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GREAT LAKES UNITED

An international coalition to conserve and protect the Great Lakes/St. Lawrence River ecosystem

Sustainable waters report makes a splash

In a first-of-its-kind effort that took two years to produce, Great Lakes United and the Canadian Environmental Law Association have written a comprehensive study of threats to Great Lakes water quantities over the next fifty years.

Entitled *The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?*, the 96-page report details the effects on water quantities caused by climate change, free trade, diversions, water system privatization, and reckless development. It proposes changes in policies and practices that can mitigate or prevent those effects.

GLU and CELA released the report in February in Buffalo, Chicago, Toronto, and Montréal. The report also received good newspaper and radio coverage in a dozen other cities and the nationally distributed *Christian Science Monitor.*

The report kicks off a major cam-

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U.S. feds rein in rogue states

EPA mails fish advice to Michigan anglers

by Wayne A. Schmidt
National Wildlife Federation
Great Lakes Natural Resource Center

Here comes spring again. Flowers. Fishing. And a fresh round of claims by Michigan Gov. John Engler that contaminated Great Lakes fish are safe to eat.

But this season may be a little more rainy for the governor than usual. After three years of delay by Michigan in implementing stronger fish consumption advisories to its citizens, apparently this year the federal government has had enough. In an unprecedented move, the U.S. Environmental Protection Agency in March decided to distribute its own, much stronger fish consumption advisory to the 1.7 million anglers who buy Michigan fishing licenses each year.

The agency warns that people should limit their consumption of Michigan's most popular sport fish, including salmon, trout, and walleye. With the exception of Michigan, all the Great Lakes states have already adopted similar fish-eating advisories.

Despite pollution clean-up progress, many Great Lakes sport fish still contain risky levels of pollutants—PCBs, mercury, dioxins, and a soup of nasty pesticides. In particular, exposure to PCBs can cause cancer, as well as IQ deficiencies and other developmental problems in children of women who have eaten contaminated fish.

History

Ironically, Michigan was once a leader on fish consumption issues. Engler's predeces-

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Citizen suit forces federal rewrite of Pa. water standards

by Reg Gilbert

In twin astonishing developments, the U.S. Environmental Protection Agency has replaced Pennsylvania's rules for protecting its water bodies and determined that the state is in effect refusing to enforce the U.S. Clean Air Act.

EPA-imposed water rules

After two citizen lawsuits and ten years of unremitting intransigence on the part of Pennsylvania's Department of Environmental Protection, EPA in January finally promulgated its own "antidegradation" standards—the rules for protecting the state's streams, wetlands and other water courses.

In the U.S. system for protecting inland waters, the states issue their own standards and permit rules but they must be at least as protective as federal law.

EPA had been negotiating with Penn-

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"Basinwide Organizing for the Future"

Ruth Grier

Alice Chamberlin

Great Lakes United's Annual Meeting
May 30–June 1, 1997

at rustic Cedar Glen Conference Center just north of Toronto—see back pages for details

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. . . Pennsylvania defiance

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sylvania over the inadequacy of its antidegradation rules since the mid-eighties when in 1992 the environment-oriented Raymond Profitt Foundation sued the agency in federal court. The foundation wanted to force EPA to finally disapprove the state's rules and issue its own.

The court ruled in favor of the foundation in 1994 and EPA complied with the ruling, disapproving Pennsylvania's standards and requiring the state to rewrite them to comply with the U.S. Clean Water Act.

In effect, Pennsylvania never did. Following the disapproval, it established a unique "regulatory negotiation" process in which industry and environmentalists discussed rewriting the rules. The Raymond Profitt Foundation sued EPA again, to force it to promulgate new rules regardless of Pennsylvania's actions.

In early 1996 the "reg-neg" group issued an interim report noting progress to date; however, progress apparently stopped at that point. The negotiating group disbanded by the summer without agreement; the industry and environmentalist factions issued separate position papers.

In the meantime the Raymond Profitt Foundation had won its second suit. Shortly after the negotiating group broke up, EPA complied with the ruling and in August it issued draft rules—a single page of standards essentially recapitulating the relatively straightforward federal text.

In a bizarre response, the state issued the early 1996 progress report by the "reg-neg" group as draft rules.

Thankfully, EPA didn't need another suit to do the right thing. It ignored Pennsylvania's now-desperate attempts at further delay and formally promulgated its draft with almost no change. The rules took effect in January.

Given its record, Pennsylvania will no doubt subtly refuse to enforce the new rules. But now environmentalists can make a legal case out of nearly any water body in the state. That could make it much harder for industry to begin new, or increase old, pollution discharge sources.

Poor air pollution enforcement

Simply refusing to enforce the law seems to be what Pennsylvania has done with air pollution. According to a scathing report issued by EPA in February, Pennsylvania's Department of Environmental Protection performed two thousand inspections during fiscal year 1995 and reported only six significant violators to EPA. But an EPA audit of the inspections says the state should have reported at least a dozen times as many violations and likely many more: "From our review of 271 or 13 percent of the 2000 Pennsylvania DEP inspections, we identified 70 additional significant violators that the state did not report to EPA."

The lack of reporting was not an oversight, or the result of incompetence, but apparently simple defiance of the law. According to the report writers, "In their conversations with us, state personnel expressed their intentions not to report violators to EPA."

In contrast with its long deference to Pennsylvania over the state's water antidegradation rules, EPA's response to the state coverup of air pollution was strong. According to a Sierra Club report on the air quality developments in 1996, EPA Region III Administrator Mike McCabe said, "On the surface, it seems that the state has deliberately and systematically concealed information essential to the enforcement of the Clean Air Act. The report calls into question our ability to trust the state."

McCabe even questioned whether the state was withholding information on other programs such as water quality and hazardous waste.

. . . Waters report

continued from the cover page

paign effort by GLU's Sustainable Waters Task Force. Among other campaign goals, which are still under discussion, is a basinwide reduction in water use of 50 percent by 2005.

The report, illustrated, heavily footnoted, and indexed, is available from the Buffalo office for $10 postpaid or in Canada from the Canadian Environmental Law Association, (416) 960-2284.

Crandon, White Pine mine developments

by Reg Gilbert

The Crandon, Wisconsin, area copper sulfide mine proposed by the Exxon and Rio Algom companies has suffered a number of setbacks since the December public relations debacle in which police were used to disperse attendees at a town hearing on the mine proposal.

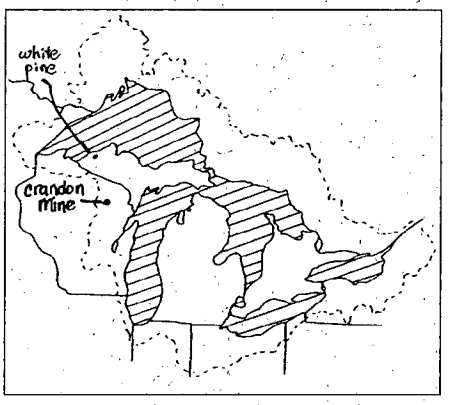
The biggest threat to the Crandon mining plan is a proposed "mining moratorium" that would ban sulfide mine projects until it can be shown that a sulfide mine in similar geographical conditions anywhere in the world had been operated safely for ten years and proved environmentally safe for ten years after being closed.

Sulfide mining is mining in ore bodies containing significant amounts of sulfur, making the ore or its remains a large source of acid and/or poisonous metals such as mercury.

After a number of legislative skirmishes attempting to weaken it by amendment, the mining moratorium bill passed the Wisconsin Senate by the surprising margin of 29-3. Given the influence in the Wisconsin statehouse of the state mining industry, which spent $385,000 and nearly 3,000 work hours lobbying last year, the vote is a testament to the depth of its public support.

Assembly leaders have finally agreed to hold hearings on the bill, now scheduled for May, and legislators are reportedly receiving large amounts of constituent mail in support of the bill.

The Crandon mine proposal is also threatened by a Wisconsin Department of Natural Resources announcement that it would hold hearings on a proposed strengthening of regulations governing landfilled mining waste.



Mine landfills are currently regulated very weakly; the proposed rules would make them subject to the same groundwater protection rules as other hazardous waste dumps and require a trust fund to pay for any cleanup that might turn out to be necessary.

Finally, in a postscript to the spirited meeting in the town of Nashville detailed last issue, four of the five town officials who signed an agreement with Exxon and Rio Algom permitting the mine were defeated in an April election.

However, the ousted officials have called the results fraudulent, rejected the results of a recount, and continue to hold meetings as if the election had never taken place. Local activists say that's the way of politics in places where a few landholding families see the possibility of immense wealth from resource extraction, whether of trees or ore.

by Laura Rose Day
National Wildlife Federation

The U.S. Environmental Protection Agency has decided on the issues it will look at when reviewing the environmental impacts of the Copper Range Company's proposal to conduct full-scale acid mining at its White Pine mine in the Upper Peninsula of Michigan.

The company began a pilot mining effort last summer, sparking a blockade of the train line supplying the mine by nearby First Nations groups. As a result of the publicity EPA pledged a previously unplanned review of the full-scale effort.

According to EPA's "Final Scoping Document," the environmental assessment for the acid mining proposal will include: transportation issues; tribal/cultural issues; economic impacts of the mine on the Upper Peninsula in Michigan, including its culture; and the effects of a potential release from the mine on Lake Superior and other surface or ground waters.

EPA has convened a multistakeholder technical committee to address each issue and retained contractors to develop the EAn, including an expert on tribal resources.

Equally significant are EPA's decisions on what the environmental assessment will *not* consider, including: most impacts of a proposed new smelter at the mine (EPA "does not believe that the smelter and solution mining projects are related activities"); the impact of solution mining on future mining in the region; Copper Range's compliance history.

EPA also refused to consider two important legal questions -- its designation of the operation as a "Class V well," the least restrictive possible under EPA regulations, and the exemption of the solution mining

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from The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?

Graphics: Barbara Klunder

Great Lakes Waters Are Not Limitless

The vast quantities of waters in the Great Lakes—20 percent of the freshwater in the world—deceive us into thinking that we have limitless supplies of water that will last forever. We think of water as a renewable resource, unlike coal or oil reserves that will be depleted, but actually only 1 percent of the waters of the Great Lakes are renewed each year. The other 99 percent was stored here at the time of the last glacial melt, almost twenty thousand years ago, and gradually renewed over time. Only the top 75 centimetres or 30 inches of water in the Great Lakes is renewed each year. We must adjust our understanding of the Great Lakes ecosystem to recognize that water is not a limitless renewable resource.

Why are the governments abandoning RAPs?

Since the Great Lakes Water Quality Agreement first called for an ecosystem approach in 1972, and for zero discharge of persistent toxic substances in 1978, the Great Lakes community has been struggling with the political, economic and technological challenges of turning that vision into reality.

The International Joint Commission provided the vision and the template for action; its Water Quality Board set an agenda by targeting forty-two toxic hot spots or Areas of Concern for cleanup. But the governments have been slow to create the legislative and financial framework that would lead to implementation of the agreement or the Remedial Action Plans.

Moreover, institutional responsibilities have been muddied with the advent of new institutions like the Commission on Environmental Cooperation, created as a side agreement to NAFTA, and the Binational Executive Committee, whose role in relation to the IJC, the governments and the public is unclear. Citizen veterans of the RAPs wonder about the Lakewide Area Management Plans or LaMPs, asking, "Why get involved? What meaning can they have without remedial action?"

Now we are observing a dangerous trend of government withdrawal from their commitments to cleaning up the most severely polluted areas in the lakes. For example, this January the province of Ontario dropped all funding for the Public Advisory Committees that oversee the RAP process. The Ministry of Environment justified this by saying the PACs' job was done once the RAPs were created, that PACs are not needed in the implementation stage.

The province also dropped funding for RAP education programs and eliminated its RAP coordinator positions for the St. Lawrence River, Severn Sound, Bay of Quinte, and the Niagara River.

In some cases, removing Areas of Concern from the list of toxic sites, "delisting," has taken the place of cleanup as a goal. Agencies are searching for ways to justify delisting without completing remediation.

At Spanish River, the government says the only remaining problem is air pollution from Sudbury; therefore the AOC may be delisted. At Nipigon Bay, contaminated sediments are seen as a problem only near the Domtar outfall, in less than 1 percent of the area of concern, and therefore not significant—they can be ignored. At Jackfish Bay, the estimated costs of cleaning up contaminated sediments is $17.3 million and Kimberley-Clark says it will leave if forced to pay for it. On March 20, PAC and government representatives for Jackfish Bay agreed to recommend the "natural regeneration" option—simply letting time bury the toxins or wash them out into Lake Superior. Contaminated sediments and inadequate sewage infrastructure remain the big ticket items in almost all areas of concern.

In the United States, absent a Superfund site or identification of a principle responsible party, there has been no sustained funding or policy for removing contaminated sediments. Meanwhile navigational dredging proceeds in places like the Buffalo River, churning up the toxic mess every year for the half dozen ships that still use the channel. The dredging both resuspends contaminants in the bottom sediments and destroys shallow habitats necessary for fish spawning and other aquatic life. In the St. Lawrence River, navigational dredge spoils are simply dumped back into the river further downstream.

At the other extreme we have the Milwaukee River proposal for dealing with toxic sediments—capping them in place by laying concrete over the riverbed. Simply put, they want to destroy the river in order to save it.

For the most part RAPs have not been incorporated into existing institutional planning frameworks at any level of governance. How does the U.S. Army Corps of Engineers annual workplan relate to the dredging and habitat restoration recommendations of the RAPs? How are state and provincial limits for permitted releases of toxic chemicals established for dischargers in already overloaded AOCs? How many local waterfront development plans incorporate the knowledge and land use planning recommendations generated by their RAPs?

Citizens in the Great Lakes Basin and Great Lakes United have a lot invested in the RAP process. In the summer and fall of 1986 GLU toured the hot spots and conducted public hearings in nineteen cities to review progress on the Great Lakes Water Quality Agreement. This tour encouraged citizens to become involved in the development of RAPs. In 1990, GLU hosted a "RAP Revival" attended by public advisory committee representatives from across the basin who shared stories and strategies. In 1995 and 1996, GLU partnered with the Institute for Conservation Leadership to conduct capacity building workshops for PACs and to develop factsheets on successful RAP strategies to share across the basin.

Now we are wondering if anything will come of all this effort. At our annual meeting last June, GLU coalition members passed a resolution calling for the U.S. Environmental Protection Agency and Environment Canada to reaffirm their commitment to cleaning up the worst polluted areas in the lakes. We asked both governments to:

- Commit the needed federal dollars for real remedial action and redevelopment in AOC communities, including assessment of health impacts and support health services
- Reassert commitment to full public participation in all aspects of the RAPs, including funding for independent technical advisors and meeting facilitators and for community organizers to encourage public participation
- Negotiate with environmental public interest groups to develop a basinwide strategy to complete and fully implement RAPs.

Tragically, over the past year the governments have moved in directions contrary to the resolution.

In this, the twenty-fifth anniversary year of the Great Lakes Water Quality Agreement and the Clean Water Act, we need to reconfirm our binational commitment to protecting and restoring the Great Lakes. We need to do so with our eyes wide open to the challenges of implementing a truly ecosystem-based approach.

Margaret Wooster

Some marsh bird populations suffering declines

by Jon McCracken
Long Point Bird Observatory

Apart from waterfowl, we know exceptionally little about marsh bird population trends. The Marsh Monitoring Program, a joint undertaking of the Long Point Bird Observatory, Environment Canada and the National Audubon Society, will address this information gap, but it will take at least five years before enough data are gathered to provide a meaningful analysis of population trends. In the meantime, the best we can do is look to the continental Breeding Bird Survey to provide us with some clues.

The BBS is rather good at detecting population trends of many species of landbirds. Because it is a roadside based survey, however, it is not particularly suited for monitoring waterbird populations, especially shy, secretive species like rails, bitterns and grebes which require special survey techniques and which may also have a tendency to avoid roadside marshes. Despite its limitations, the BBS nevertheless points to some rather worrisome trends.

Since the survey began in 1966, many marsh dependent birds have declined across North America. Among them are pied-billed grebe, American bittern, least bittern, northern harrier, Virginia rail, sora, American coot, common snipe, black tern, common yellowthroat, and even the ubiquitous red-winged blackbird. Most of these declines are statistically significant. Only a few species show increases (common moorhen, marsh wren and swamp sparrow), none of which are statistically significant. Marsh birds appear to be declining more seriously than other groups of birds. Why?

Despite the progress that is being made in Areas of Concern and other places, marshes are still under considerable pressure. The rate of wetland loss has slowed, but marshes are still disappearing incrementally. Highly invasive, non-native species (purple loosestrife, European phragmites, carp, zebra mussels, and even Mute Swans) are degrading many marshes. The water pollution problem is still with us. And we are only now just beginning to think about the possible damaging effects that a diminished ozone layer might have on wetland ecological processes. We're not out of the woods yet.

Bad news for black terns

The black tern is a little unusual in several respects:

- Unlike most other kinds of terns that nest on tiny islands and beaches, the black tern is an obligate marsh-nesting species.
- Whereas most terns and gulls are strongly colonial, densely packing as many nests as possible into the available habitat, the black tern is only loosely colonial, and generally prefers to space its nests out. Black tern colonies seldom exceed 50 pairs; most colonies consist of about 10 pairs.
- We normally think of terns as being expert fishers. Although the black tern does eat plenty of minnow-sized fish, its diet is dominated by insects, which are often "hawked" out of the air.

The black tern doesn't nest in just any old marsh. The marsh must have the right ratio of open water:emergent vegetation (generally about 50:50) as is evidenced by the Marsh Monitoring Program data gathered on black terns over the last two years.

Black terns nest in various kinds of marsh vegetation, but cattail marshes are generally favoured. Indeed, the vast majority of the Marsh Monitoring Program routes on which black terns have been recorded are dominated by cattail. Since their nests are often built on floating mats of dead cattails, rootballs and patches of floating mud, black terns need sheltered pools of open water for nesting. Stands of cattail are very good at buffering wind and wave action, helping to

from The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?

Great Lakes Water Use

Ninety-four percent of the water withdrawn from the Great Lakes for human use is taken by hydroelectric power plants. Almost all of it is returned to the lakes, but hydro's use of water seriously disrupts the natural flows and levels of the rivers and lakes and thus affects downstream users, both people and wildlife.

The quantities of water consumed by human activities are small by comparison with hydroelectric use, but they are extremely significant because much of the water used by humans is permanently lost to the Great Lakes through evaporation, incorporation into products or other processes. This is called water consumption.

In 1992 agriculture was the largest consumptive use of water. This water is used for both drinking water for livestock and irrigation of crops. The next largest consumptive use was for public water supplies, operated primarily by municipalities, for residential, commercial, institutional and industrial uses. Almost as large was use by manufacturing and mining operations using their own water supply systems, and self supply for household purposes.

Our water consumption is increasing rapidly. In 1975, the International Joint Commission predicted that water consumption in the Great Lakes will increase three to seven times by 2035. The IJC estimates that such an increase will result in drops of a third of a metre or one foot in the water levels of Lakes Michigan, Huron and Erie.

Dioxins significantly responsible for lake trout crash

by David Mahony

A new study says toxic chemicals have played a significant role in the failure of lake trout reproduction in the Great Lakes. Between 1945 and 1975, levels of dioxin and related chemicals in Lake Ontario were high enough to have resulted in zero survival of lake trout sac fry, according to Richard E. Peterson, a toxicology professor at the University of Wisconsin-Madison School of Pharmacy.

Peterson has spent ten years researching this topic for the National Sea Grant Program and he recently completed studies in collaboration with Philip Cook of the U.S. Environmental Protection Agency.

"Our data suggest that dioxins and related chemicals may have contributed to the extinction of lake trout in Lake Ontario prior to 1960 and to the recruitment failure of stocked lake trout since then," Peterson announced at a National Sea Grant news briefing in Seattle in February.

"Female fish accumulate dioxin-like chemicals in their bodies and transfer some of these toxins to their eggs," Peterson said. "At high enough concentrations, these contaminants can cause all of the fish's offspring to die within three weeks of hatching. The highest concentrations of dioxins and similar toxic industrial contaminants generally are found in the Great Lakes' largest trout and salmon, especially in the long-lived lake trout."

Of all the species of Great Lakes fish Peterson tested, he found lake trout were the most sensitive to TCDD (2,3,7,8-

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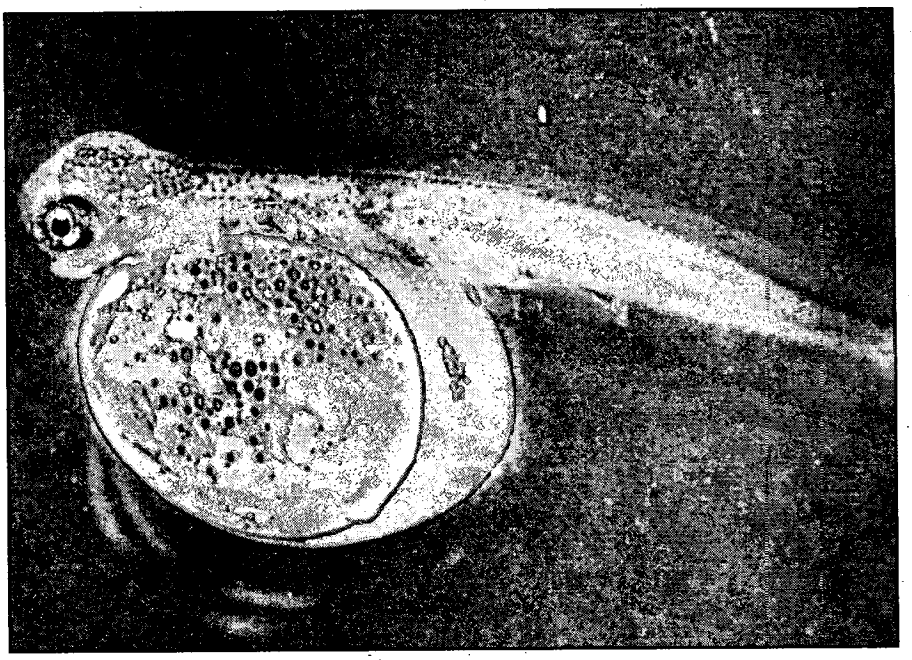

. . . *marsh birds*

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protect the vulnerable nests.

Black terns generally prefer deep water marshes (about a metre). Deep water conditions tend to create the interspersed stands of vegetation and open pools of water that the terns need. If the water is too shallow, the vegetation is too dense. If the water is too deep, then the vegetation is too interspersed.

Black terns like relatively large marshes. Just as with landbirds, several species of marsh birds are "area sensitive," requiring large tracts of habitat in order to successfully reproduce. The black tern is moderately area-sensitive. According to the Marsh Monitoring Program data, it generally requires permanent marshes that are at least 50 hectares. Black terns have disappeared from many marshes that have been reduced much below this threshold.

Though still locally common in some areas, the black tern has seriously declined throughout its range. It was recorded on only 65 of the 273 Marsh Monitoring Program routes surveyed in 1995 and/or 1996. A recent analysis of Breeding Bird Survey data showed that the population has been declining by an average rate of 4.7 percent per year since 1966. Over the span of just thirty years, this translates to an overall loss of about 75 percent of the population! This species is clearly in serious trouble.

We don't really know what is causing the decline. In coastal marshes along the Great Lakes, sustained high water levels may be effectively washing out key habitat. Elsewhere, the decline might be more directly connected to habitat loss due to development pressures, coupled with increased recreational use of marshes by power boats that can wash out tern nests. Pollution may also play a role, especially on the black tern's Latin American wintering grounds, where persistent toxins like DDT are still in use.

The future of the black tern is quite uncertain. It is already considered endangered in New York, Pennsylvania and Ohio, threatened in Ontario, and a species of special concern in Michigan.

Across the Great Lakes basin, data collected by Marsh Monitoring Program volunteers from hundreds of marshes will continue to throw light on the black tern's habitat requirements and monitor regional population trends. Together, this crucial information can be used to identify the geographic extent and seriousness of the problem, help pinpoint the source(s) of the trouble, and ultimately aid in the design, application and evaluation of recovery efforts. In the meantime, this species would likely benefit from large-scale marsh creation projects, eliminating powerboat access to nesting colonies, and installing floating nesting platforms in degraded sites.

Canada's fuzzy on fish farming

by David Mahony

Caged aquaculture -- fish farming -- is the production of fish in penned open water environments. About twelve aquaculture facilities are operating on the Canadian side of the Great Lakes, all but one in northern Lake Huron.

Like any animal farm, aquaculture facilities generate feces and its attendant problems. In water that problem mostly centers on a biological chain of events that reduces oxygen and kills the fish in the areas wherever the feces end up.

The fish raised in farms are also genetically homogeneous and can cause problems if they mate with wild fish. Penned fish can also be subject to outbreaks of disease that threaten wild fish stocks.

Worldwide aquaculture is booming as a way to increase the production of human food protein. The Canadian government is committed to expansion of this industry, and has declared, "Aquaculture development is a priority of the federal government, and will be given specific policy and developmental considerations. Government will create a climate in which aquaculture can flourish."

Such language usually does not bode well for environmental protection, but for the time being the government is at loggerheads about how to regulate aquaculture facilities. Basic licensing of aquaculture facilities is carried out by the Ministry of Natural Resources; permitting the use of water and any resulting pollution are the job of the Ministry of Environment and Energy. MNR has a skimpy policy for deciding on the appropriateness of aquaculture facilities; MOEE does not yet have any policies for them. No new facilities are being constructed at the moment.

However, looming over the issue is the desire of the aquaculture industry to be essentially unregulated; the current political climate favours this approach.

A fish farm proposed by Oliver Laperson illustrates the problem. Last year Laperson applied for approval to develop an aquaculture facility in the Adolphus Reach section of the Lake Ontario's Bay of Quinte. The Bay of Quinte Remedial Action Plan committee was never informed about the project, nor was the committee writing Lake Ontario's Lakewide Area Management Plan.

But area residents have long been concerned about eutrophication -- reduced oxygen in the water caused by the growth of bacteria. Bacteria feed on fish food and feces, and eutrophication is the most common problem associated with aquaculture.

Further, the Bay of Quinte is listed as an Area of Concern; one of the reasons for the listing is eutrophication, which wiped out the area's premier whitefish and walleye fisheries in the 1950s and 1960s.

After spending $30 million upgrading sewage treatment plants to limit point-source discharges of phosphorus, a eutrophication nutrient, and with work still ongoing to deal with other water quality issues in the Bay of Quinte, citizens would certainly be interested in some guarantees that Laperson's operation would not have a negative impact on the bay.

Laperson's facility was planned to produce some 100 tonnes of rainbow trout. Just by chance, however, Jack Christie, a retired fishery scientist with the Ministry of Natural Resources, heard about and publicized the proposal. He estimated that the facility would discharge about as much nutrients and phosphorus as the untreated sewage of a village of 850 people. Industry officials dispute the figure.

The facility has not been approved and Laperson is now pursuing a proposal for another Lake Ontario

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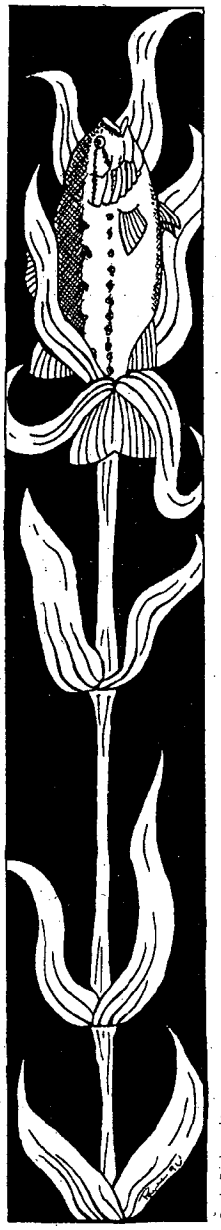

Paula Borkowski

from The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?

Living Within Our Means: Conservation

The most important element of sustainable water management is the entrenchment of the understanding that settlement should be limited to where water supplies exist. It is not an acceptable solution to water shortages in a region to pipe it from somewhere else. Sustainability means leaving our pipe dreams in the past and properly managing the water resources available in any given region.

A primary component of this is wisely using the water we have. Instead of always looking for new water sources, we should focus on reducing the demand for water through conservation measures. Canada and the United States have the highest per capita use of water in the world. Water use levels in other countries demonstrate that it is quite realistic to set a goal of 50 percent reduction in per capita use of water in Canada and the United States by 2005.

. . . Michigan fish warnings

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sor, Gov. James Blanchard, spearheaded an effort in 1986 to obtain strong, uniform fish consumption advisories among the Great Lakes states. Blanchard's leadership resulted in an agreement promising "common fish advisories" for the Great Lakes states by the next year.

Unfortunately, the states delayed, so the National Wildlife Federation conducted its own risk assessment of exposure to Lake Michigan sport fish. The conclusion: "You should severely limit your consumption of most Lake Michigan sport fish species."

NWF's findings created a furor. Even today, many critics allege that the organization's publicity damaged the sport fishing industry. However, the timing of NWF's advice merely coincided with the decline of the Great Lakes salmon fishery due to a mysterious disease. Only now is the fishery rebounding. Says NWF President Mark Van Putten, "We were right then. We're right now."

The Uniform Protocol

The states finally did convene a committee of thirty health and environmental officials. In 1993 they agreed to a new, more protective fish advisory system -- the "Protocol for a Uniform Great Lakes Sport Fish Consumption Advisory."

The protocol, at least twenty times more restrictive than the system currently used by Michigan, is designed to protect the public from the range of serious adverse health effects caused by exposure to PCBs in sport fish.

The Uniform Protocol was peer reviewed in 1993 and 1994, but Engler balked at adopting it and in 1995 referred it to a special panel of the Michigan Environmental Science Board. That panel concluded that the protocol's standards were protective for women of childbearing age and children, but overly protective for others.

Meanwhile, Michigan continued to use the outmoded advisory system, and to relax its advisories to sport anglers. Last year Engler's health department crowed in a press release that for the first time in twenty-five years there would be no recommended restrictions on eating Great Lakes salmon.

Michigan is the only state that thinks so. The Uniform Advisory issued by the rest of the Great Lakes states says that salmon should be eaten no more than once per month, particularly by women of child-bearing age and by children.

Citizen action

Meanwhile, the pressure on Engler continues to build. Citizens of the Michigan Environmental Health Coalition are sending the governor drawings of fish on paper plates with such pithy slogans as: "Engler's feeding us a line. We're not biting."

The Michigan House of Representatives approved legislation by a margin of 104 to 5 that would require the state to use the Uniform Protocol. The bill faces an uncertain future in the Republican-controlled Senate.

And scientists studying the effects on infants of maternal exposure to contaminated Great Lakes fish are starting to speak out. Researchers at SUNY Oswego's Center for Neurobehavioral Effects of Environmental Toxics describe "subtle, yet significant effects of maternal fish consumption on neonatal behavior." They conclude:

> There is insufficient data at this time to determine what effects these toxicants, singly or in combination, may be having on those exposed to them prenatally via maternal fish consumption. Given these uncertainties, we urge . . . the strictest possible fish consumption advisory for women of childbearing age. It is our opinion that this population should be advised to consume *no Great Lakes fish at all* until such time as sound research provides strong support for a safe level of exposure. (emphasis added)

For more information on this issue, connect your Internet Worldwide Web browser to www.greatlakes.nwf.org/hot.htm.

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. . . fish farming

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site in a less sheltered area. But the case is a good example of what may be a more common occurrence in the near future. If not for Jack Christie, it is possible that local people would not have been aware of the proposed facility until it was up and running.

No comprehensive policy

The Ontario Ministry of Natural Resources established a rudimentary policy on aquaculture last spring. The policy requires a three-year fish culture licence costing $150 and an analysis, for each species to be raised, of the potential for it to escape to unpenned waters and the impact that might have on the surrounding fish population.

That's about the extent of the policy. Approval is completely at the discretion the Ministry of Natural Resources district manager. There is no public notification requirement.

In addition to MOEE water use and pollution permits, for which there are not yet policies, aquaculture facilities must also get routine approvals from the local Conservation Authority regarding flood plains, the area municipality regarding zoning, and the federal Coast Guard pursuant to the Navigable Waterways Protection Act.

Industry response

The Ontario Aquaculture Association is actively lobbying government for a clear and unintrusive approval process. OAA claims that farm-raised rainbow trout pose little potential genetic threat to naturally reproducing fish. The organization says that total Great Lakes aquaculture production is about 3,000 tonnes.

OAA says Great Lakes aquaculture facilities have operated cleanly thus far and will continue to do so by controlling feed, which it claims is the best indicator of the impact of fish farming on water quality and has been widely used in Denmark and elsewhere.

Great Lakes United plans to follow this issue; if you have any comment on the practice of aquaculture or would like to work on the issue, please call the Buffalo office.

United States finally moves against exotic species in ships

by Andy Frank

Last year Congress passed the National Invasive Species Act of 1996 to help prevent the spread of nonindigenous species, mostly water creatures from Eurasia, into U.S. waters. This critical legislation funds continued inspections of ships to ensure that they comply with regulations designed to prevent the introduction of nonnative species to the Great Lakes.

The legislation reauthorizes the original, first passed in 1990. NISA, however, expands the law by making the Great Lakes program a model for other states to use voluntarily.

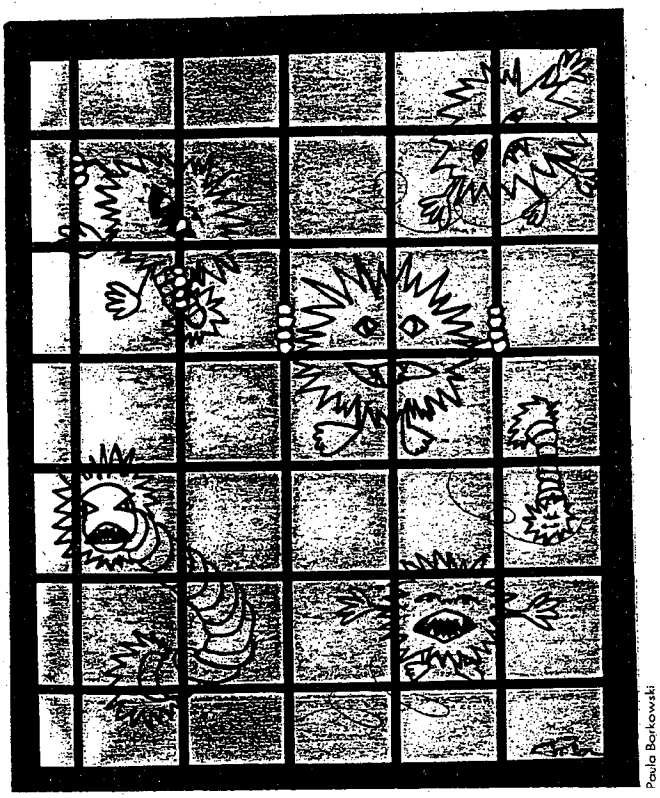
Additionally, NISA provides authority to the secretary of the U.S. Department of Transportation to mandate region-specific regulations where voluntary compliance is found to be inadequate.

NISA also provides funding for the study of nonnative populations in American waters, and for the control of threatening, invasive species.

Historical impacts

Nonnative species have found their way into the Great Lakes through a number of pathways, including escape from cultivation, intentional release for sport, and by vessels moving through canals and waterways.

A number of nonnative species, such as the sea lamprey (an eel-like parasite problematic since the 1940s) and the zebra mussel (a wildly reproducing mollusc problematic since the 1980s) have had very serious effects on the Great Lakes ecosystem.



Paula Barkowski

Prevention

Once nonnative species introduced by international shipping began causing serious economic impacts, including lamprey devastation of trout fisheries and zebra mussel interference with water intakes, a federal effort to reduce the risk of new invasions resulted in the original 1990 law.

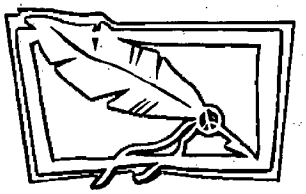
The 1990 legislation set down voluntary guidelines for ships moving through the St. Lawrence Seaway, mostly with the aim of reducing the risk of nonindigenous species entering the Great Lakes system through the ballast water of ships traveling from foreign ports.

Ballast water is water stored on board a ship in order to stabilize it. In general, the heavier the cargo a ship is carrying, the less ballast water it needs. As a ship loads or unloads cargo, it takes on or discharges ballast in order to maintain stability.

In 1992, the invasive species law's voluntary guidelines were made mandatory. The regulations allow three options for vessels coming

continued page 28

from The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?



First Nations' Water Rights

The changes that European settlement have wrought on the levels and flows of the waters of the Great Lakes Basin have had devastating impacts on the First Peoples of the Great Lakes, who arrived here approximately ten thousand years ago. The natural flows of the waters have been disrupted, resulting in the destruction of much of the natural habitat and the rich diversity of life in the Great Lakes Basin that the First Nations and Tribes have traditionally depended on.

One of the critical rights that the First Nations and Tribes have maintained is the right to use of water. Even though the courts in both the U.S. and Canada have confirmed First Nations rights to the use of water, the implications of this right continue to be disputed or ignored. One difficult aspect of this problem is that, if sovereignty is to be meaningful, its exercise has implications far beyond the lands that are still held by the Tribes and First Nations. Water does not start and stop wholly within any jurisdiction's territory. First Nations rights to the unimpeded flow of clean, life-filled water affects most of the Great Lakes region.

Although their rights seem clear, the First Nations and Tribes have had great difficulty in asserting their rights and in persuading the rest of society to acknowledge those rights and take into account the special relationship of the First Nations to the waters of the Great Lakes when they make decisions.

. . . dioxins hurt the trout

continued from page 6

tetrachlorodibenzo-p-dioxin), the most toxic form of dioxin. He discovered that TCDD levels in lake trout eggs as low as 30 parts per trillion (ppt) caused observable increases in sac fry mortality, and 100 percent mortality occurred at TCDD levels above 100 ppt.

While contaminant levels have dropped dramatically over the last decade, lake trout and other sport fish in the Great Lakes as well as most other U.S. lakes and rivers still contain detectable levels of TCDD and related toxins, including various forms of PCDD (polychlorinated dibenzo-p-dioxin), PCDF (polychlorinated dibenzofuran) and PCBs (polychlorinated biphenyls). Peterson's research shows that, in the early stages of life, fish are particularly vulnerable to the toxic effects of these chemicals, which he found act in an additive fashion.

"Toxic equivalencies"

A notable spin-off of Peterson's research was his determination of TCDD "Toxicity Equivalence Factors" for individual dioxin-like chemicals (dioxins, furans, and certain PCBs), based on their ability to cause fish embryo mortality. These "TEFs" are ratings assigned to dioxin-like chemicals that show how toxic they are compared to TCDD.

The TEF values permit an accurate evaluation of the cumulative risks to the early development of fish posed by low concentrations of dioxin-like chemicals in their eggs, Peterson said, adding that the EPA is proposing to adopt the TEF approach to more precisely assess the risks these chemical pose to wild fish populations.

Historical lakes dioxin levels

Peterson developed the TEF method as a way to convert the concentrations of several different dioxin-like chemicals found in Lake Ontario lake trout eggs to the equivalent concentration of TCDD. EPA's Cook then estimated the historical concentrations in the eggs based on the concentrations of these chemicals found in Lake Ontario bottom sediment cores covering the 1930 to 1987 period.

The EPA analysis showed that contamination of Lake Ontario by TCDD-like chemicals began in the 1930s and peaked in the late 1960s. Sac fry hatched from the lake trout eggs collected from Lake Ontario, the last lake in the Great Lakes chain, continued to exhibit blue sac disease-like symptoms up to the middle 1980s, Peterson said.

While no blue sac symptoms were evident in fry hatched from Lake Ontario lake trout eggs in 1991, Peterson said that "even at sub-lethal levels, TCDD and similar chemical contaminants may be compromising the survival of swim-up fry in the environment."

Peterson noted that dioxins and PCBs have been identified as possible endocrine disrupters — chemicals that alter the action of natural hormones and interfere with normal reproduction and development in animals. This is the focus of Peterson's current Sea Grant research.

Thanks to our new members and donors

A hearty thank you and welcome aboard to our new and renewing members so farthis year:

Dave and Judy Allen, Jedd Anderson, Hedwig Auletta, Fran Beach, Peggy Beardsley, Tim Bristol, Clean North, Jay Burney, Ronald Cass, Rick Chaianelli, Ed Cherian, Clean Water Action Council NE-Wisconsin, Frank Cole, Nadia Conforti, Conservation Fund, George Cooney, Chet Dann, Brian Denney, Ron Desjardine, Barbara Doe, Arthur Efron, Hamilton and Lilian Emmons, City of St. Clair Shores, Christopher Goddard, Greenpeace Canada, Kenneth Hall, Cheryl Hill, Mark Jenness, Edith Johnson, Ann Jones, Ohio CARE, Laura Koch, Fred Krause, George and Danielle Kuper, Thad Lang, Aaron Lercher, Simon Llewellyn, Monroe City Planning Dept, Daryl McDonald, Katherine Melby, Miriam Melis, Peter Mirando, Glenn Muhr, the Nature Preserve, Sara Noah, Norcross Wildlife Foundation, Dena Owens, Roberta Paul, Rich Peters, Perstorp Polyols, Aaron Pomerantz, Robert Ponte, William Randall, Frances Rauth, Paul Rentschler, George Rusk, Heather Schroeder, Geraldine Schulte, Lisa Segbarth Nelson, Saulius Simoliunas, U.S. Fish & Wildlife Service, Karen Vermillion, Kent Weichmann, Janet Wisbaum.

And an especial thanks to those who contribute money to Great Lakes United beyond standard membership dues. Extra donations make it possible for us to do more than just keep the doors open:

American Federation of Government Employees, Jane Armstrong, Carolyn Batt, Georganna Bidlack, Judy Bock, Richard Boehnke, Robert Boice, Eleanor Bookwalter, Barry & Jana Boyer, Stuart & Ellen Burt, Gerard Cacio, Margaret Ciccone, James Cumming, Luke Dailey, Jean Eakin, Patricia Eberlein, Kent Fuller, Linda Giarizzo, David and Holly Hahn-Baker, Ole Hendrickson, John Hoffman, F.G. Jewett, Bruce Klosner, Steven Lakomy, Peg Lush, Elizabeth Macomber, Robert McClellan, Robin McClellan, Thomas Mehaffy, Raymond & Anne Nelson, Chris Neurath, New York State CAP Council, Jack O'Dette, Bill Paxon, Susan Peimer, Kim Perrotta, Tom Potts, Katherine Rill, Dianne Russell, Paul Schillo, Dickie Selfe, G. Michael Skerritt, Camilla Smith, Robert Soderstrom, Ronald Sovak, Charlie Tebbutt, Jack Vallentyne, Leonard Weber, James and Carol Wise, Elizabeth Wood

Thank you all for your support and genorisity.

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Absent policy, Ontario roadless areas are threatened

by Andy Frank

While Ontario delays writing a required policy on designating and preserving roadless areas, proposed road developments threaten Lake Superior habitat. One of the most recent of these proposals, finally rejected in April after vociferous public reaction and months of consideration, came from the Ontario Ministry of Natural Resources itself. The ministry's Nipigon District wanted to amend its land use guidelines to permit construction of permanent roads onto the Black Bay Peninsula in Lake Superior.

The Black Bay Peninsula is one of the last significant roadless wildlands on Lake Superior. Largely because of the inaccessibility caused by this very roadlessness, the peninsula's coastal lands have remained a rich refuge for wildlife. The centerpiece to the region is an extensive peatland designated by the province a Area of Natural and Scientific Interest. Surveys of the peatlands by a local naturalist group have found evidence of nesting sandhill cranes, sharp-tailed grouse, and both boreal and great gray owls. The ministry has recorded bald eagle and great blue heron nesting sites. The peatlands also support many regionally significant plants, including twig rush, ragged fringed orchid, and lapland buttercup.

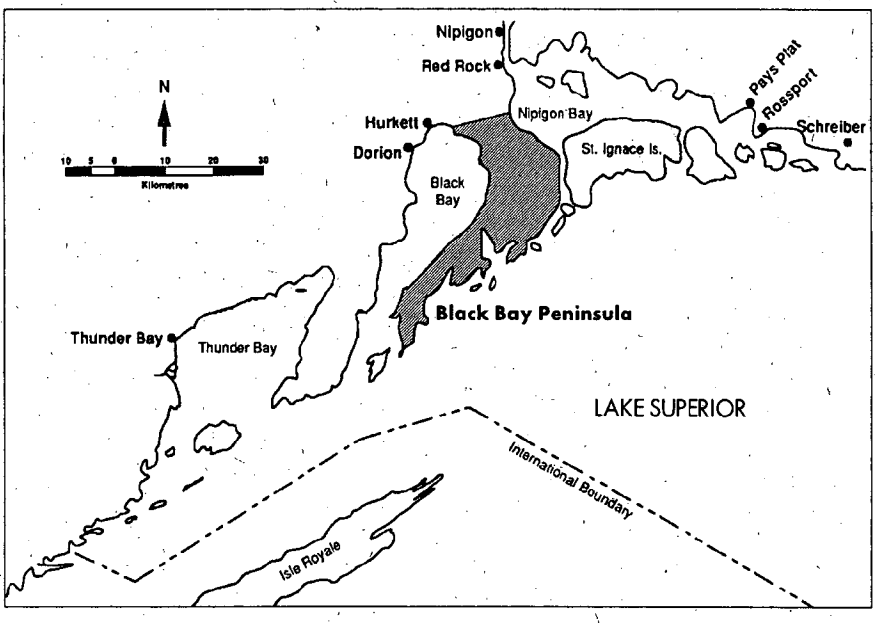
A ministry report calls the site "one of the finest examples of peatland along Lake Superior" and states that, "Maintaining the water regime is critical to the peatland ecosystem. Activities which upset this balance may cause eventual degradation to the site."

Nonetheless, the district proposed the road. Strong public reaction apparently caused a change in heart. The ministry in April stated simply, "A review of the public comment indicated that a permanent road is not in the public's best interest."

The ministry's same Nipigon District office is still proposing a year-round access road through Windigo Bay Provincial Park, opening up remaining pristine wildlands in the north end of Lake Nipigon. If you would like to object, please write to OMNR's Nipigon District Office at Box 970, 5 Wadsworth Dr., Nipigon, Ontario, P0T 2J0.

Perhaps more importantly, concerned readers should write the ministry urging completion of a strong, comprehensive policy protecting the province's remaining roadless areas. Write OMNR at 6th Fl., Rm. 6301, Whitney Block, 99 Wellesley St. W., Toronto, Ontario, M7A 1W3, (416) 314-2301

Information provided by Julian Holenstein, Thunder Bay Field Naturalists.



from The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?

Climate Change

Climate change is not a speculative issue; it is a reality that is now happening in the Great Lakes region. Scientists predict that, if CO_2 concentrations double by the year 2100 as is now predicted, climate change will have the following impacts on the Great Lakes Basin:

- Temperature increase of 9.1 C or 15 degrees F.
- Lake levels decreased basinwide by one metre or over three feet and in Lake Michigan by 2.5 metres or 8 feet.
- Loss of wetlands and the concomitant loss of essential habitat.
- Loss of forests, especially the boreal forests north of Lake Superior.
- Loss of cold water fish.
- Decreased water quality because of the resurfacing of buried contaminated sediments.
- Increased human health problems, including diseases now unknown in the Great Lakes region such as malaria.
- Increased crop damage; decreased shipping because of low lake levels.
- Losses to industries such as breweries, the chemical industry and hydropower generators that are highly dependent on water.

GLU habitat task force plans future activity

by David Mahony

The mission of Great Lakes United's Biodiversity and Habitat Protection Task Force is to protect important Great Lakes habitats and the diversity of native species that live in them.

We define habitat to include all the Great Lakes, the St. Lawrence River, the smaller lakes and river systems, and the wetlands, woodlands, dunelands and grasslands in the Great Lakes Basin.

Currently the goals of the task force are to counter the anti-conservation "wise use" movement in the Basin and to provide the missing grassroots conservation voice to Great Lakes fishery management. Our specific objectives are:

- Counter efforts that exploit natural resources for short-term gain
- Regularly provide information on "wise-use/share" activities to citizens activists throughout the Great Lakes region
- Enhance the efforts of groups working on resource stewardship on the local, state/provincial and regional levels
- Broaden Great Lakes fishery management decisions to include citizen participation and ecosystem goals

To fulfil the objectives, the Task Force has identified a range of specific activities. Great Lakes United will:

- Serve as an information clearinghouse and resource bureau for groups fighting the "wise-use" and "share" movements in the Great Lakes region
- Further the coalition of citizens and activists working to counter the anti-environmental movement through a database and interactive network
- Sponsor an annual "wise use" information and strategy retreat bringing together about forty regional conservation organizations and our nontraditional allies to assess the needs of the coalition, develop common agendas, and share strategies
- Continue to support coalitions in Pennsylvania and Ohio opposing state "takings" bills, specifically by reaching out to municipal officials, and in Ontario to review the potential impacts of international standards and forest certification on ecosystem goals for Ontario's forests
- Produce a "Citizen's Guide to Great Lakes Fishery Management" to:
  1) inform environmentalists of the need to be involved in fisheries management as advocates of natural sustainability
  2) provide the necessary information about how to get involved
  3) promote opportunities for public participation.
- Host a second Great Lakes Fishery Conference on the U.S. shore of Lake Erie to further the dialogue among diverse interests towards common goals and sustainable management practices.

The task force will also be organizing the New York Aquatic Habitat Protection Network, which will involve identifying grassroots groups who work on river, lake and wetland issues in New York state and helping coordinate efforts among these groups and build their capacity to take action.

The task force will also continue to be involved with the Long Point Bird Observatory's Marsh Monitoring Project, which uses volunteers to take a bird and amphibian census in Basin marshes. We will help find volunteers for the program.

Additional possible task force activities may include providing citizen input into forest certification in the Great Lakes-St. Lawrence region and examining the impact of small dams on river habitat in the Great Lakes Basin.

U.S. Supreme Court to assess citizen suits in Basin case

In February the U.S. Supreme Court agreed to decide whether citizens can sue to impose penalties on companies that failed file reports required for the U.S. Environmental Protection Agency's Toxics Release Inventory.

The case may also decide whether citizens seeking penalties that go to government satisfy a constitutional requirement known as "standing," that is, whether they have a sufficient stake in the litigation to be constitutionally permitted to bring suit.

Under the TRI program, part of the Emergency Planning and Community Right-to-Know Act, companies must file annual reports detailing their use, release and transfer of certain toxic chemicals. Companies that don't file reports may be forced to pay fines of $25,000 per day.

In 1995, CBE filed a required notice of its intent to sue the Steel Company of Chicago for failing to file TRI reports. The company responded by immediately filing eight years' of overdue reports. CBE then attempted to sue to obtain penalties for the company's long footdragging.

A lower court initially dismissed the citizen suit, but the Seventh U.S. Circuit Court of Appeals, which includes Wisconsin, Illinois, and Indiana, reinstated it. The Supreme Court is hearing the case because the Sixth Circuit Court of Appeals, which includes Ohio and Michigan, has ruled against such citizen suits.

In recent years CBE has sued and settled similar cases with more than a dozen polluters. In many of the cases the companies paid reduced penalties in return for carrying out environmental protection efforts such as altering their production processes to reduce pollution or financially supporting local commissions that plan emergency responses to accidents involving toxic chemicals.

In one such case, a paint company reformulated its production techniques and reduced its use of toxic glycol ethers by more than 90 percent, approximately 167,000 pounds of the substance, each year.

A PULLOUT SECTION
COMPILED BY HEATHER POTTER, THE NATURE CONSERVANCY

OUR BASIN HERITAGE

The heart of North America is home to one of the world's most remarkable ecosystems. Carved out by glaciers during the last ice age, the enormous water bodies of the Great Lakes shape the region's ecology by influencing its climate, landforms, hydrology and biota. The result is a vast, lake-influenced landscape comparable to nothing else on Earth.

This rich ecological frontier supports a stunning array of 131 plants, animals and natural communities of global significance. Nearly half are unique to the Great Lakes region or have their best occurrences here. Consequently, the global survival of these species and communities hinges on their health within the Great Lakes ecosystem—the system we call home.

THE GREAT LAKES PROGRAM

In 1994, The Nature Conservancy's Great Lakes Program released a report that documented, for the first time, the unique ecological features of the Great Lakes region. Though it represented only the first step in assembling critical data to guide conservation in the region, the findings of this report have formed a common reference point for the Great Lakes conservation community and in many instances have shaped partners' work to protect Great Lakes biodiversity.

The Nature Conservancy's Great Lakes Program, with a coordinating office in Chicago, facilitates cooperation among eight Conservancy state chapters, two Conservancy regional offices, and Canadian partner organizations that operate in the Great Lakes region. The program, established in 1992, seeks to transcend state and international boundaries to preserve the unique biological wealth of a whole ecological system—the Great Lakes.

Presented here is a sampling of places throughout the Great Lakes that offer citizens the opportunity to enjoy some of the areas that the Conservancy and others have worked hard to protect.

Not all of these places are Conservancy preserves. The goal of biodiversity conservation is too large for any of us to achieve alone. Partnership has and will continue to be a linchpin of successful conservation in the Basin. Thus, many of the places described below are owned and managed by other partners; some did not include the Conservancy as a partner.

LOOK FOR YOURSELF

As the Great Lakes conservation community pushes forward in its work, we will all do well to nurture or rekindle our personal connections to the wealth of biological features that makes this region so special. There is no substitute for getting out onto the landscape and experiencing first hand the beauty and diversity of this vast region.

MINNESOTA

TETTEGOUCHE STATE PARK

On the North Shore of Lake Superior, Tettegouche State Park boasts nearly 9,400 acres of northern mixed forest wetlands and streams. Lake shoreline includes unusual cobble beach and steep, undulating cliffs formed from basalt-lava flows.

Tettegouche ("resting place" in Ojibwa) is dominated by a rich conifer forest of birch, aspen and red and white pine. Maples and red oaks grow in the park's west section. Moose and bear abound in the park's 2,800-acre Palisade Valley recreation unit. Though the park is currently owned and managed by the state of Minnesota, the Conservancy helped establish what was then named Baptism River Park through the state legislature in 1978. A land sale and swap in 1992 engineered by the Minnesota chapter annexed the pristine Palisade Valley and doubled the size of the park. In 1993, 3M Corporation gave the Conservancy a tract of land at Crystal Bay, the company's birthplace, which later expanded the park by 310 acres. The park is open year round, though campsites and cabins require reservations. Visitors can swim and fish in five lakes, hike more than 20 miles of trail, and ski, snowshoe and snowmobile on designated trails. Tettegouche trails connect with the Lake Superior Hiking Trail.

Harold Maldie

Tettegouche State Park, Minnesota

For more information, contact Tettegouche State Park at 474 Highway 61 East, Silver Bay, Minnesota, 55614, (218) 226-6365.

INDIANA

In Lake County, Indiana, there are three preserves open to the public that feature some of the Great Lakes region's most unique examples of dune and swale ecosystems.

HOOSIER PRAIRIE

Indiana's largest high-quality prairie, Hoosier Prairie has been described as the state's "single most significant natural area." Located only minutes from the steel mills and oil refineries of the Calumet region, it seems like a lost tract just waiting to be developed. But within its 548 acres the ecological diversity is among the greatest in the state.

A wide range of moisture conditions and small elevation changes created micro-environments which cause the variety in the vegetation. Small sand rises support black oak savannas. In the depressions and flats are wet prairies, sedge meadows and cattail marshes. On the slopes between the rises and swales are mesic sand prairie openings. There are over 350 native species of vascular plants. At least 43 of these are uncommon or rarely encountered in Indiana.

In contrast with preserves like the German Methodist Cemetery Prairie, which is one community with high diversity, Hoosier Prairie is many communities with different degrees of diversity. During each spring or late fall, when the vegetation is dormant, prescribed burns are conducted to prevent woody growth from invading this sun-loving ecosystem.

Acquired by the Conservancy in 1976, Hoosier Prairie, is now owned and managed by the Indiana Department of Natural Resources as part of the Indiana Dunes National Lakeshore. Part of the preserve is open and a trail has been developed.

IVANHOE DUNE AND SWALE

An excellent example of the globally rare inland dune and swale community, Ivanhoe features savanna, dry and mesic sand prairies, cattail marshes and buttonbush-filled swales. Many rare plant species thrive and the endangered Karner Blue butterfly is resident in Ivanhoe's 114 acres.

The eastern part of the preserve, which had been divided into lots but was never developed, is more open, with lush prairie species growing among the widely spaced trees. Three roads, which had been bulldozed but were then abandoned, run north to south breaking up the swales and making the site more accessible.

In 1991, The Nature Conservancy acquired 80 acres west of the original Ivanhoe acquisitions. Here the more forested dunes and undisturbed swales extend uninterrupted for a quarter mile, from the railroad on the west to a street on the east. The deep swales restrict hiking to narrow dunes that run east to west through the tract.

Ivanhoe Dune and Swale was acquired by the Conservancy in 1984 and is currently owned and managed by the Conservancy. It is now open to the public; by spring there will be a self-guided trail in place.

GIBSON WOODS

Some of the last of the ridge and swale topography once common at the southern tip of Lake Michigan, Gibson Woods features a complex of plant communities on the longest undissected dune ridge outside of the Indiana Dunes National Lakeshore.

In this 129-acre preserve there are areas of black oak savanna, mesic sand prairie dominated by big bluestem, wet mesic sand prairie with blue joint grass, buttonbush swamp, cattail marsh, and pin oak-black willow forest. Some of the rare plants are the speckled alder, paper birch, golden sedge, large yellow lady slipper, tubercled orchid, ragged fringed orchid, twayblade, and dune goldenrod. The rare fauna include Franklin's ground squirrel, plains pocket gopher, Blanding's turtle, red-shouldered hawk, American bittern, blue winged teal, and Karner blue butterfly.

Initially acquired by the Conservancy in 1980, Gibson Woods is now owned and managed by the Lake County Parks and Recreation Department. The Gibson Woods Environment Awareness Center opened in 1984 as an outdoor education facility for individuals, families and groups. There are three developed trails and an interpretive center at Gibson Woods.

For more information on these and other preserves in Indiana, contact The Nature Conservancy's Indiana Field Office at 1330 West 38th Street, Indianapolis, Indiana, 46208-4130, (317) 923-7547.

NEW YORK

CHAUMONT BARRENS

Located in New York's Jefferson County, Chaumont Barrens is a unique alvar landscape unlike any other natural area in the northeastern United States.

Swedish scientists coined the term "alvar" to describe similar barrens in their country. Characterized by a mosaic of austere, wind-swept vegetation, North American alvar sites lie scattered along an arc from northwestern Jefferson County through Ontario and into northern Michigan.

Many scientists think that during the retreat of the last glacier some ten thousand years ago a huge dam burst. A torrent of unimaginable proportions swept away all surface debris and dissolved limestone bedrock along cracks and fissures. The result, a strikingly linear

H. Potter

Ivanhoe Preserve, Indiana. Swale with dunes on either side

H. Potter

Chaumont Barrens, New York. Grikes

pattern of vegetation visible on aerial photographs, first attracted a New York state ecologist to the Jefferson County area. There, she found Chaumont Barrens, the best-preserved of a handful of New York alvar sites.

Alvar communities are supported by a rare combination of extreme conditions: shallow soil, flooding, and drought, which provide habitat for a unique mixture of plants, including many rare in New York. The vegetation mosaic includes exposed outcrops, deep fissures, and rubbly moss gardens as well as patches of woods, shrub savannas, and open grasslands.

A kiosk orients visitors to a two-mile self-guided trail through the barrens.

For more information on Chaumont Barrens, contact The Nature Conservancy's Central and Western New York Chapter, 315 Alexander Street, 2nd Floor, Rochester, New York, 14604, (716) 546-8030.

ONTARIO

PETREL POINT NATURE RESERVE

Located adjacent to Lake Huron on the Bruce Peninsula, the Petrel Point Nature Reserve protects part of the Howdenvale Bay Wetland, a designated Area of Natural and Scientific Interest. The main feature of the wetland is a globally significant Great Lakes shoreline fen that supports in spring and summer many rare and unusual species, including a variety of orchids and insectivorous (insect-eating) plants.

The reserve itself consists of two parcels of land, separated by a dirt road, totalling 51 acres (20 hectares). The fen environment is maintained hydrologically by groundwater springs to the east and Lake Huron to the west. Calcium in the groundwater and organic debris combine to form marl, a mud-like substance that takes the place of peat within the wetland. The marl greatly influences what will and will not grow in the fen.

Additionally, the reserve is home to the threatened and elusive spotted turtle. This species was once fairly widespread in southern Ontario but has had its numbers reduced by collectors and habitat loss. The turtle appears to remain at Petrel Point although sightings are extremely rare.

This unique environment is a major attraction, with many naturalists visiting each season. However, this heavy use has resulted in impacts ranging from trampling to orchid theft, all compounded by inadequate trails and signs. Moreover, the fen is ringed by cottages and houses. Such development has altered the area's hydrology and destroyed adjacent habitat, adding to the reserve's woes. To alleviate such impacts, a management plan is being assembled that emphasizes infrastructure improvements and cooperation with the local community to save adjacent habitat.

BRUCE ALVAR NATURE RESERVE

The Bruce reserve is 167 acres of alvar and jack pine forest. Alvars are found in North America within the Great Lakes basin and in parts of Scandinavia, and are basically areas of flat limestone or dolostone bedrock with only partial vegetation. Vegetation varies from predominantly mosses and lichens to grasses with clumps of stunted trees.

RUBBERWEED RESERVE

Also an alvar ecology, the Rubberweed Reserve is a mosaic of bare rock and mosses. Within this uninviting landscape live seven nationally and provincially rare, one provincially rare and seventeen regionally rare plant species. Some may still be visible in mid-September. Moreover, one may still be able to catch a glimpse of the threatened Eastern Massasauga rattlesnake, an inhabitant of the Upper Bruce Peninsula. This snake is quite timid and poses no immediate threat to humans; simply give it a couple of meters breathing space if you do see one.

The reserve also hosts the world's fourth-largest colony of lakeside daisy, a yellow, daisy-like flower that is found only around the Great Lakes and only in about twenty places.

Unlike Petrel Point Nature Reserve, Rubberweed Reserve is only visited sporadically and has little or no impacts from surrounding land use. However, the site is becoming more and more well known, with often large groups of botanists arriving each spring. The goal at this reserve is to install a proper trail and boardwalk system before the alvar environment is damaged.

For more information on the reserves, con-

G. Bryan

Rubberweed Nature Preserve, Ontario. Bruce alvar

tact the Federation of Ontario Naturalists, 355 Lesmill Road, Ontario, M3B 2W8, Canada, (416) 444-8419.

WISCONSIN

GROMME PRESERVE

The lakeshore, sedge meadows, and uplands of Rush Lake have inspired many scenes painted by noted Wisconsin wildlife artist Owen Gromme. It is fitting, then, to recognize the Gromme conservation tradition through this ambitious project—the Owen and Anne Gromme Preserve.

Rush Lake, a 3,200-acre shallow, marshy lake, emerged from the most recent glaciation some twelve thousand years ago. The broad, shallow lake basin and widely varying drainage patterns indicate the influence of the glacier. The water levels at Rush Lake fluctuate under natural conditions. These changing water levels, combined with sedge meadows, prairie, and oak openings in the uplands, create an ideal environment for wildlife.

Because the shores of the lake are predominantly marshland, there is little shoreline development. The Rush Lake area is most significant for its outstanding migratory and breeding bird populations. The lands provide habitat for many species of waterfowl, including one of the state's largest populations of red-necked grebe, which is threatened in Wisconsin, and Forster's tern, which is endangered in the state. The Rush Lake area is also recognized by Wisconsin's sportsmen for its game species.

The Nature Conservancy made its first acquisition at Rush Lake in 1988. Today, the Conservancy owns and manages 608 acres at the Owen & Anne Gromme Preserve. The Conservancy is working cooperatively with private landowners, other conservation organizations, the U.S. Fish and Wildlife Service, and the state to secure long-term protection for the highest quality natural communities and endangered species habitat in the Rush Lake watershed.

MINK RIVER ESTUARY

One of the few high quality estuaries remaining in the United States, the Mink River Estuary is a wetland ecosystem that supports dozens of wildlife and plant species. An estuary is an area created when river water mixes with water from large lakes or the ocean. As a spawning habitat and source of organic detritus, these productive estuaries are vital to the Lake Michigan ecosystem. But they are fragile. Most estuaries along the Great Lakes have been destroyed because they cannot easily share precious shoreline with human development.

The Mink River Estuary is considered one of the most "pristine" of its kind. It begins at the alkaline spring-fed headwaters of the Mink River and empties into nearby Rowley's Bay. It is an important spawning ground for fish and a critical migration site for birds. More than two hundred bird species may pass through the area annually. Blue-winged teal, mallards, wood ducks, and black ducks are present as nesting pairs, along with great blue herons, black terns, black-crowned night-herons, herring gulls, American bitterns, northern harriers, and common loons. In late summer and fall, double-crested cormorants and red-breasted mergansers can be seen, and there is evidence of habitation by the bald eagle and sandhill crane.

Wetlands' wildlife found at Mink River include beaver, porcupine, muskrat, raccoon, and white-tailed deer. A variety of native snakes and frogs also inhabit the area.

The Nature Conservancy

The diverse vegetation in the estuary features communities from white cedar swamps to wild rice marshes. Two state-threatened species, the dune thistle and the dwarf lake iris, are found here. Lowland forest, dominated by white cedar, surrounds the edges of the emergent marsh.

The marsh itself is inhabited by willow, red-osier dogwood, and alder. Sedges, blue joint grass, and other emergent wetland species form the ground cover and continue through the wet meadow section. Sedge meadow and reed grass stands occur in the upstream shallow marsh portion of the wetland. Bulrush is the most ubiquitous species in the deep marsh area of the estuary.

This and other deep marsh varieties serve to protect the inland communities by withstanding wave and seiche action from the lake. Many springs and intermittent streams saturate the forest floor as they feed into the river. Water lilies and water milfoil repre-

Dave Westover

Mink River, Door County, Wisconsin

The Nature Conservancy

Indian Boundary Prairie, Markham, Illinois

Chicago. Natural communities include black soil prairie, sand prairie, and sedge meadow. Indian grass, little bluestem, and big bluestem are common, with cord grass, bluejoint grass, and sedges dominating the wetter swales. Unusual plants found here included the endangered prairie white fringed orchid.

The Indian Boundary Prairies are an important sanctuary for butterflies and other animals that require large expanses of high-quality natural area. More than 350 insect species are known to inhabit the prairies, including the regal fritillary, bunch-grass skipper, and dreamy dusky wing.

The prairies are open to the public for hiking, bird-watching, and other activities that do not harm the natural landscape. The prairies are in bloom from April through October, with the peak seasons usually occurring in May, early July, and August.

For more information, contact The Nature Conservancy of Illinois, 8 South Michigan Ave. #900, Chicago, Illinois, 60603-9619, (312) 346-8166.

ILLINOIS BEACH STATE PARK

Dedicated in 1964, Illinois Beach was the stae's first nature preserve. In 1980, the area was also designated as a National Natural Landmark. The preserve is one of the state's richest, most biologically diverse areas.

The 829-acre preserve lies within the Lake Michigan Dune Section of the Northeastern Morainal Natural Division, an interesting dune and swale topography that resulted from the lowering water levels of ancient Lake Chicago following the last glacial period.

The natural communities adapted to this unique lakefront environment include lakeshore, foredune, sand prairie, sand savanna, fen, panne, sedge meadow, marsh and pond. These natural communities support over five hundred plant species and a large variety of animal species. Low sand dunes near the beach contain sandbinding grasses, bearberry and trailing juniper. The dry ridges found farther inland support sand cherry, willows, New Jersey tea, shrubby cinquefoil and large colonies of prickly pear cactus.

Sand prairies are common on stabilized dunes and ridges. The typical grasses are little bluestem, switch grass, Indian grass and sand reed grass. Alkaline pannes are located in some of the swales near the lake. The common plants include sedges, Ohio goldenrod, fringed gentian, Kalm's lobelia and shrubby cinquefoil.

The preserve supports many species of ducks, shorebirds, gulls, herons, rails and songbirds. The preserve is an excellent area to see hawks, falcons and shorebirds during migration.

Illinois Beach State Park is open to visitors year-round.

For more information, contact the Site Superintendent, Illinois Beach State Park, Zion, Illinois, 60099, (847) 662-4811, or, contact the Illinois Department of Natural Resources, Natural Heritage Biologist, 110 James Road, Spring Grove, Illinois, 60081, (815) 675-2385.

OHIO

KITTY TODD PRESERVE

Kitty Todd Preserve was established in 1972 to protect one of the finest remnants of northwest Ohio's Oak Openings region. "Oak Openings" was the term used by early European settlers to describe the 130-square-mile area west of the Maumee River that supported stands of scattered oaks and treeless wet prairies. For many, the environment was entirely different from the more familiar eastern forests, including the dense forest cover of the rest of Ohio.

The combination of sandy soils, a high

Harold Malde

Oak openings, Ohio

water table and periodic wild fires kept the area open. These three factors promoted a balanced the growth of trees and shrubs with thatof grasses and wildflowers.

After European settlement, fires were suppressed and much of the land was drained. The result was a dramatic increase in the growth of trees and shrubs. Heavily shaded woods and thickets replaced many of the sunny, open oak savannas and wet prairies.

Kitty Todd consists of more than four hundred acres of black oak savanna and wet prairie habitats. Black oak savanna is found on the dunes and beach ridges and is dominated by two species of trees, black oak and white oak. The density of theses trees is variable but a healthy savanna may have approximately 2 to 17 trees per acre.

Growing under this light canopy of oaks is a mixture of grasses, sedges, wildflowers and shrubs. Selected species at Kitty Todd include:wild lupine, plains puccoon, little bluestem, June grass, wood lily, yellow false indigo, rough blazing star, tall coreopsis, New Jersey tea, western sunflower, and sweet fern.

Wetter sites within the savanna support such unusual species as the insectivorous spathulate-leaved sundew, colicroot, and the grass pink orchid. Some specialized animals are also a part of this community. Several species of butterflies, including the frosted elfin, persius dusky wing and the Karner blue depend on lupine as their sole larval food source. Certain birds like the rare lark sparrow utilize the relatively sparse ground cover as a nesting site.

The wet prairie occupies the lowest areas in elevation, the swales between the ridges and the dunes. Here the water table is near or above the surface of the ground during much of the year. The elusive spotted turtle frequents the shallow water habitat found in the wet prairie. Many rare species of sedges like twig-rush and slender sedge thrive in this environment, as do prairie grasses such as big bluestem and Blue joint. Wildflowers are abundant, including dense blazing star, fringed gentian, Ridell's goldenrod and the Great Lakes goldenrod.

Kitty Todd Preserve is open to only limited visitation in order to protect the rare species.

For information on guided walks and preserve volunteer projects, contact The Nature Conservancy's Northwest Ohio Lake Plain Office/Kitty Todd Preserve, 10420 Old State Line Rd., Swanton, Ohio, 43558, (419) 867-1521.

MICHIGAN

POINT BETSIE PRESERVE

Easterly winds cut across Lake Michigan to create the waves that maintain the sand dunes along Michigan's west coast. The sand dunes at Point Betsie Preserve in Benzie County, a globally rare and imperiled natural habitat, are one such dune complex: a mosaic of interdunal pools and forest that attracts migrating birds on their long journeys north and south.

Shifting sands provide ideal conditions for the Pitcher's thistle, a rare, fragile plant that takes five to eight years to bloom and grows in only a few places in the world, mostly in open sand along the western Great Lakes.

The 99-acre preserve is also speckled with the Michigan lily, beach pea, hoary puccoon, fascicled broomrape. Northern white cedar, balsam fir and white spruce are found in pockets of northern forest. Spotted sandpiper and American redstarts are commonly seen at Point Betsie, as are migrating birds of prey such as peregrine falcons. It is not uncommon to see loons offshore.

The preserve is open year-round to the public. Conservancy field trips provide members an in-depth look at the preserve.

MAXTON PLAINS PRESERVE

Located on Michigan's Drummond Island, Maxton Plains is a unique mixture of alvar grassland, rich conifer swamp, bedrock beach, Great Lakes marsh, and boreal (northern) forest. Part of the 828-acre preserve is bedrock pavement, a massive slab of limestone scraped clean by retreating glaciers, with a thin soil layer that provides habitat for rare but hardy plants.

Maxton Plains is known as one of the world's best remaining examples of alvar grassland.

The plant mixture is representative of both Arctic tundra and Great Plains prairie and includes some species not normally found in the Great Lakes region, such as Hill's thistle, prairie smoke and Indian paint brush. Other plants native to the region include Houghton's goldenrod, prairie dropseed, false pennyroyal and a variety of grasses and sedges.

Ted Cline, Photos

Point Betsie, Michigan

Harold Moldenke

Maxton Plains, Michigan. Alvar grassland

Mammals include beaver, red fox, snowshoe rabbit, bobcat, white-tailed deer. Birds include osprey, eagle, American redstart, blue jay, common loon, hermit thrush, merlin, sandhill crane, veery, and several species of warblers and other birds as well as a variety of butterflies.

A coalition of researchers is studying Maxton Plains and alvar in several other states and Ontario as part of a North American alvar initiative led by the Conservancy's Great Lakes Program. Conservancy field trips provide access to the Maxton Plains nature preserve.

GERSTACKER NATURE PRESERVE

The 881-acre Carl A. Gerstacker Nature Preserve at Dudley Bay protects a fabulous stretch of Lake Huron shoreline that spans nearly four miles, hundreds of acres of forest and an inland lake. The forest borders a meandering series of bays, points, and a small island along M-134 in the Les Cheneaux area of the Upper Peninsula. In the heart of the Great Lakes region, the preserve is at the center of one of the most ecologically rich landscapes in North America.

The rocky shoreline, backed by rich conifer swamp and mixed northern hardwood forest, is home to a variety of wild and plant life, including lynx, peregrine falcon, the state threatened osprey, the federally threatened bald eagle, Houghton's goldenrod, Pitcher's thistle and dwarf lake iris.

Surrounded by forest and wetlands, Little Trout Lake is habitat for loons, ducks and other waterfowl. In the spring and fall, neotropical migratory songbirds fill the shoreline and the forest.

The area surrounding and including the lake is contiguous to thousands of acres of state land, creating an unfragmented diversity of forest, bog, swamps, marshes and interdunal wetlands.

Nature Conservancy field trips provide access to this preserve.

For more information on these and other preserves in Michigan, contact The Nature Conservancy's Michigan Chapter, 2840 East Grand River #5, East Lansing, Michigan, 48823-4921, (517) 332-1741.

Dwarf lake iris

S. Crispin

The beauty and biological richness of the Great Lakes region is unparalleled anywhere else on earth. This treasure is a part of our heritage for which we all bear a personal and collective stewardship responsibility. As citizens of this region and as part of the Great Lakes ecosystem, we should foster our sense of place by visiting these and other natural areas and revitalize your connection to the Great Lakes.

The Nature Conservancy is an international, private, nonprofit conservation organization whose mission is to preserve the plants, animals, and natural communities that represent the diversity of life on earth by protecting the lands and waters they need to survive.

The Nature Conservancy has advanced a science-driven approach to conservation since 1951. Through a network of nine regional and fifty-four state chapter offices, the conservancy identifies land for protection, protects habitat, and manages protected areas in the United States, the Pacific Islands, Latin America, and the Caribbean.

One of the conservancy's principle tools for protecting biodiversity has been land acquisition. With the support of nearly 900,000 members, the conservancy now owns and manages more than 1,500 preserves that collectively represent the largest system of nature refuges in the world. By working in partnership with national, state and local institutions, the conservancy has protected more than 9.3 million acres in the United States and millions more worldwide. This includes over 100,000 acres protected by The Nature Conservancy chapters in the Great Lakes states.

For more information on conservancy's Great Lakes efforts, contact Heather Potter at The Nature Conservancy, Great Lakes Program, 8 S. Michigan Ave. #2301, Chicago, Illinois, 60603, (312) 759-8017.

U.S. EPA proposes much stricter air quality standards

by Andy Frank

Acting in compliance with the Federal Clean Air Act, the U.S. Environmental Protection Agency has reviewed the nation's air quality guidelines, the "National Ambient Air Quality Standards" and in November proposed tougher standards for ozone and particulate matter.

If implemented, the new regulations will likely cause substantial improvements in Great Lakes water quality, because the lakes' high ratio of surface area to volume makes them particularly vulnerable to air deposition of pollutants. The number of counties not in compliance with federal air standards would rise to an estimated thirty-four from the current ten.

EPA's proposed ozone and particulate standards do not technically address the organic chemical pollutants that most seriously damage the lakes and the living things that depend on them, but strategies that lower ozone and particulate emissions will in general also lower emissions of other toxic pollutants.

The battle lines

The recommendations leading to EPA's proposal were derived by an independent council of scientists after looking at hundreds of peer-reviewed studies. Despite a crushing weight of scientific evidence and EPA's very liberal proposed implementation policy, the five-hundred-member National Association of Manufacturers has mounted an aggressive campaign against the new standards.

NAM quickly adopted the tobacco industry strategy, arguing that studies linking exposure to ozone and particulates with increased rates of respiratory health effects don't prove that a particular pollutant causes the effect; therefore the new standards would pose too much financial hardship on industry and states falling out of attainment. This early push by NAM recruited 100 members of Congress and a dozen governors into the industry camp within a month of EPA's release of the proposal.

A national coalition of public health and environmental groups, headed by the American Lung Association, the Sierra Club, and the Natural Resources Defense Council, organized to challenge the industry line. Due to the grassroots efforts of the coalition, supporters of the standards out-represented challengers by nearly a three-to-one margin at public hearings across the country. Nevertheless, EPA delayed its determination and extended the public hearing period thirty days to appease the industrial lobby.

National health impacts

According to EPA's estimates, the new standards could have a major impact on the respiratory health of millions of primarily urban Americans. The EPA predicts an annual reduction of at least 20,000 premature deaths, tens-of-thousands of hospital admissions and emergency room visits, and a quarter million fewer cases of aggravated asthma in children and adults once the new standards are attained.

Groups opposing the standards have argued that it is not fair to impose standards that will only serve a minority of people with pre-existing conditions. They suggest these people should "just stay inside" on "bad" days. Despite this argument being a gross minimization of the health risks to the majority of residents in non-attainment areas, it really becomes an issue of environmental justice. By this argument, the freedom of the "minority" to go out in their community and breathe clean air is subservient to the "majority's" desire to pollute.

Airborne deposition to the Great Lakes

While the respiratory health impacts of implementing the new standards have been the primary discussion points in the national debate, the standards would also have a dramatic impact on the input of persistent toxic pollutants into the Great Lakes Basin via airborne deposition.

Over the last two decades, atmospheric transportation and deposition (fallout of airborne pollutants due directly to gravity or incorporated with rain and snow) has been linked to the occurrence of heavy metals, PCBs, and dioxin in remote, isolated locations across the globe. Studies throughout the Great Lakes show that up to 90 percent of the annual loading of some of these pol-

continued next page

from The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?

Diversion Proposals Past, Present, and Future

Major schemes repeatedly arise to divert the waters of the Great Lakes Basin. As the groundwater is mined at a rapid rate, the groundwater is being seriously depleted in the High Plains of the United States (the Ogallala Aquifer), California, the southwestern United States, Mexico City and the Valley of Mexico. As water sources throughout the continent are depleted, the grand schemes that thus far have been set aside will become much more viable and the need for them ever more compelling.

Smaller diversion proposals arise more frequently. Currently Crandon Mining Company wants to divert water from Lake Michigan at its proposed mine near Crandon, Wisconsin, and discharge it to the Mississippi water basin. Akron, Ohio, also currently has a proposal to divert water from Lake Erie to supply drinking water to the expanding suburban development just beyond its borders.

Research by Great Lakes United showed the likelihood of high demands for diversions to communities just beyond the edges of the Great Lakes Basin to support growth in the Kenosha-Pleasant Prairie (Wisconsin) area, the Lowell-Gary-Hobart (Indiana) area, the Waukesha-New Berlin-Milwaukee (Wisconsin) area, the Akron-Cleveland (Ohio) area, and the Chicago area. These numerous diversions, even if individually small, could add up to a substantial amount of diversion of waters from the Great Lakes.

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lutants is contributed through airborne deposition.

The impacts of airborne toxic pollutants in the Great Lakes Basin are numerous.

- Accumulated levels of toxic pollutants such as dioxin, lead, and PCBs have led to fish consumption advisories through the Great Lakes.
- Accumulated levels of toxic pollutants in fish, amphibians, and water-dependent birds have been linked to cancers, genetic deformities, and most recently to reproductive and other endocrine system disruptions.
- Deposition directly contaminates drinking water supplies; requiring costly pretreatment or potentially going undetected in the case of well and spring water users.
- Deposition directly contaminates food and feed crops. This issue is particularly important for feed crops. According to a 1996 study prepared by Barry Commoner et al. from Queens College, nearly two-thirds of the general populations exposure to dioxin comes from milk, dairy products, and beef. This is due to the accumulation and storage of dioxin in the milk and tissue of dairy and beef cows unavoidably eating dioxin-contaminated feed.

Ozone

The EPA's new standards are for ground-level ozone and fine particulate matter. While upper-atmospheric ozone serves a beneficial role in blocking harmful solar radiation, ground-level ozone is a hazardous product created in the reaction of two other classes of air pollutants; nitrogen oxides and volatile organic compounds (VOCs).

Nitrogen oxides are predominantly released by combustion sources, especially motor vehicles and power plants. VOCs are released by combustion sources, chemical plants, manufacturing facilities, and even consumer and commercial products.

In the presence of sunlight and heat, these two readily react to form ozone. As a consequence, smog and ozone related respiratory problems are much more severe in the summer

There are currently ten counties in the Great Lakes Basin that are out of attainment with the existing ozone standards, essentially the metropolitan areas of Chicago, Detroit, and Milwaukee.

Under the new ozone standards, the EPA estimates that an additional thirty-four counties will fall out of attainment in the Basin. The most heavily affected area more or less encompasses the entire southern shore of Lake Michigan from Chicago through Michigan City and South Bend back up to Grand Rapids. Other cities that would fall out of compliance include; Fort Wayne, Lansing, Cleveland/Akron, Erie, Niagara Falls, Syracuse, and Watertown.

Fine particulate matter

Particulates are generated by a number of sources, but especially from "dirty" combustion sources such as diesel engines, coal-fired power plants, wood stoves, and industrial processes. Particulates include various elemental and chemical compounds including carbon and several toxic metals (lead, cadmium, arsenic, and others). Fine particulates can also form in the air through the reaction of various gaseous pollutants. The highly toxic metal mercury, which is released as a gas, finds its return through this process.

EPA's current particulate standards are for particles less than 10 micrometers in diameter (approximately one-seventh the width of a human hair). This grouping actually includes two subsets: coarse particles, which are between 2.5 and 10 micrometers in diameter, and fine particulates, which are less than 2.5 micrometers.

Studies over the last decade have shown that these groups subsets have different health effects. The fine particulates generally have more severe impacts; after they are inhaled, they are deposited into deeper, more sensitive areas of the lung.

Nearly seven thousand cardiopulmonary deaths each year are attributed to particulate pollution in Chicago, Detroit, and Cleveland alone.

Under EPA's current standards there are only two counties out of attainment in the Great Lakes Basin -- Cuyahoga County (Cleveland) and Lake County, Indiana (Chicago Sprawl). EPA's proposed new rules would have separate standards for fine and coarse particulate matter. Under these standards the EPA estimates another dozen Great Lakes counties would be out of attainment, including Milwaukee, more of Chicago, Toledo, Sandusky, Akron, Ohio, and Erie, Pennsylvania.

Metropolitan areas going out of attainment will have to develop strategies to lower emissions in their regions. These strategies will vary in different regions. The small city of Erie will undoubtedly have to target large "point source" contributors such as factories, while large areas like Chicago will certainly have to address automobile emissions in addition to large point sources.

Great Lakes United has sent letters in support of the proposed standards to the EPA, and to all of the state governors and U.S. senators in the Great Lakes states.

Although the public comment period ended on March 12, continued public pressure on the EPA, congressional leaders, and state governors is critical to the outcome of this process.

For more information about this campaign contact the Clean Air Network at (202) 289-2429.

. . . White Pine review

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waste from treatment as hazardous waste.

Copper Range currently operates a pilot-scale project, but needs an Underground Injection Control (UIC) permit before proceeding to a full-scale operation. The company submitted a permit application in January. The UIC permit and environmental assessment process will be conducted in parallel. EPA intends to issue a draft permit or a decision to deny the permit, as well as the draft environmental assessment, by July.

U.S. law clearly defines the UIC permitting process, but it is unclear precisely how EPA will use information obtained from the environmental assessment. The public will have an opportunity to comment on both documents, as well as participate in a public hearing on the environmental assessment. Interested persons may request a hearing on the UIC permit as well.

EPA is facilitating public, biweekly stakeholder conference calls to share information on both the environmental assessment and the UIC permitting process. Information on how to participate in the stakeholders conference call, or on either the environmental assessment or the UIC permitting process, can be obtained from David Werbach at EPA at (312) 886-4242.

A new way of thinking environmentally: The Natural Step

by Carol Misseldine

The Natural Step is a scientifically based framework for understanding and solving environmental problems. First established in Sweden in the 1980s, the system achieved startling acceptance there and is now widely used by Sweden's leading public and private decisionmakers.

The Natural Step was created in response to the limitations of current environmental protection efforts. Although environmental concerns sustain public attention, there is only limited public consensus on the seriousness of environmental threats or what to do about them. The Natural Step attempts to foster consensus by creating a common language for defining and solving environmental problems.

The Natural Step also attempts to avoid the limitations of most current environmental solutions, which usually address the downstream effects of pollution rather than upstream processes that cause the pollution. The result of several decades' downstream-oriented effort is thousands of regulations and a corresponding backlash against them. The backlash, of course, does not change the environmental reality: scientists warn that all natural systems in the world today are in decline.

The "system conditions"

The premise of the Natural Step is that our environmental problems stem from a fundamental flaw in the working of modern society -- virtually all human activities use natural resources in a linear fashion. This conflicts with the cyclical nature of biological systems.

The power and originality of the Natural Step lie in its capacity to make this fundamental flaw, and the means to address it, easily understood and operational.

The foundation of the Natural Step is four "system conditions" for sustainable human activity. These are derived from scientific principles on which there is virtually complete agreement in the scientific community:

1. Substances from the earth's crust must not systematically increase in nature. This means systematically decreasing our dependence on fuels and minerals.
2. Synthetic compounds produced in human society must not systematically increase in nature.
3. The physical basis for nature's productivity must not be systematically deteriorated.
4. The use of resources must be efficient and just with respect to meeting human needs.

These principles allow any individual, corporation, or community to judge the environmental consequences of their acts.

The principles are guidelines, not absolute states that must be achieved tomorrow. The Natural Step does not suggest that any individual, corporation, or community can immediately operate by these conditions. Rather, they can be used as a "compass" for investing strategically in the long-term sustainability of an organization or a community.

The Natural Step does not in any way replace existing environmental protection initiatives, but the framework can be used by interested organizations as a tool for understanding and prioritizing their efforts.

Natural Step in the Great Lakes

The Natural Step is a way of thinking, but it is also an international organization for fostering understanding and implementation of Natural Step principles. The Natural Step offers training and tools to four primary audiences: corporations, academic institutions, governments, and communities.

Thanks to start-up support from the Joyce Foundation, the Natural Step now has a Great Lakes organizer: Carol Misseldine, formerly of the Michigan Environmental Council.

The principle goal of the Natural Step's Great Lakes Regional Program is to offer

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Graphic: Paula Borkowski

from The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?

Privatization of Water Services

Increasingly around the world, water services, once provided solely by government, are being privatized. This trend has now come to the Great Lakes Basin. But privatization of water supply services creates numerous problems:

- Privatization moves profits away from the water system.
- Privatization does not support conservation.
- Privatization usually leaves taxpayers with the financial risks, especially in joint government–private sector arrangements.
- Privatization ignores broader policy issues.

Since the privatization of the water supply systems in Britain and Wales in 1989, customers have experienced a number of problems, including high rates, shortages, and outreakes of disease.

Canada's toxics control process: A critique

by Stéphane Gingras

The latest installment in Canada's long-running kabuki theatre for managing toxic substances has not proven entertaining.

After an assessment of all the substances on its list of particularly dangerous "Level 1 Priority Substances," in 1995 Canada declared twenty-four of them toxic under the Canadian Environmental Protection Act. The normal procedure would have been to promulgate regulations to control the releases of these toxic substances, but the government instead decided to consult stakeholders before making any decisions.

That consultation, the Strategic Option Process, began in 1995 with eleven issue tables—multistakeholder consultations, mainly by industrial sector, on groups of the substances at issue.

According to Environment Canada, the driving force of the consultations was to be pollution prevention and sustainable development.

The government approached the Canadian Environmental Network to provide representation for environmental non-governmental organizations at these consultations. The network in turn contracted with Great Lakes United to discern consensus positions among Canadian environmental organizations, gather data on the toxic substances under discussion, and attend the issue table meetings.

The principal outcome of the consultations is the strategic option reports, which provides recommendations for action to the government's environment and health ministers.

The process

Most of the issue tables are based on industrial sector (for example, dry cleaning and steel manufacturing), but some are based on substances (such as chlorinated paraffins and dichloromethane).

Issue table stakeholders include representatives of industry, Environment Canada, Health Canada, the provinces, and environmental non-governmental organizations. There are no labor or community representatives at any of the issue tables.

After receiving information on the toxic releases in question, their environmental and health impacts, the economic profile of the industry generating them, and the economic and technical feasibility of technologies that could reduce the releases, the stakeholders discuss possible actions that could be taken. Options include voluntary agreements such as the Accelerated Reduction and Elimination of Toxics programme, existing and new regulations, memorandums of understanding between government and the sector, and "economic instruments" such as taxes and charges.

In the end the members of the issue table settle on a set of recommendations, which may or not represent a consensus of the members. When no agreement can be reached, dissenting and minority views are included in the recommendations.

The outcome

The strategic option reports summarize the discussions and list the resulting recommendations. The first reports (for the dry cleaning, degreasing, ceramic fibre, and benzidine issue tables) were submitted in December 1995 and the ministers publicly released them in December 1996. In releasing the reports the ministers claimed that the recommendations were arrived at by consensus; this was not the case for the dry cleaning and degreasing issue tables.

The ministers also claimed that the recommendations were a step toward reducing the exposure of Canadians to toxic substances. With the emphasis of the recommendations on voluntary measures, which may never really be implemented, and on pollution control, which usually just moves releases from one medium to another, this was will probably not be the case.

For every substance the federal government had the chance to promulgate a new regulation under the Canadian Environmental Protection Act to manage these toxic substances. In most of the cases, they did not do so.

The result is that of eight completed issue tables, only two (degreasing and benzidine) are proposing a regulatory mechanism under CEPA. All of the rest are recommending voluntary mechanisms to reduce toxic releases.

With the exception of the dry cleaning issue table, the reports do not recommend the use of economic instruments. Even those economic instruments actively considered during the discussions would not have worked out in practice: any money collected by a federal government agency goes into general funds and is consequently unavailable for promoting pollution prevention.

Evaluation

A thorough critique of the Strategic Option Process must consider four elements of the process:

- Process: Was the SOP fair to every stakeholder?
- Pollution prevention: Was pollution prevention truly a driving force in the issue tables?
- Community involvement: Did those directly affected by the issue table's toxic releases have a role in the discussions?
- Canada's commitments: Were the strategic option reports in line with Canada's commitments under the Canada-Ontario Agreement, the U.S.-Canada Great Lakes Water Quality Agreement, and the St. Lawrence Vision 2000 programme?

The process

The process needs serious improvement.

First, representation was very uneven in the issue tables. In some, like the wood preservative issue table, there was one environmental non-governmental representative and forty-five representatives from government and industry. In such a context, the public voice can't even be heard over the murmur of the crowd.

Second, the financial and technical resources available to participants varied from none to endless. For example, the electric power generation sector (mostly public utilities) were able to gather release data and pay for their own risk assessment study. Industry presented their conclusions at the issue table as if they were fact. Those conclusions were certainly difficult to dispute without

the proper resources.

Third, representatives from Environment Canada usually chaired the issue tables. This was problematic, because it restricted their ability to promote environmental protection measures. There were already few enough voices in this respect.

Finally, in most cases there was a lack of consistent and reliable data on releases of the toxic substances for each sector and by facility. In some cases that information gap allowed industry to promote the status quo.

Pollution prevention

Pollution prevention was not the driving force of the Strategic Option Process. In fact, it turned out to be almost impossible to get Environment Canada to support pollution prevention measures.

For example, we asked for pollution prevention plans from the electric power generation sector, but got no support from Environment Canada on the issue. As a result, the issue table recommendations are almost exclusively traditional end-of-pipe approaches. Two decades of this form of regulation has resulted in stopping only the most egregious releases, while the total problem of toxic releases has gotten worse.

We did manage to curry some support for pollution prevention planning in the steel and base metal smelting reports. In other cases (metal finishing, electric power generation), we were able to insert pollution prevention planning into the reports only as a minority view.

The Strategic Option Process has made it clear that Environment Canada views pollution prevention only as a phrase that can make it look modern; in reality the ministry does not intend to make industry change anything that will prevent pollution before it is created.

Community involvement

There were no labor or community representatives at any of the issue tables. Why? Workers are the members of society most highly exposed to toxic releases, followed quickly by those living near releasing facilities. The presence at the issue tables of these stakeholders would be just, but it would also be useful: workers and community activists often know first-hand how companies can improve their processes; they often keep records of company environmental and health and safety performance; and they usually know something about the finances of the companies they work for.

The perspective of workers and community members would bring a needed dose of reality to issue table discussions between regulators and company managers.

Canada's commitments

The U.S.-Canada Great Lakes Water Quality Agreement has general, visionary guidelines for reductions in toxic releases. The Canada-Ontario Agreement has specific reduction targets and schedules for some of the substances addressed by the SOP process, such as mercury, dioxins and furans, cadmium, lead, hexachlorobenzene, and polyaromatic hydrocarbons.

Unfortunately, the SOP recommendations are not likely to help achieve either general change or specific reductions.

Most of the SOP recommendations are in line with the targets and schedules of the Canada-Ontario Agreement, but they do not create, as they had been expected to, a level playing field with the rest of Canada.

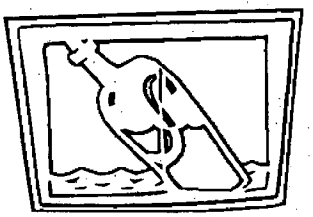
In fact, all of the SOP recommendations rely on voluntarism and voluntary targets and schedules such as the Accelerated Reduction and Elimination of Toxics programme, offering no guarantee that the commitments contained in the agreements will be met.

Our conclusions

As a full participant in the Strategic Option Process, we can say that our involvement was useful. Without it, the pollution prevention perspective would have been com-

continued page 28

from The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?



The Tap That Cannot Be Turned Off: Free Trade

The Free Trade Agreement between Canada and the U.S., and the North American Free Trade Agreement among Canada, Mexico and the U.S. facilitate the flow of "goods," including water, across the North American continent. Free trade is an essential component of the privatization of the ability to profit from the sale of resources, because it breaks down the boundaries of where profits can be made. In this situation water has become another saleable commodity like wheat, lumber and copper, which will bring prosperity to those lucky enough to have control over an excess supply.

Given the existing distribution of water on the continent, exports of water are most likely to come from the Great Lakes. Free trade has serious implications for attempts to prevent diversions from the Great Lakes. The ability of governments to act through the Great Lakes Charter, the imposition of special taxes on water use, the use of subsidies to help water users convert to conservation methods—all these are placed into serious doubt by free trade. These powers can now be challenged under NAFTA because government actions may not favour their own residents to the disadvantage of people outside of their jurisdiction. The threat of a challenge under trade agreements may well be enough to discourage governments from even trying to proceed with such programmes.

Under NAFTA, when water is exported, the proportion of the total water output available for export must be maintained at a relatively constant rate. Any attempt by an exporting country to limit exports of water must be met by a proportional decrease in domestic consumption.

Under free trade, once we turn the tap on, we cannot turn it off.

Ontario water bill portends privatization

by Reg Gilbert

In a move that could lead to widespread privatization of water-related services, the Ontario government plans to transfer ownership of its water and sewage facilities to the province's municipalities. Ontario also wants to give local governments all authority to inspect and enforce standards on septic tank and other small sewage systems.

The government's proposed Water and Sewage Services Improvement Act, also known as Bill 107, purports to encourage continued public ownership of the facilities by requiring that any sale of the facilities to the private sector must include repayment (but without interest) of provincial capital investment since 1978.

But the Canadian Environmental Law Association and Great Lakes United charge in a detailed critique submitted to the government in February and at hearings in April that the bill contains no environmental rationale, undermines drinking water safeguards, and promises underinvestment in an already neglected water infrastructure.

The groups say that privatization of the province's water services seems to be the true purpose of the bill. The single disincentive to privatization—repayment of provincial investment in a given facility—merely establishes the minimum price at which a facility could be sold. The recent cancellation of the province's grants for water and sewage infrastructure will likely drive municipalities to private funders.

The bill also makes possible the sale of facilities currently owned by municipalities.

Finally, Bill 107 contains no protections against municipal sale of water and sewage facility land, which is often located in highly desirable waterfront areas, for development at below-market prices. This abuse of public assets has proved a problem in Britain's privatization drive, which began in 1989.

Replace or rewrite Bill 107

CELA and GLU called on the government to scrap the bill and instead pass a proposed Safe Drinking Water Act, which would establish standards for health-harming substances in drinking water, institute periodic testing to ensure the standards are met, require timely public notice of water facility problems, and grant citizens the right to sue over violations of the act.

Failing a scrapping of Bill 107, CELA and GLU called on the government to:

- Restore the right of municipal citizenry to approve the sale of municipal water and sewage facilities
- Require that any privatization proposals are subject to "full cost accounting" to "ensure that the full range of short- and long-term consequences of privatization are quantified" and discussed publicly
- Establish an independent regulator of water and sewage services, similar to the National and Ontario Energy Boards' oversight of the energy industry. This regulator would ensure that drinking water and other standards are adhered to and that the public interest in water rates, investment in infrastructure, water conservation and environmental responsibility are all protected in the event of privatization.

Through the Ontario Clean Water Agency, the provincial government owns 230, or about a quarter, of province's 937 water and sewage facilities. This is thought to be the largest holding of plants in North America. The agency also operates another 116 facilities under contract. Inspections of septic tanks and other small sewage treatment systems are now carried out by the Ministry of Environment and Energy. The bill leaves untouched OCWA's operating functions, but a separate provincial commission has proposed privatization of the agency.

OCWA's charge explicitly includes promotion of "environmental accountability," water conservation, and sustainable development. Bill 107 contains no such goals.

The British example

CELA and GLU oppose privatization of water and sewage services because the goals of clean drinking water, environmental protection, water conservation, and adequate investment in water and sewage infrastructure are not compatible with private profit. Britain's experience in privatizing water and sewage services confirms this assessment. Its water service problems include:

- Substantial increases in water prices and termination of water services to low-income families unable to afford them
- Outbreaks of dysentery, hepatitis A and other public health problems caused by poor sanitation and lack of water
- Selloff of water reservoir lands
- Failure to invest in infrastructure
- Cutting corporate costs by laying off thousands of workers and cutting wages
- Excessive dividendsd and executive pay
- Numerous regulatory violations

Free trade threat

In North America, privatization of water supply carries the additional threat that private trade in water could lead to diversions from the Great Lakes Basin to water-parched areas of the United States and Mexico.

Minister of Environment and Energy Norm Sterling has stated that the province would resist efforts to divert water from the Basin, but Bill 107 contains no language preventing it; in any case Canada's international trade agreements would likely supersede provincial or federal legislation.

According to a poll conducted in April by Polara Research, 81 percent of Ontarians strongly support public operation of water services, an increase from 76 percent at the same time last year.

Septic tank inspections

Bill 107's devolution to municipalities of authority over septic tank and other small sewage treatment systems is a particularly obvious threat to public health. Design, construction and maintenance of such systems can contaminate ground and surface water and otherwiseaffect nearby landowners.

Under the bill, municipal building inspectors would take over from public health officials the task of inspecting installed systems and enforcing performance standards, regardless of desire or expertise. Approval of system construction would be removed from oversight by the Ministry of Environment and Energy and made purely local.

PRESIDENT'S MESSAGE

Please join GLU's sustainable waters campaign

Ever-fluctuating Great Lakes water levels are at near-record highs this spring, just in time to greet GLU's landmark sustainable waters report, released in February.

Among other things, GLU's report, written jointly with the Canadian Environmental Law Association, warns that the amount of water flowing from the Great Lakes into the St. Lawrence River could fall by a quarter within forty years.

As with all long-term trends, the threats to Great Lakes water quantities can be hard to see in the short term, making it more difficult to rally people to prevent them. But scientific predictions point clearly to alarming drops in Great Lakes water levels within our lifetimes unless we take strong action. We must begin this long-term work now.

Over the past two years, Great Lakes United has worked with the Canadian Environmental Law Association to gain an in-depth understanding of the threats to the bountiful water quantities in the Great Lakes. But our joint report is only the beginning of our work on this issue. Our task now has four components.

One component is to share the information we have gained and the understanding that we have developed of water quantity issues with other people in the Great Lakes basin — activist groups, government decision-makers and the general public. We are available to speak with any group that is interested in exploring this issue.

A second component is to support and encourage citizen action on water quantity issues. We plan to travel across the basin and meet with groups currently working on water quantity issues or interested in doing so. This includes groups promoting water conservation activities, fighting wasteful uses of water, opposing the diversion of water from one watershed to another, promoting sustainable communities that thrive within the waters naturally available to them, fighting the privatization of the control of our water systems, promoting energy conservation and production methods that will reduce climate change, supporting the proper inclusion of the First Nations in decision-making affecting water quantities and flows, and ensuring the inclusion of the well-being of fish, wildlife and wetlands in all decisions affecting water levels and flows.

The third component involves working basin-wide to ensure that a sustainable Great Lakes water strategy is developed. We must go beyond a piecemeal approach to the issue to develop and implement basin-wide policies and programmes that guide us as we deal with water quantity issues in each of our communities.

The fourth component involves connecting up with citizens' groups in other parts of the continent who are working on water quantity issues. In a world of increasingly scarce water resources, it is both our responsibility and in our interest to not only preserve our water supplies, but to work with other concerned citizens' groups across the continent to ensure that we all develop and implement sustainable water use and conservation programmes.

We are launching into a campaign that is only in its beginning stages and is far from being fully outlined. We need your help to develop the campaign. Please contact us with your suggestions and let us know of any groups you think might want to work on a campaign around water quantity issues.

John Jackson

from The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?

A Strategy for Sustaining the Waters of the Great Lakes

If we consume water at currently projected growth rates, and if projected impacts of climate change occur, Great Lakes water levels will drop dramatically. In less than forty years from now, the flow from the Great Lakes system into the St. Lawrence River will have been reduced to less than three-quarters of its current flow. This is without taking into account the compounding impact that diversions out of the Great Lakes. To prevent these effects, we must tackle the problems that will cause them now. A fundamental first step is the development of a basinwide Sustainable Great Lakes Water Strategy, which should include:

- A water conservation strategy.
- Plans to reduce the impacts of agriculture, the power industry and the mining industry on water levels and flows.
- Guidelines for communities to live within the water supplies available within their watershed.
- A determination of ways to avoid the negative impacts of diversions, free trade, and privatization of water services.

This strategy must be developed by the Internatinoal Joint Commission or the governments in full cooperation with the First Nations and Tribes, the public, and municipalities. Each government should adopt the strategy in a way that makes it legally binding and by changing their laws, regulations and programmes to ensure that the strategy is carried out.

We also must recognize that the Great Lakes cannot be separated from the rest of North America. Therefore, we must act with those concerned about these issues throughout Canada, Mexico and the United States.

Fundamental to sustaining the waters of the Great Lakes is a profound change in our attitudes. We must recognize that water is not just a resource and a commodity to be bought and sold. The waters of the Great Lakes are the vital lifeblood of the Great Lakes Basin upon which all the Basin's residents depend—the birds, the fish, the wildlife and humans.

. . . invasive species

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across the ocean and carrying ballast water. Incoming vessels must either 1) exchange ballast water in the open ocean, 2) retain ballast water throughout their entire voyage in the Great Lakes, or 3) conduct an environmentally sound, alternative method of ballast water treatment.

The theory behind open ocean exchange is that the ecology of deep seas salt water is so different from the fresh water lakes system that survival of species brought from one to the other is negligible.

Open ocean exchange is defined as an exchange undertaken at least 200 nautical miles outside of the Gulf of the St. Lawrence, in a depth of at least two thousand meters. The resulting ballast water must have a salinity of at least 30 parts per thousand.

Ships encountering a safety risk due to severe weather or ship design can request a variance to exchange water in the Gulf of the St. Lawrence, but must request this variance before arrival.

All cross-oceanic shipping vessels entering the St. Lawrence and holding ballast water are inspected by the U.S. Coast Guard in Massena. Ships filing that they will not exchange ballast while in the Great Lakes are re-inspected before they depart the lakes to ensure they did not exchange ballast. Finally, ships that filed as having no ballast on board, are randomly inspected to ensure compliance. To date no vessels have applied for approval of an alternative treatment method.

Efficacy and Compliance

According to the U.S. Coast Guard, compliance with the law's regulations has been relatively high and increasing across the first three years of the program. The most common issue encountered by the Coast Guard is failure to complete a proper ballast exchange. Through 1995, only one serious violation had been identified. The vessel falsified reports and criminal prosecutions were made.

Compliance may be fairly high, but the effectiveness of the ballast exchange program is not as clear. First is the effectiveness of the exchange itself. Due to mechanical (pumping) and safety limitations, the open sea exchange is actually regulated as an 85 percent exchange. While this exchange may eliminate most organism and kill many more, a Canadian study found live freshwater zooplankton in 33 percent of vessels that had undertaken a proper exchange. An Australian study found the exchange to be less effective with increasing vessel size.

A second problem is sediments retained in ballast tanks. A Canadian study found an average of 157.7 metric tonnes of slop and sediments per vessel. Since there is currently no practical way to remove these sediments during ballast exchanges, they provide a potential haven for nonnative species.

Future initiatives

The next step for the Great Lakes is to improve the efficacy of the ballast exchange program. The Great Lakes Ballast Water Demonstration Project is testing filtration techniques that could significantly eliminate sediments as well as organisms. Other management techniques include loading pretreated water, discharging ballast to shore, and vessel redesign. Most of these options are only long-term prospects.

Established invasive species

To date, the Great Lakes are host to at least 139 nonnative species. Throughout the United States the number is at least 4,500. Of these, about 15 percent have caused severe impacts to human health, agriculture, industry, or the natural environment.

Not only are measures to control invasive species often expensive, but they also carry environmental consequences. Molluscacides used to help control zebra mussels have the potential to disrupt native species and to find their way into the food chain. Proposals to control the ruffe fish may significantly displace native species as well as the ruffe.

. . . SOP

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pletely absent from the discussion. We balance the process by providing another point of view on human health, risk assessment, and the overall approach to managing toxic substances. That point of view usually appeared in the resulting documents as minority or dissenting views, but at least it has been included and becomes a basis for future education and possible implementation.

Still, the Strategic Option Process's consultation arrangements, and those of future such efforts, could be greatly improved by:

- Full participation by environmental nongovernmental organizations in consultation efforts.
- More balanced representation: 1) More representatives from environmental nongovernmental organizations and 2) the addition of labor and community representatives.
- More balanced allocation of supplementary resources. Industry and government have all the resources they need to conduct studies, reach their conclusions, and make their case. Environmental nongovernmental organizations, labor, and community groups need money and technical assistance to provide counter expertise and develop position papers.
- Hiring of professional and neutral facilitators for all consultation processes.
- Improvement of the National Pollutant Release Inventory and its introduction into the Canadian Environmental Protection Act as a national reporting mechanism for industrial toxic releases in all media. This step is needed to address the lack of consistent and reliable data on releases from Canada's industries.

Goodbye, Mr. Sederstrom

We're sorry to have to announce the departure of one of our finest organizers, Scott Sederstrom, Great Lakes United's former Clean Production Coordinator.

Scott has moved on to neighborhood !organizing for the Chicago office of Citizens for a Better Environment.

Scott got married in February, so he's made a lot of exciting changes in the last couple months. Congratulations all around and thanks for everything, Scott.

Scientists tackle endocrine disruption research

The U.S. National Biological Service is studying the possible effects of endocrine disrupters, compounds that affect the normal functioning of the endocrine (hormone) system in living things. Some of the service's relevant research projects include:

- Health status of mink in the Great Lakes; contact: Dr. Barnett A. Rattner, (301) 497-5671
- Effects of PCBs on reproduction in kestrels (a falcon); contact: Dr. John B. French, Jr., (301) 497-5702
- River Otter and Mink from the Columbia River; contact: Dr. Charles J. Henney, (541) 757- 4840
- Effects of PCBs on Reproduction and Biomarkers in Tree Swallows; contact: Dr. Mark J. Melancon, (301) 497-5710
- Endocrine-Disrupting Chemical Effects on Turtles; contact: Paula Henry, (301) 497-5728
- TCDD Impacts on Endocrine Function and Sexual Development in a Model Fish (Medaka); contact: Diana Papoulias, (573) 875-5399
- New Technologies for Assessing Contaminants; contact: Dr. James Huckins, (573) 875-5399
- Technology to Monitor Endocrine-Altering Compounds in Aquatic Resources; contact: Dr. Susan B. Jones, (573) 876-1828
- Endrocrine-disrupting Chemicals in Pulp-and-Paper Mill Effluents; contact: Dr. Donald Tillitt, (573) 876-1886
- Contaminants Impacts and Measures of Endrocrine Disrupter Exposure on Aquatic Organisms of the Lower Rio Grande River; contact: Diana Papoulias, (573) 875-5399
- Testing and Implementation of Selected Aquatic Ecosystem Indicators in the Mississippi River System; contact: Christopher J. Schmitt, (573) 876-1846
- Reconnaissance of Endrocrine-Disrupting Compounds in the Nation's Waterways; contact: Tom Muir, (703) 648-5111.

. . . *Natural Step*

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training and follow-up support to interested audiences, with a particular focus on the corporate sector. There have already been a number of opportunities in this area; all interested organizations are encouraged to contact the Natural Step's Great Lakes office.

To respond to the high degree of interest in the Natural Step in the Great Lakes, we are: 1) establishing regional "guidance committees" to disseminate Natural Step principles, augment our vision, and provide networking opportunities, and 2) establishing case studies by working with those who have already expressed an interest in training their staff in the principles of the Natural Step.

For more information contact Carol Misseldine at (517) 482-6232, fax: (517) 487-9541, carolm@pilot.msu.edu.

Join Great Lakes United!

Unless someone like you, Cares a whole awful lot, Nothing is going to get better, It's not!—The Lorax, by Dr. Seuss

Sure! Somebody's got to care! Sign me up as an:

❒ **Individual member—$25** ❒ **Family member—$35** ❒ **Sustaining member—$50**
❒ **Library subscriber—$50** ❒ **Organizational member—$25* or $100**

**annual budgets of $15,000 or less*

All members get a year's subscription to the GLU newsletter—four issues.
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Help organize for the future of the Great Lakes

This year's annual meeting will be held in the most rustic setting we have managed to find since our founding meeting on Mackinac Island in 1982: Cedar Glen Conference Center, just thirty miles north of Toronto.

A convoy of anti-mining activists from Wisconsin, Michigan, and Ontario will kick off the meeting after converging for a demonstration in Toronto at the headquarters of Rio Algom, a major Basin mining company currently working with Exxon to develop the Crandon mine.

Ruth Grier

Our keynote speaker is the Basin's first grassroots environmental activist to assume a major role in government environmental policy-making: Ontario's Ruth Grier. With the devastating demolition of environmental progress now taking place in Ontario, Ruth's insights should be fascinating.

And we have the honor of hearing first hand what a leader of the International Joint Commission—Alice Chamberlin—has to say about the direction of Great Lakes environmental policies in the highly volatile years just ahead.

But as a coalition of groups concerned about the Great Lakes–St. Lawrence River ecosystem, Great Lakes United most importantly relies on its members to set direction and play a part in the work we do.

We urge all readers to come to the meeting and join what will certainly be a vigorous discussion of the future of environmental organizing in the Great Lakes! A wide range of issues are set for major debate in the coming months:

- How should Great Lakes environmental organizations participate in the upcoming International Joint Commission fall "public forum," formerly known as the IJC Biennial?
- We made a good start organizing on water conservation issues with the release of our sustainable waters report, excerpted extensively throughout this issue. How can we capitalize on the excitement generated by the report and further the water conservation agenda?
- Should we encourage renegotiation of one of the bedrocks of our work, the 25-year-old Great Lakes Water Quality Agreement? If so, how do we want it changed?
- Given the huge quantities of air deposition of pollutants to our Basin, should we make an effort to be a part of current international discussions to ban some of those pollutants?
- Despite our general distaste for current free trade trends that promise to limit our ability to pass environmentally protective laws, should we work with a NAFTA-originated environmental body, the Commission on Environmental Cooperation?
- Should we consider putting substantial organizing resources into fighting the increasingly Basinwide problem of destructive mining?

We need the assistance of all concerned Basin citizens to help us answer these very important questions.

at Great Lakes United's 1997 Annual Meeting

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Annual Meeting Registration Form

(please mail or fax to arrive by Friday, May 23)

Name: _____

Affiliation: _____

Address: _____

City etc. _____

Phone: _____

Childcare

Number/ages of children: _____

Days/hours needed: _____

(Please inform us of your needs by Friday, May 16)

Registration Packages

- ❑ Events only (no meals/lodging)—C$59, US$55
  (Registration C$45, meeting halls C$14)

All meals and lodging, Friday–Sunday:

- ❑ With one roommate—C$174, US$136
  (Registration C$45, lodging C$74, food C$41, meeting halls C$14)
- ❑ With two roommates—C$154, US$121
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- ❑ Tent camping—C$112, US$92
  (Registration C$45, lodging C$12, food C$41, meeting halls C$14)

Desired roommate name or gender: _____

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(Some pro-rated packages available; call for details)

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(please consider rounding your contribution up to help us defray other meeting costs)

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15th Annual
General Meeting

GREAT LAKES UNITED

Registration
on reverse side

"Basinwide Organizing for the Future"

Friday, May 30

1:00pm **Choice of tours**

☐ *Niagara Escarpment: Cliff ecosystems* ☐ *Boyne River Natural Science School's "living machine" waste disposal system*

☐ *Husky Injection Molding Systems Bolton—corporate environmental responsibility*

7:45 **"Great Lakes, Bright Lights"**

Meetings of attendees from the five lakes and the St. Lawrence River, reports back, and postings to the meeting's "Citizens' Wall"

9:45 Choice of reception events

Saturday, May 31

9:00 **Panel: "Halting the Development Juggernaut: Environmentally Sound Alternatives"**

Panelists: U.S. and Canadian land use citizen activists, land-use planners, and land-use officials

10:45 **Choice of GLU taskforce strategy sessions**

Attendees will discuss the overall status of taskforce issues, recommend strategy for Great Lakes United and member organizations to move those issues forward, and propose policy resolutions for consideration during the Sunday morning business meeting.

☐ *Biodiversity* ☐ *Sustainable Waters (Water quantity issues)*

☐ *Nuclear-Free Great Lakes* ☐ *Pollution Prevention and Human Health*

☐ *Remediation (RAPs, LAMPs, and the Great Lakes Water Quality Agreement)—Lee Botts, John Jackson, Paul Muldoon, Don Munton*

1:30 **GLU Annual General (Business) Meeting I**—*Call for nominations and resolutions, executive director and treasurers' reports*

2:00 **Choice of workshops**

☐ *Just Transition to a Toxic-Free Economy* ☐ *From RAPs to Greenways* ☐ *The Natural Step* ☐ *Great Lakes Basin Mining*

☐ *Pressures to Drain the Great Lakes* ☐ *Introduction to the Great Lakes Water Quality Agreement*

☐ *Environmental Justice* ☐ *Effects on Aboriginals of the Great Lakes Environment (EAGLE) Program*

4:00 **"The Great Lakes Water Quality Agreement at 25: Past and Future"**

Panel/audience discussion: "Defending the Great Lakes Water Quality Agreement: What Should Environmentalists Do at the IJC Biennial?"
Panel members will include Lee Botts, Alice Chamberlin, John Jackson, and Paul Muldoon

7:00 **Supper and keynote speech: Ruth Grier**

Ruth Grier is Visiting Environmentalist at Innis College, University of Toronto

Sunday, June 1

8–10:00 **Elections for GLU Board of Directors**

8:30 **GLU Annual General (Business) Meeting II**—*Workgroup strategy session reports, awards, resolutions*

10:00 **Choice of organizing topics**

☐ *Planning for the IJC Biennial* ☐ *Renegotiating the Great Lakes Water Quality Agreement*

☐ *Participating in International Forums (NAFTA Commission on Environmental Cooperation, U.N. Protocol on Persistent Organic Pollutants)*

11:15 **Reports on Plans for Action in International Forums**

Regularly showing will be videotapes "Keepers of the Waters" (on citizen struggle against Crandon mine) and "The Mighty River" (on the St. Lawrence River).

GREAT LAKES UNITED

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