



## ECONOMICS MEETS ECOLOGY – LESSONS FOR ALBERTA WILDERNESS

By Carolyn Campbell, AWA Conservation Specialist

**E**xtract, alter, and trade. Our lives are filled with traded goods extracted from the earth. For countless generations, humanity has modified and traded materials in pursuit of sustenance and fulfilment. Few of us willingly stop once we've secured our physical necessities. In prosperous societies, we are able to and usually do accumulate and consume for personal development, enjoyment, and status for ourselves and our families. Many Albertans show off their big houses and vehicles, and many others aspire to do so.

As a young Albertan, I was concerned with how wealth was distributed, so I majored in economics at university. Economics is the study of how scarce resources are used to produce and distribute goods and services for the satisfaction of human wants. Like the discipline of economics itself, in the early 1980s I was somewhat but not overly concerned with environmental problems. As a social science, economics' central focus is human behaviour and institutions. (According to some prominent ecological economists, classical economics before the 1900s was fairly closely integrated with other natural sciences but later developed in isolation from them.)

As we all know, economic policies and measurements exert much influence over decision makers, in both households and governments. In the mainstream neoclassical economics I studied, the goods and services that counted were ones with prices. Unpriced offerings of nature, like plentiful clean air, were not a focus until they became scarce. Scarcity of resources is central to economics, but in a human-centred way: the supply of land, natural resources, labour, and capital is less than the human demand would be for them if they were free, resulting in prices on those assets. Traditionally, market-based prices are assumed to capture enough important information about the goods and services,



*Wetlands such as this one north of Fort McMurray provide important carbon storage and water regulation services that have been under-valued in land-use decisions.*

PHOTO: J. HILDEBRAND

and markets are assumed to function well enough, to permit a relatively efficient allocation of resources.

Traditional economics recognizes areas of market failure: so-called externalities exist when market prices do not sufficiently capture costs or benefits of a good or service, so its producers or consumers do not take its full effect into account. Societies have become aware of harmful externalities, such as some lethal chemical pollutants in air, land, or water, and have responded to these with regulations to reduce or end them. Economists have made recommendations to use taxes or subsidies, or in some cases to privatize public goods, to internalize the social costs or benefits of externalities into market-based prices. Nonetheless, even as the human economy was greatly expanding in relation to its supporting ecological systems, the study of economics by the early 1980s still treated market failures as exceptional rather than central. There was a dominant belief that price signals and technical change would resolve the shortages arising in market-based economies.

### **Sustainability and Economics**

With the landmark 1987 Brundtland Commission report came a much wider awareness of the concept of sustainability. Sustainable development, in this report's classic definition, is development that meets the needs of current generations – with special emphasis on the importance of meeting the basic needs of the world's poorest people – without compromising the ability of future generations to meet their own needs. The first United Nations Earth Summit convened in 1992, further increasing awareness of the unsustainable demands being placed upon the earth's biosphere due to human commerce.

Meanwhile, ecological economics was emerging as a recognized international discipline in the late 1980s. Building on 1960s pollution awareness and 1970s concerns about population growth and limited food and energy resources, economists concerned about environmental issues focused on resource exhaustion and ways to price nature's benefits and human pollution. To this was added the ecological understanding of the earth's life support systems that

enable all human activity to occur. Herman Daly, a founder of ecological economics, encapsulated its perspective with his famous phrase: “The economy is a wholly owned subsidiary of the environment, not the reverse.”

The influence of environmental thinking within economics continues to widen. In Alberta and Canada, and around the world, there are more analyses and efforts than ever before to attempt to integrate ecological and economic concerns. What are some of these integration efforts, and what do they mean for Alberta wilderness?

### Implementing Ecological Economics

Let’s start by recrafting the opening story of “extract, alter, and trade.” Plants harness and alter energy from the sun to form sugars. Other life forms in turn rely on these plant sugars. Plants and animals die and decompose into soil, sustaining more plants and animals. These and other energy cycles, such as the water cycle, sustain life. These complex relationships of animate and inanimate energy exchanges are now being altered by humanity. Accumulating atmospheric and oceanic greenhouse gases, a thinning ozone layer, clearing of native vegetation, and species extinctions are all examples of global-scale impacts. Human commerce must recognize and account for the real common wealth of the biosphere to guide its activities.

### Consumer Choices

One way all of us can incorporate environmental information into the economy is quite familiar – we can seek out and act upon information about ecologically sustainable practices in our commercial decisions. In economic terms, this leads to a better allocation of resources because it incorporates more complete information about product “quality” into market decisions. Labeling standards that bring reliable information right to the product make these consumer choices easier. As surely as certain car brands command a price premium because of their perceived superior reliability or performance, foods labeled “organic” command a price premium because of their perceived benefits to soil and water, to food growers’ health, to animal welfare, and to consumer health.

One ecological labeling effort affecting Alberta’s northern wilderness

### Some Ecological Economics Terms

**Natural Capital:** “Natural resources, such as water and oil, the land which provides space on which to live and work, and the ecosystems that maintain clean water, air and a stable climate. Unlike produced capital such as buildings and machinery, a significant portion of natural capital such as oil and species is irreplaceable. Natural capital is essential to sustaining all forms of life including human life. However, human activities are often responsible for the depletion of the stock and quality of natural capital.” (Government of Canada website, “Economic Concepts – Natural Capital”)

**Ecosystem Goods and Services (EGS):** “The conditions and processes through which natural ecosystems, and the species that compose them, sustain and fulfill human life.” (Western Watersheds Research Collaborative, *Climate Change in the Bow Valley: Continuing the Dialogue*, 2008)

is the Forest Stewardship Council (FSC) certification process. The Forest Stewardship Council was created after the 1992 Earth Summit to define credible international standards for well-managed forests. By setting high standards and conducting regular audits of both environmental and human rights management practices, FSC would certify forests that would be recognized as acceptable sources of timber and other forest products. For a consumer item such as a book (or the *Wild Lands Advocate*) to carry the FSC label, its forest products must have been FSC-certified through all phases of extraction, manufacture, and distribution.

The FSC standard applying to Alberta’s boreal forests, referred to as Canada’s National Boreal Standard, was developed in August 2004. In September 2005, Alberta Pacific Forest Industries (Al-Pac) received the largest FSC forest management certification in the world for 5.5 million ha of its Forest Management Agreement (FMA) lands in northeast Alberta. Al-Pac is still the only certified FSC forest in Alberta. Its lease is enormous, roughly 9 percent of Alberta’s total area; it extends from the Cold Lake Air Weapons Range at the Saskatchewan border west to Lesser Slave Lake and north to the Birch Mountains. More than 80 percent of the FMA is in the central mixedwood subregion of the boreal forest. At the time of certification, approximately 134,800 ha of provincial parks and wildlands were protected within Al-Pac’s FMA.

How has FSC certification advanced wilderness conservation in Alberta? Criterion 6.4 of Canada’s National Boreal Standard states: “Representative samples of existing ecosystems within

the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.” Unfortunately, not a single new hectare of protected area has been established because of Al-Pac’s FSC certification. In 2005, Al-Pac agreed to defer logging on roughly 4 percent of its certified lands and committed to work with other parties to achieve permanent protection and document its progress in doing so. To date there has been some progress in reaching agreement on logging deferrals with other forest companies holding overlapping tenures, and in expanding the areas on which Al-Pac itself will defer logging. However, given the intensity of energy industry, recreation, and other habitat-fragmenting activities over much of this landscape, its future remains precarious without permanent protection supported by the provincial government.

FSC is still widely viewed as the best forestry standard among the various certification processes used in North America. AWA and other environmental groups are still working within FSC audit processes to advocate for protected areas. But the FSC label alone, while signaling some useful information to consumers in the forest products marketplace, is no replacement for continued pressure on government and industry for permanent protection of significant wilderness areas.

### What’s Nature Worth?

Another major endeavour to integrate ecosystem knowledge into economic decisions involves promoting the concepts of “natural capital” and “ecosystem goods and services” (EGS) and assigning monetary values to



Because of the drastic effects of tar sands surface mining, at Al-Pac's request an area of approximately 292,000 ha in the mineable oil sands region was excluded from its Forest Stewardship Council certified area. PHOTO: C. WEARMOUTH

them (see sidebar, p. 5). None of the economists working on these valuations would claim that we are close to measuring the totality of sustenance and fulfilment provided to us by nature. However, within the bounds of economic trade-off decisions, this work informs us of what has been disregarded in land use decisions: the economic aspects of ecosystems (such as wetlands), their processes (such as wetland water filtration) and outcomes (such as clean water). Three recent examples of ecosystem services valuation illustrate the variety of approaches to increase awareness of that aspect of wilderness values.

In September 2008 a pioneering study of B.C.'s spotted owl habitat value was released (*The Economics of Protecting Old Growth Forest*, by Duncan Knowler and Kristin Dust, published by David Suzuki Foundation, Ecojustice, and Western Canada Wilderness Committee). The only spotted owl habitat in Canada is in old-growth forest in a relatively small area of southwestern B.C. The goal of this research was to compare the net economic values of this habitat under three land-use scenarios: 1) limited logging of suitable spotted owl habitat, as permitted in the current species management plan (under which the spotted owl population has continued to decline); 2) conservation – that is, no logging – of all current suitable spotted

owl habitat; and 3) conservation of all current suitable habitat plus all adjacent logged land that could regenerate in time to suitable habitat.

To compare these scenarios, an annual monetary value was estimated for a few key ecosystem services provided by this forest: carbon sequestration and storage, non-timber forest products such as mushrooms, and recreational value. Because of uncertainty of their values, services such as water flow regulation, water quality, and biodiversity-related services were not estimated. Then the authors used three different timber price and carbon price assumptions. They found that for almost all scenarios except rising timber prices (at 0.2 percent annually above inflation) and the lowest carbon prices (\$25 a tonne), increased forest conservation would yield a higher economic value than status quo logging. In economic trade-off terms, this wilderness habitat is more valuable to society if protected than if logged.

Another notable 2008 study is a comprehensive approach to valuing ecosystem services provided by Ontario's Green Belt (*Ontario's Wealth, Canada's Future: Appreciating the Value of the Greenbelt's Eco-Services*, by Sara Wilson, published by Friends of the Green Belt Foundation and David Suzuki Foundation). The Green Belt, established by Ontario legislation in 2005, is 1.8 million acres of environmentally

sensitive and agricultural lands protected from urban development. It forms a horseshoe shape around metropolitan Toronto and extends northwest up the Bruce Peninsula.

The study values a range of ecosystem services including carbon sequestration and storage, rare species habitat, water runoff control, pollination, and recreation. The estimated average ecosystem-service values of Green Belt lands are \$3,487 per hectare. By land type, the per-hectare estimated values are \$5,414 for forests, \$14,153 for wetlands, \$1,618 for grasslands, and \$477 for cropland. Unlike in the spotted owl habitat study, the author did not look at economic tradeoffs for alternative land uses of these protected areas. Rather, the value estimates are expected to help assess incremental costs and benefits of policy and investment decisions to enhance Green Belt ecosystem services.

To value water filtration services provided by wetlands and forests, the author used results of an American study of 27 U.S. water suppliers (reprinted in *The Economic Benefits of Land Conservation*, by The Trust for Public Land, 2007). This research found that for every 10 percent increase in forest cover in the suppliers' source water area (up to about 65 percent cover), treatment and chemical costs decrease by about 20 percent. It would be fascinating to see a similarly comprehensive study of water regulation values and other ecosystem goods and services provided by Alberta's Eastern Slopes to the Athabasca, North Saskatchewan and South Saskatchewan watersheds.

A third major effort has been the collaboration of independent ecological economists Mark Anielski and Sara Wilson in valuing Canada's boreal ecosystem services. Their approach is to estimate annual ecosystem service values and then compare them to conventionally calculated Gross Domestic Product (GDP) values. Their 2007 study of the Mackenzie watershed (which includes Alberta's Athabasca watershed) estimated an "ecosystem services product" at \$450 billion per year, about 10 times greater than the region's GDP (*The Real Wealth of the Mackenzie Region*, published by the Canadian Boreal Initiative). Their revised 2008 estimates for Canada's entire boreal region are \$703 billion of ecosystem services per year, or

13.8 times greater than the GDP of the watershed. The highest ecosystem service values are for carbon storage by forests and wetlands (\$582 billion per year) and flood control and water filtering by peatlands (\$77 billion per year).

I discussed the goal of this work with Mark Anielski. “Ecological service valuation can optimize our policy and resource development choices,” he said. “It’s about finding the ‘sweet spot’ of balance between getting GDP for sustained economic well-being of human communities, yet ensuring healthy ecosystems with a full spectrum of ecological functions.” I asked whether tar sands mining projects would always out-value the ecological services in that region. “That all depends on whether there are ‘diamonds’ of EGS values that could be as important as the next barrel of oil,” replied Anielski. “We would have to demonstrate that these ecosystem function values exist and may be at risk with resource development. Effectively, the surface mining area represents the complete loss of all ecosystem functions in the medium term; reclamation may bring some functions back. The social cost of carbon values, while high, are



*“Angel Glacier” 16x20 inches, oil on canvas © S. MCMILLAN*

still eclipsed by the market value of oil, at least when oil is above \$75 per barrel. The specific effects on water values for other people would have to be factored in too.”

Anielski and land-use modeler Brad Stelfox are working on indicators that Anielski says will inform the Alberta government’s Land-Use Framework regional planning. They can create

polygons of ecological value by mapping subsurface values and land-cover types, and then overlaying these with ecological service values. I thought of the ecological “diamond” of the McClelland wetland complex in the mineable oil sands region. Can its unique topographical features and rich biodiversity be adequately valued so as to forego strip mining in its watershed?

Biodiversity, an important attribute of wild lands, is a challenging issue for ecosystem valuation. The 2008 boreal figures show \$5.4 billion calculated for “pest control by birds,” and while this is the fourth-highest estimated value in the study, it seems a limited and unsatisfactory appraisal of biodiversity. According to Anielski, the trick to ecosystem-service valuation is to demonstrate a direct linkage to human well-being and then to ascertain a money replacement value for that service. We spend money on nature-related activities and on pest control, so these can be valued. Right now, there is no rigorous way to assign a monetary value to the existence of diverse species *per se*.

However, ecosystem valuation can reinforce the importance of biodiversity and intact habitat. An ecosystem must have integrity – that is, it must have intact functions, processes, and natural array of interacting organisms – in order to provide ecological services. Anielski points out that there is considerable work being done in Alberta by Brad Stelfox, the University of Alberta’s Stan Boutin, and others to understand and develop indicators of cumulative land-use impacts on ecosystem functions and integrity. According to Anielski, “The ‘holy grail’ of this analysis will be to demonstrate the relationship between incremental loss of ecological integrity and the direct impacts to economic, social, health, and ecological values that we can measure with some certainty.”

Even so, Anielski is clear about the limitations of ecological services valuation. “Money is simply a human creation useful for exchange and making trade-off decisions. Ecosystem valuation is helpful in making economic trade-off decisions. Beyond that, we are in the realm of ethical decisions. It may be inherently wiser to forgo a development with net economic benefits because of the immeasurable, irreplaceable assets of a natural ecosystem.”

### Redefining Progress

*Excerpted from “Return Trip: At Home and Away in Wilderness,” AWA’s 2008 Annual Lecture. For more, see page 24.*

In order to engage citizens as advocates for the wise use of land, we need to be completely honest when we speak to the public or the media. Do we really think the dominating, domineering stance of the current global economic system can be rectified by fine-tuning? Or is wide-ranging, radical change necessary? If yes, we should say so. We’ve tried tinkering and it doesn’t work. Surely reasonable people cannot continue to put their faith in the dangerous absurdity of a “sustainable, environmentally friendly, industrial growth economy.”

Wendell Berry, the American poet, farmer, and very fine essayist, contends that conservation will always be bogged down “unless answered positively by an economy that rewards and enforces good use.” Our present economy, he says, does not account for value: “it is simply a description of the career of money as it preys upon both nature and human society.” I think we should be willing to voice our resistance.

Another way of veering toward an inescapable and long overdue confrontation is to compile, carefully articulate, and begin to shout aloud our own definition of progress because I know it is fundamentally different from the one foisted on us by those in power. If we don’t accept that trying to achieve endless growth in a finite world is progress, if we refuse to agree that ever-increasing material consumption is the highest good and a useful measure of progress, we should say so. And we should offer our own ideas in rebuttal. We may need to tackle small issues one at a time, but we dare not ignore the overriding assumptions and the collective greed, fear, and selfishness that create them.

– Mike McIvor

## Challenging the Concept of Economic Growth

Another distinct approach to integrating economic and environmental thinking is taken by individuals and groups who advocate for ecologically mindful living without conventional economic growth. They share some fundamental perspectives of ecological economics: that humans are a part of the ecosphere; that the world economy should not (and in the long run cannot) be bigger than the earth's ecological limits; and that we must devise institutions to better measure and educate about our impacts, and to manage decisions to bring our economy within these limits. However, in the global North, to get ourselves down to our fair and sustainable share of the earth's resources will require a profound change in our thinking and living. Advocates of these changes fundamentally question the expansion of goods and service production as a social goal, and material accumulation as a sign of individual well-being.

One such group, inspired by the Quaker tradition of seeking right relationships, has formed under the banner of the Quaker Institute for the Future's Moral Economy Project. Two Montreal-based members of this project, environmental lawyer Geoffrey Garver and McGill environment professor and tree farmer Peter G. Brown, have just published a book outlining these ideas, called *Right Relationship: Building a Whole Earth Economy*.

Garver and Brown start from a moral foundation: they declare "a reverence for life" in the humanitarian tradition of Albert Schweitzer, and they have recast conservation biologist Aldo Leopold's 1940s land ethic as "A thing is right when it tends to preserve the integrity, resilience and beauty of the commonwealth of life, which includes human communities." Moving from these first principles, they assert that the economy's role is for respecting and preserving life, not for getting rich.

I discussed with Geoff Garver some of the ideas of "right relationship" between our economic choices and the earth. "It's the golden rule extended to the earth," he said. "A key to changing our overall culture is a person's understanding of 'what's my fair share,' and then deciding to live that way." A greater awareness of our ecological



*Old-growth forest in Lakeland Provincial Park. The economic value to society of unlogged forests such as this may well exceed their logged value. PHOTO: J. HILDEBRAND*

footprint can really help with that. As well, wilderness areas can play a significant role by reminding us what the integrity, beauty, and resilience of the commonwealth of life truly means.

Garver doubts whether the enormous effort required to systematically value ecosystem services and put "the right" price signals into the market place is really a solution, if we still rely on a growth paradigm. What about people's fear that foregoing economic growth will reduce jobs and harm their livelihood? "People focus more on that than our looming ecological crisis because we don't perceive long-term threats as easily as short-term ones," Garver replies. "But our current path is much more harmful to economic security and jobs. Besides, we can all focus on the abundant opportunities for individuals and our governments to invest in 'green paths' for society. There are lots of inspiring examples of people living more within a community's environmental and social bounds, and the fulfilment that comes with all those local connections." He cites as examples local vacations, community-supported agriculture, and innovative high-density communities such as Victoria's Docks Green.

Douglas McCauley of Stanford University's biological science department wrote a far-sighted

commentary in 2006 on the meeting place of ecology and economics ("Selling Out on Nature," *Nature*, September 7). He warns environmental scientists against placing much emphasis on economic or market-based mechanisms for conservation. He points out that while the biosphere provides us with many benevolent services, some aspects of nature conflict with human interests, and some parts neither help nor harm us directly, yet are worthy of protection. Moreover, future technological innovation may indeed lessen the cost of human-engineered alternatives to some ecosystem services, so that conservation plans must not be reliant on a cost-benefit analysis for public approval. Instead, McCauley urges conservationists to focus on instilling a love for nature in more people and on the moral imperative of preserving nature for nature's sake.

Integration of economics and environmental thinking can help us make better-informed land-use decisions. But it's still unlikely that approximations of monetary values will wholly encapsulate the values of wildlife and wild spaces. As wilderness advocates have known all along, we protect what we know and love, not just what we measure with money. 🌲