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LIVING

Change is at hand

The warming of the environment affects our forests, wetlands, rivers, lakes and wildlife

For many people, the sense of place that we experience living in the Kawarthas has been rattled as of late. The violent rain and wind storms of the past two summers,



OUR CHANGING SEASONS
Drew Monkman

last winter's record warm temperatures, and the total absence of winter this year until mid-January have left many of us somewhat bewildered. But violent or abnormally warm weather is not the only consequence of climate change. Less evident, at least for the time being, are the changes that are taking place in our forests, wetlands, rivers and lakes — and the wildlife that make these habitats home.

In general terms, climate change is having a filtering effect on our flora and fauna, reducing those plants and animals that are not highly mobile and adaptable. Invasive species, because of their generalized habitat and feeding requirements, are expected to do much better than those native species with more specialized needs. The term "invasive" usually refers to organisms that are so reproductively successful and aggressive that they can dominate an area, often to the point of becoming a monoculture. Most of these are non-native in origin. Starlings, buckthorn, carp and zebra mussels are a few well-known examples.

Forests, in particular will be impacted as the climate warms. There will be major changes in temperature, soil moisture, forest fire risk, and the concentration of various gases such as atmospheric nitrogen, carbon dioxide and ground-level ozone. How these changes will interact is very difficult to predict. In the short term, higher levels of CO₂ and nitrogen in the air will likely bring about increased forest growth. At the same time, however, there will probably be a reduction in the overall health of the forests because of higher concentrations of ground-level ozone and more frequent droughts and forest fires. Insect damage is projected to get worse, too, as a result of the hotter and drier summer conditions and the milder winters. Both the frequency and duration of insect outbreaks will probably increase. We can also expect a less diverse, more 'weedy' variety of species.

An increase in the frequency of extreme events like the ice storm of



The black tern (top left), and moose (right) are seen as big losers in climate change predictions for central Ontario, while the wild turkey (bottom left) and European starling are expected to do well.

1998 and the huge blow-downs of trees caused by last summer's violent winds will also have a negative effect on our woodlands. This will be especially hard on smaller parcels of forested land that are isolated from other similar natural areas which might otherwise provide a source for replenishing a species that is wiped out locally.

The implications for wetlands are troubling, as well. They will suffer from more intense flooding, lower summer water levels because of increased evaporation, and the constant pressures of agriculture and development. Reduced summer water levels are likely to diminish the recharge of groundwater, cause small streams to dry up, and reduce the area of wetlands, resulting in poorer water quality and less wildlife habitat. Amphibians, along with bird species such as rails and bitterns, stand to suffer major losses. The vitally important services

that wetlands provide — water purification and flood control to name two — stand to be degraded, as well. However, some lake margins may essentially turn into wetlands as a result of lower water levels.

Quite obviously, our lakes, streams and fish populations will not go unscathed, either. On the positive side, the decline in the duration of winter ice may reduce the frequency of winter kill of fish which occurs when low oxygen levels sometimes develop under the ice. Lake levels, however, are expected to decline as more moisture is lost to evaporation due to warmer temperatures and less ice cover.

Native fish communities could change fundamentally. Cold-water species such as lake trout and brook trout will have a much harder time surviving in the warmer lakes and streams. Even cool water

species such as walleye are expected to decline significantly. Climate change will impact walleye both directly and through enhanced production of competitors such as bluegills, black crappies and bass whose populations should do well in the future.

We can also expect the spread of non-native nuisance species like zebra mussels, rusty crayfish and carp. Zebra mussels are already suspected of having a detrimental affect on walleye. By filtering the water, the mussels allow more sunlight to penetrate the water column. This forces walleye, which are light sensitive, to find new habitat.

Amphibians may prove to be particularly vulnerable to a changing climate. The timing of their breeding is largely driven by environmental cues such as temperature and moisture. Therefore, wetter and warmer weather in early

spring may encourage frogs and salamanders to become active earlier than usual and to immediately migrate to ponds and wetlands to breed. However, if they breed too early, their eggs could be destroyed by early spring freezes that are usually less common later in the season. There is also the danger that a warming environment may lead to pathogen outbreaks and higher mortality among amphibians. An infectious fungus aggravated by global warming has already killed entire populations of frogs in Central and South America and driven some species to extinction. Also, a significant reduction in the volume of frog breeding ponds because of longer, hotter summers may lead to greater tadpole mortality.

As for mammals, nuisance species such as raccoons and skunks will probably benefit from milder winters. The already prolific white-tailed deer should also fare well, since this species is not really adapted to traditional Canadian winters to begin with. Black bears, too, will probably be able to take the heat, since their huge range from Mexico to Alaska is a sign of the species' adaptability. We may even see southern species such as the Virginia opossum make their way to the Kawarthas. Until the 1980s, the opossum was unknown in southern Ontario.

Moose, however, which strangely enough seem to be increasing for the time being in the northern Kawarthas, stand to be losers in most climate change scenarios. Increased temperatures cause a lot of extra stress on these animals. The increased deer population will also mean that deer-carried parasites such as brain worms will kill greater numbers of moose.

The complex changes in habitat and food resources will also reduce the diversity of the bird species we presently enjoy. Models have been developed that look at the associations between bird distributions and climate. These models are forecasting a net loss of 53 per cent of species that are currently breeding in the states surrounding the Great Lakes. Birds that are at highest risk from climate change are mostly migratory and wetland species. Species that can only live in a narrow range of environmental conditions — black terns and Kirtland's warblers for example — will almost certainly decline and, in some cases, become extinct. However, birds such as blue jays that can move and adapt easily to different habitats should continue to thrive.

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Karl Egressy, special to The Examiner