

# BLIMP Science Report

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## Use of Herbicides to Control Invasive Aquatic Plants:

NH has been actively testing and using herbicides to manage invasive aquatic plants for many years.

Maine currently uses herbicides to treat invasive aquatic plants only when it is a rapid response to control an incipient invasive species. The goal is habitat restoration and complete eradication. Variable and Eurasian milfoil, the most common non-native aquatic plants in Maine and NH, have been well-established in most waters where it has been discovered, with dense plant populations in multiple areas of the lakes. Because eradication of these plant populations is unlikely, Maine DEP has not supported herbicides for invasive milfoil as its use would likely require recurring treatments which constitutes maintenance, not eradication/restoration. To date Maine has used herbicides, including most recently ProcellaCOR, to treat invasive aquatic plants on 6 waterbodies, including Cobbosseecontee Lake in late July. Two of these waterbodies had Hydrilla and 3 had Eurasian water milfoil (*Myriophyllum spicatum*).

Maine currently has no plans to use ProcellaCOR in any other waters. The use of ProcellaCOR on Cobbosseecontee Lake was the first time that Maine has used this particular product to control invasive Eurasian watermilfoil. The decision to use herbicides to treat this incipient population came after a year of trying to manage the infestation by manual means with little impact to the overall population. By regulation, Maine is required secure a permit following: 1) assessment of native plant communities before and after treatment, 2) hold a public meeting, 3) notify abutting landowners, 4) get permission from any public drinking water source, and 5) complete water quality testing after treatment.

As to the results of the treatment in Cobbosseecontee Lake, it is too early in the process to determine if the treatment was successful in eradicating the Eurasian watermilfoil, but it did kill all the invasive milfoil in the target area.

## Have chemicals been used to effectively control invasive milfoil?

Yes. NH DES has collaborated on a number of research projects focusing on chemical control of milfoil. Through that research, 12 aquatic herbicides have been evaluated and the results indicated that ProcellaCOR worked best on invasive milfoil and hydrilla, with limited impacts on non-target species. Used at lower concentrations to target milfoil, native aquatic plants and other aquatic life are not significantly impacted by this herbicide, according to Amy Smagula, NH DES Exotic Species Coordinator.

## How does ProcellaCOR work compared to 2-4 D?

Both have a similar general mechanism. Counterintuitively, they try to speed up the growth of the already faster growing invasive species. They do this so effectively that the plant cells self-destruct because they are growing out of control. These chemicals have less effect on native, slower-growing plants because the native plants are slower-growing. As for the specific mechanism, 2-4 D and ProcellaCOR target very different proteins, which accounts for the more effective and selective effect of ProcellaCOR. In addition, the shorter half-life contributes to a reduced, shorter-term effect on native species. Humans, aquatic wildlife and fish are unaffected by ProcellaCOR.

## What factors determine how good an herbicide is?

Many factors come into play, in this order of importance:

- 1) Effectiveness
- 2) Specificity/Selectivity (ie, side effects)
- 3) Toxicity to humans and animals (also included in side effects)
- 4) Potency—sometimes affects cost
- 5) Half-life

The wild card: Experience, ie long-term effects, which is critical to informing toxicity

Studies in several states, including Washington, Wisconsin, CT, NH and others provide important information on all of these factors (**bold** font indicates a clear advantage to one of the chemicals):

	<b>2-4D</b>	<b>ProcellaCOR</b>
<i>Effectiveness</i>	1 growing season	<b>2-3 growing seasons</b>
<i>Specificity</i>	native milfoil/water lilies/FH	native milfoil/water lilies/FH
<i>Toxicity</i>	moderate short-term	<b>“essentially non-toxic” (US EPA)</b>
<i>Potency</i>	100 times less than ProcellaCOR	<b>100x higher than 2-4D</b>
<i>Half-life</i>	10-20 days	<b>6 hours</b>
<i>Experience</i>	<b>decades</b>	< 5 years

### **The Drift Effect: Fact or Fiction?**

It's fiction! Here's the deal: Any herbicide needs to be present at a certain concentration to kill invasive milfoil or any other plant. The more rapidly it gets diluted the more ineffective it becomes on all species, especially native ones. In a relatively large body of water like Balch, it is impossible for an application of ProcellaCOR, with its short half-life and rapid dilution, to be effective more than a few hundred yards from where it is applied. NH DES has done careful water sampling measurements a day or two after application and cannot detect it more than a few hundred yards from the application point.

### **Oxygen levels**

When plants die, their degradation requires oxygen, so large amounts of rapid plant death can result in oxygen depletion in the water, with subsequent toxicity to animal life. NH DES routinely measures oxygen levels in the lakes they treat with ProcellaCOR, including Balch. Even at times of maximum plant death after application, oxygen levels remain relatively unchanged and at acceptable levels. This is likely due to the water turnover from the river and the dozens of springs that feed the lake.

### **Any other good news?**

Yes. NH and Maine cooperate and communicate regularly, and they are happy to work with us and appreciate our observations and input. For example, NH did testing of Balch on the Maine side according to Maine standards to measure ProcellaCOR levels after application and shared the results with Maine: ProcellaCOR was not detectable.

**Questions?** Please feel free to call or email anytime!