

Hydrilla plant: Alien in search of a predator

Super-invasive weed headed this way Joins long line of environmental threats

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Beware the hydrilla.

The super-aggressive weed — the latest in a long line of careless, devastating imports — is advancing our way from Florida.

It was shipped from Asia in the

1970s as an aquarium plant. Soon, it was outdoors and spreading fast.

Hydrilla flourishes in water — any depth, any temperature, fresh or moderately salty, in sun or shade. It wipes out local plants and chokes lakes and rivers in thick mats of tough stems

and leaves.

With no known predators here, it appears impossible to eradicate. It reproduces from seeds, leaf buds, underwater tubers; even tiny bits of its stalk.

“No matter what part you kill, there’s another waiting to take over,” says Martin Hilovsky, who runs an Ohio company, EnviroScience Inc., that provides non-traditional solutions to environmental problems.

If hydrilla hasn’t arrived in Canada yet, it soon will, Hilovsky says. It’s a major and expensive nuisance for anyone whose livelihood or recreation depends on lakes, rivers or wetlands.

It’s also an object lesson in how difficult it is to undo environmental blunders. Over the past three decades, one man-made “menace” after another has taken its turn in the spotlight.

Lake Erie was dying. Acid rain was decimating our lakes and forests. Industrial chemicals were destroying Earth’s protective ozone layer. Dioxin, PCBs and other toxics in the Great Lakes were endangering human health. Purple loosestrife and Eurasian milfoil, two earlier invaders, were ruining Ontario’s wetlands and lakes.

► Please see **Environment, A9**

Eco-perils outpace solutions

► **Environment** From A1

In most cases, corrective measures were taken, alarm subsided and once-major issues sank out of sight.

Some problems improved. Remedies are being developed for others. But none can be declared solved.

And, it seems, every time we pat ourselves on the back for a success, some new threat comes along — like hydrilla — that's as bad or even worse:

Acid rain

Twenty years ago, acid rain seemed the darkest of all the environmental clouds looming over Canada.

Media reports warned that sulphur dioxide pollution from industrial smokestacks and nitrogen oxide, mainly from car and truck exhaust, were combining with moisture in the atmosphere to create acids that killed lakes and forests and threatened human health.

An intense and ingenious lobbying effort headed by two Canadians — Michael Perly and Adele Hurley — led to a 1990 agreement between Canada and the U.S. to cut sulphur emissions. The success was toasted at a gala celebration in Casa Loma, and the lobby coalition disbanded.

But while emissions have dropped, acid rain continues its nasty work. About 800,000 square kilometres of eastern Canada, and its 95,000 lakes, still get more pollution than they can handle, Environment Canada says. And most of the acidified lakes aren't recovering.

Acid rain also leached huge amounts of nutrients out of forest soils, and they, too, have not rebounded. With current controls, recovery could take a century, Environment Canada says. Success is far from a sure bet.

Canada has cut sulphur dioxide emissions in half since 1980 and promises modest steps to reduce them further. The United States isn't required to hit its target until 2010. Even then, the total North American reduction will be only 38 per cent below the ruinous 1980 levels.

The U.S. Environmental Protection Agency is aiming for deeper cuts. It plans to require power plants to reduce sulphur dioxide emissions by 70 per cent by 2015, at a cost of about \$48 billion (U.S.).

Nitrogen oxide emissions have dropped only slightly in the U.S. and not at all in Canada. Environment Canada says controls on cars will cut the pollution by 71 per cent within 16 years.

A further 75 per cent cut would be needed to protect all the lakes and forests in eastern Canada, Environment Canada says. Canada will work toward further reductions and seek them from the U.S.

Critics complain that Canada's proposed measures are toothless. And U.S. industries are battling hard against further cuts.

Ozone layer

The hole in the ozone layer over Antarctica — created by industrial chemicals — still exists. The layer shields Earth from cancer-causing ultraviolet radiation from the sun, and news of the hole had people scurrying for sunscreen.

An international agreement called the Montreal Protocol cut production of CFCs and other chemicals, used in air conditioners, aerosol spray and plastic foam, that destroy ozone in

Over the past 30 years, one man-made 'menace' after another has taken its turn

the upper atmosphere.

But since the chemicals hang around for decades, the damage continues. The hole reached its biggest in 2001 and was almost as large in 2003, while global ozone levels are at their lowest.

And the United States still blocks controls on the biggest remaining ozone-destroyer — methyl bromide, used to fumigate grain crops.

On top of that, global warming is making the upper atmosphere cooler, which speeds ozone destruction.

"There's no recovery yet," says Tom McLroy, an Environment Canada scientist who is measuring ozone levels over the Arctic. Scientists hope it's a problem we can wait out.

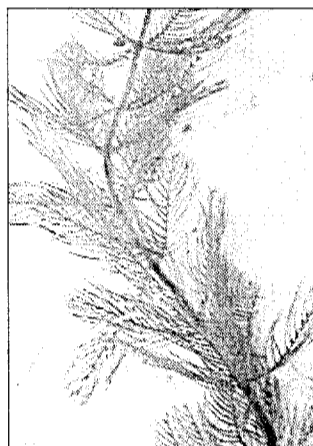
"It will be a decade or more be-



LUCAS OLENIUK/TORONTO STAR

Deadly chemicals, such as dioxins, remain in the Great Lakes, including Lake Ontario, above.

Environmental menaces



Eurasian milfoil

THE WATER WEED

ORIGIN: Native to Europe, Asia, Africa. Brought here in ships' ballast in late 1800s.

DESCRIPTION: Prefers water one to three metres deep. Smooth rigid stem. Feathery leaves along top of stems, which curve across surface in dense mat. Can reproduce from bits of stem.

PROBLEM: Spreads fast. Clogs lakes and rivers used by boaters. Entangles swimmers. Eliminates native plants, reduces food for waterfowl. Decaying plants foul beaches.

SPREAD: Throughout North America. Kawartha Lakes most infested in Ontario.

CONTROL: Mechanical: pulling and cutting, but it can increase spread. Biological: Experiments with milfoil weevil.



Purple loosestrife

THE BEAUTIFUL KILLER

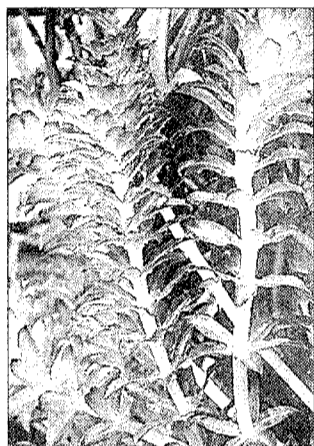
ORIGIN: Europe and Asia. Arrived in ships' soil ballast in early 1800s. Also imported as medicinal herb. Aggressive spread began in 1930s.

DESCRIPTION: Plant with 30 to 50 stiff stems, up to eight metres tall, topped by spikes of fuchsia flowers with five or six small petals. Prefer moist or wet ground.

PROBLEM: Chokes wetlands and eliminates feed plants on farm pastures.

SPREAD: Throughout the U.S. and eastern Canada.

CONTROLS: Chemical: Roundup, but not approved in Ontario for use near water. Biological: Experiments with two variants of leaf-eating beetle.



Hydrilla

THE COMING THREAT

ORIGIN: Korea and southern India. Brought here as an aquarium plant.

DESCRIPTION: Dense stands of slender stems up to eight metres long. Branches and spreads across surface. Thrives in any fresh or moderately salty water. Rough to touch. Small pointed leaves.

PROBLEM: Grows very fast. Reproduces several ways. Clogs water, kills native species, reduces oxygen in water.

SPREAD: Moving north from southern U.S.

CONTROL: Mechanical and chemical methods used in U.S. Biological: experiments with Asian grass carp, which is itself an environmental menace.

COMPILED BY PETER GORRIE/TORONTO STAR

fore we can unambiguously say that the ozone hole is recovering," says Britain's Royal Astronomical Society. "This assumes that the decline in ozone-depleting chemicals continues and that there are no other perturbations to the ozone layer, such as might be caused by a massive volcanic eruption."

At best, "it will be the middle of this century or beyond before the ozone hole ceases to appear over Antarctica."

Death of Lake Erie

In the 1960s, massive algae blooms were suffocating Lake Erie, sucking oxygen from the water and depositing mounds of rotting fish along the shore.

The algae gorged on phosphates and other nutrients from sewers and farm fields. After years of denial and debate, governments banned phosphates from detergents and improved sewage treatment plants, and Erie's waters turned blue again.

The lake now appears to be sliding back into a slimy green mess, with a large dead zone in its centre. Some blame lies with zebra mussels and other foreign creatures dumped into the Great Lakes in the ballast water from ocean ships. As well, though, increasing quantities of nutrients are pouring into the lake. More people live around Erie, creating more sewage; and even the best treatment plants don't remove everything. Farmers are using more fertilizer. The dead zone wasn't as big

this summer, but it's still there, says Jennifer Nalbano, of the Buffalo-based environment group Great Lakes United. "There are still some strange things happening in Lake Erie."

Great Lakes invaders

Zebra and quagga mussels, gobies and other creatures dumped from ocean ships' ballast have overturned the ecology of the Great Lakes, forcing the spending of billions of dollars to unclog mussel-clogged intake pipes at generating stations and water treatment plants.

The invaders' numbers are no longer exploding, but they continue to spread. And new ones are arriving. The U.S. has imposed controls on dumping ballast water, but they were recently weakened. Canada relies on ineffective voluntary measures.

The biggest looming threat to the lakes are three versions of Asian carp, brought from China to the southern U.S. to clear vegetation from fish farms. These fish, up to a metre long and 40 kilograms, have taken over much of the Mississippi River system and have reached the Chicago Sanitary and Ship Canal, which connects the river system to Lake Michigan.

A temporary electric barrier that keeps them out of the lake is deteriorating and must be replaced by the winter by an \$8.5 million (U.S.) permanent one.

Funding is about \$2 million short, and some Great Lakes states refuse to contribute. Without that cash, reports suggest the new barrier will have one, rather than two electrified

human health and reproduction. Tests on fish and people suggested the water contained enough of the pollutants to cause cancer and birth defects.

In what appeared to be another hard-fought environmental victory, the chemicals were eliminated from industrial processes or banned outright.

"There's no question the lakes are in much better condition than they were 50 years ago," says Gail Krantzberg, director of the Windsor regional office of the International Joint Commission, an organization established a century ago to deal with disputes over waters along the Canada-U.S. border.

But the battle is far from over. The chemicals remain in the water and bottom sediments — most notably in 43 "areas of concern," including Toronto Harbour. The cleanup is painfully slow. Pregnant women, in particular, are still warned not to eat a lot of fish from the lakes.

And new hazards are appearing, Krantzberg says.

Mercury, which damages the nervous system, has been in the lakes for a long time. Many traditional sources are under control, but it still spews from the smokestacks of coal-fired electricity generating stations and falls into the water. Recent studies suggest it harms people and

Lake Erie recovered from phosphates. Now it has an unexplained dead zone

wildlife at much lower concentrations than previously thought, Krantzberg says.

As well, other chemicals and sources are being found.

Prescription drugs taken by humans are excreted and pass through sewage treatment plants. Fireplaces, wood stoves and other open fires generate dioxins, one of the most deadly families of chemicals. There are more cars and trucks around the lakes, and more land is being paved. The result: Rain is washing more oil, grease and other poisons into the water.

And polybrominated biphenyl, a fire retardant used in car seats, carpets, computers, upholstery and many other products, is getting into the lakes. The chemical escapes into the air from the products it's used in, and also leaches from landfills.

Suspected risks include cancer and harder-to-detect problems such as brain damage in fetuses.

Purple loosestrife

For years, this beautiful but devastating plant appeared unstoppable.

It had been in North America for about two centuries, after being dumped with dirt ballast from a ship that sailed from Eastern Europe. It took a while to gain a foothold, but by the 1980s, with no local predators, it was spreading rapidly across Ontario, creating thick mats of vegetation in wetlands and fields that killed off native plants, along with the birds and animals that feed on them.

Chopping and pulling couldn't contain it. Herbicides were dangerous and ineffective.

But a solution appears to be at

hand. It's the Galerucella beetle, a predator imported from the loosestrife's home territory. The beetle's entire life cycle is tied in with the plant, in which it is born, shelters, overwinters, mates, and deposits its eggs. Most important, at all stages of its life it eats loosestrife, voraciously. Tests have shown it also dines on a native version of loosestrife, but no other plants.

Last year, packs of several thousand larvae were put into 40 loosestrife patches in Northern Ontario. This summer, 80 sites in eastern Ontario were treated.

The results have been dramatic, says Dawn Hutchinson, of the Ontario Federation of Anglers and Hunters, which has been working with Ducks Unlimited and the provincial ministry of natural resources. The beetle doesn't eliminate loosestrife, but reduces it to the point it's no longer a problem.

"It's definitely a success story," Hutchinson says. "But I wouldn't stop worrying about loosestrife... There are still hot spots where it's a major problem."

European water milfoil

This imported plant pest is the bane of boaters and cottage-owners. It grows prolifically across North America, clogging lakes and rivers. When it dies, it produces a nasty stench. A few American swimmers have drowned after becoming entangled in the tough stems.

Until recently it appeared, like purple loosestrife, to have no predators here. People try to rake it out of the water, but that's backbreaking work and, because the plant can grow from little pieces, tends to just make it spread. No chemical treatments are approved.

"It continues to spread like wildfire," says Hilovsky, of EnviroScience.

But relief might be at hand. Researchers have found a weevil that lives on a native cousin of the milfoil. Until now, there were too few in the wild to have any effect on the invader. The tiny bugs, the size of sesame seeds, move so slowly they don't even appear to be able to find it.

The weevils are now being raised in labs and have been introduced, thousands at a time, into several U.S. lakes and rivers.

After three or four years, 90 to 95 per cent of the milfoil is eradicated. Just enough remains to sustain a few weevils to hold the plant in check, says Hilovsky, whose company is the main supplier of weevils. "The good news is, it really seems to work." Quebec has authorized EnviroScience to treat two milfoil sites. The work will start next summer. But provincial officials have imposed such severe restrictions that Hilovsky fears the weevils won't survive long enough to do any good.

He's hoping to start tests in Ontario, where, he believes, there will be less milfoil-like red tape.

Beyond that, of course, lurks hydrilla, one of several other invasive species that, Hilovsky says, are headed this way.

"It makes milfoil look like a desirable plant."

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