

## **Bull Pond Dam – Comprehensive Summary** *Updated 11/4/17*

The dam at Bull Pond has become an important issue for the Harwinton Land Trust. At risk is the complete loss of Bull Pond. The following is an on-going summary of relevant events, land trust activities, and progress.

After Hurricane Irene hit Connecticut in mid August 2011, the CT Dept. of Energy and Environmental Protection (DEEP) inspected numerous dams in the area and determined that several in Harwinton, including the Bull Pond dam, were in need of renovation. In late September 2011, the Trust received a certified letter from DEEP requiring either: #1) the reconstruction of the dam or #2) breaching or removal of the dam.

The DEEP directive was issued despite the dam having maintained its complete integrity during Hurricane Irene, as well as through other recent storms that had caused major flood damage elsewhere in Harwinton. In particular, flooding of Rock Brook during Irene and during the fall of 2005 caused two major washouts of Locust Road less than 1/3 mile away from Bull Pond. The small outflow from Bull Pond had nothing to do with the Locust Road damage, since flows from Bull Pond join the larger Rock Brook flow several hundred yards downstream of the damaged area. While major flood damage was occurring nearby on Rock Brook, no observable damage occurred along Bull Pond's outlet stream.

On September 27, 2011, the Executive Committee of the Land Trust held an emergency meeting to discuss the DEEP directives. The directives were of great concern because Bull Pond is a very important recreational, ecological, and aesthetic resource in Harwinton. Costs of compliance to either directive #1 (dam reconstruction) or #2 (dam removal) would be prohibitively high and likely out of reach of the Trust's limited financial resources. The DEEP letter also indicated that debris below the dam needed to be removed within 14 days of receiving their letter, while surrounding trees needed to be removed within 120 days. Our ability to remove these trees and debris was complicated by the Executive Committee's belief that the Trust did not have sole ownership of the dam and its surrounding area. Thus, the Trust would have no authority to remove trees or debris surrounding the dam outside of its ownership.

On September 29, 2011, the Trust met with DEEP engineers at Bull Pond. The purpose of the meeting was to share information and to obtain clarification on compliance with the DEEP's requirements. The Trust was most appreciative of the DEEP's timely response to our concerns, and to the assistance the engineers provided. The DEEP had inspected the Bull Pond dam earlier in 2003-04 and found no problems. Their recent inspection found that an upper section of the ~4-ft. high masonry dam had collapsed. Yet, a 1-2 ft. high beaver dam built over the top of the masonry dam was safely holding water in place at normal levels, as it had for several years.

The Trust expressed concern that Bull Pond would lose its value as an aquatic resource if it had to be drained for dam removal and/or replacement. Draining the pond would cause severe ecological damage, including a massive fish kill. It was also pointed out that ownership of the dam was not clear and that the Trust was probably not the sole owner of the dam. The DEEP agreed to send certified letters to adjacent property owners, which would state the same

directives as had been imposed upon the Trust. The Trust agreed to have the area surrounding the dam professionally surveyed.

Questions were also posed to the DEEP engineers as to the relevant flood risk and potential property damage from a failure of the Bull Pond dam. An instantaneous breaching would be unlikely. Any failure of the dam would more likely occur through a much slower erosive process, starting by an uprooted tree near the dam.

On October 5, 2011 the Trust's Board of Directors met to review the issues raised by the DEEP. The Board agreed that it was important to retain the ecological, aesthetic, and recreational importance of Bull Pond, and not to allow it to become a swamp by following the DEEP's order #2--to breach the dam. Although the Trust felt that the risk of property damage from dam failure would be negligible, it sought to comply with the DEEP directive #1--to rebuild the dam. The Board voted to: 1) hire a licensed surveyor to confirm ownership of the dam and surrounding areas, 2) seek bids from professional engineering firms for costs of dam removal and replacement, and 3) immediately remove debris below the dam on property thought to be owned by the Trust.

During late 2011 through 2012, much cost and effort was expended to comply with the DEEP directives:

- The Trust appeared before the town's Inland Wetlands and Watercourses Commission and received its approval to conduct debris and tree removal on Land Trust property, and on other properties around the dam pending a resolution of ownership.
- Debris just below the dam was immediately removed on the east side of the outlet stream, which was thought to be on Trust property.
- We immediately began to incrementally hand-remove beaver material from the dam in order to reduce the pond's water level and hence the perceived flood risk. However, this proved futile, since beavers quickly replaced material that had been removed; their persistence maintained the normal water level of the pond.
- We had our property boundaries near the dam professionally surveyed, which confirmed that the Trust was not the sole owner of the dam.
- We had discussions with the other dam owner(s) to help resolve ownership and compliance issues. In the meantime, DEEP acknowledged that work on the dam could not proceed until the joint ownership issues are resolved.
- Trees surrounding the dam were marked and cost estimates for their removal were received from several tree service companies. However, work could not proceed due to nearly all of the problem trees being located on property other than ours.

- We obtained estimates from well-established engineering firms for costs of dam replacement. Initial cost, just for a feasibility study, was estimated at \$20,000. Actual design and engineering work for dam renovation was estimated at close to \$60,000. Total costs for constructing a new dam (including design work) was estimated at \$250,000 – \$300,000, which is well beyond the Trust’s financial capability. We discussed the limited possibilities for fund-raising and grants to help cover project costs.
- On April 18, 2012 the Trust held a public informational meeting at Harwinton Town Hall. Issues regarding costs and ownership were discussed, and good suggestions regarding funding and future options were made by town residents. One suggestion by a town official was to hire an engineering firm to: 1) determine the volume of water currently being held by the dam, 2) the flood risk posed by current water levels, and 3) to determine if flood risk could be reduced with a modest lowering of water level. Perhaps a modest lowering of water level would reduce the DEEP’s flood- risk rating of Bull Pond, and thus reduce repair costs, or even negate the directives to remove or repair the dam. However, it was pointed out that beavers would likely return the pond to its normal level if such water level manipulations were attempted.
- A list of licensed beaver trappers was obtained from the DEEP, and several individuals were consulted. However, beaver activity is currently in balance with the environment and is keeping Bull Pond at normal water levels.
- For the first time in its existence, the Trust was compelled to purchase Directors and Officers liability insurance because of the Bull Pond dam issue. This insurance costs the Trust an additional \$1,500/year, or about 20% of its average annual income (\$7,300 during 2006-2013) obtained through membership dues. This extra cost will likely continue until the dam issue is resolved.

In 2013, the Trust continued to be responsive to the DEEP’s directives as much as was possible considering that work cannot proceed on the dam until ownership issues can be resolved with the adjacent owner(s) of the dam. Work that was accomplished during 2013 included:

- Cut and removed the only tree near the dam that was growing on Trust property. Two other trees that fell partially on Trust property were pulled away from the adjacent private property onto land trust property and were also removed.
- Cleared debris on our property below the dam.
- Performed checks of recreational use of Bull Pond and found a substantial increase in use, particularly shore fishing by families and senior citizens (The DEEP advertises public fishing at Bull Pond in its Annual Angler’s Guide).
- Continued discussions of alternatives to keep Bull Pond an important aquatic resource for the public to enjoy.

During the fall of 2013, we learned that state regulations pertaining to dam safety were repealed (Effective 10/1/13). Under the previous regulations, regular dam inspections were carried out by DEEP inspectors at no cost to the Trust. Under the newly published regulations, dam inspections will need to be performed by registered professional engineers licensed in the state. It is anticipated that inspection costs by registered professional engineers will prove to be a financial burden to the Trust.

In 2014:

- Were notified of a pending tax sale of the adjacent private property (house and two lots) having joint ownership of the dam. The lawyer conducting the auction was notified of the DEEP order to remove or renovate the dam, and the likelihood that the new owner would inherit shared responsibility for rectifying the dam issue. The auction took place on June 11, but ownership wouldn't be final (known) until a 6-month waiting period elapsed.
- On June 11, 2014, a letter was sent to Rep. John Piscopo's office informing him of the dam situation, and our thought that the DEEP's hazard rating of the dam could be lowered. His office contacted the DEEP, and a Supervising Engineer promptly replied with information indicating that we could request a lowering of the hazard rating, but that dam renovations would still be necessary regardless of hazard rating. If the current moderate hazard rating of the dam could be reduced to a negligible hazard rating, inspections by private engineering firms would not be necessary.
- On July 27, 2014, the Trust sent a letter to the DEEP requesting a negligible hazard rating for the Bull Pond dam. The following points were made in that letter:
  1. "The dam has already breached without consequence. A collapse of the stone/masonry dam appears to have occurred sometime during the spring of 2004. However, any surge of outflow that occurred from that collapse went unnoticed, and no detectable or reported damage occurred downstream. In particular, there was no overtopping of the two local road crossings (Bull and Plymouth roads) immediately downstream of the dam. Yet, during some natural flood events that occurred both before and after the collapse, water has overtopped the crossing at Plymouth Road, making it impassible. The Trust noticed the collapse upon inspection of the dam when a neighbor complained about low water in the pond. The water level of Bull Pond was about 12" below normal when photo documented on May 3, 2004. Normal water levels returned as a result of beaver activity by July 2004. If another breach were to occur in the future, it is likely that no substantial downstream damage would occur, as was the case in 2004. Since then, no breach of the intact portion of the masonry dam, or of the overlying 1-2 ft-high beaver dam, has occurred.
  2. There are specific reasons why no damaging outflow occurred during the masonry dam collapse of 2004. Bull Pond is shallow (~1-2 ft avg. depth) and small, with a portion of its ~20-acre area taken up by six islands. Thus, the pond's storage volume is low. Further, much of its water

volume is bound in weed mass. Water retained in weeds would not exit the pond in the event of a dam breach. Conversely, the aquatic vegetation, as well as the islands, would impede a surge of outflow. Water would also ooze slowly from the pond's extensive mud flats.

3. The dam is not prone to damage during floods due to Bull Pond's watershed characteristics. The pond's watershed is relatively small (roughly estimated at 650 acres) with a low watershed to pond area ratio (~35:1). The pond is fed by several low gradient brooks, of which only one is perennial. Further, most of the watershed area is undeveloped with minor impervious surface area. These characteristics will cause relatively low water volumes and less "flashy" flows to be conveyed to Bull Pond during heavy rain events. In addition, floodwaters from all feeder streams will spread over the pond's surrounding marshland, thus reducing the potential rise in water level at the dam.
  4. Should floodwaters ever rise to a critical level in the pond, a paved Fire Department driveway will function as an emergency spillway. The driveway, which connects to the dam, is protected with a row of several pond-side concrete blocks. The surface of the driveway that is adjacent to the dam is about 1 ft above the normal surface level of the pond. Should a major flood hit the region, pond water exceeding 1 ft above normal would spill over the driveway and then flow into the pond's outlet stream, completely bypassing the dam.
  5. Downstream areas would not be prone to damage should another breach of the Bull Pond dam occur. The outlet stream of the pond passes under only two local roads before joining the much larger stream bed of Rock Brook, located a very short distance (~¼ mile) downstream of the dam. As noted previously, no overtopping of either road crossing occurred during the dam breach that occurred 10 years ago. Once Bull Pond's outlet stream joins with Rock Brook, the larger stream bed can contain a much greater volume of water. After passing by several house lots (all houses appear well above any conceivable flood level), water from Bull Pond passes through unoccupied forestland (DEEP's Roraback Wildlife Management Area) and can then be held in check by the Thomaston Flood Control Dam.
  6. In reality, Bull Pond is now a natural body of water contained by a low beaver dam. Beaver dams are not regulated by the DEEP. Beavers have consistently maintained a normal water level of the pond over the last 10 years."
- Despite the points presented above, the Trust received a letter from the DEEP (dated October 9, 2014) denying our request to lower the hazard rating of Bull Pond dam. DEEP's ruling was based on best professional judgment fearing that under a worst case scenario, a washout of Bull Pond would "likely cause some damage to one of the seven downstream crossings".

In 2015:

- Despite the June 11, 2014 tax auction of the property of the western half of the dam and a willing new buyer, the previous owner paid the back taxes on the property. In doing so, the previous owner retained ownership of the property. The property continues to appear unoccupied.
- On June 11, the Trust's president met with Harwinton's First Selectman to discuss possible State funding for dam renovation. The Town will try to obtain State funding for the Trust once joint ownership issues of the dam can be resolved with the private owner of the western half of the dam. It was agreed that the legitimate problem with the dam was the large trees growing on the private property's half of the dam. A blow-down that uproots the trees could cause a breach. The Town would ask a private company if they would remove the trees at no cost, once the property owner could be contacted. As of Aug. 2015, the Town has been unable to contact the owner, so no progress has been made.

In 2016: No important matters to report.

In 2017:

- Another tax sale was held on the house lot that shares ownership of the dam. The owner once again paid back taxes, so no work can proceed on the dam until the owner can be located. The house continues to appear unoccupied.
- Continued to monitor water levels and condition of the dam, particularly after heavy rains. The dam has remained completely intact, including through the highest annual rainfalls:
  - 2013: 4.0 inches on 11/27/13
  - 2014: 3.75 inches on 10/16/14
  - 2015: 4.25 inches on 10/29/15
  - 2016: 3.0 inches and less throughout 2016
  - 2017: 4.5 inches on 10/24/17 (highest since Hurricane Irene in 2011)
  - 6.0 inches on 10/29/17