Conducting a Survey of a Lake Watershed

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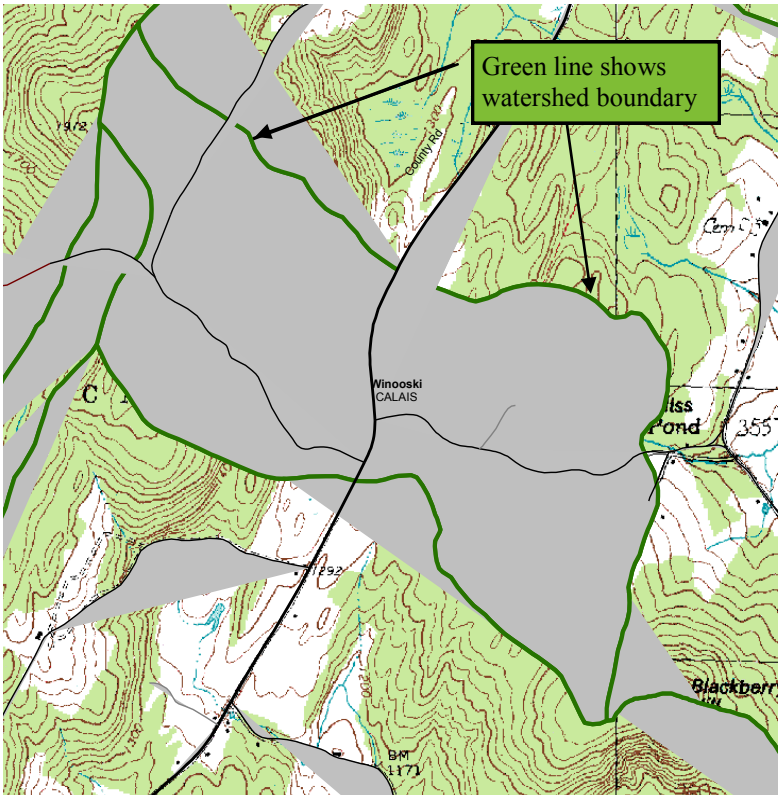
How to Assess a Lake's Watershed and Take Protective Action

Learning about a lake's watershed and possible sources of nutrient and sediment pollution is important whether a lake is already experiencing water quality problems, or if the conditions are currently good. Observing the watershed conditions is the first step in taking action to protect or restore a lake or watershed. Information from an in-lake, a shoreland and a watershed survey provides a picture of potential land use issues and problems in the watershed (including the shoreland) and their affect on conditions in the lake. A guide to conducting a survey, "Citizen Lake and Watershed Survey," is available from the Lakes and Ponds Section, and technical assistance is available to get an association started, assist with field observations, and interpret results.

The most common threat to lake water quality in Vermont is phosphorus enrichment. Although phosphorus will increase slowly under entirely natural conditions, one would not expect to see any noticeable changes in any given lake during one person's lifetime. However, human-caused phosphorus enrichment will result in decreased water clarity, increased plant and algae growth, increased sedimentation of shallow areas, and alterations of the natural habitat of the lake.

The Citizen's Lake and Watershed Survey is conducted in three parts:

1. **In-Lake Survey**—In this portion, lake residents boat around the shore and make notes about conditions in the water such as areas of attached algae growth, sediment accumulation, aquatic plants growth. These conditions can help pinpoint where nutrients and sediments are entering the lake. These shorelines conditions are "early warning signs" that appear before the overall phosphorus concentration of the lake changes.
2. **Shoreland Survey**—Observations are made of shoreland development types and locations, and other conditions that might have an effect on the lake, particularly in areas of concern as noted in the In-lake survey. Things such as vegetation density and types (trees, shrubs, lawn etc), artificial structures (retaining walls), shoreline erosion, driveway erosion are noted.
3. **Watershed Survey**—In the watershed portion of the survey, the land area that drains to the lake is studied. Observations are made about erosion, stream conditions, and land use types and locations. In big watersheds, a preliminary survey done by driving the roads and making observations at all the stream crossings can help prioritize the tributary watersheds that need further study.



Bliss Pond in the town of Calais is 46 acres in size and has a watershed of 591 acres. All the land shown within the green line above drains into Bliss Pond. The map shows there is one main inlet, several gravel roads, and about 18 houses or camps in the watershed. While some open fields are shown by the white areas, the green shading indicates most of the watershed is forested.

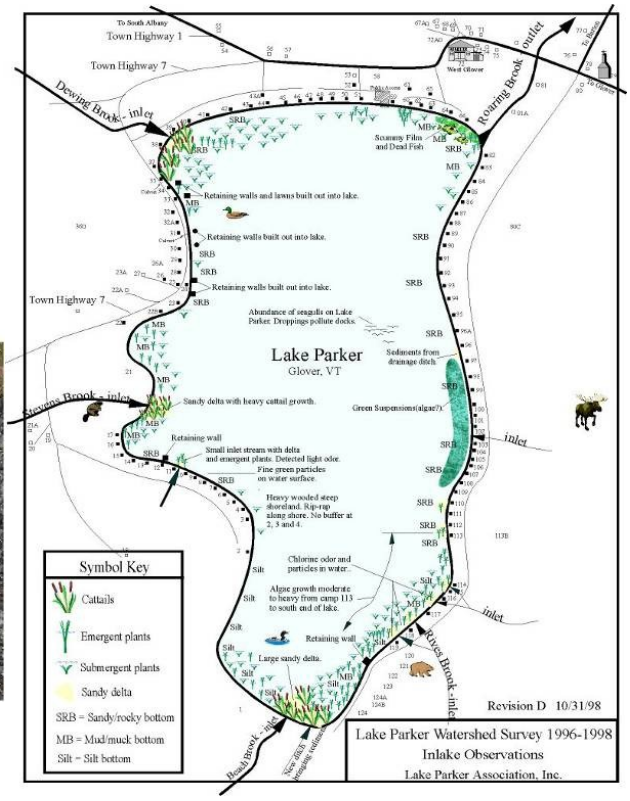
When completed, the Watershed Survey combines observations of in-lake conditions with observations of potential land use issues that can result in water quality problems, and a plan of action can be developed particular to the conditions at that lake. Examples of Vermont watershed surveys and actions taken are provided on the next page.

Lake Parker, Glover

Lake association members spent three years completing their watershed survey; the In-Lake map they created is shown at right. Issues identified included rapidly growing stream deltas and uphill town road erosion. The association then cooperated with the Town of Glover to assist them in applying for grants from the VT Better Backroads Program to correct several problem spots. One of these is shown below.

King Hill Road—Before

King Hill Road—After



Lake Carmi, Franklin

Lake Carmi's watershed in the town of Franklin was surveyed by a group of volunteers, including detailed stream walks. The Franklin Watershed Committee has been addressing the variety of land use issues identified by the survey with such programs as subsidized septic tank pumpouts for shoreland residents, assistance for farmers participating in "integrated crop management" (manure and fertilizer efficiency resulting in less phosphorus runoff), stabilization of eroding ditches, and shoreland revegetation.

Curtis Pond, Calais

The watershed of Curtis Pond in Calais was surveyed by members of the Lakes and Ponds SubCommittee of the town's Conservation Commission. Needs identified were correction of road erosion and increased outreach about good shoreland management.