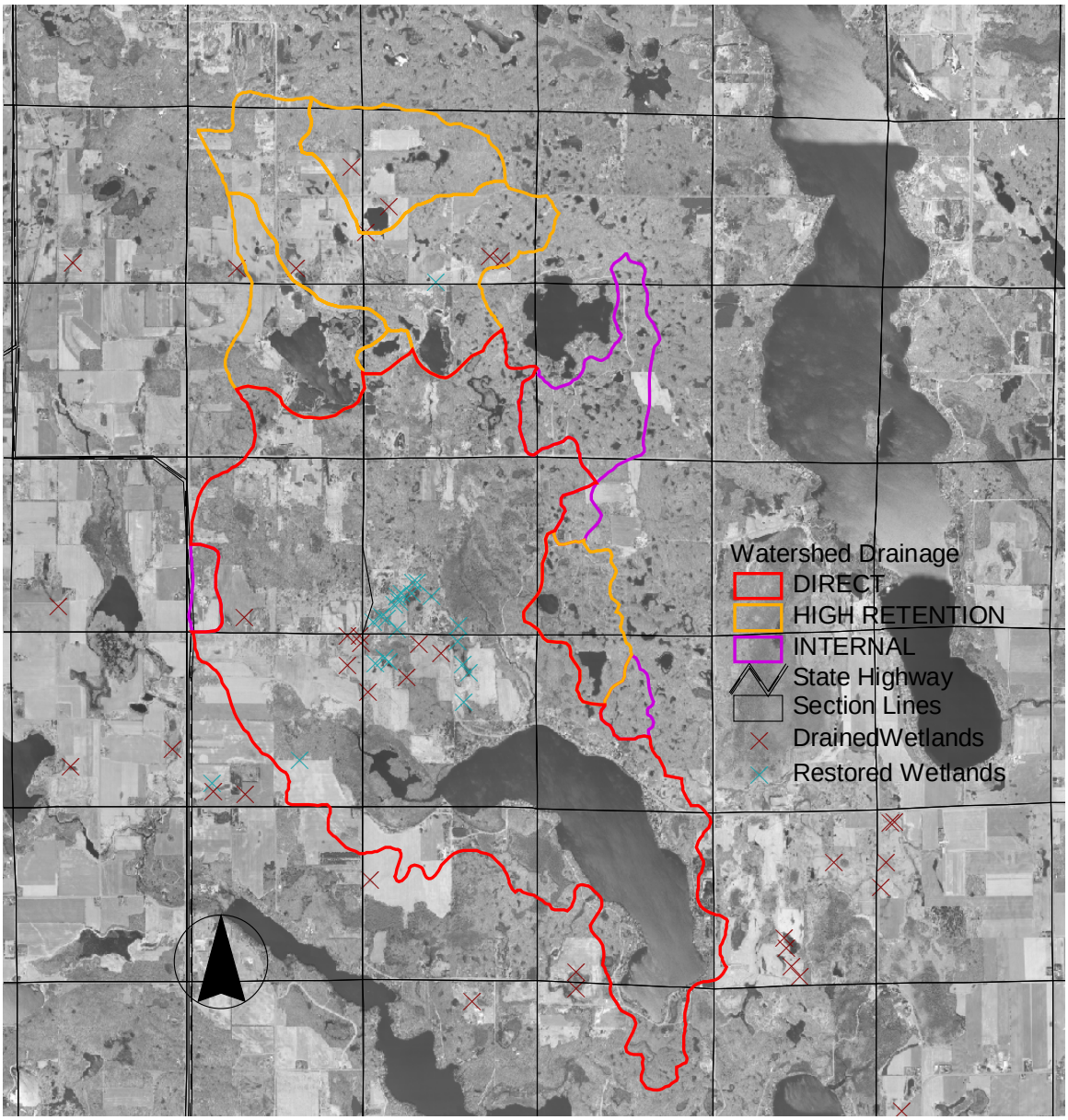

Figure 9. Half Moon Lake Drained and Restored Wetlands

Wetlands

Restored and drained wetlands (not yet restored) are indicated in Figure 9. Approximately fifteen acres of wetlands were restored through 2006. Most of these wetlands were in the direct drainage area. Drained wetlands are generally restored by breaking up tile installed to drain the wetland or constructing berms across drainage channels. Additional wetlands are being restored through funding from the North American Waterfowl Conservation Act (NAWCA) in the northern section of the watershed in 2007. This project will result in approximately seventy-two acres of open water.

Additional wetland restoration potential remains in the Half Moon Lake watershed. Increasing wetland acres would increase water-holding capacity of the watershed and decrease runoff and nutrient loading to the lake.

Manure Pit Closure

One manure pit was closed within the watershed. Pits that remain unused after the producer has left the dairy business are a threat to the groundwater and surface water and may contaminate drinking water.

Conservation Easement

Through funding from the Balsam Branch Watershed, Polk County holds a perpetual easement on 35 acres of land along Harder Creek. The property is owned by the Half Moon Lake Conservancy. Preservation of this property will prohibit development and allow the natural vegetation and wetlands to filter pollutants and prevent nutrient loading to Half Moon Lake.

USDA Conservation Reserve Program

The Conservation Reserve Program (CRP) compensates farmers for putting land out of production. In the process, fields are returned to natural vegetation for a period of time. There are currently approximately 212 acres of grassland and trees under CRP contract with the USDA in the Half Moon Lake watershed. Contracts expire beginning in the fall of 2007, with the last contract expiring in 2015.

Tracking Pollutant Reduction

Because state-provided computer tracking methods for sediment and phosphorus delivery to water were not year 2000 compliant, it was not possible to assess progress toward meeting the watershed phosphorus reduction goal from installation of conservation practices.

Changing agricultural practices also influenced sediment and phosphorus delivery to Half Moon Lake, although it is uncertain whether this change was positive or negative. There are currently fewer dairy farms (a potential source of nutrients from animal manures) than when the watershed inventory occurred in 1994. In 1994 there were 9 barnyards inventoried for a total contribution of 167 pounds of phosphorus. Retirement and economic attrition has claimed 5 of these originally inventoried farms. Based on the modeling at the time of inventory, these reductions amount to 92 pounds of annual P loading.

However, phosphorus loading reductions from fewer barnyards may be negated because of increases in soil erosion. Fields that grew hay for dairy cattle consumption ten years ago may now be used for row crop production. Row crop production generally results in higher soil erosion rates and nutrient and sediment delivery to water bodies.

Transect surveys, used by the Polk County Land and Water Resources Department to monitor soil erosion, found that erosion increased in the 110 square mile Balsam Lake

watershed from 1999 to 2006. The Half Moon Lake watershed is a subset of the larger Balsam Lake watershed. Within the entire Balsam Lake watershed, there are more sample sites above T, the tolerable soil loss rate, as more fields are planted to row crops. Forage and idle ground is decreasing, and there seems to be a trend toward less residue left on crop fields. Crop residues help to decrease soil erosion from fields. The graph below illustrates the percentage of crop fields sampled with various multiples of T, which is generally a loss of 4 to 5 tons of soil per acre per year in Polk County.

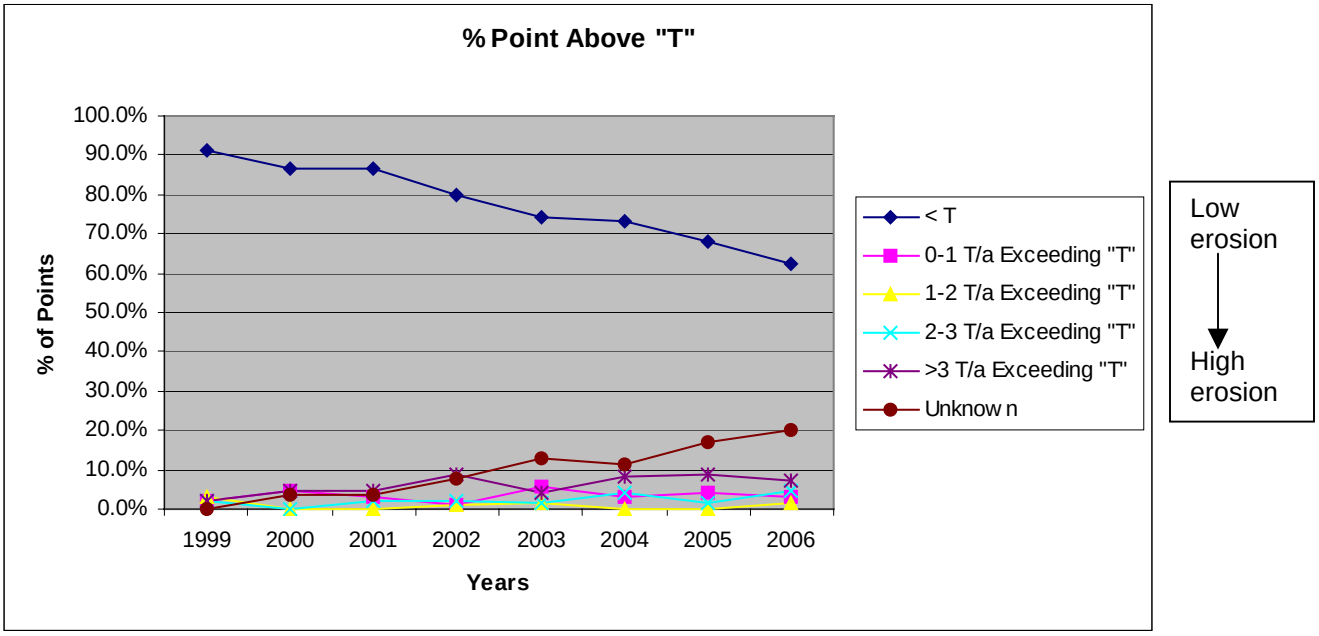

Figure 10. Soil Loss in the Balsam Lake Watershed

Recommended conservation practice installation

- Identify and restore drained wetlands in the direct drainage area.
- Encourage restoration of shoreline buffers of native vegetation along the Half Moon Lake shoreline.

Related Plans and Ordinances

Knowledge of and involvement in development and implementation of local plans and ordinances will assist the Conservancy in its efforts to minimize the water quality impacts of land use changes.

Town of Milltown Comprehensive Land Use Plan

The Town of Milltown adopted the *Town of Milltown Year 2025 Comprehensive Plan* in June 2002. The plan follows guidelines of the State of Wisconsin Smart Growth Law. The plan is intended to assist the town in making decisions related to conservation and development of land over the next 20 years. The following excerpt from the Plan Advisory Committee vision statement illustrates common ground with the Half Moon Lake Conservancy mission and goals: "We want to maintain a pleasant rural atmosphere with lakes and woodlands, marshes and hills; traditional and progressive farming activities; clean rivers, streams and wetlands; fresh air and quiet evenings; and familiar faces to work and play with . . ."

Milltown Comprehensive Plan Goals and Objectives also fit well with proposed Half Moon Lake Conservancy activities. Plan recommendations encourage the town to work with local conservation and lake organizations to accomplish the goals and objectives.

Goal ANC-1
Provide incentives and options to landowners to retain the town's contiguous areas of agricultural lands, natural areas and open spaces.

Supporting Objective
Seek opportunities to get existing conservation organizations more involved in land protection in Milltown.

Goal ANC-4
Maintain, preserve and enhance the town's natural environment and open spaces.

Supporting Objectives
Manage growth to protect town open spaces which, through their preservation, would: conserve and enhance natural or scenic resources; protect streams, water supply/quality, and fish and wildlife habitat . . .

Maintain a network of natural area and open space corridors and connections.

Maintain and enhance natural buffers along town shoreland and wetland areas . . .

Land surrounding Harder Creek, Tamarack Creek, and Tamarack Bay are designated as preferred Conservancy Areas in the plan. Policies and recommendations for Conservancy areas include maintaining or restoring wetlands, requiring a buffer around wetland edges, and steering development away from these areas.

Town of Milltown Land Division Ordinance

The Town of Milltown adopted a land division ordinance in December 2002. This ordinance includes standards from the Polk County Subdivision and Shoreland Zoning ordinances. Minimum lot sizes are established by land use according to the preferred land use map in the town comprehensive plan. Conservation design layout, which preserves open space while allowing more dense development in other areas, is encouraged. The Milltown Plan Commission reviews preliminary and final plats.

Polk County Comprehensive Land Use Plan

The Polk County Comprehensive Land Use Plan was adopted in 2002. The plan includes an analysis of population, economy, housing, transportation, recreation, and land use trends. It also reports the physical features of Polk County. The purpose of the land use plan is to provide general guidance to achieve the desired future development of the county and direction for development decisions. The lakes classification outlines restriction on development according to lake features. Planning areas are recommended in the plan. The plan is available online at http://co.polk.wi.us/landinfo/comprehensive_plan.htm. A county plan update will follow individual municipality smart growth plans.

Shoreland Protection Zoning Ordinance

The Shoreland Protection Zoning Ordinance applies to areas located with 1,000 feet of the ordinary high water mark (OHWM) of navigable lakes, ponds or flowages, within 300 feet of the OHWM of a navigable stream, or the landward side of the a floodplain. The ordinance identifies requirements for lot size and dimensions, setbacks, removal of shore cover, and filling and grading activities.

Polk County passed an update of the Shoreland Ordinance in 2002. The update put in place standards for impervious surfaces, a phosphorus fertilizer ban for shoreland property, and lakes classification and setback standards. The ordinance is available online at http://www.polkshore.com.

Polk County Subdivision Ordinance

The subdivision ordinance, adopted in 1996, requires a recorded certified survey map for any parcel less than 19 acres. The ordinance requires most new plats to incorporate storm water management practices with no net increase in runoff from development. The ordinance is available online at http://co.polk.wi.us/landinfo/PDFs/subdivisionordinance.pdf.

Storm Water and Erosion Control

The ordinance, passed in December 2005, establishes planning and permitting requirements for erosion control on disturbed sites greater than 3000 square feet, where more than 400 cubic yards of material is cut or filled, or where channels are used for 300 feet or more of utility installation with some exceptions. Storm water plans and implementation of best management practices are required for subdivisions, survey plats, and roads where more than ½ acre of impervious surface will result. The Polk County Land and Water Resources Department administers the ordinance.

Construction Site Erosion Control (WI Department of Commerce)

The Wisconsin Department of Commerce has authority and responsibility for construction site erosion control for building sites for public buildings and places of employment and one and two-family dwellings. For commercial building sites and places of employment, the erosion control plan must comply with the performance standards listed in s. NR 151.11, Wis. Adm. Code.

If a one- or two-family construction site disturbs less than one acre, the specific erosion control requirements in the Uniform Dwelling Code Chapters 20 and 21 must be met. Municipalities (Towns) are required to enforce the erosion control provisions of the Uniform Dwelling Code. Standard erosion control plan sheets and a checklist are available from the DNR and UWEX.

Polk County Land and Water Management Plan

The land and water management plan guides the activities of the Polk County Land and Water Resources Department from 2005 – 2009. The department will partner with local, state, and federal agencies and organizations to conserve soil and water resources, reduce soil erosion, prevent nonpoint source pollution and enhance water quality. Activities include technical assistance with enforcement, technical and financial assistance, and education. Local plans and ordinances are described in the document. The land and water management plan includes an implementation strategy for state agricultural performance standards. Farmers are required to meet these standards when the county offers cost sharing.

Animal Waste

The Polk County Manure and Water Quality Management Ordinance was revised in January 2000. A policy manual established minimum standards and specifications for animal waste storage facilities, feedlots, degraded pastures, and active livestock operations greater than 300 animal units for livestock producers regulated by the ordinances. The Land and Water Resource Department's objective was to have compliance with the ordinance countywide by 2006. The ordinance is available online at http://www.co.polk.wi.us/landwater/MANUR21A.htm.

Recommendations

Conservancy board members are encouraged to participate in planning, zoning, and permitting processes that affect the Half Moon Lake watershed and may impact the lake's water quality.

- Include representatives from the Town of Milltown, Polk County and the lake district on the Conservancy Board.
- Designate board members to participate in Town of Milltown and Polk County planning and zoning activities within the Half Moon Lake direct drainage watershed area.

Land Protection Options and Recommendations

Land protection is considered in order to maintain desirable watershed land cover characteristics and prevent changes that negatively affect the water quality of Half Moon Lake.

A Few Definitions

Land preservation or protection *means setting aside property so that it will not be developed (or will be only very minimally developed) for residential, commercial, or agricultural use in the future.*

Conservation easement *means a legal document that restricts the use of land to farming, open space, or wildlife habitat (conditions are negotiated). A landowner may sell or donate an easement to a government agency or a private land trust.*

In general, property may be preserved through ownership of fee title (simply means owning the land) or a conservation easement. The Half Moon Lake Conservancy could hold a conservation easement or title to land, or work with another entity to take responsibility for either. Polk County is willing to consider holding additional conservation easements. The West Wisconsin Land Trust is also willing to consider holding and monitoring easements for a fee. (Currently negotiable, but in the neighborhood of $10,000 - $15,000 per property depending upon easement complexity. This fee is currently not grant eligible.)

Considerations for title *or* conservation easement ownership

- Grants (paying 50% - 75%, up to $200,000) are potentially available from the Department of Natural Resources and other funding sources (see Appendix C).
- Landowners may be willing to donate all or a portion of the property or easement value
- There may be tax benefits to landowners for making charitable donations of property or easements
- It may be appropriate to consider purchase or easement of only a portion of property (such as a buffer zone adjacent to a stream or wetland)

Considerations for fee title ownership

- Ownership allows greater control of the property
- Higher purchase cost than easement
- Organization may have to pay property taxes
- Responsibility for property maintenance

Considerations for holding conservation easement

- Lower cost than full title (although may be 70-90% of total property cost)
- Oversight responsibilities - monitor easement conditions
- Need to communicate with landowners who may change
- Potentially extensive certification requirements (Land Trust Alliance) to be grant eligible
- Another entity may be willing to hold easement (but may charge non grant-eligible fee)

For more information please review handouts provided by Gathering Waters the statewide organization supporting land trusts in Wisconsin (www.gatheringwaters.org).

Conservation Options Available to Landowners
Conservation Easement Q&A
Donating Land to a Land Trust
Tax Saving Generated by Gifts and Donations to a Land Trust
Preserving Wisconsin's Natural Heritage: A Land Trust Mission

Recommendations

- Consider various tools available to the Conservancy at the time a property is available for sale or donation.

- Give preference for land ownership over easement

  Land ownership avoids conservation easement responsibilities to inspect and enforce the allowed activities of another party on his or her own property.

- Facilitate easement transfer or sale to another entity such as the West Wisconsin Land Trust who will take responsibility for enforcement of easement conditions.

  Payments will generally be necessary to support easement monitoring and potential enforcement.

- Inform property owners about Conservancy mission and goals and opportunities available to them for their land.

  Seek participation from willing landowners

- Investigate and secure funding sources to support land protection.

Selecting Land Protection Projects

Each project presented to the Half Moon Lake Conservancy should be evaluated based upon the goals and objectives laid out in this plan. In particular, the resource and public benefit values listed below must be weighed against the estimated costs of the project. In the end, some land offered for sale or donation may not be worth pursuing.

Resource and public benefit values

- Project will protect or improve water quality or natural beauty or provide an educational resource.
- Is under probable threat of future development.
- Is a prudent financial investment.
- Benefits of protecting property remain intact even if adjacent property is developed.
- Initiates or sets a precedent that additional property will be protected.

Financial feasibility

- Costs can be covered by organization, partners, and grants.

When not to go forward

✖ Landowner insists on provisions in conservation easement that would limit the conservation value of property.

✖ Managing conservation easement would be too expensive.

✖ No access for management or monitoring (access may also be required for creating parcel or remaining eligible for grants).

✖ Overall project has negative public image that is not likely to be overcome.

Land Protection Priorities

The land protection priorities discussed below were offered in a 1998 study and remain on the mark today. A buffer width of at least 100 feet along the lake, streams, and wetlands is recommended for water quality protection with greater buffer widths needed for water quality protection when there are steep slopes. Gaining control of land through fee title or conservation easement purchase or donation is recommended in order to restore wetlands, protect wetlands and the lake from agricultural runoff, take highly erodible land out of agricultural production, and ensure land use in the watershed protects water quality (by limiting grazing, row cropping, clearing, and residential development).

Harder Creek

Acquisition of wetlands and uplands around Harder Creek are the top priority for water quality protection. Most of the water coming into Half Moon Lake enters via Harder Creek. Because of steep banks along the wetland, it is important to acquire adjacent uplands to ensure water quality protection.

Tamarack Bay/Creek

Tamarack Bay is the second priority for water quality protection. Although fewer acres drain to Tamarack Bay than Harder Creek, the area has more agricultural land. Portions of Tamarack Creek (which flows into Tamarack Bay) are unbuffered by wetlands, so nutrient rich waters flow into Tamarack Bay from agricultural lands along the creek. The report noted a definite flow of water from Tamarack Bay into Half Moon Lake, but did not quantify this flow.

Quoted from the report:

> *Perhaps of greatest immediate concern in this subwatershed is land use along Tamarack Creek. . . Agricultural land use in the upper reaches of this tributary probably contributes a significant amount of the phosphorus that powers the algae bloom and aquatic plant growth in Tamarack Bay. It is in this area that land acquisitions and other efforts (pursuit of easements) could have a positive impact on water quality entering Tamarack Bay and ultimately Half Moon Lake.*

Recommendations

- Land protection efforts should be limited to the direct drainage area of Half Moon Lake.
- Protect priority areas adjacent to Tamarack Creek and Harder Creek and uplands (high ground) that buffer Tamarack Bay wetlands through land purchase or accepting donations. Seek grants and other funding sources to support land acquisition.
- Another high priority for acquisition is land in the direct drainage area where there is potential for wetland restoration.
- Protection of land where wetland restorations have already occurred should be a secondary priority.
- Accepting donations of land and easements should be considered throughout the direct drainage watershed area.

Educational Efforts

The Half Moon Lake Conservancy has the benefit of an active Half Moon Lake District public education program. The District maintains a website and distributes a newsletter twice each year, and has expressed a willingness to share information the Conservancy provides through these methods. District annual meetings might also be used to share Conservancy activities.

Recommendations

- Support Lake District Educational activities by supplying information and funding support.

- Consider outreach that does not rely upon the Lake District to communicate with lake residents. (postcards, letter updates of activities, funding appeals)

Potential Partners and Roles

Several organizations and agencies have jurisdiction over land and lake management activities and common interests in preserving lake water quality and natural beauty. This plan encourages partnering with appropriate agencies to achieve plan goals. Among the agencies and organizations that might work together with the Half Moon Lake Conservancy:

Federal

USDA – Natural Resources Conservation Service (farm programs, conservation information, and grants)
Farm Services Agency (farm programs)
United States Geological Survey (climate, soils, and groundwater data)

State

University of Wisconsin Extension (educational information and cooperative projects)
Wisconsin Department of Natural Resources (technical assistance, grant funding, enforcement)
Wisconsin Department of Commerce (enforcement of construction site erosion control)

Local

Half Moon Lake District (all activities that impact Half Moon Lake)
Town of Milltown (planning and land division)
Polk County Land and Water Resources Department (technical assistance, stormwater ordinance, agricultural enforcement)
Polk County Land Information and Zoning (mapping information, planning and zoning)
Balsam Lake Protection and Rehabilitation District (advice and experience, cooperative projects)

Private Organizations

Gathering Waters (statewide organization – referrals, information, and advice)
Land Trust Alliance (national organization – certification, information, and training)
West Wisconsin Land Trust (cooperative projects – easement holder)
Deer Lake Conservancy[6] (advice and experience)
Ducks Unlimited (grant and information source)
Polk County Association of Lakes and Rivers (cooperative projects)

[6] The Deer Lake Conservancy has provided the benefit of ten years of water quality protection experience in the development of this plan. A brief summary of their efforts is included in Appendix D.

Recommended Management Activities

The management activities listed below are drawn from the background information reviewed and from board input during the planning process. A work plan for 2008 – 2009 is included as Appendix E. The work plan lists potential partners, cost estimates, and funding sources for plan activities recommended for the next two years. The work plan progress should be reviewed and revised for the coming year by the board prior to each annual meeting. Updates of the entire plan are recommended every five years.

Goal 1: Watershed characteristics protect and maintain Half Moon Lake water quality.

Objective: Discourage land use changes that will negatively impact Half Moon Lake water quality.

Objective: Work effectively to influence local and state decisions that impact Half Moon Lake water quality.

Objective: Protect critical parcels of land in the Half Moon Lake watershed.

Action Items

1. Designate board members to participate in Town of Milltown and Polk County planning, zoning, and other regulatory activities within the Half Moon Lake direct drainage watershed area.

2. Include representatives from the Town of Milltown, Polk County and the lake district on the Conservancy Board.

3. Approach priority landowners to encourage land protection. Emphasize the voluntary nature of options available to them.

4. Consider preservation of priority parcels to protect watershed characteristics and water quality.

5. Complete fundraising campaigns to support land protection activities.

Guidelines for land protection/acquisition approach

- Inform property owners about Conservancy mission and goals and opportunities available to them for their land.

  Seek participation from willing landowners

- Consider various tools available to the Conservancy at the time a property is available for sale or donation.

- Give preference for land ownership over easement

  Land ownership avoids conservation easement responsibilities to inspect and enforce the allowed activities of another party on his or her own property.

- Facilitate easement transfer or sale to another entity such as the West Wisconsin Land Trust who will take responsibility for enforcement of easement conditions.

  Payments will generally be necessary to support easement monitoring and potential enforcement.

- Investigate and secure funding sources to support land protection.

Guidelines for parcel selection

- Land protection efforts should be limited to the direct drainage area of Half Moon Lake.
- Protect priority areas adjacent to Tamarack Creek and Harder Creek and uplands (high ground) that buffer Tamarack Bay wetlands through land purchase or accepting donations. Seek grants and other funding sources to support land acquisition.
- Another high priority for acquisition is land in the direct drainage area where there is potential for wetland restoration.
- Protection of land where wetland restorations have already occurred should be a secondary priority.
- Accepting donations of land and easements should be considered throughout the direct drainage watershed area.

Goal 1: Evaluating Progress of Management Efforts / Monitoring

Action Items

6. Encourage Half Moon Lake District to continue volunteer Secchi-depth measurements.
7. Encourage Half Moon Lake participation in expanded self-help monitoring to include long-term phosphorus and chlorophyll a levels (seek DNR funds for 2008).
8. Update phosphorus loading estimates, measure inflows to Half Moon Lake, measure release of phosphorus from the sediments, and develop a nutrient and water budget for the lake.

Goal 2: Water quality practices reduce pollutant loading from the watershed.

Objective: Maximize wetland restorations in the watershed.

Objective: Promote the preservation and restoration of natural vegetation along the Half Moon Lake shoreline.

Action Items

1. Promote technical assistance provided by the DNR, Polk County LWRD, UWEX, and other agencies.

2. Identify and implement incentives to encourage restoration of buffer zones and reduction of waterfront runoff around Half Moon Lake.

Goal 3: Half Moon Lake residents understand and support lake management activities.

Objective: Increase lake residents' understanding of the connection between watershed activities and lake water quality.

Objective: Inform lake residents about Half Moon Lake Conservancy land protection priorities and rationale.

Objective: Increase lake resident awareness and support of Half Moon Lake Conservancy water quality and land protection efforts.

Emphasize the following educational topics

Impacts of runoff from waterfront property and waterfront development
Infiltration practices / alternatives to lawn
Local land use plans and ordinances
Activities of the Half Moon Lake Conservancy
Local land use planning and zoning
Importance of shoreland habitat/buffer zones
Zero/low phosphorus fertilizer
Septic system maintenance

Desired action by waterfront property owners:

Minimize impervious surfaces on your property and increase infiltration of runoff water.

Install a buffer of native vegetation.

Shoreland ordinances are understood and followed.

Do not fertilize, or use zero phosphorus fertilizer.

Have your septic system pumped regularly.

If you have an old system (installed before 1987), volunteer for a septic system inspection.

Action Items

1. Develop an organizational brochure: summarize strategic plan, status of current land holdings (public access?), present land protection priorities and options available to landowners.

2. Update lake residents and partner agencies regularly regarding Half Moon Lake Conservancy progress and activities.

   Use the following methods to communicate information on educational topics:
   Lake District Newsletter
   Seek assistance from Polk County LWRD, UWEX, DNR, and other agencies to author appropriate articles on priority topics
   Provide assistance to the lake district in publishing newsletter

   Lake District Web site
   Update with information from articles above

   Lake District Annual Meetings
   Distribute handouts and present information on priority topics (guest speakers and authors)

   Independent outreach that does not rely upon the Lake District to communicate with lake residents. (postcards, letter updates of activities, funding appeals)

   Work with the Polk County Association of Lakes and Rivers on cooperative education projects for priority topics.

Evaluation

3. Conduct a survey to assess resident understanding and support of Half Moon Conservancy efforts.

4. Assess effectiveness of various educational techniques and incentives residents will respond best to through surveys and focus group sessions.

Goal 4: The Half Moon Lake Conservancy maintains a vital board to address lake and watershed management issues.

Objective: Increase board knowledge of water quality and land protection tools.

Objective: Develop and maintain a clear understanding of roles and responsibilities for Half Moon Lake management with partner organizations such as the Half Moon Lake Protection and Rehabilitation District.

Action Item

1. Support board training by paying the following expenses: workshop registration, travel, and lodging.

2. Meet initially with the Half Moon Lake Protection and Rehabilitation District to discuss roles for lake management then on an annual basis (at least) to discuss planned activities and opportunities for cooperation.

3. Invite guest speakers to provide land protection and lake and watershed management information to the board.

Appendix A. Review of Previous Studies (1980 – 1998)

Half Moon Lake

Polk County, Wisconsin

Wisconsin Lake Planning Grant Report. Half Moon Lake Polk County, Wisconsin. Prepared for the Half Moon Lake Protection and Rehabilitation District. June 1994. Barr Engineering.

The project examined land use in the watersheds and estimated water and phosphorus loading from five subwatersheds or areas that drain to the lake. It also reviewed Half Moon Lake water quality data. Lake management policy recommendations for the Half Moon Lake Protection and Rehabilitation District with an emphasis on the Harder Creek subwatershed were included.

Results and Discussion

Of all the subwatersheds, Harder Creek delivers the highest amount of water and phosphorus to Half Moon Lake (39% of P) followed by Tamarack Creek (19%) then by the area that drains directly to the lake (12%).

Septic system loading was estimated to be approximately 4 % of the total phosphorus loading to Half Moon Lake.

Harder Creek drains 2,500 acres. Of this area, 50% is wetland and 18% is agricultural.

Tamarack Creek drains 1,300 acres. Of this area 7% is wetland and 47% is agricultural.

Antler Lake and Little Pine Lake subwatersheds, because they drain to the lakes themselves, effectively contribute no surface water and nutrients to Half Moon Lake.

Wetlands in the subwatersheds provide important water quality protection. The lake had greater water clarity than was predicted by phosphorus loading estimates from the watershed. Study authors attributed this potentially to the pollution reduction provided by wetlands.

Half Moon Lake stratifies during the summer months, and phosphorus is released from the lake sediments during this period. This phosphorus is not mixed in the lake until the fall.

Study Limitations

The date of the plan. Land cover and resulting pollutant loading was calculated from 1992 aerial photos. Land use and cover has likely changed in the 14 years since these photos were taken.

Nutrient loading was estimated based upon samples taken from Harder Creek and land uses in the subwatersheds. Barr reports that a beaver dam may have been breached during the 1993 sampling period perhaps leading to elevated nutrient loading estimates from the subwatersheds.

Outstanding Questions

Has phosphorus loading changed since 1992 based on changes in land use?

What water quality impacts might result with further changes in land use in Half Moon Lake subwatersheds?

How much water flows from Tamarack Bay to Half Moon Lake? No analysis was completed on water flow from Tamarack Bay to Half Moon Lake. Nutrient loading from Tamarack Creek may be reduced significantly when water is held for a time in Tamarack Bay.

Policy Recommendations

Policy recommendations emphasized actions to be taken by the Half Moon Lake Protection and Rehabilitation District. At the time of the report, the Half Moon Lake Conservancy did not exist. Conversations between the two organizations regarding implementation of the recommendations (who is leading, who is participating and how) would be beneficial.

Recommendations *related to potential work of the Half Moon Lake Conservancy* include:[7]

5.1 Protect the lake from changes in watershed management

5.2.2 Protect and preserve wetland areas in the shoreland and watershed areas

5.2.3 Conduct a public information and education program

5.4 Protect wetlands through involvement in government permitting programs and encouraging wetland restoration

6.0 Recommendations specific to Harder Creek

[7] The numbers are from the lake planning study.

6.1.5 Buffer strip easements – especially in agricultural areas next to the stream or lake

6.1.9 Land purchase – the plan identifies 500 – 1000 acres along Harder Creek for potential purchase, but does not prioritize specific parcels or parcel characteristics

Additional recommendations are perhaps most related to potential work of the Half Moon Lake Protection and Rehabilitation District (rather than the Conservancy).

5.2.2 Implement watershed best management practices

5.2.3 Conduct a public information and education program

5.3 Prevent exotic plant and animal species

7.0 Other Half Moon Lake alternatives

Septic system survey

Macrophtye survey and management plan

Long term lake monitoring program (including tributary monitoring)

Half Moon Lake. Polk County. Feasibility Study Results. Management Alternatives. By Office of Inland Lake Renewal. Wisconsin Department of Natural Resources. 1980.

A general phosphorus budget is provided including an estimate range for septic system contributions. No differentiation is made for individual watershed contributions. Groundwater was described as flowing in to the lake from the northwest and out of the lake along the southern two thirds of the shoreline. Management alternatives emphasized construction site erosion control, shoreland buffer establishment, and limiting lawn fertilization. Lake aeration was also discussed as an in-lake management alternative.

Wisconsin Lake Planning Grant Report. Half Moon Lake. Polk County, Wisconsin. Prepared for the Half Moon Lake Protection and Rehabilitation District. June 1998. Robert Bursik. Botanical Enterprises.

This report examines four wetlands in the Half Moon Lake watershed adjacent to Harder Creek, Tamarack Bay, Nelson Bay, and Baldwin Bay. Inventory of plant communities, wildlife potential, and descriptions of the wetland functional values are emphasized. Each wetland area is examined for potential for water quality protection, wildlife value, and recreation trails. The report also reviews wetland ownership (above and below the ordinary high water mark of the lake), discusses zoning and wetland restrictions, and summarizes pier regulations.

A buffer width of at least 100 feet is recommended for water quality protection with greater buffer widths needed for water quality protection with steep slopes. Gaining control of land through fee title or conservation easement purchase or donation is recommended in order to restore wetlands, protect wetlands and the lake from agricultural runoff, take highly erodible land out of agricultural protection, ensure land use in watershed protects water quality (limiting grazing, row cropping, clearing, and residential development).

Harder Creek

Acquisition of wetlands and uplands around Harder Creek are identified as the top priority for water quality protection. Most of the water coming in to Half Moon Lake, enters via Harder Creek. Because of steep banks along the wetland, it is important to acquire adjacent uplands to ensure water quality protection.

Harder Creek serves as a corridor for movement of a variety of wildlife. Plant communities are diverse, but common in this part of Wisconsin.

This area would be relatively easy to develop for recreational use, and trails could access both wetland and upland communities. The wetland communities are not particularly unique, however.

Tamarack Bay

Tamarack Bay is identified as the second priority for water quality protection. Although fewer acres drain to Tamarack Bay than Harder Creek, the area has more agricultural land. Portions of Tamarack Creek (which flows into Tamarack Bay) are unbuffered by wetlands, so nutrient rich waters flow into Tamarack Bay from agricultural lands along the creek. The reported noted a definite flow of water from Tamarack into Half Moon Lake, but did not quantify this flow.

Quoted from the report:

> *Perhaps of greatest immediate concern in this subwatershed is land use along Tamarack Creek. . . Agricultural land use in the upper reaches of this tributary probably contributes a significant amount of the phosphorus that powers the algae bloom and aquatic plant growth in Tamarack Bay. It is in this area that land acquisitions and other efforts (pursuit of easements) could have a positive impact on water quality entering Tamarack Bay and ultimately Half Moon Lake.*

The Polk County Land Conservation Department noted while there are several wetlands that have been restored in this watershed, additional wetland restoration potential remains. Increasing wetland acres would increase water-holding capacity of the watershed, and decrease runoff and nutrient loading to the lake.

Tamarack Bay is identified as a top priority for wildlife habitat protection because of its diversity of plant communities and wilderness setting.

Recreational development is a good potential because of extensive wetland communities and wildlife viewing possibilities. Floating boardwalks would be needed to provide access.

Nelson Bay

The wetland has a small watershed draining to it, and it is wide enough to absorb most water quality impacts from adjacent land use. This site is lower in priority for water quality than Harder Creek or Tamarack Bay wetlands and uplands.

Nelson Bay is identified as a second priority for wildlife habitat protection because of its plant species diversity.

The accessibility of the bay and quality and diversity of habitats make this a good potential for recreational trail development. Care would need to be taken to limit impacts on bog habitat.

Baldwin Bay

The wetland has a small watershed draining to it, and it is wide enough to absorb most water quality impacts from adjacent land use. This site is lower in priority for water quality than Harder Creek or Tamarack Bay wetlands and uplands.

Baldwin Bay is a small peatland community with less plant species diversity to provide wildlife habitat than the Nelson Bay wetland. It is probably too small to develop for recreational trails.

Alternatives

The board is advised to pay attention to changes in the watersheds and wetlands and utilize legal processes to prevent wetland degradation until acquisition of fee title or conservation easement is an option. Wetland restoration is encouraged. Walking paths are offered as an option to increase recreational opportunities around the lake. Consideration of purchase of fee title or conservation easements is recommended for priority properties when and if properties become available.

Addendum No. 1. Wisconsin Lake Planning Grant Report. Half Moon Lake. Polk County, Wisconsin. Prepared for the Half Moon Lake Protection and Rehabilitation District. November 1998. Cheryl Bursik. Dragonfly Consulting.

This report further refines the protection recommendations from the June 1998 document. Parcels in the Harder Creek bottomlands and Tamarack Bay areas are identified, and maps are prepared. Potential funding sources and contacts are provided.

Don Nelson (now Tom Martini) and Mark Nelson own top priority parcels for acquisition in the Tamarack Bay watershed and Richard McClain (now Half Moon Lake Conservancy) and Richard Kaiser own top priority parcels in the Harder Creek subwatershed. Maps of the most critical portions of each parcel are included in the report.

Addendum No. 2. Wisconsin Lake Planning Grant Report. Half Moon Lake. Polk County, Wisconsin. Prepared for the Half Moon Lake Protection and Rehabilitation District. December 1998. William P. O'Connor. Wheeler, Van Sickle & Anderson S. C.

Mr. O'Connor reviews means of protecting environmentally sensitive areas on Half Moon Lake by reviewing regulation of structures below the ordinary high water mark and local zoning regulations.

Two general approaches are recommended for the Half Moon Lake Protection and Rehabilitation District. First, to pursue adoption of a local ordinance regulating the placement of piers. Second, to work with the Polk County Zoning Administrator to ensure that existing zoning provisions are applied to any future proposals to construct upland walkways over designated areas. Finally, the District could seek the amendment of the Polk County Shoreland Protection Zoning Ordinance or the enactment of a town ordinance to specifically address construction of wetland walkways.

Note: Both the state pier regulations and the Polk County Shoreland ordinance have been revised since the report was written.

Appendix B. Definitions

Conservation easement — A legal document that restricts the use of land to farming, open space, or wildlife habitat. A landowner may sell or donate an easement to a government agency or a private land trust.

Eutrophic — Refers to a nutrient-rich lake. Large amounts of algae and weeds characterize a eutrophic lake (see also "Oligotrophic" and "Mesotrophic").

Eutrophication — The process of nutrient enrichment of a lake leading to increased production of aquatic organisms. Eutrophication can be accelerated by human activity such as agriculture and improper waste disposal.

Land preservation or protection means setting aside property so that it will not be developed (or will be only very minimally developed) for residential, commercial, or agricultural use in the future.

Mesotrophic — Refers to a moderately fertile nutrient level of a lake between the oligotrophic and eutrophic levels. (See also "Eutrophic" and "Oligotrohpic.")

Oligotrophic — Refers to an unproductive and nutrient-poor lake. Such lakes typically have very clear water. (See also "Eutrophic" and "Mesotrophic.")

Subwatershed — A portion of the land area that drains to a lake or river. Subwatersheds are generally divided into portions of land that drain to a particular stream or intermittent channelized flow.

Stratification — Horizontal layering of water in a lake caused by temperature-related differences in density. A thermally stratified lake is generally divided into the epilimnion (uppermost, warm, mixed layer), metalimnion (middle layer of rapid change in temperature and density) and hypolimnion (lowest, cool, least mixed layer).

Watershed — The entire surface landscape that contributes water to a lake or river.

Appendix C. Potential Grant Sources

PROPERTY AND EASEMENT ACQUISITION[8]

Grant Program: Lake Protection
Wisconsin Department of Natural Resources
Program Goals/Objectives: lake protection and restoration
Eligible Applicants: Qualified lake and conservation organizations
Eligible Project Elements: property acquisition, engineering, conservation easement, wetland restoration
Funding Limits and Rates: 75 % of project costs up to $200,000
Application Deadline: May 1st each year
Contact: Pamela Toschner 715.635.4073
Comments/concerns:

Grant Program: North American Wetland Conservation Act (Federal)
Program Goals/Objectives: long-term enhancement of wetlands
Eligible Applicants: local conservation groups
Eligible Project Elements: wetland restoration and acquisition
Funding Limits and Rates: 50% up to $75,000
Application Deadline: through December 1, 2006
Contact: Tim Grunewald, WI DNR, Barb Pardo 612.713.5433 (Joint Venture Coordinator)
Comments/concerns:
Since this is a federal program, state grant money could be used as match.

[8] A note about acquisition grants
Grant projects offer revenue to preserve conservation features of properties. They are highly competitive, and awards are generally given only where considerable work is already completed to clearly frame and commit a project. This work requires investment for initial steps such as surveys, appraisals, preliminary landowner approval, development of conservation easement requirements, and grant writing. While many of these costs are reimbursable expenses under the grant, grants are certainly not guaranteed. Allowing unrestricted public access increases grant funding possibilities.

Grant Program: River Protection Management
Wisconsin Department of Natural Resources
Program Goals/Objectives: river protection and restoration
Eligible Applicants: Qualified river organizations
Eligible Project Elements: property acquisition, engineering, conservation easements, restoration
Funding Limits and Rates: 75 % of project costs up to $50,000
Application Deadline: May 1st each year
Contact: Bill Jaeger 715.365.8971

Grant Program: Acquisition and Development of Local Parks (Stewardship)
Wisconsin Department of Natural Resources
Program Goals/Objectives: expand opportunities for outdoor recreation
Eligible Applicants: Non-profit organizations such as the Half Moon Lake Conservancy (acquisitions only)
Local governments including Polk County (acquisition and park development)
Eligible Project Elements: property acquisition and park development (trails, restroom facilities, picnic areas, parking)
Funding Limits and Rates: 50% funding of appraised value
Application Deadline: May 1st each year
Contact: Pat Zatopa, Community Services Specialist, 715.365.8928
Comments/concerns:

- Park development would require partnering with a local government such as the Town of Milltown, or Polk County.
- Land donation may be used as match for the acquisition.
- Federal dollars for outdoor recreation are also funneled through the Stewardship program to local government. The Land and Water Conservation Fund and Recreational Trails Act have similar goals and eligible elements.

Grant Program: Acquisition of Development Rights (Stewardship)
Wisconsin Department of Natural Resources
Program Goals/Objectives: protect natural, agricultural, or forestry values that would enhance nature based outdoor recreation
Eligible Applicants: Local Government
Eligible Project Elements: purchase of development rights (conservation easements)
Funding Limits and Rates: 50% funding of appraised value
Application Deadline: May 1 of each year
Contact: Pat Zatopa, Community Services Specialist, 715.365.8928

Grant Program: Farm and Ranchlands Protection
Natural Resources Conservation Service
Program Goals/Objectives: Purchase development rights to keep productive farm and ranchland in agricultural uses.
Eligible Applicants: nongovernmental organization; state, tribal or local government with existing farm and ranch protection programs
Eligible Project Elements: Acquisition of conservation easements from landowners
Funding Limits and Rates: 50% of fair market easement value
Application Deadline: not currently available on web site
Contact: http://www.nrcs.usda.gov/programs/frpp/
Comments: Farm must be part of a pending offer from a protection program; must have a conservation plan for highly erodible land
Landowner may provide donation of up to 25% of easement value; applicant must provide at least 25%

Appendix D. The Deer Lake Conservancy Model Projects

The Deer Lake Conservancy formed in 1995 with a mission of preservation of Deer Lake. Deer Lake is located along U. S. Highway 8 about 5 miles east of St. Croix Falls, WI. The lake is quite clear, but has periodic algae blooms.

The Deer Lake Conservancy successfully reduced watershed inputs by identifying significant watershed sources of phosphorus, gaining control of important drainage areas through purchase or conservation easements, and installing conservation practices. Crop fields were planted to native prairie, wetlands were restored, and sediment basins were constructed. With much hard work and a combination of public and private investment, significant reductions in phosphorus loading were achieved. Conservancy projects resulted in a 51% decrease in annual watershed phosphorus loading to Deer Lake from 1996 to 2000.

The most recent land acquisition is a 70-acre parcel on the south side of Deer Lake adjacent to U.S. Highway 8. In addition to conservation practice installation, the Conservancy worked successfully with WI DOT to encourage movement of the highway away from the lake.