

Put ecosystem to work

Restoring wetlands, managing watersheds could save Lake Winnipeg

By Henry David Venema

In 1997, American scientist Robert Costanza published a remarkable study in the journal *Nature* that attempted to answer the question: What is our environment worth in dollars? Globally, ecosystems provide human society with at least \$33 trillion worth of services annually, he claimed.

In a sense, Costanza and his colleagues merely formalized the obvious, that our environment provides the basic elements of human well-being—drinkable water and breathable air and the cost of engineering alternatives would be astronomical. Nonetheless, the scientific community was staggered by the size of the numbers.

Faced with serious threats to the health of iconic Lake Winnipeg, Manitobans would do well to heed the insights of Costanza.

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According to the Manitoba Department of Water Stewardship, fully two-thirds of the phosphorus generated within Manitoba comes from agricultural watersheds—

about half of this is from human activities, and about half from natural sources. Better managed, these same watersheds can be a big part of the solution by providing ecosystem services like filtering and removing algae-causing nutrients.

Watersheds of the Catskill mountains had provided a pristine water supply to New York City, but by the 1990s this water supply had fallen below acceptable standards due to poorly managed agricultural and sewage runoff. The city could have spent up to \$8 billion building a filtration plant to replicate the water purification service it used to get free, but chose instead to spend about one-tenth that amount restoring the natural capital in its watersheds.

New York City again enjoys its pristine water supply, having raised an environmental bond for \$660 million and used the funds to fix sewer systems, and to compensate landowners for ecosystem protection and environmentally-sustainable agricultural practices.

Another pioneering program for rewarding farmers as environmental stewards also has its roots in Manitoba. Farmers enrolled in the Alternative Land Use Services program currently being piloted in the Rural Municipality of Blanshard are paid annually for protecting ecosystem services provided by grazing lands, riparian areas, and wetlands on their farmland. The program is very popular and is expanding to other provinces. Over 70 per cent of eligible farmers participate in alternative land use and other municipalities and conservation districts around the province have expressed interest. The popularity of the program is quite understandable—with farm incomes

so depressed the prospect of being paid not to cultivate land that is usually marginal anyway is indeed attractive.

Therein lies the rub; although farmers have embraced this new income opportunity, governments that invariably must fund such programs are more cautious and need assurances that ecological goods and services programming provide good value to the taxpayer. Demonstrating that soft infrastructure approaches like payments for

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ecosystem services are cost-effective and workable is a scientific and institutional challenge, but the New York example shows that the payoff can be enormous.

The state government of Victoria, Australia, is testing an ingenious solution to the always vexing question of how many public dollars should be spent buying ecosystem services. The EcoTender concept is an auction-based approach to buying ecosystem services, where a physical model of a watershed is used to rank competing bids from farmers to produce ecosystem service on their land.

An auction-based approach like EcoTender assures governments that they're getting the best possible value for scarce dollars.

The designers of the EcoTender program visited Manitoba in 2006 and 2007—generating much interest. The International Institute for Sustainable Development is working with the province to investigate the potential for applying EcoTender here, while also conducting research on the public benefit of best management practices in agricultural watersheds, which includes benefits like the avoided costs of water treatment and damage to infrastructure from flash floods.

In collaboration with the University of Manitoba and Ducks Unlimited, the institute is also involved in innovative research to quantify the potential for the huge Netley-Libau marsh complex at the mouth of the Red River to simultaneously filter nutrients and produce bioenergy. The cost-effective restoration of this marsh could play an important role in reducing the phosphorus load on Lake Winnipeg.

Clearly, Manitoba is an incubator for innovations in ecological economics. Ducks Unlimited Canada, headquartered at Oak Hammock Marsh just north of Winnipeg, has been a strong advocate of the natural capital approach, emphasizing the economic benefits of retaining wetlands on agricultural landscape.

Wetlands—our Prairie potholes—are truly an enormous economic asset, providing waterfowl habitat, removing excess nutrients from water, sequestering carbon and reducing the impacts of floods and droughts.

The Manitoba Habitat Heritage Corporation also works to conserve, restore and enhance natural habitat on Manitoba's agricultural landscapes. The corporation uses conservation agreements with private landowners, farm organizations, conservation groups, corporations and government agencies to protect valuable habitat. Although landowners retain title to the land, through the conservation agreement or conservation easement, the corporation buys an assurance that the habitat under the agreement will always be protected. Billions of taxpayer dollars will be spent expanding the Winnipeg Floodway and upgrading Winnipeg's sewage treatment plants—these hard infrastructure investments are appropriate and well-intentioned. However, rather than continue to burden future generations with the maintenance liability of more hard infrastructure—which is already proving unsustainable in the transportation sector—we would be well-advised to recognize that well-managed ecosystems can provide many of the equivalent services cost-effectively. The institutions for watershed-based ecosystem management are a public investment well worth our serious consideration.

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