Economic Growth and Avian Biodiversity Conservation: a fundamental conflict

Neil K. Dawe, The Qualicum Institute, 438 Temple Street, Parksville, BC V9P 1A3

Andrew C. Stewart, 3932 Telegraph Bay Road, Victoria, BC V8N 4H7

Ian Robertson, Robertson Environmental Services Ltd., 1525 200th Street, Langley, BC V2Z 1W5

Terri Martin, Martin Environmental Services, Box 311, Heriot Bay, BC V0P 1H0

John M. Cooper, Manning, Cooper and Associates Ltd, Box 646, 1799 Swayne Road, Errington, BC V0R 1V0

Rick Howie, Aspen Park Consulting, 4898 Spurraway Road, Kamloops, BC V2H 1M6

Suzanne Beauchesne, Western Wildlife Research, 1799 Swayne Road, Errington, BC V0R 1V0

This article was written as an information preamble to a proposal that the British Columbia Field Ornithologists adopt a position statement on the fundamental conflict between economic growth and avian biodiversity conservation following those of a number of ecological and economic societies around the world. While this may be an extraordinary direction for the BCFO to take, the evidence is overwhelming that many avian species are in global decline and that orthodox conservation measures do not appear to be effective on their own. This article attempts to explain why, in spite of serious conservation efforts by ornithologists, ecologists, and conservationists, many avian populations still remain threatened today.

Introduction

In 2005, the Millennium Ecosystem Assessment Board summarized the findings of over 1,300 scientists who evaluated the consequences of ecosystem change for human well-being. They wrote:

> *Human activity is putting such strain on the natural functions of Earth that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted.*
>
> *The provision of food, fresh water, energy, and materials to a growing population has come at considerable cost to the complex systems of plants, animals, and biological processes that make the planet habitable* (Millennium Ecosystem Assessment 2005).

One wonders how this can be, when there are more environmental laws and regulations, more protected areas, more ecological and conservation research, more ecosystem restoration activities, and more environmental awareness than ever before.

In this article, we discuss the costs to one of those complex systems of animals, the declines in avian populations. We offer an explanation as to why, despite concerted efforts to reduce these declines, many populations continue their downward spiral. Specifically, we contend that there is a fundamental conflict between what we believe to be the root cause of these declines—economic growth—and avian biodiversity conservation.

Finally, we present a draft position statement for the BCFO membership to consider, one that discusses this fundamental conflict between economic growth and avian biodiversity conservation and considers a solution to continuous economic growth that respects physical and ecological principles.

The problem: Declining bird populations

Even after a century of conservation efforts around the world, a recent IUCN report (World Conservation Union 2006) notes that at least 12% of the bird species on the planet are threatened with extinction. Projections by Sekercioglu et al. (2004), indicate that between 6% and 14% of all bird species will be extinct by 2100 and a further 7% to 25% will be functionally extinct. Avian extinctions may also be exacerbated by declines in fish, amphibians, reptiles, and mammals as these groups are 1.7–2.5 times more threatened than birds (Birdlife International 2000).

Pimm et al. (2006) determine that corrected extinction rates for birds since A.D. 1500 are in the order of ~100 extinctions/million species/year (E/MSY). While conservation efforts may have reduced that rate in recent decades (<50 E/MSY), the reduction will be short-lived

and a 21st century rate of ~1,000 E/MSY is predicted. Pimm et al. (2006) also contend that if present forest losses continue, bird extinction rates will reach 1,500 E/MSY by the end of the century.

Canada and British Columbia are no different. Nationwide, 65 avian taxa are now considered extinct, extirpated, endangered, threatened, or of special concern (Environment Canada 2006) and provincially, 43 avian taxa are considered extirpated, endangered or threatened with a further 48 of special concern (British Columbia Ministry of Environment 2006).

If we look at the dominant causes of avian taxa endangerment in British Columbia and the economic sectors of which they are a part, the effect that economic growth is having on our native species is clear (Table 1). The dominant endangerment cause is habitat loss or conversion, however that loss does not occur spontaneously; it is facilitated by urbanization, forestry, and agricultural practices, among others—significant players in the economy. Clearly, all but a few of the endangerment causes are directly related to our perennial demand for economic growth.

The fatal flaw of neoclassical economics

There are many things wrong with the conventional or neoclassical economic model under which much of the global economy operates and today, conventional economics appears to be at a crossroads (for a brief introduction see Adbusters, 2006). As Stiglitz observes, "[Economics as taught] in America's graduate schools ... bears testimony to a triumph of ideology over science" (Post-autistic economics network 2006).

Unfortunately, critical discussions on the flaws of conventional economics and their attendant concepts have not yet filtered down to global decision-makers. As a result, most governments still strive for the perennial goal of economic growth.

While it is not within the realm of this paper to go into all the details (the reader is referred instead to Keen 2001, Fullbrook 2004, Daly and Farley 2004, and Post-autistic economics network 2006, for more thorough discussions of the flaws), it is sufficient in the context of biodiversity conservation to show that neoclassical economics has a fatal flaw: it ignores basic principles of physics and ecology.

For example, the conventional economic model assumes it can run forever on its own output much as a perpetual motion machine; thus infinite economic growth on a finite planet is deemed possible. This, of course, runs counter to thermodynamics.

The current model also assumes near perfect substitutability between factors of production so there's no need at all for natural resources (Costanza 2004). As economist and Nobel laureate, Robert Solow, confirms: "if it is very easy to substitute other factors for natural resources, then there is in principle no 'problem.' The world can, in effect, get along without natural resources, so exhaustion is just an event, not a catastrophe" (Solow 1974). We suggest that an economic model with no connectivity to the biosphere is fatally flawed.

The fundamental conflict

Economic growth is an increase in the production and consumption of goods and services and is a function of increasing population and per capita consumption (Czech 2000). It is an increase in throughput, or flow of natural resources, through the economy and back to the environment (Daly and Farley 2004). The general indicator of economic growth is gross domestic product (Daly 1996), simply an indicator of the size of the economy, not a reliable indicator of human welfare.

The theoretical framework for explaining the fundamental conflict between economic growth and wildlife conservation is thoroughly discussed by Czech (2000) and is summarized in Figure 1. Essentially, the economy grows by appropriating natural capital from the *economy of nature* and using it for the *human economy*. The natural capital acts as throughput to the human economy where it is converted to manufactured capital and consumer goods. Because of the tremendous breadth of the niche that humans occupy, the human economy grows at the competitive exclusion of wildlife in the aggregate (Czech 2000), including birds.

Czech (2000), using an ecological analogy, identifies economic growth as a *limiting factor* to wildlife conservation. Recall that a *limiting factor* is a factor, such as food or water that controls a process, such as species population size. The key point is that if you don't address the limiting factor, it doesn't matter what else you do; the population is in trouble.

If Czech's analogy is accurate — and we believe it is — it suggests that continuing with orthodox conservation actions will have little effect on avian biodiversity conservation because they do not address the limiting factor. For example, no matter how many biological habitats we secure, as long as our economic goal is

perennial growth, the growth will eventually cave in the political boundaries of those "secured" habitats or pollute them from the outside as is now happening with a number of United States National Wildlife Refuges (National Wildlife Refuge Association 2005).

Can technological progress solve the problem?

There are many who believe that technological progress will solve environmental problems (e.g., Lomborg 2001) while others believe that technological progress will result in the further liquidation of natural capital and thus biodiversity (Czech 2003).

Trauger et al. (2003) discuss economic growth, technological progress, and wildlife conservation. They argue that there are three main types of technological progress: *explorative, extractive,* and *end-use.*

The first two obviously result in the reallocation of natural capital to the human economy and thus a reduction in biodiversity.

The third, end-use technological progress, results in a more efficient use of inputs to the economy. This could be seen as beneficial to the environment but for a variety of reasons this, too, often results in increased consumption and thus faster conversion of natural capital (Foster 2000). The World Health Organization (2005) in their contribution to the Millennium Ecosystem Assessment, points out that:

> *In the 200 years for which we have reliable data, overall growth of consumption has outpaced increased efficiencies in production processes, leading to absolute increases in global consumption of materials and energy.*
>
> *This means that, in practice, economic growth tends to increase consumption of energy and materials.*

Consider, too, that industry conducts research and development as a function of profit (Trauger et al. 2003). Thus technological progress is also a product of economic growth as much as the other way around and as long as it is used to enhance economic growth, competitive exclusion takes place (Czech 2003).

Finally, empirical evidence shows us every day that biodiversity continues its worldwide decline concurrent with attendant and copious technological progress. This implies that technological progress is not being used for biodiversity conservation or solving environmental problems as technological optimists suggest, but rather for furthering economic growth.

The solution: A steady state economy.

The solution to this dilemma is to move towards a sustainable economy with reasonably stabilized population and levels of consumption: a "steady state economy" (Daly 1996).

This means our economy must operate sufficiently below the ecological limits (Figure 1) so that enough natural ecosystems and biodiversity remain to allow normal ecosystem functioning, which provides the ecosystem services necessary for life.

Daly and Farley (2004) summarize the concept:

> *The main idea of a steady-state economy is to maintain constant stocks of wealth and people at levels that are sufficient for a long and good life. The throughput by which these stocks are maintained should be low rather than high, and* **always within the regenerative and absorptive capabilities of the ecosystem** [our emphasis].

A position statement from the BCFO ?

Others are now beginning to recognize the disparity between what conventional economists are promising and what's really happening to the biodiversity of the planet (see, e.g., Naidoo and Adamcowicz 2001).

The number of professional organizations that have taken a position on the fundamental conflict between economic growth and biodiversity conservation continues to grow and includes, for example, the North American Section of the Society for Conservation Biology (2004), the United States Society for Ecological Economics (2005), and the venerable, The Wildlife Society (2005).

Politicians, too, are now recognizing that without addressing economic growth, efforts to reduce carbon emissions to counter global climate change—which also exacerbates biodiversity loss (Parmesan 2006)—will be futile.

Recently, a group of over 80 British MPs, members of an All-Party Parliamentary Climate Change Group, concluded that although government policies in Britain were lowering carbon emissions, more and more industrial plants resulting from economic growth were swamping the reductions. The group called for the abandonment of

the two hundred year old, business-as-usual pursuit of economic growth (McCarthy 2006).

Since one of the purposes of the BCFO is "the study and enjoyment of wild birds in British Columbia through conservation efforts to preserve birds and their habitats" (British Columbia Field Ornithologists 2006), we're suggesting that the BCFO join these illustrious organizations and forward-thinkers and adopt a position statement on the fundamental conflict between economic growth and avian biodiversity conservation. How would the BCFO adopting such a position statement help? Here is how Czech (2004) explains it:

> *Political scientists describe "iron triangles" that dominate policy arenas. An iron triangle consists of a special interest group, a political faction, and a professional society (usually manifest in a government agency). The economic growth iron triangle is formidable. The "special interest group" is essentially the entire corporate community, which benefits from a theory of perpetual growth and resulting policies. Given our campaign finance system, the entire political community is wedded to corporate interests…. The professional side of the iron triangle is neoclassical economics….*
>
> *The economic iron triangle has had carte blanche to boldly claim, "There is no conflict between economic growth and environmental protection!" If a critical mass of ecological societies adopts a position on economic growth, it will get media attention. Economic growth will be open to public scrutiny....*

We encourage the BCFO and its membership to become engaged in this effort.

Proposed BCFO Position Statement on economic growth.

What follows is a proposal for a position statement on economic growth for the BCFO membership to consider. The position statement has been adapted from a similar statement the North American Section of the Society for Conservation Biology adopted in 2004 (Society for Conservation Biology 2004).

The Steady State Economy as a Sustainable Alternative to Economic Growth

Whereas:

1. Economic growth is an increase in the production and consumption of goods and services, which entails an increase in throughput, or flow of natural resources, through the economy and back to the environment and;
2. Economic growth occurs when there is an increase in the product of population multiplied by per capita production and consumption, and;
3. Economic growth is often and generally indicated by increasing real gross domestic product (GDP) or real gross national product (GNP), and;
4. Based upon established principles of physics and ecology, there is a limit to economic growth, and;
5. A steady state economy is generally indicated by stabilized (or mildly fluctuating) real gross domestic product (GDP) or real gross national product (GNP), and;
6. A steady state economy, with a stabilized (or mildly fluctuating) product of population multiplied by per capita consumption, is an alternative to economic growth; and;
7. A steady state economy, with stabilized (or mildly fluctuating) production and consumption of goods and services, is an alternative to economic growth, and;
8. That British Columbia is a part of the North American economy, which grows as an integrated whole consisting of agricultural, extractive, manufacturing, and services sectors that require physical inputs and produce wastes, and;
9. There is increasing evidence that North American economic growth is having negative effects on the long-term ecological and economic welfare of North America and the world.

Therefore, the **British Columbia Field Ornithologists** take the position that:

1. There is a fundamental conflict between economic growth and avian biodiversity conservation based on the ecological principle of competitive exclusion, and;
2. There is a fundamental conflict between economic growth and the ecological services underpinning the human economy (for example, avian insect and vermin control, avian pollination, decomposition, climate regulation), and;

3. Technological progress has had both positive and negative ecological and economic effects and may not be depended upon to reconcile the fundamental conflict between economic growth and avian biodiversity conservation, and;
4. Because of its negative effects on ecological sustainability and sustainable economic welfare, economic growth is an increasingly dangerous and anachronistic North American goal, and;
5. A steady state economy is a viable, sustainable alternative to a growing economy and has become a more appropriate goal, particularly in the larger, wealthier economies of North America, and;
6. The sustainability of a steady state economy requires its establishment at a size that does not breach ecological and economic capacity during expected or unexpected supply shocks such as droughts and energy shortages, and;
7. A steady state economy does not preclude economic development, a qualitative process in which different technologies may be employed and the relative prominence of economic sectors may evolve, and;
8. Upon establishing steady state economies, it would be advisable for North American nations to assist other nations in moving from the goal of economic growth to the goal of a steady state economy, beginning with those nations currently enjoying the highest levels of per capita consumption, and;
9. For many nations with widespread poverty, increasing per capita consumption (or, alternatively, more equitable distributions of wealth) remains an appropriate goal for the time being; yet the ultimate goal should be the establishment of healthy ecological and social conditions within the framework of a steady state economy.

Acknowledgements

We thank Brian Czech for providing comments on the manuscript. The opinions expressed in this article are those of the authors and not necessarily of their employers.

Literature Cited

Adbusters. 2006. True Cost Economics. http://adbusters.org/metas/eco/truecosteconomics/ (Accessed 3 December 2006).

BirdLife International (2000) Threatened Birds of the World. BirdLife International, Barcelona and Cambridge, U.K.).

British Columbia Field Ornithologists. 2006. Birding with a purpose…. http://www.bcfo.ca/ (Accessed 6 December 2006).

British Columbia Ministry of Environment. 2006. BC Species and Ecosystem Explorer. http://srmapps.gov.bc.ca/apps/eswp/ (Accessed 30 November 2006).

Costanza, R. 2004. Changing visions of humans' place in the world and the need for an ecological economics. Pages 237-246 In Fullbrook, E. (Ed.). 2004. A guide to what's wrong with economics. Anthem Press, London.

Czech, B. 2000. Economic growth as the limiting factor for wildlife conservation. Wildlife Society Bulletin 28:4-15.

Czech, B. 2003. Technological progress and biodiversity conservation: a dollar spent is a dollar burned. Conservation Biology 17:

Czech, B. 2004. Taking on the economic triangle! Frontiers in Ecology and the Environment 2:227.

Daly, H.E. Beyond growth: the economics of sustainable development. Beacon Press, Boston.

Daly, H.E., and J. Farley. 2004. Ecological economics: Principles and applications. Island Press. Washington.

Environment Canada (2006). Species at Risk. http://www.speciesatrisk.gc.ca/ (Accessed 29 November 2006).

Foster, J.B. 2000. Capitalism's Environmental Crisis—Is Technology the Answer? Monthly Review 52. http://www.monthlyreview.org/1200jbf.htm (Accessed 12 December 2006).

Fullbrook, E. (Ed.). 2004. A guide to what's wrong with economics. Anthem Press, London.

Keen, S. 2001. Debunking economics: the naked Emperor of the social sciences. Zed Books, New York.

Lomborg, B. 2001. The skeptical environmentalist: measuring the real state of the world. Cambridge University Press, Cambridge, United Kingdom.

McCarthy, M. 2006. Global warming: your chance to change the climate. The Independent. http://news.independent.co.uk/environment/article354055.ece (Accessed 1 December 2006).

Millennium Ecosystem Assessment. 2005. Living beyond our means: natural assets and human well-being. Statement from the board. 28 pp. http://www.maweb.org/proxy/document.429.aspx (Accessed 29 November 2006).

Naidoo, R. and W. L. Adamowicz. 2001. Effects of Economic Prosperity on Numbers of Threatened Species. Conservation Biology 15:1021-1029.

National Wildlife Refuge Association. 2005. State of the System: An annual report on the threats to the National Wildlife Refuge System. http://www.refugenet.org/new-pdf-files/BeyondtheBoundaries.pdf (Accessed 7 December 2006).

Parmesan, C. 2006. Ecological and Evolutionary Responses to Recent Climate Change. Annu. Rev. Ecol. Evol. Syst. 2006. 37:637–69

Pimm, S., P. Raven, A. Peterson, Ç.H. Sekercioglu, and P.R. Ehrlich. 2006. Human impacts on the rates of recent, present, and future bird extinctions. Proc. Nat. Acad. Sc. 103: 10941-10946.

Post-autistic economics network 2006. Quote on sidebar to A Brief History of the Post-Autistic Economics Movement. http://www.paecon.net/#_A_Brief_History (accessed 8 December 2006).

Sekercioglu, Ç. H., G.C. Daily, and P.R. Ehrlich. 2004. Ecosystem consequences of bird declines. Proc. Nat. Acad. Sc. 101: 18042-18047.

Society for Conservation Biology. 2004. The Steady State Economy as a Sustainable Alternative to Economic Growth. http://www.conservationbiology.org/Sections/NAmerica/NAS-SCBPositionOnEconomicGrowth.cfm (Accessed 30 November 2006).

Solow, R.M. 1974. The Economics of Resources or the Resources of Economics. American Economic Review 64:1-14.

Trauger, D. L., B. Czech, J. D. Erickson, P. R. Garrettson, B. J. Kernohan, and C. A. Miller. 2003. The relationship of economic growth to wildlife conservation. Wildlife Society Technical Review 03-1. The Wildlife Society, Bethesda, Maryland, USA. 22 pp.

United States Society for Ecological Economics. 2005. Position of the United States Society for Ecological Economics on Economic Growth. http://www.ussee.org/PDFs/Position%20of%20the%20United%20States%20Society%20for%20Ecological%20Economics%20on%20Economic%20Growth.pdf (Accessed 1 December 2006).

The Wildlife Society. 2005. TWS Final Position: Economic Growth. http://www.wildlife.org/policy/positionstatements/34%20-%20Economic%20Growth.pdf (Accessed 1 December 2006).

World Conservation Union. 2006. IUCN Red list of threatened species. http://www.iucn.org/themes/ssc/redlist2006/categories.htm (Accessed 28 November 2006).

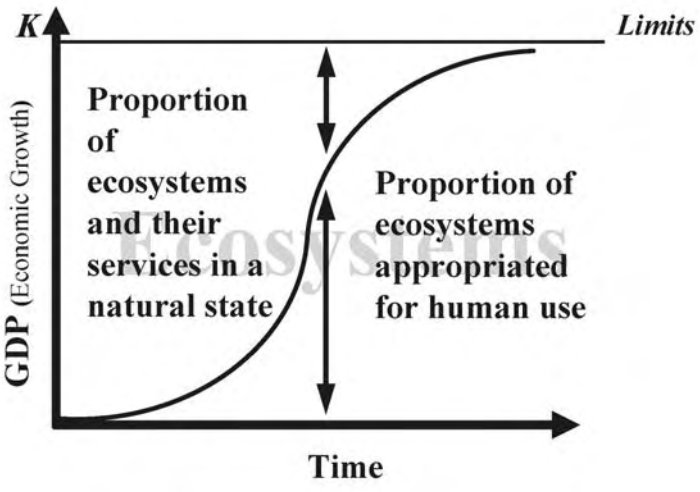

Figure 1. A fundamental conflict between economic growth and wildlife conservation occurs because as the economy grows over time it appropriates a greater and greater proportion of natural capital from the economy of nature for use in the human economy. The tremendous breadth of the niche that humans occupy means that the human economy grows at the competitive exclusion of wildlife in the aggregate with an attendant loss of biodiversity. K is carrying capacity (limits) for the human economy. A steady state economy would maintain the economy sufficiently below the limits so that the areal extent of ecosystems would be adequate to maintain biodiversity and thus allow proper ecosystem functioning (Adapted from Czech 2000).

Table 1. Causes of endangerment for red and blue-listed bird taxa in British Columbia1 and the economic sectors involved in their endangerment.

Causes of Endangerment	Number of taxa[2]	Economic sector
Urbanization (including ruralization)	33	Labour, light manufacturing, service
Forestry (including modi ed re regimes)	32	Agro-extractive
Agriculture (including pesticides)	30	Agro-extractive
Small population[3]	16	
Exotic species interactions	10	Trade & commerce
Recreation & tourism	9	Service
Native species interactions	8	
Livestock ranching	7	Agro-extractive
Fishery	7	Agro-extractive
Natural stochastic events (e.g., severe weather)	5	
Harvest	5	Agro-extractive
Global warming	3	Economic by-product
Pollution	2	Economic by-product
Industrialization	2	Labour, manufacturing