

UVM Study Finds Possible Harvey's Lake Dam Fix

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BARNET — Student engineers have come up with a proposal to fix the problem at Harvey's Lake dam for less than \$6,000.

A group of University of Vermont civil and environmental engineering students picked the Harvey's Lake dam problem for their senior capstone design project, under the supervision of professor Mandar Dewoolkar and other faculty.

Monday night during its regular meeting, the board of selectmen accepted the students' final report. It's in a 3-inch-thick, three-ring binder, so selectmen took no action until they have had time to read and study it.

Presenters also recommend a Vermont licensed engineer review and independently evaluate the report before it is used.

The report includes studies of hydraulics, flows and mathematical computations, as well as a proposed solution to Harvey's Lake's problem that

seems simple in its concept, which is what the board wanted.

It is also inexpensive with the total cost of implementation estimated to be \$5,820. The majority of the cost comes from the price of a crank mechanism "requested by the community partner," who in this case is Selectman Ted Faris.

The objectives of the project are to create a sluice gate in the stoplog slots that will be safe and easy to operate. It would analyze the possible flow effects on the current system because of the opening of the fish ladder to controlled flows, the report notes. Fish don't use the fish ladder, they discovered.

The solution is to a problem that is corrupting the integrity of the lake. During a heavy rainstorm, the South Peacham Brook that flows toward the lake then makes a connection to Stevens River backs up, depositing prime agricultural soil sediment.

The unwanted sediment has filled in behind the dam so an outlet where there once was water skiing

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is so filled in a canoe can barely make it through. If the channel from the lake to the dam is made navigable again, it will open up more than 1,500 feet of waterfront property, the report notes.

Silt has contaminated the public beach, which now has an increasingly mucky bottom with algae and weeds growing to tickle the legs of swimmers. Contamination is also contributing to a reduction of oxygen level in the lake, which is impacting fish.

The crank-operated mechanism is a Rodney Hunt-design floor stand that costs \$3,230. Cost of the gate and frame is put at \$4,755, and also includes cedar wood stop logs, plastic spines, and a hard plastic gate footing. A railing and walkway add another \$1,054.

Harvey's Lake has been noted for its record-sized lake trout and pickerel, with the most recent big catch recorded at 22.8-pound lake trout caught in February 2007. The report also mentions the return of a nesting pair of bald eagles that rely on fish from Harvey's Lake and the Connecticut River, which is also fed by the South Peacham Brook and the Stevens River.

The UVM student study reported the channel width decreasing at a rate of 6 inches per year and that the stream upstream of the dam had moved west 3 feet.

"Continuing these trends may threaten private property, so implementing a plan to eliminate the back flow and maximizing the flow through the dam is essential to the residents of Barnet," students reported in the executive summary of the report.

Private property threatened includes the West Barnet Garage

and adjacent homes, where they discovered banks are eroding behind the buildings.

"Maintaining the quality of Harvey's Lake is an extremely worthwhile venture," students advised. "Currently, Harvey's Lake is on of the last lakes in Vermont that has not been contaminated with milfoil, an invasive species that significantly reduces the quality and aesthetics of lakes."

The first option selectmen thought of when the problem surfaced in 2003 was to dig out the channel and sell the prime top soil back to Peacham farmers where it came from, or anyone else who needed it. But, the state would not allow that.

Instead, engineering studies had to be done. So the town hired Milone & McBroom of Burlington to do the study for \$25,000.

The company did the site investigation, evaluation of existing studies, hydraulic analysis, and alternatives for correcting the problem. Among the eight alternatives offered were an automated sluice gate, a movable gate or stoplogs, modification of the fish ladder, a notch at the top of the dam, an automated rubber bladder system, building a boulder sill at the outlet channel or removal of the dam.

A combination of the last three resulted in a conclusion that it would not be enough to eliminate the reverse flow. There were also concerns about flooding downstream and loss of property for lakefront owners.

The dam was originally built in 1908, and damaged by floods of 1927. It was reconstructed in 1949 and renovated in 1970.

The sub-water shed area is 13,055 acres, or 20.4 acres.