



*Penobscot County
Soil & Water
Conservation
District*

Watershed Survey Report

Cold Stream Pond



Penobscot County Soil & Water Conservation District

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In Cooperation With

University of Maine Cooperative Extension
And the Cold Stream Campowners' Association

Cold Stream Pond Watershed Survey Report



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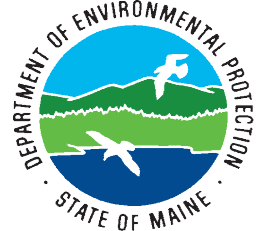
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Summary



In 2010 and 2011, volunteers and experts documented 142 sites within the 21.7 square mile watershed that had potential to negatively impact the water quality of Cold Stream Pond. The number of sites found in this small land area is alarming, well above what we normally document in a watershed survey. Site issues ranged from camp road and ditching problems, to lakefront properties that do not provide any protection for the lake in the form of lakefront buffer vegetation.

We believe that actions must be taken by the local lakefront residents, the lake association, and the Towns of Lincoln, Enfield and Lowell to prevent degradation of the lake. These actions include:

- Strengthening of the Cold Stream Campowners' Association,
- Consistent volunteer monitoring of both lake basins,
- Education of camp road association members and road commissioners to ensure proper maintenance,
- Outreach to lakefront landowners to begin to remediate problem areas, and
- Seek funding to address high priority areas that are affecting the lake.

What is a Watershed Survey

A watershed survey is the process of identifying and documenting the potential for polluted runoff to reach a lake. A watershed is the land area that drains to a specific watershed. Pollution from anywhere in the watershed has the potential to reach the lake, even if it originates miles away from the water.

Once identified, many of these sources of pollution can be fixed by landowners, or

by larger cooperative efforts. The general method to protect lakes in Maine is:

1. A lake group or interested local residents are trained to do a watershed survey.
2. Technical staff review all identified issues and make recommendations.
3. Local individuals (landowners) and groups (lake associations) work together to fix as many problems as possible.

TAKING CARE OF OUR LAKE

A lake is a magnificent water resource. The quality of its water is a reflection of what happens on the land that surrounds it. Rain and melting snow flow across fields, towns and roads, picking up pollutants along the way...



The greatest threat to water quality in Cold Stream Pond, and for all Maine lakes, is polluted runoff. During and after storms, soil and nutrients like phosphorus and nitrogen wash it the lakes from the surrounding landscape via ditches, streams and overland flow as stormwater. In an undeveloped forested watershed stormwater runoff is slowed and filtered by trees, shrubs and other vegetation. It then filters through the soil and soaks into the uneven forest floor. In a developed watershed, stormwater velocity increases on hard surfaces like rooftops, compacted soil, gravel camproads and pavement, and does not always receive the filtering treatment the forest once provided.

Cold Stream Pond

Cold Stream Pond is an uncolored lake with an average transparency (how far down into the water a secchi disk can be seen) of 10.2 m (33 ft.) in the main basin and 6.9 (22.6 ft.) in the north basin. Total phosphorous (the nutrient that controls the growth of algae) ranges from 3-7 ppb (parts per billion) with an average of 5 ppb in the main basin from 4-8 ppb with an average of 6 ppb in the north basin. The “danger zone” for phosphorus in Maine lakes is around 15 ppb. Phosphorus enters most lakes in Maine via soil erosion—Maine’s soils are naturally high in phosphorous.

Based on these secchi disk transparencies and other data, the lake is consid-

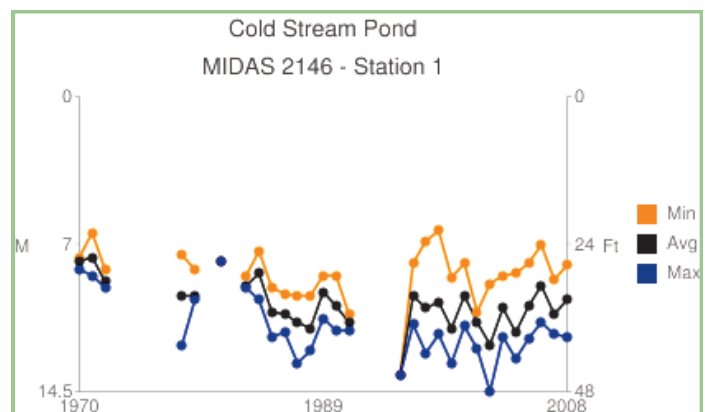


Figure 1—Transparency for main basin

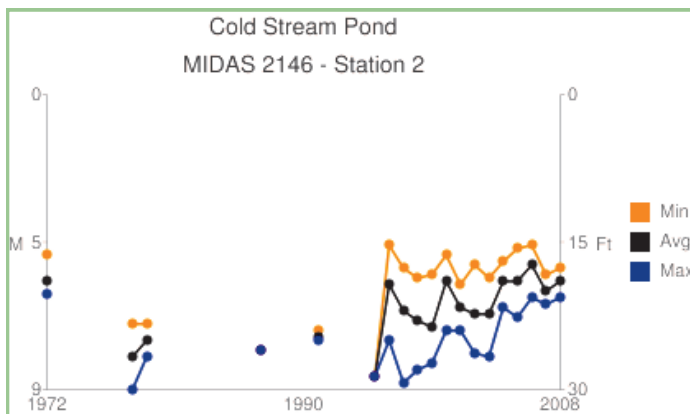


Figure 2—Transparency for north basin

ered to have overall excellent water quality, which makes this lake an especially valuable recreational and fishery resource. The lake is managed as a cold-water fishery. However, in the north basin in the late summer, conditions exist that restrict the growth and reproduction of coldwater fish. The dissolved oxygen in the north basin is consumed as part of the decomposition of algae. The inputs from soil (and phosphorus) from the surrounding watershed lead to increased algae growth. When that algae crop dies and sinks to the bottom of the

lake, it decomposes. The decomposition process uses oxygen, which cannot be replenished until the lake “turns over” (mixes) in the fall. This can place stress on the cold water fish and in time could eliminate their habitat in the north basin, this could also begin to place stress on the water quality of the basin.

Watershed Survey

In 2010 members of the Cold Stream Pond Campowners’ Association completed the University of Maine Cooperative Extension’s Watershed Stewards Program. The Watershed Stewards Program is a workshop series that provides background information on Maine Lakes, including threats and protection methods. For a volunteer service project (required as part of the program), the association partnered with the Penobscot County Soil and Water Conservation District and UMaine Extension to complete this watershed survey. During the summer of 2010, volunteers were asked to locate



An example of a site that was documented by survey volunteers.

sources of soil erosion and runoff that could be affecting the lake. The sites were documented and in the fall and spring of 2011, technical staff (Sarah Johnson a private consultant for the District, Chris Brewer from the District and Laura Wilson from Extension) reviewed the sites for completeness and accuracy.

Significant Findings

Overall, 142 sites within the lake watershed were found to either be contributing eroded soil to the lake, or were areas where lake protection measures were missing or inadequate. Sites were broken into significant types of land uses (Figure 4), general problem descriptions (Figure 5) and the estimated impact, technical ability required to fix the site and the estimated cost of site repairs (Figure 6). **The majority**

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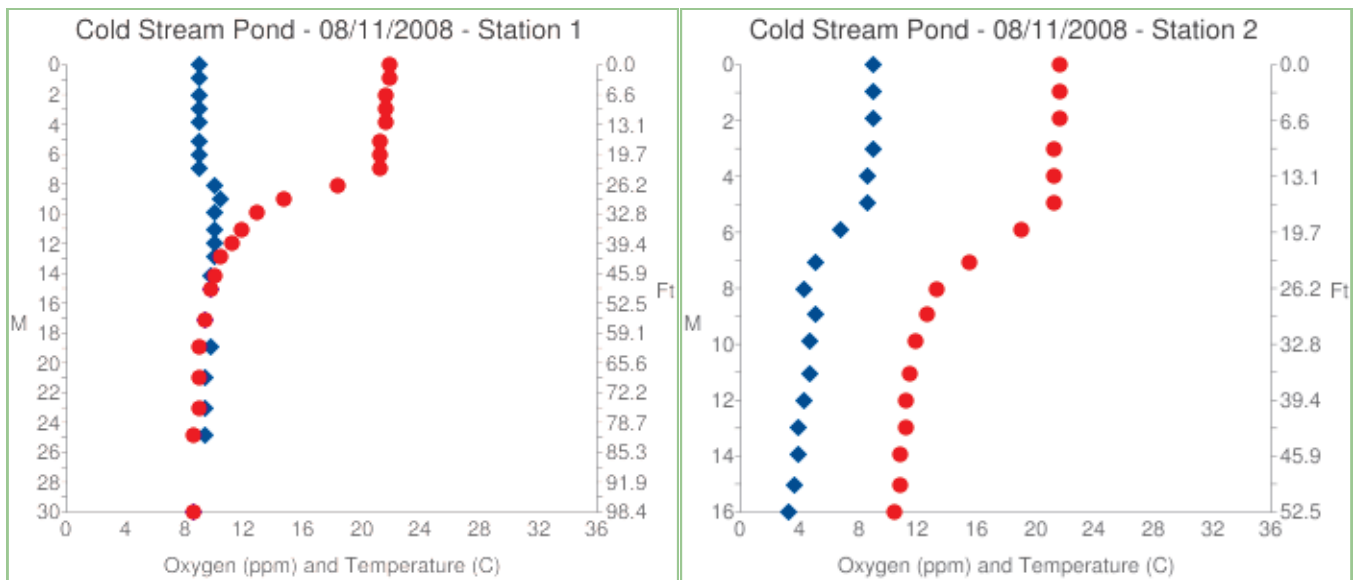


Figure 3—Main basin and north basin temperature and dissolved oxygen.

of sites were identified on individual residential properties, with the lack of a shoreline buffer (the last opportunity to capture pollution before it enters the lake) occurring on 70 properties. Our first recommendation is that the lake association focus on outreach to encourage property owners to install lakefront vegetation to capture polluted runoff. Other residential property issues range from rooftop runoff, extensive driveways/parking areas that sometimes extend from the road directly to the lake and under-cut shorelines.

Private road issues make up 20 percent of identified problems. Which is a dramatic improvement from the 1999 watershed survey where they made up 55%. Most road issues pertain to regular camp road maintenance, and include issues with culverts, ditches, road surfaces and shoulders. In some areas, berms (piles) of road material prevent water from running from the road into the ditch, leading to road surface erosion. Berms exist on both private, town and state roads and should be removed each spring. Most of the identified issues can be addressed through annual maintenance programs.

The majority of problems documented appear to be (individually) low to moderate impact. However, the cumulative effects of many low impact

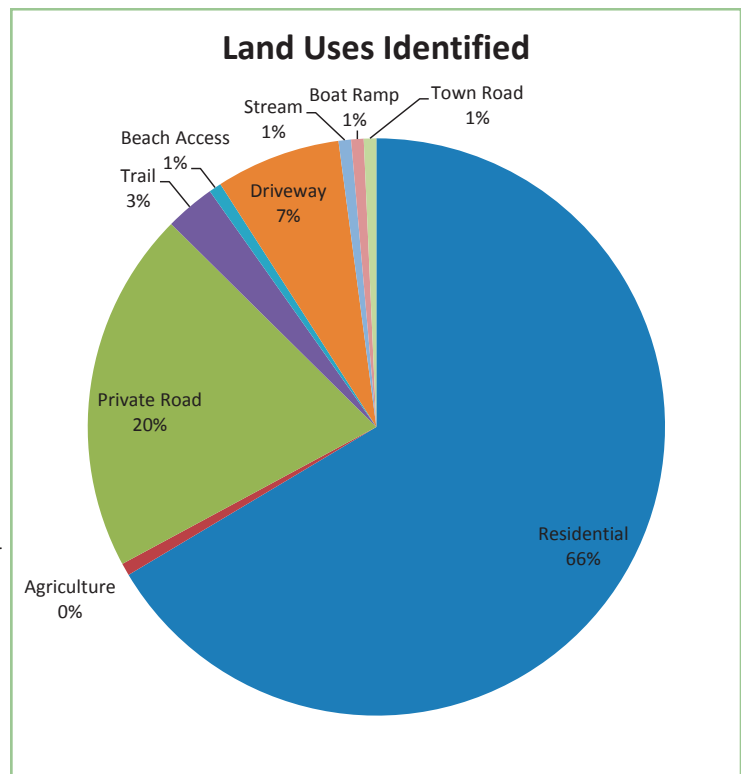


Figure 4—Land Uses

Impact, Tech Level and Cost

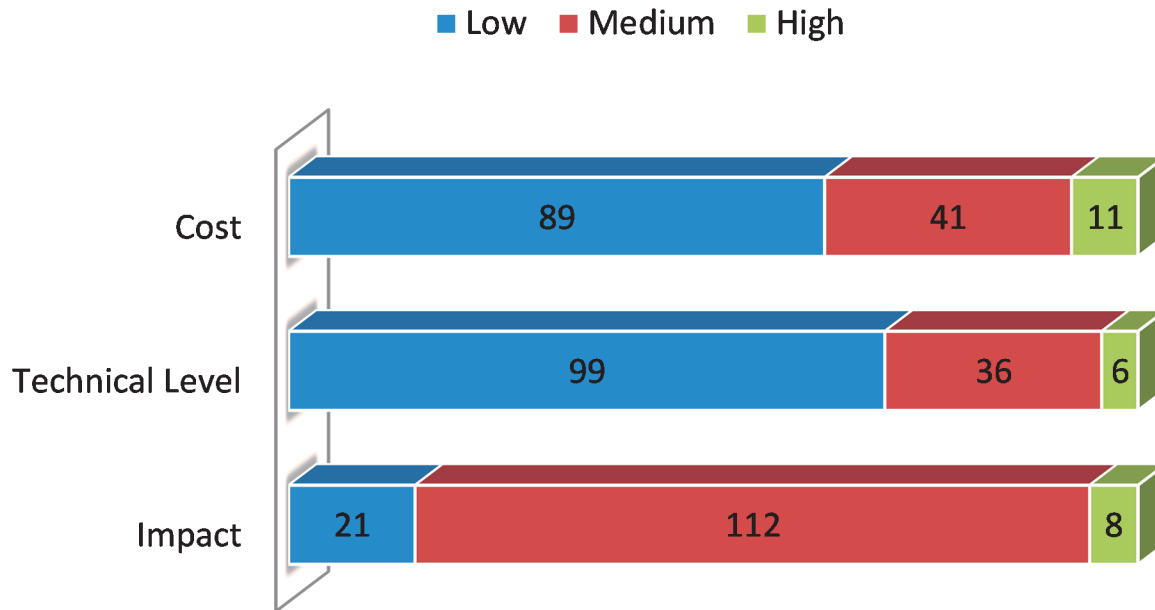


Figure 5—Impact, technical level for installation, and cost estimates for repairs.

problems can be considerable when it comes to lake pollution. That said, the majority of recommendations made to fix these sites would be low cost to implement, estimated at \$500 or less. We recommend that the lake association members become familiar with some of the more common solutions to the problems, and assist lake-front landowners with these tasks. The District and Extension can provide information to assist in this effort.

Conclusions

The small watershed of this lake has many problems that could lead to decreased water quality. The responsibility for protecting this lake falls primarily on the lake front landowners. Many of the problems that occur on this lake are on individual camp/house lots; therefore the lake association will need to communicate both the survey results and the simple steps that landowners can take to address trouble areas on their properties. There is a continued need for a strong lake association on Cold Stream Pond. The efforts the association has taken in the past year have been great, and should strengthen their efforts, and make them the leaders of the long term protection of Cold Stream Pond. Other issues such as private and town road problems, related both to construction and long-term maintenance. Road crews (both municipal and private road volunteers) should be trained in erosion control measures, such as proper grading, crowning and culvert placement and protection. The District and Extension will help the association by providing information, technical assistance and workshops to assist with outreach efforts.



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