LAKE PLAN - SMITH POND

PURPOSE: To maintain and improve water quality for fish and water fowl and for recreation and aesthetic purposes; to proactively deal with sedimentation and runoff and safe weed control. To educate residents on water quality strategies, wildlife around Smith Pond, and other related issues which affect the quality of life at the lake.

Smith Pond could benefit from a carefully designed cooperation and partnership with local government, suggestions that could be implemented by lakeside and watershed residents, as well as government agencies, to protect and enhance water quality.

INTRODUCTION:
Smith Pond is a small, shallow lake (60 acres according to the DEC) in the Towns of Howard and Avoca in Steuben County, New York. The lake is surrounded by seasonal and year-round cottages and is privately held with no public access. There are two DEC-protected wetland areas on the lake. The watershed is primarily forested and agricultural land. Smith Pond is in the Middle Cohocton River/Goff Creek watershed and is in NOAA weather zone 1, the Western Plateau. Residents have incorporated under the name Smith Pond Sportsmen Club, but are more commonly referred to as Smith Pond Association.

The DEC lists Smith Pond as an **"Impaired"** water body due to the heavy growth of aquatic vegetation (primarily Eurasian water milfoil) which interferes with recreational use of Smith Pond. The dense aquatic vegetation indicates that considerable amounts of nutrients are being added to the lake. Likely nutrient sources are inadequate on-site septic systems, agricultural runoff, road runoff, and nutrient-rich sediment. An adverse impact may have also been left by a cheese plant which was located at the northeast end of the lake in the late 1800's/ early 1900's.

Smith Pond was sampled by the NYS Conservation Department (the predecessor to the NYSDEC) in July of 1937 as part of the Biological Survey of the Allegany River basin. Extensive water sampling was not conducted as part of this survey. However, the limited water quality data indicated that oxygen depletion occurred below a depth of at least 15 feet. The pH readings were elevated at the lake surface, suggesting that algal blooms may have been common

Three common indicators of lake health have been routinely monitored through CSLAP since 2003. These indicators include clarity (Secchi depth), nutrient levels (total phosphorus), and algal levels (chlorophylla). In combination, these three indicators provide a good indication of lake biological activity or trophic state, a standard lake assessment tool. A lake with high concentrations of nutrients and algae and low transparency or clarity is considered eutrophic.

Water quality monitoring through the Citizen's Statewide Lake Assessment Program (CSLAP) has been conducted since 2003. CSLAP data indicate that the lake continues to be assessed as **eutrophic**, or highly productive. Phosphorus levels in the lake are consistently above the state phosphorus guidance value and clarity regularly fails to meet the guidance for swimming beaches. Less favorable recreational assessments continue to be associated with both poor water

clarity and excessive weed growth. In addition, aquatic life may be threatened by high PH. The 2008 Annual Report for Smith Pond prepared by New York State Federation of Lakes Association (NYFOLA) concluded that Smith Pond continues to be more productive than other Allegheny River basin lakes, other Class B lakes, and other NYS lakes for water clarity, chlorophyll a concentrations, and total phosphorus concentrations. In fact, the report stated that the lake was more productive in 2008 based on higher algae levels and lower water clarity. The report also stated that the lake appears to be susceptible to zebra mussel infestations based on the moderately high calcium levels in the lake. Weather patterns for Smith Pond were summarized as being wet to very wet conditions over most of the sampling time frames.

Water clarity readings were lower than normal in the 2009 report, consistent with higher than normal chlorophyll *a* readings. Algae levels have generally been higher in recent years, although neither phosphorus readings nor lake water clarity has exhibited any clear trends over this period, and the rise in chlorophyll *a* levels was not accompanied by a similar increase in phosphorus readings. The reports concluded that management geared toward improving water clarity will require addressing nutrient loading to the lake since phosphorus levels in the lake are consistently above the state phosphorus guidance value. It was recommended that we focus on reducing nutrient loading to the lake through maintaining septic systems, shoreline buffer zones, limited use of lawn fertilizers, minimizing land disturbances in the near-lake watershed, localized storm water management, and minimizing the input of exotic plants and animals.

Bacterial testing was performed twice in 2004. No significant level of sodium (road salt) or salmonella was found. Elevated readings of fecal coliform/ ecoli were from the east marsh land in front of a north shore site, and the RV camp on the first test; even higher readings were received on the second test.

In 2006, Paul Lord, a consultant who has worked on related projects with Cornell University, was hired to test, assess, and make recommendations for controlling excessive weed growth, especially Eurasian water milfoil. Recommendations included the use of sediment traps and buffer strips of deep-rooted terrestrial and emergent vegetation on the shoreline to intercept pollutants from fertilizers, animal waste, and atmospheric deposition. It was also recommended that municipalities properly construct ditches, properly grade unpaved roads with erosion resistant materials, reduce the use of winter road salt, and use an alternative to brine for summer dust suppression, e.g. washed gravel.

In 2008, this same consultant was hired to perform a fish study which was accomplished using electric shocking for counting and species identification. His summary follows:

> Smith Pond Association has long sought to manage Eurasian watermilfoil (*Myriophyllum spicatum*) hereinafter referred to as "milfoil" since no native milfoils are known to persist in Smith Pond. Milfoil management facilitates lake recreational uses which are obstructed by milfoil's aggressive, invasive growth. This report summarizes the 2008 cooperative effort between the Smith Pond Association and the Fish & Wildlife Department, State University of New York at Cobleskill. It was prepared for the Smith Pond Sportsmen's Club to present the 2008 Smith Pond electro fishing data collected, and its analysis, as well as to make recommendations on milfoil management and research.

Conclusions and recommendations in this report are all based on one weak assumption: that Smith Pond aquatic plant and aquatic insect populations have not varied significantly since evaluation in 2006 by the Cornell University Research Ponds (CURP; Ecology and Evolutionary Biology, Cornell University). Given the year-to-year variation of plants and insects noted in other waters, this assumption is weak, but without a concurrent sampling of Smith Pond fish, insects, and plants, this is the only way we can form conclusions and make recommendations.

Key conclusions from our 2008 effort in this project include: Fishery community impacts on milfoil herbivores appear significant; bluegill were sampled at a rate of ~1800 per hour which is associated with recreationally impeding milfoil growth; pumpkinseed were sampled at a rate of ~240 per hour which exacerbates the impact of the bluegill regarding recreationally impeding milfoil growth

Recommendations include:

- Stocking of Smith Pond with walleye fingerlings at rates in excess of the recommended New York State walleye stocking rate.
- First year stocking should be 8 times the NYS stocking rate or 7,200 fingerlings Subsequent yearly stockings should be 2 times the NYS stocking rate or 1,800 fingerlings.
- Size limit for walleye in Smith Pond should be raised from 15" to 18" to ensure fish stocked control sunfish prior to harvest.

Note: This recommendation was presented to the DEC who was unaware of the direct impact that Walleye would have on the Bluegill population. No documented evidence could be found that stocking Walleye would eventually impact the milfoil. Due to the expense of the stocking, the recommendation, which at this point is experimental, was shelved.

OPPORTUNITIES, CHALLENGES, CONCERNS:

Overview: A call for a heightened commitment and sense of urgency to continue our efforts to control excess nitrogen, phosphorus, and sediment levels is needed. Lake problems can reduce property values and make swimmers sick. Continued efforts are needed to educate residents to implement stewardship activities as a way of life. Because all watershed residents have direct impact on the water quality of Smith Pond, informed choices should be made regarding landscaping, fertilizer and pesticide use, maintenance of on-site septic systems, car washing, and pet waste management. The management and choices made for all these actions can positively or negatively influence water quality. By planting native and drought-resistant vegetation, as well as reducing lawn size, residents can lower their landscape water demand and chemical usage. Other sources come from pet or live stock waste left on the ground, vehicle washing, and erosion of soil on the shoreline or from barren upland areas.

Storm Water Runoff

Overview: Rainwater collection and distribution systems can be incorporated into almost any existing site. Homeowners can build or purchase simple or complex systems to capture, store, and use rainwater to water their landscape plants.

Runoff defined: Runoff is the rainwater that flows off a surface. If the surface is impermeable (for ex. pavement, concrete, roofs), runoff occurs immediately. If the surface is permeable, runoff will not occur until the surface is saturated. Runoff can be harvested (captured) and used immediately to water plants or stored for later use. If precipitation occurs faster than it can

infiltrate the soil or if the soil is saturated, it becomes runoff. Runoff remains on the surface and flows into streams, rivers, and eventually large bodies such as lakes or the ocean. Impervious surfaces such as driveways, sidewalks, and streets block rainfall and other precipitation from infiltrating naturally into the ground. Precipitation that does not soak into the ground and instead runs off its surface is called storm water. Movement of this storm water across the soil causes erosion. Along the way, it picks up a stew of pollutants, from animal droppings to pesticides, chemicals leaked from cars, air pollutants falling from the sky, road salt, sediment, and bacteria/pathogens, all bad for fish and humans. Corrective action includes:

- Educate residents to do what they can on their own property to minimize storm water runoff by such things as: Rain barrels, rain gardens, landscaping for proper rain water absorption, including establishment of a riparian buffer with native plants where possible.
- Develop a resource listing of persons/organizations which can provide technical assistance, monetary assistance, and actual labor to correcting storm drains and ditches around the lake and within our watershed.
- Locate and map all of the storm drains and primary ditches around the lake. Determine in priority order each of the storm drains, ditches, to be addressed. Contact the individuals who can provide the above assistance.
- Budget projects by priority. Enlist the assistance of township crews where permitted. File for grants as needed.
- Shore Line Erosion Control:
    - Encourage preservation/restoration of shorelines to lessen the impact on water quality filtering, near-shore habitat for fish, frogs, insects, water fowl, and other animals, and erosion control.
    - Development plans (home construction/reconstruction) may include the removal and replacement of native vegetation and soils which can often result in shorelines vulnerable to non-native weed infestations, erosion and sedimentation, increased maintenance issues, nuisance waterfowl taking up residence, and localized water quality problems. Through restoration of shorelines, common problems that plague property owners may be eliminated (like nuisance water fowl and noxious weeds), and water quality and functional habitat can be restored. Most shorelines can be restored and still maintain easy access to the water for recreational use as well as provide beautiful views.
    - Establish riparian buffer using native plants. Provide to residents a list of web sites which list plant and tree options.

<u>Canada Goose Control</u>:

- Canada geese are beautiful and enjoyable to watch, however, their waste product adds considerably to the nutrient load and adversely impacts water quality.
- Establishment of a riparian buffer along the water front is the best method for discouraging Canada geese from taking up residency and having young on Smith Pond.

Road/Drainage Ditches:
In 2008, Steuben County Soil & Water Conservation District (SWCD) measured and developed a correction plan for the road/drainage ditch situation, but due to the economic down turn were unable to actually do the project. It should be noted, however, that this information has been developed when funds do become available.

Steuben County Water Quality Coordinating Committee (SCWQCC) developed a Water Quality Strategy for Highway Operations in Steuben County which presents problems and solutions to runoff issues. Recommended management practices were provided in detail on such subjects as proper design, obtaining necessary permits, managing road and right-of-way drainage, erosion prevention, sediment control, management of chemicals on the roadway and in the garage, protection of streams and wetlands, inspection and maintenance of the road system, properly trained highway staff, implementation of drainage improvements and road bank/road ditch stabilization, seeking funding for salt barns and equipment needs, providing municipalities with seeding and mulching assistance, reduction to drainage impacts from off right-of-way land uses, and support for the Chesapeake Bay Program pollution reduction efforts.

Within the Strategy, current practices for snow and ice removal for Avoca Township listed deicing material as salt and sand and in 2004-2005, 200 tons were used. The township of Howard also uses salt and sand and used 500 tons in the same time period. Dust control within the Township of Avoca is salt brine used on 21.69 miles of road with 2 road sweeps per year. Road sweeping amount removed is not monitored. The Township of Howard uses brine for 25 miles of road with 1 sweep per year. Road sweeping amount removed is not monitored.

Smith Pond Environmental Committee should work with township highway supervisors to: Encourage as much reduction in salt as possible during the winter; encourage spring removal of material swept to road edges. Gravel or sand is a better choice, but it should be swept up in the spring so it won't clog culverts or smother fish eggs where the storm culverts empty and; Encourage elimination of salt for summer dust control with material which would cause less damage to the lake, such as washed gravel.

Septic Systems:

- Educate residents on current laws and encourage septic testing and replacements where needed. Also remind residents of the need to pump systems every 3 to 5 years at a minimum for better operation efficiency.
- Educate residents on the different types of septic systems available with pros and cons noted.
- Apply for grants if a resident or residents need assistance with a specific septic replacement project.

Excessive Weed Growth:

- Factoring in recommendations from Paul Lord's study, determine the best avenue for Smith Pond.
- If stocking walleye is considered, controls will be necessary to protect the investment. Voluntary cooperation by residents would be needed by posting properties and banning nonresidents from bringing boats into the lake. People who are granted permission to fish must be advised to release any walleye catches. These practices will also help with weed control in general.
- Consider continued weed cutting while simultaneously working on other methods of elimination of Eurasian milfoil.
- Continue CSLAP water testing through NYSFOLA.

General Practices to improve water quality:

- Provide a "Welcome" packet to new residents with information on the topics which affect water quality, for example, different types of septic systems, web sites to check local laws, and general maintenance suggestions for septic systems. Pond 101 topics such as not feeding the water fowl, being careful of the bass beds in the spring, Association meeting dates, etc.
- Encourage residents to reduce the input of toxic chemicals: use alternative, nontoxic products like phosphate-free detergents and water-based products, to never pour household chemicals down drains, to read the labels and learn proper disposal.
- Educate and encourage residents to practice conservation landscaping by: Planting native species which generally require less watering, reducing or eliminating fertilizers and pesticides; Decreasing lawn size and replacing the lawn with shrubs, trees, gardens, or meadows; Ensuring that gutters and sprinklers drain into grass or gravel areas to reduce runoff; Spreading mulch on bare ground to help prevent erosion and runoff; and using safer alternatives for controlling pests.

Implementation:

Goals: Set goals in modest two-year increments.

Funding: Develop varied creative ways to raise funds for projects.
Board of Directors: Sets policy and direction for the Association.

Officers/Environmental Committee: Should be familiar with or know where to access current federal, state, or local laws relating to water-pollution control, septic systems, wetlands regulations, environmental impact reporting requirements, regulations for protection of state waters, and boating regulations.

Committee Volunteers: participate in research on specific topics, use their own talents and experience together with board members and officers to shape and achieve goals.

Smith Pond Association Members: Vote in accordance with the by-laws at meetings for actions and/or distribution of funds for projects.

Local authorities: Since the Association has a somewhat limited role in implementation of some projects, calling the attention of local authorities to lake & watershed management issues is a must.

Steuben County Water Quality Coordinating Committee has a representative from Smith Pond.
CSLAP samples are collected by a resident of Smith Pond.

Appendix A - Smith Pond Lake Plan – Glossary

Algae/Algal Bloom	Three major varieties of algae dominate New York State lakes: blue-green algae, green algae, and diatoms. The rapid growth of algae on the surface of the lakes, streams, or ponds which is generally stimulated by nutrient enrichment is referred to as algal bloom.
Chlorophyll a	The measurement of chlorophyll a, the primary photosynthetic pigment found in green plants, provides an estimate of algal productivity which may be strongly influenced by phosphorus.
DEC	Department of Environmental Conservation
Eutrophic	Highly productive lakes with low clarity. Cultural eutrophication, or eutrophic conditions caused by human activity, may include fertilizers, shoreline erosion, agricultural runoff, wastewater discharges or septic seepage, and other non-point source pollution sources which wash into lakes which eventually die and fill the water body at an accelerated rate.
Impairment	Use is threatened for purposes of swimming, fishing, or drinking.
Native Plant	A plant species that originally occurred in an area.
Nitrogen (nitrate, ammonia, and total (dissolved), mg/1)	Nitrogen is another nutrient necessary for plant growth. It is measured in CSLAP in three forms: nitrate/nitrite, ammonia, and total nitrogen.
NOAA	The National Oceanographic & Atmospheric Administration.
Nonpoint source pollution	Many small sources of sediment or pollution distributed across a broad area which runoff into the lake.
pH	The term pH refers to the concentrations of hydrogen ions on a scale of 1 (many hydrogen ions, very acidic) to 14 (few hydrogen ions, very alkaline, or basic). Pure water is neutral, (which is a pH of 7). Most clear lakes must maintain a pH between 6 and 9 to support most types of plant and animal life. Low pH waters (<7) are acidic, while high pH waters (>7) are basic.
Phosphorus (total, mg/1)	Phosphorus is one of the major nutrients needed for plant growth. When present in high concentrations due to pollution, it disrupts the ecological balance of a lake.
Priority Waterbody List 303d List	(PWL) An in-state assessment of all the water bodies within New York State. Lakes identified as impaired on the PWL are usually placed on the 303d list of impaired water bodies as determined by the DEC.

Riparian Buffer	An area of vegetation maintained around the shoreline or edge of a lake, wetland, or stream. The buffer reduces adverse impacts to the water from adjacent upland areas.
Runoff	Rainwater which flows off a surface and may include, but is not limited to pollutants such as pesticides, sediment, road salt, animal droppings, chemicals leaked from cars, and bacteria/pathogens.
Secchi Disk Transparency	Determined by measuring the depth at which a black and white disk disappears from sight, the Secchi disk transparency estimates the clarity of the water. In lakes with low color and rooted weed levels, it is related to algal productivity.
Sediment/sedimentation	Sediment is a mixture of organic and inorganic materials carried into the lake. Land use issues, poor catchment management, and excessive erosion result in excessive quantities of sediment. With the sediment come phosphate and nitrate which cause enrichment or eutrophication of the lake, very poor water quality, and algal blooms. The sediment acts as a store of phosphorus which 'leaks' out into the water causing long-term pollution.
Soil and Water Conservation District (SWCD)	A locally managed district (generally follows county boundaries) established to plan and implement comprehensive soil and water conservation on a watershed-by-watershed basis through coordination with landowners.
Water Temperature	Water temperature affects many lake activities, including the rate of biological growth and the amount of dissolved oxygen. It also affects the length of the recreational season.
Watershed	The area of land that drains into a lake, river, or river system. Water may enter a lake through streams and rivers, overland sheet flows, or through the ground as shoreline or underwater springs. The ridges and hills that divide or direct water movement into one drainage basin define the boundaries of the watershed.
Wetlands	Unique habitats that form the transition between the lake and the surrounding land with vegetation adapted for life under those soil conditions, such as swamps, bogs, and marshes.