Eagle Lake (Town's of Ticonderoga and Crown Point) Milfoil Project
Presentation to the Essex County Board of Supervisor
April 20, 2009

Phase II Herbicide Use Proposal

Presented by:
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Eagle Lake Property Owner's Inc.- (member)
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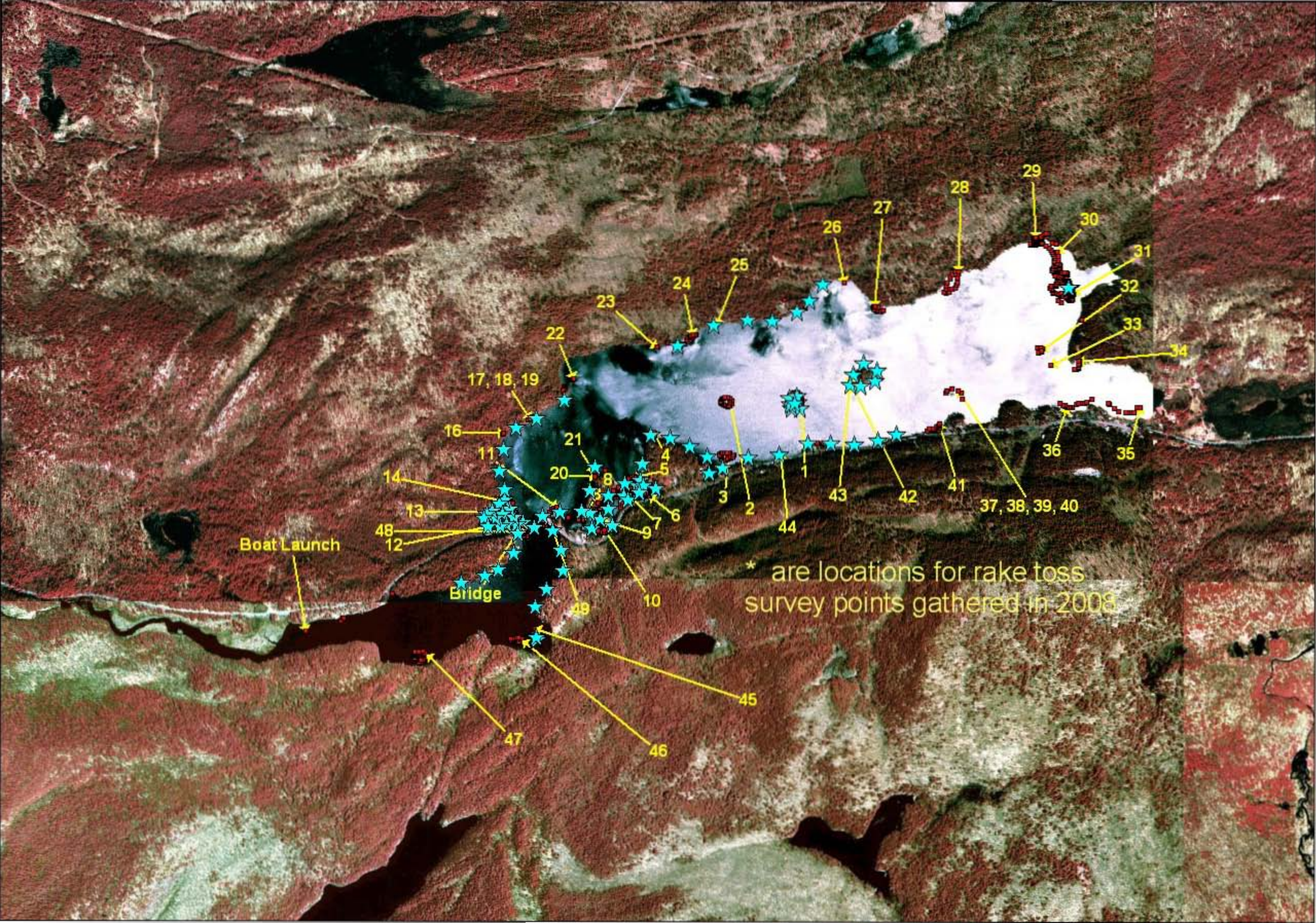
Copies of the notes and handouts for this presentation can be found at
http://www.eaglelake1.org/html/documents/supervisor_meeting_handouts.shtml
Or access Eagle Lakes website, select *Archives* and look in *Communications/Correspondences, 2009*

Agenda:

1. Meeting purpose
    a. To present basic information regarding the Phase II Proposal for the use of the herbicide, Renovate, in Eagle Lake for the control of the invasive plant - Eurasian Water Milfoil
    b. To answer questions regarding the proposal and to gather suggestions for moving Phase II through the permitting process
    c. To seek support by Resolution for Phase II's proposal to use the aquatic herbicide, Renovate, under a "plan" agreeable to those that are involved in the permitting process. (DEC, APA, Towns, Lake Association and Licensed Applicator)
2. Milfoil, what it is and what is the problem?
3. Where in Eagle Lake milfoil is located – *2003 GPS survey map*.
4. Current (April 2009) *Small test patch demonstration proposal overview* handout
5. Recent alternative options (March 2009) - *Renovate water restriction and use plans for Eagle Lake*
    a. Water use restrictions
    b. Plan #1, Large 10 acres with curtain use.
    c. Plan #2 Continued hand harvesting and matting, as undertaken in 2008 w/o herbicides.
    d. Plan #3 Spot treatment w/o curtain containment (the way Waneta Lake and several VT lake treatments were done), integrated with hand harvesting and matting.
6. Summer 2008 Phase I overview, what has been done so far – *Quarterly Report #1*
7. Where Renovate has been recently used and how successful was it? *Post renovate plant surveys_ELPOI web page*
8. *Triclopyr (Renovate's active ingredient) Questions and Answers*
9. Where to find more information about Renovate? *Herbicide information_ELPOI web page*
10. Questions and suggestions
11. Call for Resolution Bob Dedrick / Dale French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27
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26
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25
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32
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33
22
34
17, 18, 19
16
21
11
4
5
20
8
1
36
35
14
3
43
42
41
2
37, 38, 39, 40
13
6
7
9
48
12
44
Boat Launch
Bridge
49
10
45
47
46
* are locations for rake toss survey points gathered in 2008

April 18, 2009
Small test patch demonstration proposal overview plan for Eagle Lake
Prepared by Rolf Tiedemann

What follows below is a revision of the *March 2009 Renovate water restriction and use plans*. This revision was developed after completing a more comprehensive cost analysis for Plan #1 (a large 10 acre curtain contained treatment), described in the above-mentioned March document. It was determined that the costs associated with curtains, their depth, length and associated deployment and removal labor costs, would be well beyond the costs originally budgeted for the total milfoil project. Plan #3 (spot treatment without curtains) was presented to the APA, but is currently unacceptable because of their concern for in-water drift of Renovate from the treatment location and possible damage to native vegetation as a result of it. Plan #2 (the continuation of hand harvesting and matting) is going to be implemented in 2009.

As discussions were taking place as to location and size of herbicide treatment sites for plan #1 and the cost escalated the suggestion to "go small" was made. While this does not remove large amounts of milfoil as is the interest of the applicant(s), the purpose of the go small approach would allow for a test or demonstration of the product within the Adirondack Park. As a result of the suggestion for a small test patch, criteria for selection of this type of patch needs further exploration by the permitting parties and others involved.

Plan #4, the proposal for this plan is to;

- Look at one of a few small patch sites that are in the several hundred square foot size.
- Use a curtain to contain this site, but limit the length of the curtain to a couple hundred feet, even if the containment ring does not include all of the milfoil in the patch. A preference however would be to select a patch that would be completely contained so that eradication of this site could be completed, thus reducing the possibility of nearby milfoil plants re-establishing themselves or re-populating the site.
- Make a site selection where the depth of the milfoil patch is in no more than 15 feet of water. Commercially produced curtains are most commonly used in this depth range, and it might be possible to locate a used curtain for our application. The used curtain would have to be cleaned to prevent introduction of anything from the location of its previous use. Consideration is also being given to fabrication of a "lightweight" purpose-built curtain, as most commercially produced turbidity curtains are built for heavy-duty, long-term deployment under construction conditions. The lightweight curtain might be able to be fabricated for a cost less than that associated with rental and delivery of a commercial curtain. Options for this are still being explored, and since this proposal was very recently presented, there are no specific details or costs worked out as of yet.
- Dye test the curtain-contained site, if required, specifics for an acceptable percent of leakage are still in need of determination. A staff member at DEC Raybrook has commented that he is optimistic that he will be able to provide support for this part of the project, especially if the plan is for a small sized containment.
- Have a licensed applicator treat the curtained site.
- Complete appropriate post application assay test(s) for herbicide concentrations.
- Complete a follow up plant survey to assess the effectiveness of the treatment.

March 24, 2009
Renovate water restriction and use plans for Eagle Lake
Prepared by Rolf Tiedemann

What follows below is a short presentation of information related to the use of Renovate that was collected from other Renovate lake applications within the states of New York, Vermont and Washington and from the Federal and special NYS product labels as they relate to and help define three different plans currently being considered for an Eagle Renovate herbicide treatment.

Timing of the Renovate treatments varied from state to state for a variety reasons. Renovate was applied late spring, mid to late May, and sometimes as late as the end of June. Timing is based on the need for milfoil to be actively growing. (See Eagle Lake's web page 2008 other lakes treated plant surveys) The early May application in several Vermont lakes was a condition of the VT DEC to have the application completed prior to water temperatures reaching 60*F, VT DEC considered temps below this as a "no spawn" temperature. The late June application condition was again a VT requirement and was considered the time after spawning was completed. Other considerations for application timing are impacts the required water use restrictions will have on lake users. The NY lakes that were treated were done in late May, consideration was for milfoil to be growing well, and the 2-3 wto be used in this manner.

Typically at the time of application there is a 24-hour restriction on water use for all activities; swimming, fishing, drinking, irrigation, etc. (notification for this needs to be sent to all affected lake property owners and needs to be posted around the lake at all access points prior to application). The product label directions drive posting requirements and restrictive use; they are specific to the Federal label and in NYS the "special" NYS specific label restrictions. NYS is more restrictive than the Federal. The label directions/ restrictions include a setback guideline from the targeted treatment area as well. The restriction for swimming, fishing and use for non-potable water (washing cloths, toilets, dishes, etc.) is usually lifted 24 hours after application; Drinking restrictions are typically in place for 2 - 3 weeks depending on herbicide break down. Specific timing for lifting this restriction is when all herbicide concentration is below 50 parts per billion (ppb) as determined by several different location herbicide specific assay tests. Herbicide breakdown speed is sunlight and wave action driven. (Just a reminder- Eagle Lake is NOT tested for drinking water purposes by ELPOI or anyone else and those that choose to drink the water do so at their own risk!) This said, agencies that have approved the herbicide for usage consider concentrations below 50ppb safe to consume. Irrigation of croplands can be resumed after the concentration is assay tested to be below the 1ppb level at all sample locations. This can take 3-4 weeks, or in one reported case, several weeks longer to occur. Again this is sunlight and wave action driven. The one case where it took longer to break down was where the lake had very limited clarity. Depending on application location in EL restrictions may or may not affect everyone. For those that have a hardship as a result of the restrictions, alternative water sources, etc. will need to be explored for the duration of the hardship.

There are currently three different plans for continued milfoil eradication within Eagle Lake being discussed between the ELPOI Project Coordinator, the Town(s), the Regulators and the Applicators:

Plan #1,involves the use of the herbicide Renovate with the APA proposed requirement for a curtain-contained" herbicide application. (As a note- neither the Federal or NYS specific use labels require or even suggest the need for curtains. Additionally, the DEC department(s) that was responsible/ involved with the NYS specific use registration process does not support the concept of or the need for the use of curtains and none of the applications profiled on the Renovate plant surveys web page used curtains.) This plan proposes a treatment site located in the area between Foxes Island and Rt. 74. Curtains would be stretched between Hurd Point and the island and again from the island to a point by the cottages on Rt. 74. The contained area of water at this site is about 10 acres in size and contains about 2 acres of milfoil (out of the total 8 acres of milfoil identified by the '03 GPS lake survey). To satisfy the APA, Plan #1 requires the following:

- The purchase/ rental of curtains- new curtains retail for $25.00 - $30.00 per linear foot, rental curtains may not be available, and utilizing "used" curtains from another lake presents the opportunity to contaminate Eagle Lake with whatever was in the water where the curtains were last used. The cost estimate mentioned above was based on an anticipated depth across the channel of 10 – 15 feet; a recent depth profile study (performed February 2009 by Rolf and Michael Tiedemann)

indicated that the channel reaches depths of 35 feet. This makes the curtain cost jump significantly since the curtains will be required to reach and seal to the lake bottom. Length of the two required curtain sections measures out at 450 feet each. The curtain material also weighs in at the 2 – 4lb per foot range, adding additional considerations with regards to curtain deployment, placement, removal, storage and/or disposal, given the limited open shore line access available on Eagle Lake

- Additional labor costs associated with installation, end of use removal and storage/disposal. This is figuring in the need and cost for a 3 –4 person surface team for several days, for curtain deployment and removal, in addition to a dive team. Storage/ disposal/ reuse costs are not even considered at this point due to many other issues associated with this plan and some of the more favorable alternatives still available for consideration.
- The proposed/required completion of a 7-10 day dye leakage analysis of the containment site prior to introduction of an herbicide-This requirement has very specific costs associated with it; at a minimum the cost of the dye, the cost to rent a fluorometer to measure dye concentrations and the need for a specially trained person capable of using this equipment to be on the lake on days 1, 2, 3, 5, and 7, following introduction of the dye. Cost figures for these items have not been fully determined. A staff member at the DEC Raybrook office has indicated that they might be able to help with this phase of the project. Discussion on this is on going.

- On top of these "additional" APA requirements are the "normal" costs associated with the application of the herbicide; the assay testing and the pre and post application plant surveys. Factoring in the above APA additional curtain requirements, Plan #1 has an estimated cost of $65,000 - $75,000 or roughly $6,500 - $7,500 per acre of water treated. More specifically it means a cost of about $35,000 plus/acre to address the 2 acres of milfoil contained within this curtained 10 acre containment zone. Plan #1 would end up exceeding the $65,000 worth of funding that remains in the DEC Invasives Species Grant. Plan #1 also lacks one of the Grants requirements, which is the plan for prevention of reintroduction. There simply are not enough funds to address this. Again it needs to be stated that the proposed curtain requirement is one that the APA has put forth and is NOT a NYS DEC requirement. The reasoning behind the APA requirement is their concern for in water "product drift out of the target area" and the potential for collateral damage to native species in this non-target area. The previously referred to Renovate treatment plant surveys indicate that there was no damage to native plants outside the target area and that any native plants in the target area that showed stress after treatment showed signs of later season recovery. The only plant reported damaged by the use of Renovate was Milfoil.

Plan #2, is to continue with the same hand harvesting and matting that was undertaken in 2008. This option has an associated labor cost of approximately $10,000 -$15,000 per acre and is dependent on milfoil density in the mat areas and the amount of isolated plants around the mats that need to be removed. Working with this cost figure and the then existing identified 8 acres of dense patches of milfoil in Eagle Lake; cost figures would be in the $80,000 - $120,000 plus range to remove most of EL's milfoil. By casual estimates it is guessed that the 2003 GPS survey missed identifying about 50% or more of the patch size and isolated plants as it was only intended to measure the size of the largest patches and was completed by surface observation where depth visibility was only to about 15 feet. During the 2008 harvest, divers quickly saw that milfoil was growing well into 20 plus feet of water, depths that are beyond the range of surface visibility. Just as a note-Milfoil removal by hand is not 100% effective as small amounts of roots left behind can re-grow and matting is not in anyway selective and kills native vegetation on the patch/mat perimeter where natives are mixed in with the patch. Also when mats are removed the fertile open ground is very susceptible to supporting growth of any floating fragments from yet to be removed milfoil plants. There are also many patches/isolated plants that, due to their entanglements with trees, rocks, etc., would not be removable because access by divers ranges from limited to impossible and/or dangerous.

Plan #3, is to use an integrated approach. This approach would use the herbicide Renovate in a manner similar to the way it was used on the lakes described in the various plant surveys on the web page, and that is to complete a partial lake "spot" treatment, as opposed to the once considered "whole lake" approach. This process would see renovate broadcast over those areas of the lake where milfoil patches of sufficient size and density warrant it. The plan would look at the entire lake, not just specific ends or a few specific sites, and

could bring control to all treated patches and many of the isolated plants surrounding them. After such treatment, hand harvesting and matting would be utilized to clean up those areas that might not have been treated and to complete a lake swim over to remove missed plants. Cost estimates for this non-curtained use of Renovate without follow-up surveys is estimated in the $800- $1,500 range. This cost number is based on actual costs spent to treat Saratoga and Waneta lakes, as well as several lakes in VT. The broad cost range is listed because even though this is the preferred treatment plan by the Towns and is supported within DEC (based on the data that supports Renovates success in other lakes), little discussion has been devoted to it due to the APA's past and current insistence on using curtains. Much uncertainty for specifics of cost needs to be addressed. If one considers that 8 acres of milfoil was identified in 2003 and there is a need to add to this figure another 4 acres (or 50%) not originally accounted for in '03, plus an additional 6 acres (or 50% of the identified 12 acres that needs to be allotted for a treatment buffer zone around the treatment site(s)), one quickly sees that a total of 18 acres will need to be treated. At $1,500 per acre, the cost of this portion of this plan would be $27,000. Add to this a generous $10,000 for a post plant survey and the required assay tests, etc. and the herbicide treatment is set to cost $37,000. With the herbicide treatment completed it would still leave approximately $28,000 for follow up hand harvesting of missed plants and addressing concerns for reintroduction. If a Renovate treatment of Eagle Lake can bring the same level of control as it did on Saratoga Lake, then some 90 plus percent of the milfoil should/could be eradicated in Eagle Lake.

All three plans are in the discussion phase with the APA and DEC, the Towns, the Applicator, the herbicide manufacture and the ELPOI project coordinator.

Since the initial release of this document to several individuals on March 16, further discussions have taken place between the various involved parties and myself. See "small test patch demonstration proposal" for details on what this discussion has led to.

Quarterly Report #1

Town of Crown Point - Eagle Lake Milfoil Eradication
Contract: C303601
September 30, 2008
Prepared by: Rolf Tiedemann, Project Coordinator and ELPOI member

The following items took place towards the Eagle Lake Milfoil Eradication Project during the time period prior to Sept 30, 2008. They are roughly in order but no specific time for completion is implied by their order. Photos of the summer 2008 work can be found at http://www.eaglelake1.org/photo album.html

- Composed and distributed 3 "Spring" ELPOI newsletters informing ELPOI members and riparian lake property owners of the summer 2008 milfoil project and enlisting their support, see February 2008 Newsletter, April 2008 Newsletter, May 2008 Newsletter/ Membership Renewal/ Annual Meeting Notice
- Worked closely with both Ti and Crown Point Town Supervisors and their staff for coordination of all plans for the Invasives Species Grant in 2008
- Worked closely with the ever supportive officers of the ELPOI in coordination of planning and securing volunteers to help with the project
- Purchased 1,500 pounds of steel ballast for mats, transported it from Rochester to EL (best price, easy access)
- Constructed an "Herbicides" Information web page that has links to manufacture, product information, product label, MSDS sheets, toxicology studies and more, see Herbicide also see Herbicide specific information
- Addressed issues of concern for proposed Renovate herbicide use raised by 2 riparian property owners
- Compiled an extensive library of technical information regarding milfoil and other invasives from; lake associations, state agencies, interested academia's etc., see Environmental Issues- Invasives
- Secured as a donation approximately 6,000 square feet of "mill wire" from International Paper Corp. (IP) for use as benthic mats
- Secured a contract with Lycott Environmental to hire a project coordinator/ topside dive attendant and 4 divers for the summer of 2008
- Coordinated with DEC, APA and other local and State officials to ensure all planning was appropriately carried out.
- Worked with NYS Office of General Services OGS, Allen Bauder, to obtain letter of permission for APA 0 to 2 meter permit application, see 2008 OGS Letter
- Obtained plant results from the Natural Heritage Program Plant Identification Survey identifying a rare plant located in Crown Point Bay at the northeastern end of lake (well away from any planned 2008 work area) see natural heritage plant survey

- Verified that previously obtained permits (non jurisdictional letters) from DEC and APA for hand harvesting and matting were still in effect, see http://www.eaglelake1.org/milfoilproject.html for copies of letters
- Secured job applications/ hired divers and topside personnel
- Completed APA permit application to hand harvest and mat in waters less than 2 meters, see APA Under 2 Meter Permit
- Secured lake resident volunteer(s) commitments to work on mat construction
- Stitched (zip-tied) 1,500 pounds of ballast to approximately 6,000 square feet of mill wire (sized approximately 10' x 16') (approximately 4 pounds per square foot of mat)
- Secured donation of work float building materials from Town of Crown Point
- Secured donation of plastic barrels for buoyancy floats for construction of "work barge" from Harbour Industries
- Secured donation of "Hooka" surface air compressor with accessories to support four divers from Town of Crown Point
- Secured donation of dive "goodie bags" for milfoil collection from Town of Crown Point
- Secured donation of underwater video camera and surface video TV/VCR recorder from ELPOI
- Secured donation of a handheld GPS unit from ELPOI
- Secured donation of fragment collection tools (pool skimmers) from ELPOI
- Completed construction of 8' x 18' work barge, see 2008 Project Pictures
- Secured lake resident volunteers to launch work barge
- Secured donation of 24' pontoon boat with engine from Hyde's Boat & RV for summer of 2008for use as staging for diver related activities
- Met with ELPOI Board Members to outline specific plans for summer 2008 work schedule and planned work areas, see Board of Director Minutes 5-24-2008
- Received cost estimate for Herbicide Containment Study Protocol from Allied Biological, 3 site locations with curtains and dye testing $89,000, see Containment Protocol Proposal
- Shared Herbicide Containment Study with ELPOI officers and APA
- Secured permission from lake resident property owner to dispose of removed milfoil in a secure composting setting on his property
- Placed seasonal, lighted, milfoil patch hazard maker buoys
- Checked milfoil "kill rate" at a 2007 demonstration test site (patch 12), where one (1) 10' x 16' mat had been positioned/placed (no sign of milfoil or other vegetation under mat, some signs of small root milfoil plants collecting in sediment on top of mat)
- Had ELPOI transfer $14,000 to Town of Crown Point milfoil eradication account
- Shared with ELPOI general membership at July Annual Meeting news of receipt of Eradication Grant and specifics for 2008 project and plans for future years of work including use of Renovate see Annual Meeting Minutes 7-2008

- Addressed dialog about lake resident concern for use of recycled mill wire and possible environmental impact (did not have "in hand" a copy of DEC's Benefits of Use Determination (BUD) letter allowing International Paper (IP) to provide mill wire for this use)
- Compiled and shared with ELPOI membership the 2008 ELPOI Annual Report, see 2008 Annual Report
- Secured BUD and follow-up confirmation that BUD is still in effect from both DEC and IP, see BUD Determination
- Secured lake resident volunteers to help with milfoil fragment collection during times of diver work
- Initiated procedures to track labor specific to project
- Worked with involved parties on completing payroll/ reimbursement documents related to project expenditures
- Constructed a "Recent Events" web page to provide timely updates to the milfoil project and lake happenings, see Recent Events
- Secured permission/ notified local land owner(s) in location 48 regarding work in front of their place
- Placed twenty-two (22) 10' x 16' mats and hand harvested 22 large goodie bags from patch 48 on 2003 GPS Survey, patch just south of causeway bridge in western basin of lake, see map at 2003 GPS map. Patch 48 in 2003 was identified to be approximately 2,600 square feet - matt coverage in summer 2008 for this area was approximately 3,500 square feet approximately 35% greater in dense patch size and the hand harvest area that extended beyond this was several thousand square feet larger.
- Secured permission/ notified local land owner(s) in location 11 regarding work in front of their place
- Placed fourteen (14) 10' x 16' mats and hand harvested 12.5 large goodie bags from the tip of patch 11 (patch 11 is a collection of several small patches located in front of the "cabins" along Rt. 74). The owner of the cabins started an independent perimeter hand-harvesting project in fall of 2007. Placement of mats and hand harvesting completed the work on the patch at this site.
- Secured permission/ notified local land owner(s) in location 36 - 41 regarding work in front of their place
- Placed all remaining donated mill wire mat material over the leading (western) edge of patch 36 at the entrance to Ti Bay
- Met with ELPOI Board regarding progress to date and need for additional materials, interest/ directions for spending remainder of funds in Aids to Localities Grant by end of Aug 2009, and to get OK to purchase additional mat ballast and tarp material, see Board of Director Minutes 7-19-2008
- Purchased an additional 3,800 pounds of steel ballast for construction of additional mats
- Researched sources and type of material that could be used as mat material beyond mill wire (contacted Lake George Association, DEC, Lycott Environmental, Lake Luzerne and others)

- Selected “lumber tarp” material as replacement, see Lumber Tarp Specifications
- Received DEC permission to use it if it is new material, see DEC OK to use lumber tarp
- Purchased 6,000’ x 10’ roll of lumber tap material for use a benthic mats (black on white)
- Constructed 13,800 square feet of lumber tarp mats (sized 10’ x 21’), used all 3,800 pound of ballast (approximately 3.8 pound per square foot of mat)
- Completed a photo slide show of procedures to complete mat construction, see Mat Assembly Photos
- Completed matting and hand harvesting of patch 36
- Matted and hand harvested patches 37, 38, 39, 40
- Identified, matted and hand harvested several new 200 – 1000 plus square foot patches of 2003 GPS survey unidentified patches, between patch 36 and 41
- Surveyed patch 41 and identified significant tree tops and other debris that created opportunity for diver entanglement, material is believed to have come from clearing along Rt. 74. Dive team collectively decided not to harvest/mat this patch in interest of safety
- Completed a boat float/swim over waters on south shore from patch 41 to 44, identified several small hand harvest sites not identified on 2003 GPS survey, these will be addressed in 2009 as interest for immediate work to move forward was to place remaining assembled mats before losing divers for season
- Inquired and received confirmation of “permission to over winter benthic mats” see Inquire letter see Affirmative response to over winter
- Completed an underwater video swim over survey of patch 24 (approximately 35’ x 250’ with its long edge parallel to and about 30 feet off shore) prior to matting see Invasive Videos and Eagle Lake Milfoil Videos The shallow waterside (3 – 4 foot depth) had a distinctive edge between milfoil and native vegetation with a narrow 3-6 foot interface band; the deep-water edge (20 – 25 foot depth) had a hard edge between plants and ledge rock with no native vegetation in the area. The milfoil was growing in the silt it had trapped on the rock. Gradation of slope at this site was significant, this combined with a lack of anything for an anchor to grab into made anchoring the work float at this location difficult, it required wrapping the anchor line around large rocks at the bottom.
- Placed forty-one (41) 10’ x 21’ mats, 8610 total square feet, over patch 24. This patch was identified in the 2003 GPS survey at 7344 square feet in size. This was a 17% increase in previous identified patch size
- Completed very limited hand harvesting at patch 41, as focus was on getting mats placed due to coming of seasons end
- Carefully removed several “long plant specimens” from near the deep edge of patch 24 and measured plant length, plant length was 16 plus feet, roots to top

- Observed several distinct differences in milfoil plant communities as mating and hand harvesting took place:
    - Patch 48, milfoil was strong and robust, mats were placed over plants with little break off of fragments, there was negligible tall native vegetation in the area, hand harvested plant root mass produced limited amounts of stirred up silt and was easy to remove, bottom was a mix of ledge/boulders, rocks and sand
    - Patch 11, milfoil fragmented more than that at 48 but was still limited, for the most part this area had only milfoil with very limited native vegetation around the patches, bottom was sand and fine dirt that produced reasonable amounts of stirred up silt when individual plants and roots were removed
    - Patch 36, milfoil was very fragile and produced a "blizzard" of fragments as mats were placed over it; isolated milfoil plants outside the matted patch were mixed with a robust amount of native vegetation varying from short to very tall making it difficult to locate these isolated plants. The bottom was very silty and produced dense clouds when isolated plants were removed
    - Patch(s) 37 – 39 were similar in fragmentation to patch 11 but hand harvesting was very challenging as the bottom was a hard well packed sand and small pebble mix that made getting roots out difficult.
    - New patches between 36 and 41 were all similar in fragmentation to patch 11, what was most notable was that one patch was growing on a bed of small coble that was raked at about a 45* angle with no native vegetation around it.
    - Patch 24 had fragmentation similar to 48, the bottom was ledge rock covered with minimal amounts of milfoil root/ plant trapped sediment. The gradation of the bottom required careful placement of mats so that they didn't slide down the hill
- Obtained APA final details for proposed herbicide use required aquatic vegetation survey (1/4 mile radius of proposed treatment sites)
- Hired Allied Biological to complete Tier III Aquatic Vegetation Survey, see Photos -completing the survey
- Logged for four divers a total of 398.5 hours of dive time, actual underwater time is slightly less than this
- Logged 109.25 hours of top side diver support time
- Placed a total of 118 mats, fifty-two (52) 10' x 16' and sixty-six (66) 10' x 21' for a total of 24,200 square feet
- Removed 90.5 large goodie bags of milfoil with an estimated weight of 5,910 pounds
- "Eradicated" milfoil from approximately 8 of the 50 plus locations identified in the 2003 GPS survey
- Eradicated milfoil from several locations not identified as having milfoil in the 2003 GPS survey
- Billed approximately $11,300 in diver and dive support services

- Composed and distributed a September 2008 ELPOI newsletter informing ELPOI members and riparian lake property owners of the Summer 2008 milfoil project out comes, see September 2008 Newsletter
- Coordinated with Lake Management firm Allied Biological details for hand harvest and matting effort and interest in use of an herbicide for milfoil control
- Completed a brief surface visual inspection of above mat sites to verify mats are still in place (no apparent billowing from plant decomposition), noticed that in several places milfoil was growing out from mat overlap area, also noticed that rather tall plants (18 – 24 inch plus) had re-grown out of previously, just weeks earlier, hand harvested native vegetation areas.
- Returned 24' pontoon boat to Hyde's Boat and RV for winter storage
- Secured permission from local resident and moved work float to their "beach" area for winter storage
- Removed milfoil buoy markers for winter storage
- Winterized all dive and project related equipment and supplies

End of work for this reporting period 9-30-2008

Eagle Lake Property Owners Inc.
Celebrating 100 years of responsible lake stewardship in 2007.

Back to Previous Page

Pre/Post Treatment Plant Surveys

Here you will find the plant survey results from other lakes that have done Renovate treatments in their lakes. These surveys include both pre and post treatment data. Frequently asked questions about the herbicide Triclopyr can be found here.

New York

New York State	NYS list of confirmed lakes with Aquatic Invasives: Larry Eichler Darin Freshwater Institute January 2008
Saratoga Lake	Aquatic Plant Survey: Darrin Freshwater Institute (DFWI) 2008-12-01
	Fisheries Survey of Saratoga Lake: SUNY Cobleskill 2008-12
	Aquatic Vegetation Management Program: Aquatic Control Technology (ACT) 2008-11
	Herbicide Working well on Milfoil: Daily Gazette Article 2008-08-07
	Lake to use Herbicide SONAR: Leigh Hornbeck Article 2006-03-30
	Saratoga Lake Managing Non Native Plants with SONAR: Town meeting follow up to 2000 SONAR treatment 2001-02-01
	Aquatic Plant Survey: Aquatic Control Technology (ACT) post 2000 SONAR treatment survey 2001-12
	Note: Saratoga Lake was treated as part of a demonstration with SONAR in early summer 2000.
Waneta/ Lamoka Lake	Aquatic Plant Community: Response to application of herbicide (Robert L. Johnson, Cornell University) 2008-11-08
	Pictures from Waneta/ Lamoka Lake: Picture 1, Picture 2, Picture 3
	Note: Waneta Lake was whole lake treated with SONAR in 2003
Saratoga / Waneta/ Lamoka Lake	SePro Corp, North East Aquatic Plant Management Society Conference (NEAPMS): Presentation 2008-01-19: Successful Operational use of Renovate OTF, Dr. Mark Heilman
Eagle Lake	Located HERE (separate page coming soon)

Vermont

Lakes Morey and St. Catherine	Non-Target Plant Species Response From 2007 Spot Treatment: Vermont Agency of Natural Resources (VT ANR) 2008-03-10
Lake Morey	Aquatic Vegetation Management Program: Aquatic Control Technology (ACT) 2008-10 (Year 2 of a 5 year integrated plan)
	2008 Vermont DEC Herbicide (Renovate) use permit: for year 2 of 5 for an integrated lake management plan. Vermont DEC 2008 Application number 2007-C13
Lake St. Catherine	Aquatic Vegetation Management Program: Aquatic Control Technology (ACT) 2008-11 (Year 5 of a 5 year integrated plan)
Lake Hortonia and Burr Pond	Aquatic Vegetation Survey: Darrin Fresh Water Institute (DFWI) 2008-11 (Summaries from 1999-2008)

	2008 Vermont DEC Herbicide (Renovate) spot/partial lake use permit: for year 5 of 5 for an integrated lake management plan. Vermont DEC 2008 Application number 2008-C01
Star Lake	Post Renovate Treatment Survey: Lycott Environmental 2008-09-07
	Pre-treatment Survey: Lycott Environmental 2006-09-07
	Lake Report Post SONAR Treatment: Update 2004
	Lake Management Plan: 5 Year Goals 2003
	Note: Star Lake was treated with SOANR in 2003 and again with Renovate in 2007

Rhode Island

Rhode Island	As part of a new 2008 RI permit for the use of an aquatic herbicide lake property owners need to "signoff" prior to a treatment. The following is a Lycott Environmental sample of such notification

New Hampshire

Captains Pond	Visual Observations of Pre and Post Renovate Application: Amy Smagula NH Department of Environmental Services, Aquatic Control Technology (ACT) contractor. 2008 Summer

Thank you for your support in helping to make ELPOI's goal of maintaining our lake and its surrounding shorelines a reality.

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Site layout by Michael Tiedemann
Comments and additions are greatly appreciated!
Last Updated: April 18, 2009

Triclopyr Questions and Answers

These questions were submitted by the public. The questions were answered by a team of experts.

1. **What is triclopyr?**

   Triclopyr *(pronounced tri–clo–peer)* is an herbicide that can control infestations of Eurasian watermilfoil and other broad-leaf water plants. Eurasian watermilfoil is more sensitive to triclopyr than many native aquatic species including coontail, rushes and cattails. Triclopyr can therefore be used at label concentrations to remove Eurasian watermilfoil without killing many native plants. One triclopyr product is currently registered and marketed for aquatic weeds - Renovate 3™.

2. **There are two types of triclopyr. Which one is registered for aquatic use? What distinguishes these two types of triclopyr from each other?**

   Renovate 3™ (triethylamine salt of triclopyr – 3 lb/gal acid equivalent) is the only formulation of triclopyr registered by the US EPA as an aquatic herbicide. The other formulation Garlon 4 is a butoxyethyl ester formulation with 4 lb/gal acid equivalent and this formulation is not registered for aquatic use.

3. **Has a full risk assessment been performed on triclopyr? If so, by whom?**

   An Environmental Impact Statement (EIS) has been completed by the Washington Department of Ecology and a full risk assessment was conducted by Ecology and formed the basis for the EIS.

4. **How toxic is triclopyr to humans?**

   Concentrated triclopyr products are corrosive and can cause skin irritation and irreversible eye damage if splashed in the eye. However, only dilute amounts of triclopyr are needed to kill Eurasian watermilfoil. These dilute concentrations have not been shown to cause skin irritation or other health effects. Triclopyr is not well absorbed through skin. If ingested, research has shown that low doses of triclopyr are rapidly excreted in humans and are unlikely to accumulate in human tissue or cause adverse effects.

   In natural waters, the initial breakdown products of triclopyr are TCP and TMP. Tests in laboratory animals on both these metabolites have shown that their toxicity to mammals is less than or equal to triclopyr. These metabolites are relatively short-lived in the environment. Complete breakdown of triclopyr results in carbon dioxide, oxamic acid, and other low molecular weight carboxylic acids.

   Triclopyr is not considered to be a cause of cancer, birth defects, or genetic mutations. Nor is it considered likely to cause systemic, reproductive, or

developmental effects in mammals at or near concentrations encountered during normal human use. However, Washington State Department of Health considers it prudent public health advice to minimize exposure to pesticides regardless of their known toxicity.

5. **Does triclopyr accumulate in human and animals?**

   Triclopyr and its metabolites are excreted rapidly in humans and mammals. A study in human volunteers, given low doses showed that blood levels peaked two to three hours after ingestion and declined to undetectable levels within 48 hrs. A studies in rodents showed that triclopyr and metabolites have a short residence time in other bodily tissues (12-15 hours).

6. **Is there any relationship between triclopyr and cancer?**

   Triclopyr was determined to be "not classifiable as to human carcinogenicity" by EPA reviewers. This means the EPA did not consider the animal evidence to be sufficient to list triclopyr as a possible human carcinogen. Nor did it find the evidence definitive enough to rule out carcinogenicity. EPA considered results of the a 22 month assay in mice, a 24 month assay in rat, and results from *in vitro* tests for mutations. There were marginal increases in some breast tumors (benign) but no consistent pattern across dose groups and no dose-response pattern. EPA does not consider this a data gap since the required studies were conducted and were acceptable to EPA.

7. **Does triclopyr have impacts on reproduction?**

   EPA requires that pesticides be assessed for reproductive effects. In the reproductive tests two generations of rodents are fed the pesticide in their daily diet. It is common that pesticides have a positive response at the highest dose tested. This is because the test protocol requires the highest dose to be high enough to elicit a reproductive effect (unless the dose required causes death or severe suffering of the animal). Generally the highest dose must show an effect or the test is unacceptable to EPA. Impairment of reproduction by triclopyr was seen only at doses high enough to cause toxicity to the mothers. No reproductive effects were seen at lower doses. The high dose was very high relative to potential human exposure. It was 500 times the dose considered by EPA to be safe for daily exposure to humans and over 1400 times higher than the worst-case scenario for human exposure to triclopyr in lake treatments.

8. **At what levels of application is there documented evidence of impacts to people, fish, wildlife, microorganisms etc? Will these levels be achieved in applications to lakes to control Eurasian watermilfoil?**

   Renovate 3™ is used at levels no greater than 2.5 ppm (maximum labeled rate) in lakes. These levels have been found to be safe to the environment and non-target species based upon testing conducted for US EPA Registration.

9. **If my lake is treated with triclopyr, will I be exposed to this herbicide?**

   Residues of triclopyr and its metabolites should not be detectable in lake water more than a couple weeks past the application. If you do wade or swim in the lake, touch pets that have been in the lake, or eat fish from treated water shortly after the treatment, you may be exposed to dilute concentrations of triclopyr and its metabolites.

   There is little chance of exposure to bystanders during the herbicide application process. This is because liquid triclopyr herbicide is injected directly into the water column. The application method eliminates opportunity for drift of sprays onto bystanders or nearby residents during the application. Triclopyr has a low vapor pressure and is quite water-soluble so it will not volatilize from treated water and drift through air following the application.

10. **Is it safe to swim or play in the water following the herbicide application?**

    There are no swimming restrictions on the Renovate 3™ label following application of triclopyr to water. This means that the federal EPA considers the treated water safe for swimming. However, to impose an additional layer of safety to swimmers (due to potential for eye irritation) the Washington Department of Ecology is imposing a twelve hour swimming restriction in Washington after treatment with triclopyr.

    Washington State Department of Ecology recently contracted for an independent scientific assessment of triclopyr safety including this question of a swimmer's exposure. The most conservative scenario considered was a six-year-old who swims for three hours and inadvertently swallows 150 ml of water from a lake treated with the maximum allowable rate of triclopyr. The estimated amount the child would absorb in this scenario was still more than 100 times less than the daily dose animals were fed over their lifetime with no observable adverse effects.

    Washington State Department of Health (DOH) has reviewed the data and agrees that skin contact with treated water at the dilute treatment concentration is unlikely to result in any adverse health effect in people. Triclopyr products are concentrated when initially injected into water during an application so, as a precaution, DOH advises people to avoid contact with water in treated areas for twelve hours following an application to allow the herbicide concentrate to disperse and reach the dilute treatment concentration.

11. **Are fish from the treated area safe to eat?**

    One breakdown product of triclopyr, called TMP, can temporarily accumulate in fish and shellfish immediately following a triclopyr application. The EPA did not consider the concentration of this metabolite to be of health concern and requires no fishing restrictions.

    Washington State Department of Ecology recently contracted for an independent scientific assessment of triclopyr safety including this question of eating fish from treated

waters. Scenarios for children and adults consuming fish every day from treated water resulted in estimated exposures that were more than 1000 times less than the daily doses animals were fed over their lifetime with no observable adverse effects.

12. **Has triclopyr been tested for special sensitivity to children?**

The EPA is required to assess each pesticide for its potential to cause toxicity specifically to infants and young children. This is because children's bodies are still developing and they may be more susceptible to the action of a toxicant. EPA conducted this assessment using animal tests and concluded "Reliable pre-and post-natal data indicate no special sensitivity of young animals to triclopyr residues."

13. **What are the toxicity levels of triclopyr to aquatic organisms?**

For aquatic organisms, the acute toxicity values for triclopyr with rainbow trout, salmon species, bluegill sunfish, and the water flea (*D. magna*) are shown below in Text Table 1. Note: All testing done with laboratory water at pH of ~7-8, typical of conditions in the Pacific NW area, as demonstrated in Figure 1.

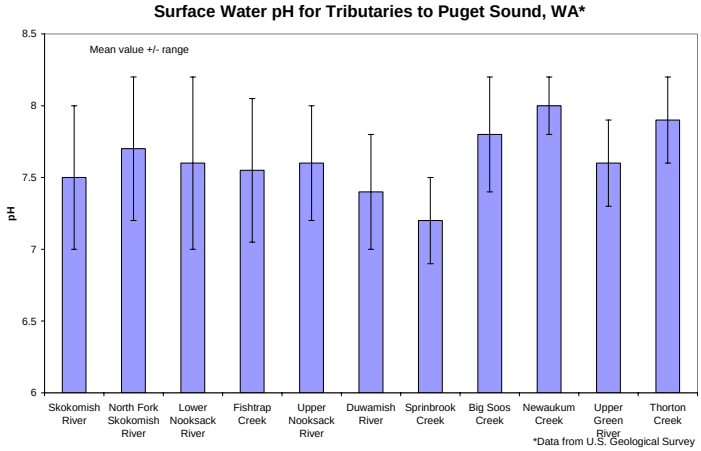

Figure 1. Surface water pH for Puget Sound tributaries (from U.S. Geological Survey)

Text Table 1. Acute toxicity data for aquatic species with Triclopyr

	R. Trout	Salmon sp.	Bluegill	Water Flea
Acute 96-hr LC50 (ppm)	86 to 117	82 to 182	148	133 (48-hr)

EPA Toxicity Rating: "Slightly toxic to Practically non-toxic"

The EPA classifies pesticides according to their acute toxicity responses. Compounds with acute values >100 ppm are classified "Practically non-toxic" (best rating), while compounds with acute values of 10-100 ppm are classified as "Slightly toxic" (second best classification). The overall weight of evidence indicates that triclopyr acute toxicity values average ~100 mg/L or greater with invertebrate and vertebrate species, indicating

that a collective “Practically non-toxic” rating is most appropriate as a generic classification.

14. **What does “practically non-toxic” mean?**

Practically non-toxic is an ecotoxicological category used to describe pesticides and other chemicals. In the chart below you will see that it is the lowest toxicological category.

Table II: Ecotoxicological Categories

Toxicity Category	Mammalian (Acute Oral)* mg/kg	Avian (Acute Oral)* mg/kg	Avian (Dietary)– ppm	Aquatic Organisms‡ ppm
very highly toxic	<10	<10	<50	<0.1
highly toxic	10-50	10-50	50-500	0.1-1
moderately toxic	51-500	51-500	501-1000	>1-10
slightly toxic	501-2000	501-2000	1000-5000	>10-100
practically non-toxic	>2000	>2000	>5000	>100

* Reflects dose given to test animals and is based on body weight of the test animal.
_Concentration in the diet. Unrelated to body weight of the test animal. Measure of environmental exposure.
‡Concentration in water. Unrelated to body weight of test animal. Measure of environmental exposure.

The words "pesticide" and "poison" are not synonymous. Relatively few pesticides are poisonous to humans according to the standard meaning of the term. “The dose makes the poison" is a saying all doctors understand. What it means, in essence, is that it’s not simply *what* you come in contact with or ingest that determines risk, it’s also *how much* you contact or ingest. This point is important because most pesticides are designed to control pests with amounts far smaller than the amount that would affect humans and pets. Contrary to popular belief, pesticides are not a uniquely toxic class of substances. They range from practically non-toxic to highly toxic—as with other classes of natural and manmade substances.

15. **Why does the Renovate 3™ label state to not apply to saltwater? Does it become toxic in a saltwater environment? Are salt water plants, creatures etc more susceptible to triclopyr than freshwater? If so how and why?**

A pesticide can only be directly applied to sites that it has been approved for through the US EPA label registration process. The label only indicates where a pesticide may be applied and does not restrict where residues may be discharged. Triclopyr does not become toxic in salt water. Salt water plants and animals should not be any more sensitive to triclopyr than the freshwater organisms that have been tested with triclopyr. As an example from the Renovate 3™ Material Safety Date Sheet (MSDS) the Acute

LC50 for pink shrimp (*Penaeus duorarum*) is 895 mg/L. This is over 350 times higher than the maximum rate that is normally applied to lakes.

16. **What are the long term affects of triclopyr on mammal systems - if it accumulated in mammalian tissue 5 yr, 10 yr, 20 yr. later?**

    Populations of several native mammals and birds were studied for several years following triclopyr, prescribed burning, and combination treatments in oak-savanna woodlands. Populations for all species showed either no change or increases following treatments. Thymus gland weights showed a statistically significant increase in burned areas both with and without triclopyr applications (Lochmiller et al. 1995). Recently published studies showed no impact of triclopyr applications on wildlife populations, relative to non-herbicide based vegetation management practices (Duchesne et al. 1999; Harpole and Haas 1999; Leslie et al. 1996; Leutenschlager et al. 1998; Lindgren et al. 1998; Nolte and Fulbright 1997). One study (Obenshain et al. 1997) reports that the combined use of triclopyr with 2,4-D and glyphosate may lead to concentrations of these herbicides in water that may cause adverse effects which are not detailed in the publication. In mammals, most triclopyr is excreted, unchanged, in the urine. Triclopyr was observed to concentrate slightly in ovaries of laboratory animals given repeated doses. No accumulation was observed in other tissues. The authors concluded that triclopyr and its metabolites are likely to have a low potential to accumulate upon repeated exposure (Timchalk et al. 1990). Data quoted from this website: http://www.fs.fed.us/r6/weeds/Triclopyr_Profile.PDF

17. **Could triclopyr possibly impact bats and or other mammals, especially bats that are pregnant or nursing their young?**

    Renovate3™ has a low potential for bioaccumulation. Triclopyr is typically found at a concentration in animals many times less than what is present within the surrounding water and is eliminated relatively quickly. The LD50 for Rats has ranged from 630-729 mg/Kg (Tu et. al.). Since the material does not bioaccumulate bats would not be able to develop concentrations that would affect them or their offspring by drinking treated water or foraging on insects from the treated water.

18. **What are the inert ingredients in triclopyr?**

    Garlon 3A™ and Renovate 3™ are identical products marketed under two names. Ingredients listed on either the pesticide label or Material Safety Data Sheet are:

    - triclopyr TEA salt (44.4%)
    - ethanol (amount not specified but more than 1%)
    - triethylamine 3%,
    - ethylenediamine tetraacetic acid 2.3%.

    The regulatory manager at Dow Agrosciences (manufacturer of triclopyr) disclosed that the product is more than 45% water and contains small amounts of an antifoam product

and a surfactant. He explained that triethylamine is used extensively in cosmetics and has an allowable level in food. He also explained that EDTA helps the product adjust to the hardness of the lake water. He confirmed that the ethanol was present at ~2% of the formulated product. Some of the other ingredients could contribute to the hazard of the product for pesticide applicators if direct skin or eye contact with the concentrated product occurs. The other ingredients listed do not pose a risk to the general public in contact with the diluted product. This is because the product is diluted in water more than 100,000–fold for control of Eurasian watermilfoil.

19. **Are there "gaps" in the data on triclopyr - things that we do not know the answers to?**

    There are often site-specific endangered animals or rare plants that have not been tested. To avoid impacts, the Washington Department of Ecology requires that the applicant check with the Department of Natural Resource's Heritage Program for rare plant locations and to consult the lists for animals. Because some salmon stocks are listed as threatened and endangered in the Pacific Northwest, the Washington Department of Ecology has also contracted with the University of Washington to conduct tests for potential sub-lethal effects on salmon with various herbicides.

20. **Are there any "unknown" risks to the use of triclopyr?**

    The world is full of potentially toxic substances and dangerous situations. However, separating the trivial and low level risks from the important environmental risks requires the application of sound scientific principles. Both the US EPA and the Washington Department of Ecology have examined the wealth of data and conducted risk assessments on triclopyr. They have both determined that triclopyr will have no significant acute or chronic impact on people, fish, or freshwater invertebrates when recommended rates are used.

21. **Is triclopyr one molecule away from Agent Orange?**

    The health effects of Agent Orange are linked to its dioxin contamination. Triclopyr does not contain toxic dioxin impurities so we do not need to be concerned about health effects of dioxins in the use of triclopyr.

    The molecule of triclopyr acid is structurally similar to the two herbicides in Agent Orange.

    - Agent Orange was an herbicide used extensively in the Vietnam war to defoliate large tracts of forest.
    - Agent Orange contained two active ingredients: 2,4-D and 2,4,5-T. Triclopyr acid is one atom different from 2,4,5-T and two atoms different from 2,4-D.
    - Triclopyr acid differs in an important feature. Triclopyr is based on a pyridine ring and 2,4,5-T is based on a phenol ring.

- This ring difference prevents dioxin impurities from forming during production of triclopyr.
- The principle health issue with Agent Orange was contamination with a highly toxic dioxin impurity (2,3,7,8- TCDD) formed during the synthesis of 2,4,5-T.
- Health effects observed in Airforce mixers, loaders, and sprayers; who experienced heavy occupational exposure to Agent Orange; have generally been ascribed to dioxin exposure.
- 2,4,5-T is now banned, largely because of unavoidable dioxin impurities formed during its production.
- Dioxin impurities do not occur in the synthesis of triclopyr because of the difference in the ring structure.
- There is no natural pathway for triclopyr to chemically convert to 2,4,5-T or form dioxins in the environment.

22. **How many of the triclopyr studies have been funded - in whole or in part - by Dow Chemical or one of its subsidiaries? What is the level of potential conflict of interest here?**

    Most of the studies required by EPA for the registration for triclopyr as an aquatic herbicide have been funded by its manufacturer. This is normal since companies typically spend 20-50 million dollars in testing to meet EPA registration requirements for aquatic herbicides. EPA has extremely rigorous testing standards called Good Laboratory Practices that the laboratories must comply with. This helps ensure quality results. Who else, besides the company selling the product would be willing to invest this sort of money in toxicity testing? However, government agencies and Universities often conduct their own field trials and other research and these published results are considered by the state when conducting risk assessments. For instance the University of Washington has published studies on using triclopyr to control purple loosestrife. The Washington Department of Ecology and the University of Washington are conducting research on the impacts of triclopyr (and other aquatic herbicides) on the smoltification of juvenile coho and chinook salmon.

23. **What does "half-life" mean and what is the "half-life" of triclopyr?**

    Half life is the period of time that must elapse for a pesticide to breakdown to ½ its original concentration. The half-life varies dependent upon where the triclopyr is found (i.e. water, hydrosoil, etc.) and other environmental factors. Half-lives for triclopyr and its breakdown products average six days or less in water and 8.4 days or less in sediment. (Citation: Letter to Kathleen Emmett, Dept. of Ecology, March 18, 2004: Comments on Environmental Impact Statement for Permitted Use of Triclopyr – Draft from Brian L. Bret, Ph.D.). Renovate 3™ has been shown to drop to non-detectable levels in 24 hours – 15 days (typically 3-7) based upon immunoassay testing completed during the 2003 field season.

24. **What does triclopyr "break down" into – are these elements harmful in any manner?**

Triclopyr's eventual, final metabolite is carbon dioxide (CO_2). To get there, it typically breaks down into trichloropyridinol or TCP, a compound that itself is far less stable than triclopyr in aquatic systems, as seen in aquatic field studies. TCP itself has a comparable level of toxicity as triclopyr and is frequently found at low concentrations in early sampling points in field studies. The methoxypyridine or TMP metabolite is rarely observed but also has a comparable level of toxicity as triclopyr and TCP.

25. **How long will the herbicide last in the lake water?**

In natural water, sunlight and microorganisms rapidly degrade triclopyr. Triclopyr concentrations decline sharply over the first several days after treatment. Residues should be more than 95% degraded and dissipated from treated water in 1-2 weeks following treatment with triclopyr.

26. **Will triclopyr, be found in the sediment of lakes after treatment?**

Renovate3™ degraded in the sediment in a relatively short period of time

27. **What are the impacts that triclopyr could have on ground water?**

The limited mobility of triclopyr in soil, low absorption constant, and high rate of microbial and photolytic degradation in water and sediment would indicate that this compound would have little potential for the extensive mobility required to contaminate groundwater supplies. This assumption is supported by data collected by the US Geological Survey (USGS), as this federal agency has collected over 850 groundwater samples over a five-year period in the Pacific Northwest area and these samples have been examined for pesticide residues. Triclopyr has never been detected in any of the groundwater samples taken by the USGS, despite extensive use as an herbicide in this region in forestry applications over a 20-year timeframe.

28. **What will be the positive impacts of utilizing triclopyr to control Eurasian watermilfoil?**

Triclopyr (Renovate 3™) is selective to broad-leaved submersed aquatic plants such as Eurasian watermilfoil. Many native aquatic plants are not broad-leaved and are not significantly impacted by triclopyr. Significant reduction of Eurasian watermilfoil is a key component of improving and restoring the native aquatic plant community. If native species have less Eurasian watermilfoil to compete with they recover. There are additional benefits to the organisms that utilize these native species for food or shelter with the reduction of the Eurasian watermilfoil.

29. **What are the risks associated with a "Do Nothing Alternative" in lakes with Eurasian watermilfoil?**

Eurasian watermilfoil generally dominates the ecosystem to depths up to 20 feet (depending on the light conditions) and out-competes native submersed aquatic vegetation. The diversity of the aquatic vegetation community generally declines in Eurasian watermilfoil infested water bodies and this impacts the entire community within the lake. A plant such as Eurasian watermilfoil invades takes over and becomes a *keystone* species in a foreign environment/ecosystem. This changes and has negative impacts on the entire ecosystem.

30. **How can triclopyr kill only the milfoil and not other plants?**

Broad-leaf plants (dicots) have different biochemistry than monocots. Triclopyr affects the family of broad-leafed plants or dicots. Eurasian watermilfoil is a broad-leaf plant whereas most native aquatic plants are monocots and not susceptible to triclopyr.

31. **Is triclopyr a long term solution - or a short term fix?**

Eurasian watermilfoil is extremely difficult to eradiate. If diver hand pulling of Eurasian watermilfoil can be successfully accomplished in the water body after the triclopyr treatment to remove remaining milfoil, then the triclopyr treatment could offer some long-term results.

32. How will the die off of Eurasian watermilfoil plants in lakes after triclopyr treatment impact the lake?

Eurasian watermilfoil plants will slowly exhibit symptoms of herbicide damage (twisting of the stems due to the plant hormone (auxin-like) effect of triclopyr). The plants will gradually sink to the lake bottom and decompose. Systemic herbicides generally take a week to several weeks to entirely kill the plants so that you don't tend to get severe oxygen depletion that can sometimes occur when using contact herbicides. Native plants will fill in the areas left unoccupied by Eurasian watermilfoil.

33. **Are there any species "at risk" with the use of triclopyr?**

Broad-leaf aquatic plants, such as Eurasian watermilfoil, will be affected by triclopyr.

34. **Where else has triclopyr been used? Were any problems encountered with these applications – to the environment, fish, wildlife etc.?**

Renovate 3™ was labeled for use by the EPA in November of 2002. Prior to this triclopyr it had been used under an Experimental Use Permit as an aquatic herbicide since 1988 (for small test plots around the country). Additional field trials have been completed by researchers since 1984). A number of scientific papers by independent researchers have been published about field studies including studies in the Pend Oreille

River, Washington, and Lake Minnetonka Minnesota. Triclopyr has also been used for purple loosestrife control in Washington. In 2003 (Renovate 3™'s first field season after EPA registration) it was used in 27 states on hundreds of projects. There have not been any reported problems encountered with these applications.

35. **Is it true that some native plants take over a year to recover from an application of triclopyr?**

Triclopyr is a selective herbicide which means that it generally targets the broad-leaved aquatic plants. Although there are few aquatic broad-leaved plants, there are others beside Eurasian watermilfoil. These species could be expected to be impacted by triclopyr. Eurasian watermilfoil is not thought to have viable seeds or other reproductive structures (besides fragments), whereas native aquatic plants have seeds, and sometimes tubers and other over-wintering structures. Even if the mature native plants are impacted by triclopyr, these plants should recover from their seeds or tubers the next season. Triclopyr treatment should enhance native plant growth since Eurasian watermilfoil crowds out native species. Removing Eurasian watermilfoil opens up niches that native species will fill. A study done in the the Pend Oreille River by the US Army Corps of Engineers with triclopyr documented that removing Eurasian watermilfoil markedly enhanced native plant growth in the treated areas.

36. **Can milfoil plants develop immunity to triclopyr?**

Short-term and long-term data collected by the U.S. Corps of Engineers Aquatic Plant Control Research Program (Vicksburg, MS) has not demonstrated that Eurasian watermilfoil is capable of developing immunity or "resistance" to triclopyr's mode of action. Work conducted by Dr. Kurt Getsinger and others with the Corps of Engineers indicates that "*control of this species is likely*" with appropriate dose regimes of triclopyr, which generally range from 0.5 to 2.5 ppm. The Corps of Engineers is particularly interested in the use of triclopyr to control milfoil for maintenance of waterways, as "*this herbicide shows a low order of toxicity to microbial communities and higher aquatic organisms and residue accumulation in sediment, shellfish, and fish is negligible**".

*Netherland, M. and Getsinger, K. 1992. Efficacy of triclopyr on Eurasian watermilfoil: Concentration and exposure time effects. J. Aquatic Plant Management 30: 1-5.

Eagle Lake Property Owners Inc.
Celebrating 100 years of responsible lake stewardship in 2007.

Back to Previous Page

Herbicide Information

Aquatic herbicides are an integral part in a full tool box approach to the management of aquatic nuisance species. This method of control allows a selective targeting of species that is unavailable with other methods of control. These herbicides are available in a variety of contact times, and application forms.

Pellets and flakes allow for a slower release of the herbicide into the water column to offer an extended contact period with the plant; and are recommended for use in areas with large amounts of water change. Liquid forms allow for faster dilution into the water column and faster interaction with plants.

Renovate comes with no restrictions on water use in the treatment area. Renovate's shorter contact time can cause under certain conditions, treatment of aquatic weeds to result in oxygen depletion or loss due to decomposition of dead plants.

Pesticide Awareness Network (PAN) Chemicals of Special Concern and Acute Toxicity Explanation

SEPRO (the Manufacturer of Sonar and Renovate)	
Renovate (active ingredient Triclopyr)	Sonar (active ingredient Fluridone)
Triclopyr Frequently Asked Questions	
Renovate (General Use Label)	Sonar Aqueous Solution (AS) (General Use Label)
Renovate On Target Flake (OTF) (General Use Label)	Sonar Slow Release Pellet (SRP)(General Use Label)
Renovate (NYS Supplemental Use Label)	
Renovate OTF (NYS Supplemental Use Label)	
Material Safety Data Sheets	
Renovate (MSDS)	Sonar AS (MSDS)
Renovate OTF (MSDS)	Sonar SRP (MSDS)
EPA Triclopyr Reregistration (Full Report)	
EPA Triclopyr Reregistration (Fact Sheet)	
Toxicology Reports (PAN)	
Product Info for Renovate herbicide	
Triclopyr, Triethylamine Salt (Molecular Properties)	
Triclopyr's impact on Fish	
Triclopyr's impact on Aquatic Plants	
Triclopyr's impact on Aquatic Organisms	
Adirondack Council (Information on Renovate)	
Washington State Environmental Impact Statement (EIS): for use of Renovate	

Army Corps of Engineers
A Review of The Aquatic Environmental Fate of Triclopyr
Small-plot low dose treatment with triclopyr
Aquatic Dissipation (Triclopyr in Lake Minnetonka MN.)
Dissipation of Triclopyr (Herbicide applied in Lake Minnetonka)

Vermont DEC Applications Renovate for Use

Renovate Treated Lakes Pretreatment and Follow Up Plant Surveys	
Lake Morey	2008 Vermont DEC Herbicide (Renovate) use permit: for year 2 0f 5 for an integrated lake management plan. Vermont DEC 2008 Application number 2007-C13
Lake Hortonia and Burr Pond	2008 Vermont DEC Herbicide (Renovate) spot/partial lake use permit: for year 5 of 5 for an integrated lake management plan. Vermont DEC 2008 Application number 2008-C01

Thank you for your support in helping to make ELPOI's goal of maintaining our lake and its surrounding shorelines a reality.

The ELPOI is a 501(c)(3) not for profit organization.

Site layout by Michael Tiedemann
Comments and additions are greatly appreciated!
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