

New York State Department of Environmental Conservation

Division of Fish, Wildlife & Marine Resources

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Alexander B. Grannis
Commissioner

July 10, 2009

Mr. Rolf Tiedemann
358 Electric Avenue
Rochester, New York 14613

SUBJECT: The use of curtains in association with the use of Renovate Herbicide in Eagle Lake

Dear Rolf:

In the past few months, you advised me that the Adirondack Park Agency (APA) had recommended for a Renovate treatment to be allowed in Eagle Lake, curtains should be placed around the treatment area to prevent the herbicide from drifting out of the treatment area and harming non-target vegetation in areas of the lake not designated for treatment. Yesterday, you asked if I could provide you with a written summary of my professional opinion regarding the use of curtains for that purpose.

In my opinion, the use of curtains around a proposed Renovate treatment area in Eagle Lake would be unlikely to result in any substantial environmental benefit, and if the requirement for curtains precluded the use of the herbicide, then the lake could suffer environmental harm.

The reason for proposing an herbicide treatment in Eagle Lake is to enhance efforts to eradicate the aquatic invasive plant Eurasian watermilfoil (*Myriophyllum spicatum*) (aka EWM). Eagle Lake was awarded a New York State Aquatic Invasive Species Eradication Grant (through the Town of Crown Point) for this purpose in November 2007. While other Adirondack Lakes have initiated EWM eradication programs based solely in hand harvesting and benthic matting programs, Eagle Lake chose to augment a hand harvesting/benthic matting program with a limited herbicide application in one area of the lake where it was believed the other, non-chemical techniques would not be effective because of the depth of the water and the density of EWM present.

Renovate, with the active ingredient triclopyr, is a selective herbicide. EWM is highly sensitive to triclopyr and is killed quickly and easily by the chemical. Other native plants are resistant to the effects of triclopyr and will be completely unharmed when exposed to the same concentrations that are 100% lethal to EWM. Others are moderately sensitive and could experience varying degrees of harm ranging from slight browning around the plant margins to death of a small percentage of the exposed plants.

I compared the results of the 2008 Tier III Aquatic Plant Survey of Eagle Lake with Table 4-2 of the Renovate/triclopyr SEIS. This table lists the impact of Renovate to common aquatic plants in New York State.

Of the five submerged aquatic plants listed in Table 4-2, the only ones identified as “highly sensitive” are four species of milfoil (including EWM) and the water marigold. Of the ten plant species that are listed in Table 4-2 as highly sensitive to triclopyr, only one is a monocot. The other nine species are all dicots, which demonstrates that triclopyr is clearly selective for dicot aquatic plants. Of the ten plant species listed in Table 4-2 as highly sensitive to triclopyr, only two are listed in the Tier III aquatic plant survey as present in Eagle Lake; EWM (the target species), and water marigold. There are 12 species of the aquatic plant genus *Potamogeton*, better known as pondweeds, listed in Table 4-2. All of the *Potamogeton* species are of low susceptibility to triclopyr. *Potamogeton* species are also all monocots. There are three species of *Potamogeton* species found in Eagle Lake that were not listed in Table 4-2. Because all *Potamogeton* species are monocots and of low sensitivity to triclopyr, it is reasonable to assume that these three other species are likewise insensitive to the toxic effects of triclopyr. Table 4-2 lists *Chara* species (muskgrass) as being insensitive to triclopyr. *Chara* species are actually macroalgae. The Tier III aquatic plant survey of Eagle Lake lists stonewort (*Nitella flexilis*) as one of the species present. *Nitella*, like *Chara*, is not a macrophyte, it is a macroalgae. Both species are in the family Characeae. Because *Chara* species are insensitive to triclopyr, it is reasonable to expect that stonewort would be insensitive also. Another plant listed in the Tier III aquatic plant survey of Eagle Lake that is not listed in Table 4-2 is pipewort (*Eriocaulon aquaticum*). Pipewort is a monocot. Table 4-2 lists 35 monocot aquatic plants. One is highly sensitive to triclopyr, four are of medium sensitivity, and 20 are insensitive. The fact that pipewort is a monocot suggests that there is a good likelihood that pipewort is insensitive to triclopyr as well (see Table 1).

This analysis suggests that if all of the 28 plants identified in the Tier III aquatic plant survey as being present in Eagle Lake were present in the same one acre square, and that one acre were to be directly treated with triclopyr, the most likely results would be that two species, EWM and water marigold, would be eradicated. Five other species may suffer some damage and/or a portion of their populations might be lost. Nineteen species are insensitive to triclopyr and would probably not be effected at all. For two species, the potential effects are unknown. Thus, directly within the treated area, 25% (7/28) of the plant species are likely to be effected to some greater or lesser degree, while 75% of the plant species present are unaffected by the treatment. One of the seven species that will be effected is EWM, which is the species targeted for eradication and is the most abundant plant in the lake.

The OTF flake formulation of Renovate is designed to reduce the potential for drift, and without curtains, some herbicide will undoubtedly drift from the treatment area. But what are the consequences of such drift? If the herbicide drifts, the concentration will be diluted. A more dilute concentration would effect the seven susceptible plants even less. Drift/dilution would reduce the likelihood that any of the five plant species present of medium susceptibility would be effected at all, and the highly sensitive plants would only suffer moderate effects. The benefits of curtaining the treatment area are not significant, considering that 75% of the plant species in the direct target area of the treatment are unlikely to be harmed at all, and only two plant species present are likely to be damaged to the point of eradication, which is the point of the treatment for one of the two species.

There are two plant species present in Eagle Lake that are listed as protected species in New York State; northern pondweed (*Potamogeton alpinus*) and water marigold (*Megalodonta beckii*). Both

listed in the “threatened” category. Northern pondweed is unlikely to be harmed by a Renovate treatment because as a *Potamogeton* and a monocot, it is most probably insensitive to triclopyr. Water marigold, however, is listed in Table 4-2 as highly sensitive to triclopyr. Ostensibly, a case could be made that the Renovate treatment should be denied or curtailed in order to protect water marigold.

That might be true if the nature and capacity of Eurasian watermilfoil is not taken into account. EWM is an aggressive, invasive plant because it outcompetes and overwhelms native vegetation. If EWM is not removed from the lake, then water marigold could well be extirpated as a result of the competitive growth of milfoil.

If water marigold is growing in close proximity to targeted stands of EWM, than it is at risk, either from EWM competition or the effects of the herbicide. In this situation there might be a value to the use of curtains, but if the expense of the curtains precludes their use, and subsequently the denial of a permit to use the herbicide, the water marigolds still remain at risk from expansion of the milfoil.

Water marigolds growing some distance away from areas targeted for EWM eradication (perhaps 100 feet to 100 yards) are probably unlikely to be effected by the herbicide.

Perhaps one way to use curtains effectively might be to curtain off areas where water marigolds grow in close proximity to treatment areas, rather than curtaining off Renovate treatment areas, if the depth and extent of that type curtaining is more affordable.

One worst case scenario is that the Renovate treatment is allowed without curtains. Then 75 – 93% of the plant species present in and around the treatment area would be unaffected but EWM and water marigold would be eradicated. Another worst case scenario is that Eagle Lake is not treated, and water marigold is extirpated by encroaching milfoil.

In summary, curtains provide little benefit to the protection of the lake from a Renovate treatment, as most of the plant species in the lake are not going to be impacted anyway, even in the treatment areas. Curtains could be useful for protecting water marigold, however, perhaps curtains could be used more practically to screen off areas of water marigold from the rest of the lake. If the curtaining requirements for screening off the water marigolds is still too expensive and extensive to allow any herbicide treatment, the marigolds will not be protected. They will continue to be at risk from competitive pressure from the milfoil.

Sincerely,



Timothy Sinnott
Biologist 2 (Ecology)
Leader, Ecotoxicology and Standards Unit

Table 1. Comparison of the plants listed in the 2008 Tier III Aquatic Plant Survey of Eagle Lake and their sensitivity to Renovate Herbicide with the active ingredient triclopyr.

Macrophyte	Susceptibility
Submerged vegetation	
Eurasian watermilfoil	high
Pipewort	Low because it is a monocot
Slender Naiad	Low
Common waterweed	Low
Water stargrass	Medium
Muskgrass	Low
Flat-stemmed pondweed	Low
Bass weed	Low
Tapegrass	Low
Robbins pondweed	Low
Coontail	Low
Leafy pondweed	Low because it is <i>Potamogeton</i>
Water marigold	High
Sagittaria (rosette)	Medium
Lake quillwort	
Needle spikerush	Low because it is a monocot
White-stem pondweed	Low
Ribbon-leaf pondweed	Low
Small pondweed	Low
Watermoss	
Creeping bladderwort	Low because it is <i>Potamogeton</i>
Variable-leaf pondweed	Low
Alpine pondweed	Low because it is <i>Potamogeton</i>
Vasey's pondweed	Low because it is <i>Potamogeton</i>
Stonewort	Low because it is macroalgae related to <i>Chara</i>
Floating vegetation	
Watershield	Medium
White water lily	Medium
Spatterdock (<i>Naphur</i> spp)	Medium