OSSIPEE LAKE REPORT

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MILFOIL FOUND IN BIG LAKE, ONE OF FOUR NEW INFESTATIONS

OSSIPEE—Milfoil has finally found its way to the big lake. Confirmation of the infestation at the mouth of the Pine River was made by Amy Smagula, the limnologist who heads the Exotic Species Program for the Department of Environmental Services.

New infestations were also found in Pickerel Cove and Huckins Pond. The Pickerel Cove patch is at the south end of the cove near the stream from Pequawket Bog. Pickerel Cove is at the extreme south end of Broad Bay.

At Huckins Pond, one new population was found to the east after coming out of the river, and a second was found to the north almost into the pond itself. Huckins Pond is north of Danforth Pond.

All four infestations were uncovered by Barre Hellquist, a biologist and long-time lake resident who is a director of Ossipee Lake Alliance. Hellquist and his son have been conducting an environmental inventory of the Ossipee Lake system.

In an email, Hellquist described the big lake

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Autumn's cool days and cold nights will soon put an end to swimming, and power boats will give way to kayaks and canoes as the lake starts to be drawn down after Columbus Day. Weather prognosticators are busy betting whether it will be another mild winter with late ice cover. *Photo: Susan Marks*

SAFE OR UNSAFE? THE TRUTH ABOUT MILFOIL CHEMICAL TREATMENTS

By Bob Reynolds

OSSIPEE — Talk about variable milfoil in New Hampshire and it's hard to avoid military terms. Keeping it in check is a "war" against "invaders." Each year, lake communities draw up "battle plans," "fight" for limited State funds, and deploy "search and destroy" missions with "weapons" drawn from an "arsenal" of control methods.

New Hampshire has been at war with milfoil for so long that its Department of Environmental Services has become a national resource—the go-to agency for states needing advice on the control methods that have been pioneered, tested, and refined here.

Yet for all of our innovation, New Hampshire's weapon of choice is the same as it was almost a decade ago. It's the chemical herbicide 2,4-D.

2,4-D is the short-hand term for 2,4-dichlorophenoxyacetic acid. Invented in the 1940s

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KEY DATES:

- Monday, October 8 – Annual winter drawdown of Ossipee Lake begins. Info @ (603) 271-3406.
- Saturday, November 24: Holiday Open House, Loon Preservation Committee, Moultonborough. 10 AM–2 PM. Info @ (603) 476-5666.

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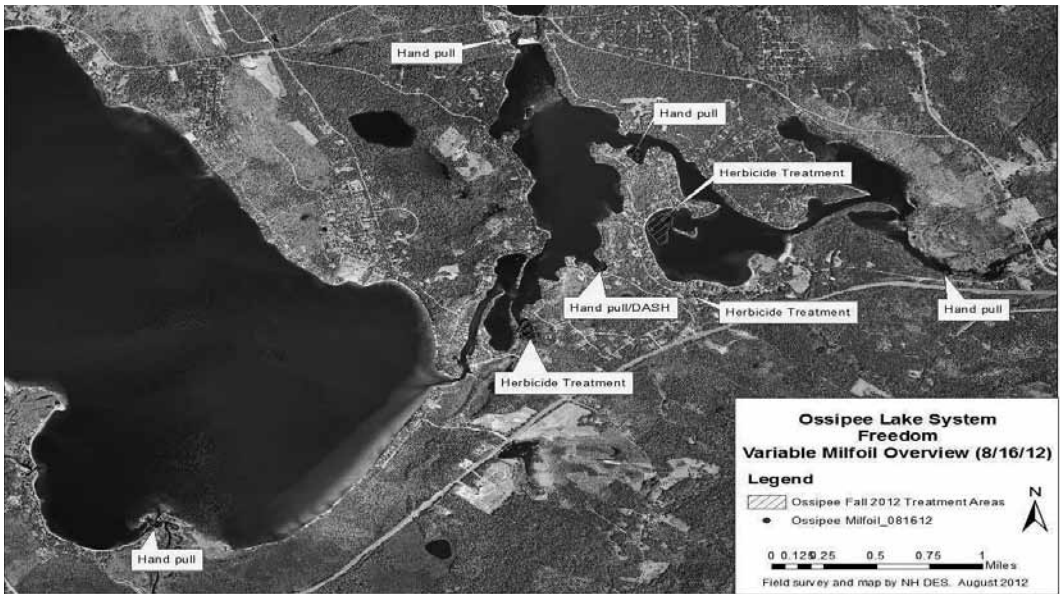
OSSIPEE LAKE, THE BAYS, THE RIVERS AND CHANNELS, DANFORTH POND, LOON LAKE AND ROUND POND

SAFE OR UNSAFE? THE TRUTH ABOUT MILFOIL CHEMICAL TREATMENTS



DES map shows the challenge of managing milfoil infestations in the Ossipee Lake system using chemical and non-chemical methods. The map does not include Danforth Pond or Huckins Pond, to the north.

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to control dandelions in lawns, it's one of the world's most widely used pesticides. Sold as "Navigate" or approximately 1,500 other product names, 2,4-D is used extensively for broadleaf weed control on crops, grasslands, forests, and residential gardens and lawns.

While chemical treatments once were the only way to control milfoil, 2,4-D is now typically used only to reduce the size of large infestations, enabling non-chemical control tactics to become effective and economical. 2,4-D is safe when used correctly; but since it is a chemical, questions continue to be raised about its safety.

Fortunately, 2,4-D is probably the most thoroughly studied pesticide in the world, which means there is abundant scientific evidence about its affect on health and the environment. To understand this evidence, however, you need to understand how tests are designed and conducted to generate the data New Hampshire officials rely on to support their contention that 2,4-D is safe.

Toxicology 101

Toxicology is the science of how poisons affect living organisms. The ultimate goal of toxicological testing is to predict the effect of poisons on humans. For obvious moral and legal reasons we can't simply grab people and force them to swallow a chemical to see if it makes them sick. So, we test the effects of chemicals in different species of animals to predict the effects in humans.

Important factors in the toxicological testing of chemicals include:

• The amount (dose) of a chemical given to an organism and the length of time it is exposed to the chemical are critical. For example, an animal could react very differently after a single exposure to a large dose of a chemical than if it were exposed to multiple small doses of the same chemical over a long period of time.

• The ratio of chemical dose to the animal's weight is important when comparing different species. For example, feeding 1 ounce of a chemical to a 1-pound rat would be comparable to feeding 150 ounces (9½ pounds) of the same chemical to a person weighing 150 pounds.

• The route of exposure is critical. For example, an animal might react differently if it ingested (ate or drank) 1 ounce of chemical ("oral" exposure), or if 1 ounce of the chemical were rubbed on its skin ("dermal" exposure), or if it breathed in 1 ounce of the chemical as dust ("inhalation" exposure).

• Different species can have dramatically different reactions to toxins. For example, Thalidomide was a "morning sickness" medicine developed in the 1950s that caused birth defects in the children born to women who took the drug. It was tested in many animal species and no adverse effects were seen. However, when the drug was eventually tested in rabbits, the same resulting birth defects were observed.

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OSSIPEE LAKE REPORT:

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The Alliance is a member of the New Hampshire Lakes Association (www.nhlakes.org).

NEW MILFOIL IS FOUND, INCLUDING A PATCH IN THE BIG LAKE

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infestation as the "most disturbing" of the four findings, saying the invasive was growing with the non-invasive weed *Potamogeton vaseyi* slightly to the west of the Pine River's main channel as it enters the lake.

Within days, state divers made a site visit and hand-pulled the invasive weeds to clear the area. Smagula said divers will return this fall to remove any weeds that were missed and address any regrowth.

Pickerel Cove also received a state site visit, and officials said much of the milfoil there had regenerated from treatments last year. Since several small to medium sized patches were distributed throughout the shallow cove, the state determined it was too difficult to use divers to remove it, and recommending instead that the area be treated chemically.

Marc Bellaud, the state-approved contractor licensed to conduct such treatments, confirmed that Pickerel Cove was treated in September along with Leavitt Bay infestations at Phillips Brook and the area to the northwest of Loon Island. Danforth Pond is also scheduled for a chemical treatment this fall.

While on the lake this summer, state divers visited Portsmouth Cove and found variable milfoil growth this year was sparse. Only a few plants were visible, and they were shorter in height than in previous years. The divers removed them by hand last month.

At press time, Smagula said state divers were scheduled to return to the big lake infestation at Pine River to ensure that there are no remaining weeds at the site. Smagula added that divers also removed a small clump of milfoil in the outlet channel on the western shore just above the Ossipee River dam.

NATURAL AREA CONTINUES TO REBOUND

OSSIPEE—The management plan for Ossipee Lake Natural Area continues to produce positive results, according to the state and local representatives attending this year's meeting of the Natural Area Working Group.

Stakeholder feedback was generally good, with education efforts, the issuance of fines for trespassing, and the diligence of the boaters cited as factors contributing to improvement.

The number of fine grass-leaved goldenrod stems continues to increase, especially in the areas closed to the public. Comparing areas surveyed in each year, the number of fine grass-leaved goldenrod stems has increased 14 percent from 2009 to 2011 - from 2,207 in 2009 to 2,262 in 2010 to 2,516 in 2011. In addition, Natural Heritage staff observed another 1,420 stems along the eastern shore of the peninsula formed by the Pine River, an area that had not been previously surveyed.

Hairy hudsonia persists in the public use area and in the far western part of the property known as "Short Sands." Plant cover has increased incrementally from 91.1 ft. in 2009 to 92 ft. in 2011. The bulblet umbrella-sedge open sandy pond shore community has also increased noticeably in the past two years in all of the closed sections of the preserve.

SAFE OR UNSAFE? THE TRUTH ABOUT MILFOIL CHEMICAL TREATMENTS

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Had the drug been tested in rabbits before it was approved, the Thalidomide tragedy could have been avoided.

We typically evaluate several key health effects in test animals including: (i) Toxicity (short-term and long-term effects such as death and damage to specific organs); (ii) Carcinogenicity (cancer); (iii) Teratogenicity (birth defects); and (iv) Mutagenicity (mutations in chromosomes).

Public health scientists and regulators evaluate all of the environmental and toxicological data and use mathematical models to estimate a dose that is considered safe to humans. This "approved" concentration of the chemical is thoroughly re-evaluated every few years to ensure that the latest data from new tests is incorporated into the regulatory decision-making.

Environmental Fate of 2,4-D

Since the length of time that an organism is exposed to a toxin is important, we measure

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INVEST IN THE FUTURE OF OSSIPEE LAKE

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LAST YEAR THE STATE PAID JUST 12% OF THE COST OF CONTROLLING MILFOIL IN ITS INFESTED LAKES. TOWNS LIKE OURS PAID THE REST OF THE BILL.*

That's Not Right!

NEW HAMPSHIRE NEEDS A LONG-TERM PLAN TO FUND MILFOIL CONTROL – AND THE STATE NEEDS TO PAY ITS FAIR SHARE OF THE COST.

Help us take that message to Concord.

PLEASE MAKE A TAX-DEDUCTIBLE CONTRIBUTION TODAY TO SUPPORT OUR WORK.

***Source: OLA/Bianco Professional Association Study (2011)**

SAFE OR UNSAFE? THE TRUTH ABOUT MILFOIL CHEMICAL TREATMENTS

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the "half-life" of each chemical in typical situations to predict how long the chemical persists before disappearing. Oxygen, bacteria, sunlight, and plants break down 2,4-D in water. Studies show that the half-life of 2,4-D in water ranges from 9 hours to two weeks, depending on the levels of oxygen, acidity, bacteria, and sunlight. In sediments (the "ground" on the bottom of a lake or river), the half-life of 2,4-D is between 1 and 14 days.

Toxic Effects of 2,4-D

Following acute (single) doses by all routes of exposure, 2,4-D is rated as "low" to "very low" toxicity. Following long-term exposures, 2,4-D had a No Observed Effect Level (NOEL) in rats comparable to feeding an average human 3 pounds of 2,4-D per day for 90 days. The 2-year NOEL in rats and mice is comparable to feeding 9 ounces of 2,4-D per day for 2 years in humans. Doses comparable to 6 pounds per day for 2 years in humans cause toxicity in rats. Human chronic exposure to 2,4-D has not been linked to any effects seen with other pesticides.

Carcinogenicity of 2,4-D

The U.S. Environmental Protection Agency (EPA) conducted comprehensive evaluations of 2,4-D for carcinogenicity in 1988, 1992, and 2004. Animal studies consistently show no carcinogenic effects. As usual, there are some positive results, but these are not "statistically significant." In other words, they are as common as cancers that appear in untreated animals. Epidemiological studies previously claiming a link between 2,4-D and cancer were evaluated by scientific experts and found to lack enough evidence for the linkage.

Teratogenicity of 2,4-D

Studies in rats and mice fed doses of 2,4-D comparable to 9½ pounds per human showed no observable reproductive effects. Mice and rats fed doses comparable to 38 pounds per human showed signs of reproductive toxicity, but very limited teratogenic effects (can you imagine eating 38 pounds of a pesticide?). No direct evidence of reproductive or teratogenic effects in humans is available.

Mutagenicity of 2,4-D

2.4-D has been extensively studied in almost every known mutagenicity test. It is non-mutagenic in most tests. One study reported chromosome damage in cultured ("test tube" grown) human cells; most effects seen are toxic effects, not mutagenic.

Ecological Effects of 2,4-D

2,4-D exhibited "low" to "very low" toxicity to wildfowl (mallards, pheasants, quail, pigeons), brown shrimp, Dungeness crabs, and most aquatic invertebrates. Honeybees treated with low doses had impaired reproductive effects at moderate doses, but actually survived longer than untreated bees. Some pesticide formulations are highly toxic to fish, while others are only slightly toxic (including the formulations used to control variable milfoil).

Questions and Answers

The evidence is clear that 2,4-D poses little threat to humans if used according to Department of Environmental Services regulations. Yet misinformation about this important milfoil weapon continues to be spread. The following are the most commonly heard questions about 2,4-D:

Q: I've heard 2,4-D is in Agent Orange and that was terrible stuff! A: It is correct that 2,4-D was a component of Agent Orange, but it did not cause the infamous adverse health effects. Agent Orange was a combination of two herbicides, 2,4,5-T and 2,4-D. The adverse Agent Orange health effects were caused by a dioxin that formed during the 2,4,5-T manufacturing process. As a result, 2,4,5-T was banned in 1985 and has not been used in N.H. since 1983.

Q: If 2,4-D is so safe, why do they ban swimming in lakes for 30 days after treatment? A: This is false. There is no 30-day swim ban after treatment. Swimming is restricted for 24 hours after treatment to keep swimmers away from 2,4-D pellets as they settle to the bottom, dissolve, and are absorbed by the milfoil plants. In short, the restriction is to protect the 2,4-D pellets, not swimmers!

Q: Maine has banned the use of 2,4-D. A: This is false. Maine has not banned 2,4-D; they just do not use it often. They just recently used it to control a new infestation of Eurasian water milfoil in one of their ponds.

Q: Canada has banned the use of 2,4-D. A: Canada did prevent use of the product for some time, but they reversed their decision in 2008 and it is now permitted in that country.

Q: We've heard that 2,4-D causes cancer. Is that true? A: There is no scientifically accepted data to support the claim that 2,4-D is a carcinogen. EPA is currently re-evaluating the carcinogenicity of 2,4-D (the fourth time) but there is no direct linkage to cancer.

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COMMON AT THE OCEAN, SPOTTED SANDPIPERS ALSO THRIVE ON LAKES AND RIVERS

By David Eastman

The following article originally appeared in the Conway Daily Sun and is reprinted with the kind permission of the author and publisher.

TAMWORTH—The spotted sandpiper is usually our only native shorebird of that ilk to enjoy here, and most times, it doesn't get much sand to work over in New Hampshire! Most of our secluded woodland ponds have fairly organic shorelines of muck and woody debris, instead of accreted sandy shores.

As spring progresses, I sometimes notice one at the water's edge of the Bearcamp River, near whose banks I reside. A slight motion is what I notice first; it is such a tiny creature characteristically teetering its tail and rump up and down, as it probes for insect life and crustaceans.

It hops over the boulders and cobbles among the river's corridor, working over the algal surfaces for possibilities. This small speckled bird leaves us with an amusing impression of being a bit too delicately balanced, as it walks with its little body leaning forward, and keeping the head low.

The spotted sandpiper is found everywhere in the country, and commonly is seen perched on a slanted log stretching into the brown water. I have often watched this particular species working over the rocks sticking up out of a wild river's rapids, skillfully avoiding being swept into the current as it probes.

Flitting from one rock to another without any trouble, while never getting knocked off into the white water, it continues searching the boulders creating those rapids. I have heard that spotted sandpipers can also swim and dive readily; using their wings underwater like the water ouzel does, as this dipper walks on the gravelly bottom of the West's streams.

An Early Arrival

This is one of the first birds to show up in the emerging spring while the trees are just budding up. The small spotted sandpiper has returned from wintering as far south as Uruguay, northern Chile, and northern Argentina.

Our common sandpiper flies low over the water with the quivering wings held stiffly, and bowed slightly downward. The bird's short, shallow wingbeats alternate with gliding flight. If alarmed or flushed, it may give out with its characteristic "peet-weet-weet-weet" call, whenever we sometimes surprise it during its shoreline hunting. Children delight in sighting this small bird with its olive-brown back and round black spots on its whitish breast—though these markings fade towards fall.

There is always something mystical and pleasing at suddenly finding a sandpiper, especially as it quickly flies away from us. We watch its flight skimming over the surface, rocking from one side to another, and then soon swinging in to land again farther down the border of a sheltered pond or river.

Whenever this bird scurries up and away from New Hampshire's pebbly lakeshores, it adds to the cheer of any summer's day. Its actions have generated names like, "Teeter-tail," or "Tip-up," or "The Spotted Tattler."

The only other freshwater sandpiper we might see locally in mid-May to July is the solitary sandpiper. It is a larger, darker bird and behaves differently. And, as true for most waders in the Northeast, it is just passing through as a migrant on its way to Canadian breeding grounds. You won't find it nesting down here, and the next time you sight it is on its return journey south to the tropics.

Identifying Characteristics

With darker, streaked upperparts and a longer bill and blackish legs, it has a tendency to gravely nod its head than teetering up and down. Peterson said that it may best be described as a dark winged sandpiper with flashy white sides to the tail, which are very conspicuous in flight. It also has a prominent white eye-ring.

The solitary sandpiper stands 8 to 9 inches high and has noticeable white underparts. The bird's swift, swallow-like flight is buoyant with deep wingbeats. It also has a graceful habit of holding its wings high over the back—for a moment—just after alighting. Though fairly numerous, it is usually alone or in pairs in shallow backwaters and pools.

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MOST COMMON QUESTIONS ABOUT THE SAFETY OF USING CHEMICALS TO CONTROL MILFOIL

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Q: We've heard that 2,4-D kills fish. Is that true? A: There are no documented fish kills as a result of a 2,4-D treatments in New Hampshire. Generally a fish kill can be caused by decomposition of large amount of vegetation, so in a whole-lake treatment targeting all plants, decomposition may lead to loss of oxygen and fish kills. But safeguards are put in place (on the pesticide label and in the permitting process) to make sure treatments are conducted in a way that will lessen the likelihood of harm to fish. Used at appropriate concentrations to kill milfoil, 2,4-D is not directly toxic enough to fish to result in their death.

Q: Is it true that 2,4-D kills other aquatic plants? A: 2,4-D is an herbicide and its purpose is to kill plants; so yes, this is true. Pesticide effectiveness is a function of dose and exposure time. Milfoil is killed by a low application rate (100 lbs/acre in most scenarios), which is too low a concentration to affect most other aquatic plants. Our goal is not to kill all plants, so we use low concentrations.

Q: I know you say it's safe, but isn't all that data just provided by the manufacturers who want to protect their product and profits? A: Most of the testing is performed in Federal government, university, and private laboratories that must comply with strict Federal regulations. These labs are not paid by manufacturers, so they are not influenced in their research. Testing protocols and results are closely reviewed by qualified experts at the U.S. EPA.

Q: I worry about 2,4-D getting into my drinking water. Isn't that a danger? A: Permitting agencies are very cautious about allowing chemical treatments near drinking water sources. They "run the numbers" to make sure there is no risk of contamination that would exceed drinking water standards, and often err on the side of caution and call any amount of herbicide in the water too much.

For wells, it is unlikely that 2,4-D moves readily through the soil to groundwater. We have never detected it in near-shore wells adjacent to treatment area in New Hampshire that DES and the Department of Agriculture have sampled.

Q: I know you say it's safe, but I still worry about chemicals building up in our lake and drinking water. How do you know that 2,4-D doesn't build up in the water?

A: 2,4-D is not a product that bioaccumulates in nature. It is quickly broken down by microbes and by oxidation. Routine water quality monitoring post-treatment in the last several years shows that 2,4-D does not linger in the water column, and sediment sampling shows it does not persist in sediments.

There is abundant information about 2,4-D online. Interested readers should start with the U.S. Environmental Protection Agency's website, which is at www.epa.gov/oppsrrd1/REDs/factsheets/24d_fs.htm.

Bob Reynolds is an M.I.T.-trained toxicologist whose career in environmental services spans 35 years working for research, consulting, and hazardous waste remediation companies. He has provided expert toxicological services to government agencies including the EPA, Food & Drug Administration, the National Institutes of Health, and the White House. He is an Ossipee Lake Alliance board member and serves on the N.H. Legislature's Exotic Aquatic Weeds and Species Committee.

SPOTTING SPOTTED SANDPIPERS ON THE LAKE

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The solitary sandpiper may agitate water by trembling the lead foot, presumably to stir up prey, as it gently stalks woodland shores. There, the bird hunts aquatic animals of all sorts, from insects and crustaceans to tadpoles and even small frogs.

I've read that when the solitary sandpiper does reach the seclusion of its Canadian and Alaska breeding habitat, this species does an odd thing for sandpipers. It nests in coniferous trees--preferably in the former nest of a grackle or blackbird—about 40 feet above the ground!

Here, its offspring face a formidable challenge, because all sandpiper chicks can leave the nest as soon as they hatch. Solitary sandpiper chicks have to launch themselves precariously from the nest and flutter their tiny wings frantically as they fall to the forest floor below. Then, they follow their parents to nearest shallow water, where they skillfully bob and pack at creatures there in the mud.

David Eastman also broadcasts "Country Ecology" four times weekly over WMWV 93.5 FM. As Vice President of the Lakes Region Chapter/ASNH, he welcomes you to monthly programs at the Loon Center in Moultonborough. He is available at: cebirdman@hotmail.com or www.countryecology.com for consultation.

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