



The Finch Meander, Rouge River

That is the true measure of a city — the well-being of its people. Their opportunities, the quality of life they lead, the air they breathe. At the end of the day, I would be much prouder to have Toronto known as a 'healthy city' than a 'world-class city'.

Eggleton, A. 9 June 1990. In "Toronto: it's pricey but livable: survey gives us edge over Montreal, five U.S. cities." *Toronto Star* D1.

tion and harm human health. Ozone is formed downwind of originating sources through a complicated series of reactions involving nitrogen dioxides and volatile organic compounds in the presence of sunlight. Over the past ten years, levels of ozone have remained essentially constant, and are fairly uniform across Southern Ontario. They are highest in the City of Toronto, where they regularly exceed the federal standard of 120 parts per billion.

In October 1989, the City of Toronto's Special Advisory Committee on the Environment recommended a comprehensive strategy to reduce automobile emissions. This included improvements to public transit and aggressive management of automobile use in

the City, as well as suggestions that the federal government strengthen automobile fuel efficiency standards and adopt California's tough emission standards for nitrogen oxides and hydrocarbons.

The fact that concentrations of ozone are highest in warm, sunny weather, when winds carry ozone-laden air north from the United States to the north shore of Lake Ontario, is a reminder that we are part of an ecosystem: while U.S. sources are largely responsible for our smog problems, the pollutants generated here will be carried off on the winds to cause ozone problems elsewhere.

Another class of air pollutants for which distant sources appear to be largely responsible is toxic organic compounds — those that can affect health, even at extremely low concentrations. Among such compounds are dioxins and furans, as well as a host of industrial and agricultural chemicals. As yet, however, the magnitude of the problem has been neither well defined nor addressed comprehensively by governments.

However, in order to study the type and concentrations of trace organic compounds in the air, the Ontario Ministry of the Environment has recently established a monitoring station on the Toronto Islands. There, levels of these compounds are found to be similar to those at rural monitoring stations throughout Ontario, which suggests that distant sources are responsible for much of the toxic organic compounds found in the air.

In recent years, atmospheric scientists have warned about the dangers of global warming — the “greenhouse effect”. Trends to global warming are attributed to the emission into the environment of greenhouse gases, including carbon dioxide, methane, nitrous oxide, ground-level ozone, and chlorofluorocarbons (CFCs). There are predictions that by 2050, if emission of these gases goes unchecked, temperatures will rise as much as 4.5 degrees celsius above those of the late 1880s. On a global scale, this kind of increase is expected to result in more frequent and serious droughts, extensive desertification

of some areas, forest dieback, and rising sea levels.

Recognizing that these problems are global in scale, the City of Toronto recently adopted recommendations made by the Special Advisory Committee on the Environment in its 1989 report, *The Changing Atmosphere: A Call to Action*. It recommended urgent action at the local level, including preventive measures (a reduction in emissions and increased energy efficiency of buildings), reforestation projects to offset and recycle carbon emissions, and measures to adapt locally to climatic change.

Recent news reports about the thinning of the ozone layer above Toronto have brought the global problem of ozone depletion disturbingly close to home. While ozone at ground level is harmful to humans and vegetation, at high levels in the stratosphere it is a shield protecting the earth from harmful ultraviolet radiation. A significant thinning of the ozone layer is expected to lead to a dramatic increase in radiation-induced skin cancers.

Chlorofluorocarbons (CFCs) are the prime culprits implicated in the destruction of the ozone layer. Global recognition of the problem has improved in the past five years, and it appears that the production of CFCs will be largely eliminated by the year 2000. But concerns have already been raised about the chemicals that would replace CFCs: they are considered potent greenhouse gases that will exacerbate global warming.

The foregoing is merely a snapshot of the regional air quality in the Greater Toronto Area. But air quality can also be affected dramatically by local sources: in Toronto's South Riverdale neighbourhood, for example, residents are beset by odours and pollutants from a local lead smelter, a variety of nearby industries, and Metro's Main Sewage Treatment Plant. There are probably similar situations in other areas where industrial and residential land uses conflict.

The Royal Commission's audit of Toronto's Port Industrial Area indicates



that, in areas close to major traffic arteries, levels of dustfall, suspended particulates, and carbon monoxide may affect human health. This may be particularly relevant to the waterfront because of the network of traffic corridors that run from Burlington to Newcastle.

Wildlife

It is difficult to draw an accurate picture of the wildlife that flourished in the Greater Toronto Bioregion before European settlement began in earnest — information is fragmented and comes largely from diaries, articles, and other writings of the time. We do know, however, that the area was rich in animal life: the forests and plains of the Don Valley watershed were alive with beaver, porcupine, timber wolf, black bear, marten, otter, wolverine, lynx, and elk. The extensive coastal marshes and inland wetlands

The real Toronto Bluejay

were host to a variety of ducks, geese, herons, and other birds, as well as reptiles and amphibians. The waters of Lake Ontario and the lower reaches of its rivers teemed with a huge variety of fish including lake trout, herring, sturgeon, salmon, pike, and muskellunge.

The picture today is dramatically different because of loss of wildlife habitat, human predation, and the introduction of persistent chemicals into the environment and foreign species into the bioregion. All these factors have contributed to a significant decrease in wildlife diversity, and wildlife populations which are under stress.

Altering shorelines and filling wetlands has reduced the space available to animals, fish, and birds for living and reproducing. Spawning grounds for cold-water fish have been lost because rivers were dammed.

With the exception of beaver and porcupine, none of the mammals previously found in the Don watershed are now common in the GTA. The passenger pigeon nested in several colonies on the Don watershed and could be found in large numbers in 1870. Clearing of land for farms and intensive market shooting and trapping rendered this handsome bird extinct. The piping plover, with its musical, plaintive voice, used to be resident, in large numbers, in the beaches around the Great Lakes but was declared an endangered species in Ontario in 1977. It no longer nests in the GTA, primarily because of the recreational use of beaches: the destruction of nests and young by people and vehicles and the disturbance of nesting birds.

The numbers of many species of frogs, turtles, and snakes have decreased dra-

matically in southern Ontario during the 20th century, largely because their habitats have been degraded or destroyed. Many of the reptiles and amphibians inhabiting the remaining coastal marshes in the GTA are classified as rare, including the eastern spiny softshell turtle, as well as the Blanding's, wood, stinkpot, and map turtles.

Fisheries are sensitive to a variety of influences: shoreline alterations, overfishing, pollution, destruction of wetlands, and the introduction of exotic species. Twenty endemic species of fish have disappeared from the Toronto waterfront in the past century, including such valuable sport fish as muskellunge, and species such as herring, which were the backbone of local commercial

Liquid bulk storage, Port Industrial Area



... Western Europeans and Americans have been carrying around with them as part of their mental baggage a deeply felt and despairing assumption that progress demands degraded surroundings. You put up with such surroundings as long as you have to, and you run away from them as soon as you can afford to, but, this belief has it, deteriorated landscapes and debased communities and bad smells and hideous noises are simply a given — something we all have to live with.

Hiss, T. 21 August 1989. "Reflections: encountering the countryside: II." *New Yorker* 40.



fishing. While the mouth of the relatively unpolluted Rouge River hosts 31 species of fish, only three can be found in the severely degraded Don.

The bald eagle is rarely found in the Great Lakes Basin, because of chemical contamination there. Originally threatened by habitat loss and hunting, populations began to recover early in the 20th century when protection measures were enacted. However, a rapid decline in populations in the Great Lakes Basin began again in the 1940s, as the result of persistent pesticides such as DDT and dieldrin.

Such chemicals and PCBs were also responsible for the collapse, in the 1970s, of populations of herring gulls, black-crowned night herons, and cormorants in the Toronto area. Prohibition of such chemicals has allowed the herons and gulls to make a recovery, but the cormorant and bald eagle have yet to return to Toronto's shores. This may indicate, in part, how long it takes some of these chemicals to break down completely: although no longer in use, they remain in water, sediments, and tissues. PCBs and mirex, for example, have been banned in Ontario for some time, yet are still found in fish taken from Lake Ontario.

The Ministry of the Environment advises that people restrict their intake of seven species of fish caught in Toronto waters because of high levels of PCBs, mirex, pesticides, mercury, and other metals. Contamination of fish populations occurs all along the Greater Toronto Waterfront, with level and type of contamination varying from location to location.

Levels of contaminants in wildlife are good indicators of ecosystem health. Like the canary in the coal mine, the effects of chemicals in animal populations can be a warning of the potential effects on humans. Persistent organic chemicals and metals can bioaccumulate in animal tissues and levels can increase moving up the food chain. In other words, levels of toxics can be quite low in water, and slightly higher in organisms

like zooplankton, but can reach dangerous levels in animals at the top of the chain — such animals as fish-eating birds, turtles, mammals, and even humans.

Humans carry persistent toxics, like the ubiquitous PCBs, in their fatty tissues, especially in the liver and brain, and in breast milk. In wildlife, depending on the chemicals and the species, such contaminants can cause reproductive failures, deformities, and tumours.

Species of wildlife introduced from elsewhere have altered, and in some cases, damaged, the ecosystem. North Americans are only too familiar with the European starling, the house sparrow, and the carp, all imported species that have become nuisances. There are many others in the same category: for example, 11 species of fish along the Toronto waterfront can be classified as introduced, of which the sea lamprey is most notorious — a voracious predator that entered the Great Lakes when the St. Lawrence Seaway was opened. Although largely controlled now, it played a significant role in the decline of certain varieties of sport fish in Lake Ontario.

Today, the tiny zebra mussel is one of the latest immigrants to the Great Lakes; it travelled from Europe in the hold of a ship, entered the water when the bilges were pumped out, and has found our lakes attractive. A prolific breeder, it has been dubbed the “cockroach of the Great Lakes”. The mussels are costing millions of dollars in repairs, removal, and lost opportunities. They attach themselves to working and recreational boats, and block water intake pipes, thus frustrating public works departments and industrial users of water.

The tiny molluscs also cover fish-spawning habitat, and consume vast quantities of plankton that are a vital part of the food web for many other species.

For all the reasons outlined — loss of habitat, predation, persistent chemical contaminants, and introduced species — wildlife is under siege in the Greater Toronto Bioregion.

But there is some encouraging news: many river valleys and other green spaces in the region — while not pristine — still provide habitat for wildlife and important links for migration and movement. This is why flying squirrels and deer can still be found in Scarborough’s Rouge Valley, or red fox sighted on the Leslie Street Spit.

The Toronto area lies in the overlapping zones of the two major North American migratory flyways, the Atlantic and the Mississippi. The waterfront and its remaining green spaces provide important staging grounds for birds during their spring and fall migrations, allowing stopovers before birds continue south to wintering grounds or north to summer breeding grounds. All too often, however, these green corridors are becoming fragmented by development.

Much of the wildlife habitat that remains is degraded from nearby urban use; protecting and enhancing remaining wildlife will require changes in attitude and adherence to the ecosystem approach, in order to ensure healthy, self-sustaining populations.

Conclusions

This sketch of the air, land, water, wildlife, and human activities in the Greater Toronto Bioregion reveals an ecosystem under considerable stress. Rivers, creeks, and the lake are polluted and unfit for swimming, and cannot be used for drinking water unless they are treated. Persistent organic chemicals and heavy metals are found in the air, water, wildlife, and soils of the region. The pressures of development continue to pose a threat to wildlife habitat and species diversity. Landfills are nearing capacity and more sewage and stormwater run-off is generated than can be effectively treated. Transportation networks are at, or above, capacity. Prime agricultural land and green space are being lost to apparently relentless urbanization, and the Oak Ridges Moraine, a precious resource for groundwater, wildlife,



and open space, is threatened by development pressures.

This is an ecosystem that, to a large degree, is literally “dis-integrated”, one in which the carrying capacity — the ability of air, land, and water to absorb the impact of human use — is clearly strained, and cannot be sustained over the long term unless fundamental changes are made.

Who is responsible for tackling these problems? The answer is complicated: governance in the Greater Toronto Bioregion is shared by five regional municipalities, 30 local municipalities, and numerous federal and provincial ministries, departments, boards, agencies, and commissions. In an era when it is clear that governments alone cannot solve our environmental problems, the 6,000 industries in the GTA and its four million residents also have a role to play.

Toronto skyline from Polson Quay, Port of Toronto

The ecosystem approach highlights the interactions among ecological, social, economic, and political systems within the bioregion. It suggests that economic development patterns, resource policies, consumer trends, and public attitudes must all be considered in terms of their actual or potential effect on the integrity of the system. This requires a strong emphasis on setting goals in common, changing attitudes, co-ordinating plans and actions across jurisdictions, co-ordinating mechanisms for allocating and using resources, and planning co-operatively.

Environmental processes are not confined within political boundaries, and actions in one jurisdiction may affect environmental health in others. It is therefore imperative

to develop administrative mechanisms that bring jurisdictions together to solve problems co-operatively and to develop environmentally sound ways of living in this bioregion. For example, the Lower Don Task Force in the City of Toronto realizes that any efforts to clean up the Lower Don will be futile unless they are accompanied by co-ordinated action on the part of the two regions and seven municipalities in the watershed.

There is an urgent need for regeneration of the entire Greater Toronto Bioregion to remediate environmental problems caused by past activities, to prevent further degradation, and to ensure that all future activities

result in a net improvement in environmental health. In a region experiencing dramatic economic growth and rapid urbanization, it is crucial to heed the warning signs of ecosystem stress, so that the quality of life that attracted people here can be restored and maintained, for existing and future generations.

Focusing on the needs of the Greater Toronto Waterfront in the context of its bioregion, the next chapter offers a set of principles for planning, developing, and managing a healthy, integrated waterfront. Chapter 3 contains specific recommendations for regeneration, both on a waterfront-wide scale and on a local basis.



The Artist's Choice, Don River near Toronto, early 1900s, Edwardian postcard

The Trillium, Ontario's symbol