

Prepared by

*The Qualicum Institute*

for presentation to

**BC Nature - AGM**

by

**Neil K. Dawe, RPBio**

**Courtenay, B.C.**

**13 May 2016**

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***Growing, growing  
gone!***

***(Not with a steady state economy!)***

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## *BC Nature Resolution (2008)*

Be it resolved that BC Nature support in principle the steady state economy as a sustainable alternative to economic growth.

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## *Steady state economy*

A steady state economy aims for stability (sustainability) or mildly fluctuating levels in population and consumption of energy and materials.

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## *Goals of a SSE*

- Sustainable scale
- Just distribution
- Efficient allocation
- Maximize human well-being



Energy and  
material flows  
within ecological  
limits

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## *Sustainable scale*

1. maintain the health of ecosystems and the life-support services they provide in adequate amounts

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## *Conservation targets*

The median protected proportion of a region's land base necessary to meet conservation objectives lies above 50 percent.

# *Qualicum Institute*

## *Conservation targets*

“From a precautionary perspective, 50% is scientifically defensible as a global target.”



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## *Sustainable scale*

2. extract renewable resources at a rate no faster than they can be regenerated

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## *Sustainable scale*

3. Consume non-renewable resources at a rate no faster than they can be replaced by the discovery of renewable substitutes

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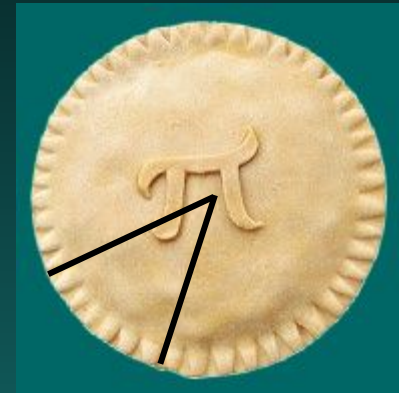
## *Sustainable scale*

4. Deposit wastes in the environment at a rate no faster than they can be safely assimilated by the ecosystems

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## *Goals of a SSE*

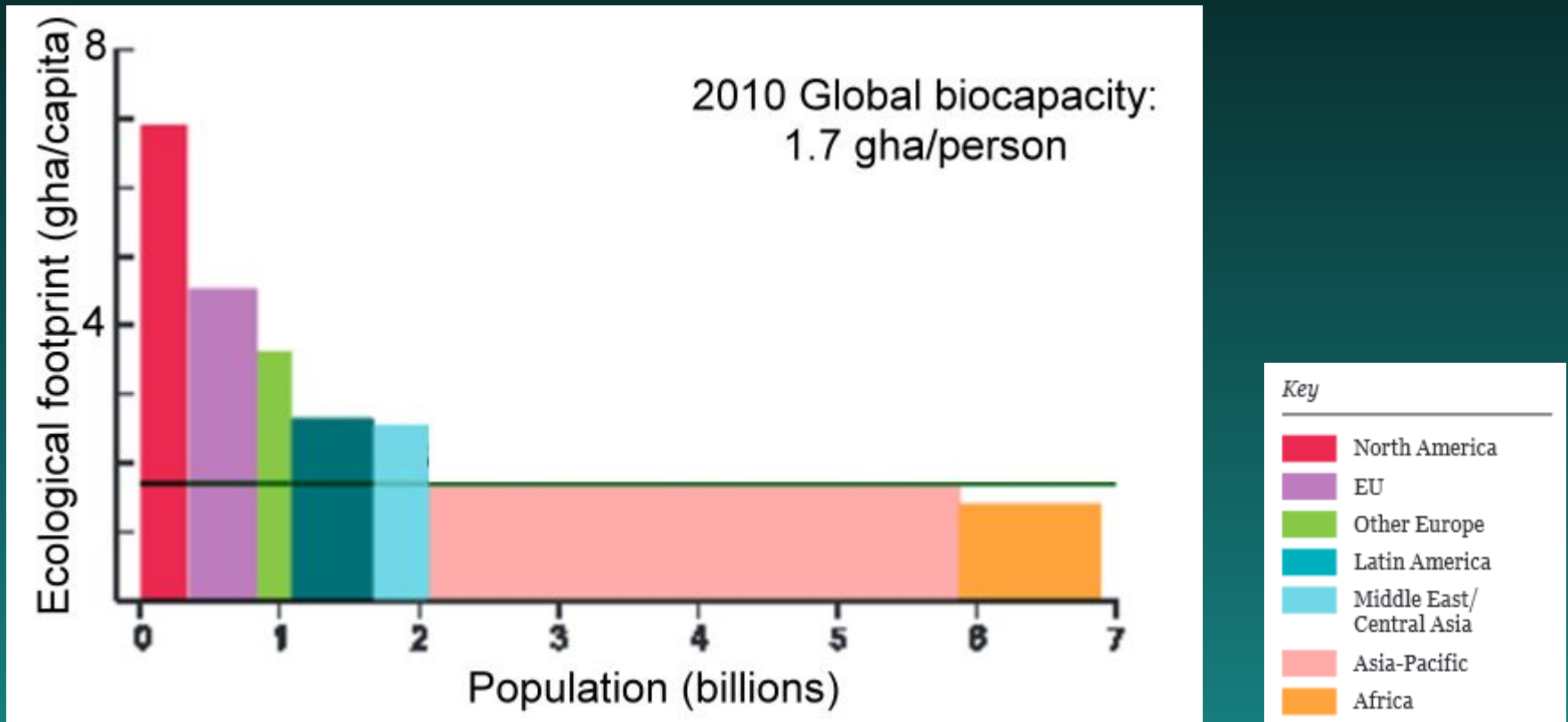
- Sustainable scale
- Just distribution
- Efficient allocation
- Maximize human well-being



Limits to  
inequality

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## Ecological footprint



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## *Goals of a SSE*

- Sustainable scale
- Just distribution
- Efficient allocation
- Maximize human well-being



Use markets only  
where appropriate;  
avoid externalities

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## *Market forces & externalities*

Climate change is “the greatest and widest-ranging market failure the world has seen.”

*Nicholas Stern, 2007*

*Author of the STERN REVIEW: The Economics of Climate Change*

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## *Market forces & externalities*

“The externalities [affecting ecosystems and their life-support services] are the fate of the species. If [the externalities are] disregarded in the operations of the market system, there’s nobody around who is going to bail you out from that. So this is a lethal externality.”

*Noam Chomsky*  
MIT Professor Emeritus



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## *Goals of a SSE*

- Sustainable scale
- Just distribution
- Efficient allocation
- Maximize human well-being



Health, time,  
prosperity,  
and community

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The steady state economy aligns with basic, universal human values we cherish:

- Life
- Respect
- Equality
- Justice
- Happiness
- Safety
- Nature
- Freedom

# *Economic Growth*



*Economic Growth*  
is not  
irrelephant!



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## *Economic growth*

An increase in the production and consumption of goods and services in the aggregate (increase in GDP).

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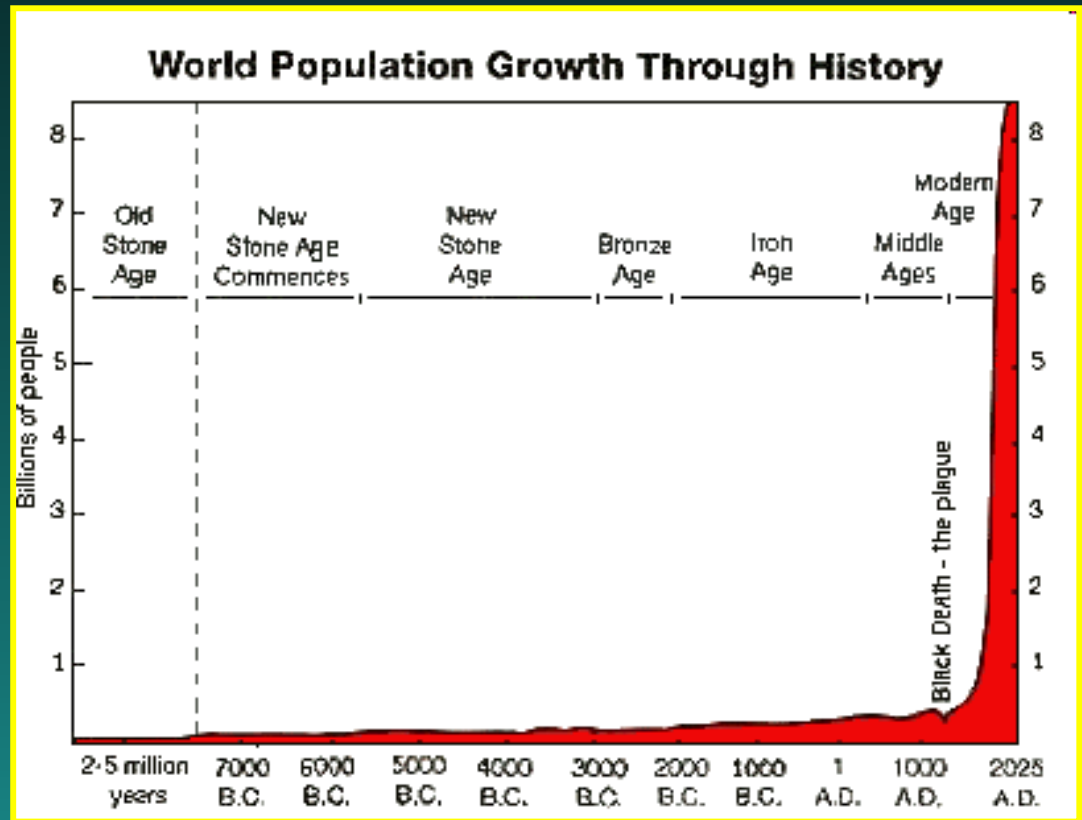
## *Economic growth*

An increase in throughput, or flow of natural resources from ecosystems through the economy and back to the environment as waste.

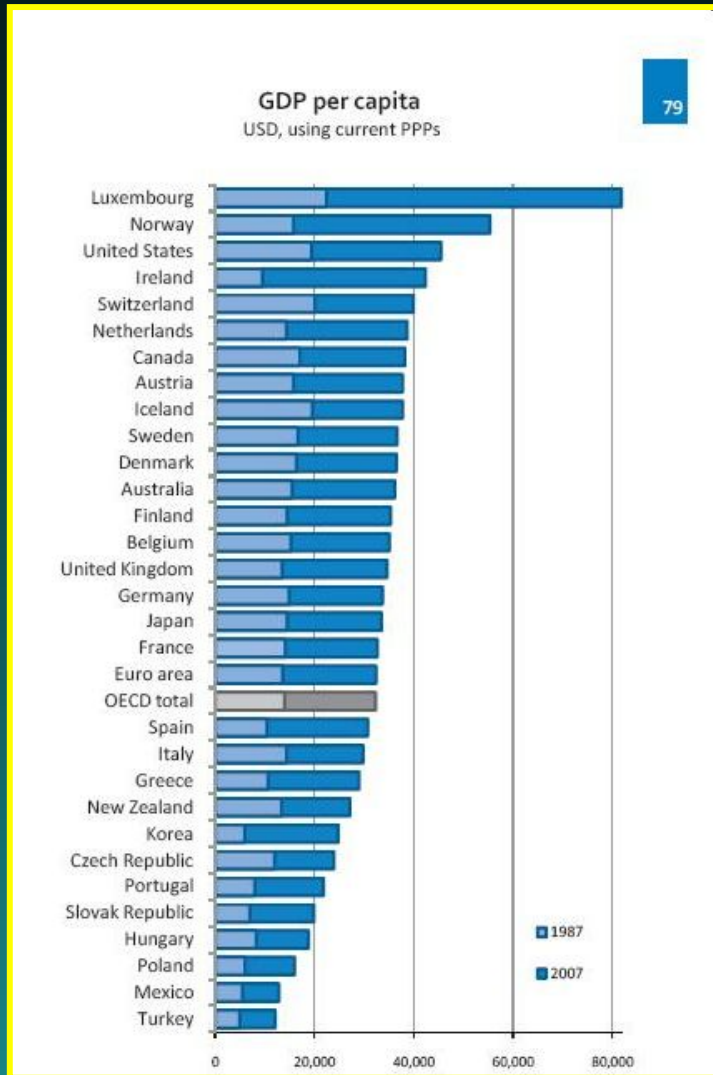
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Facilitated by:

- increasing population



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- increasing per capita consumption



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## *A perennial goal of governments*

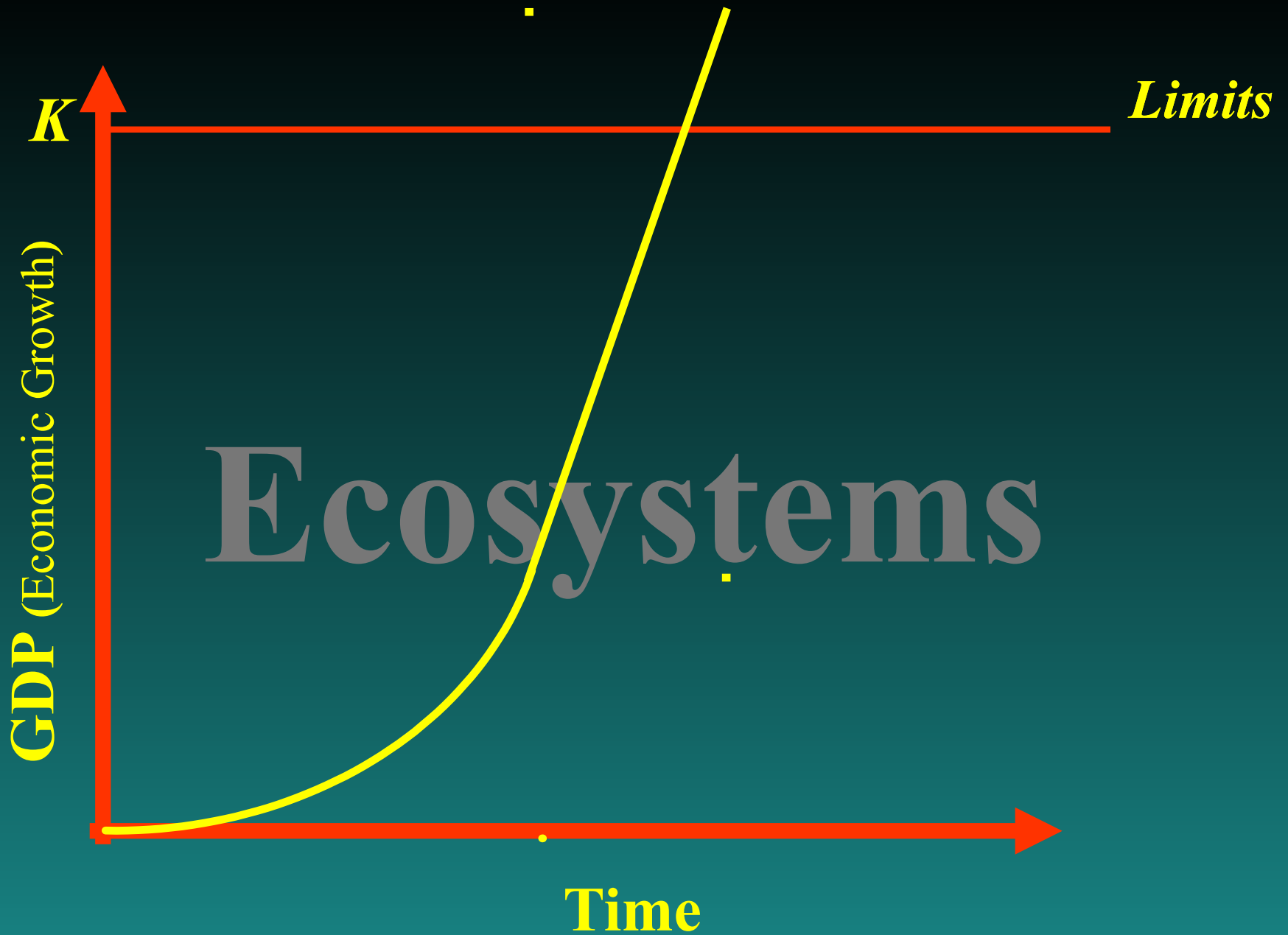
“[Budget 2008] completely overturns the outdated notion that you have to choose either a healthy environment or a strong economy. That is simply not the case. That either/or thinking belongs to the past.”

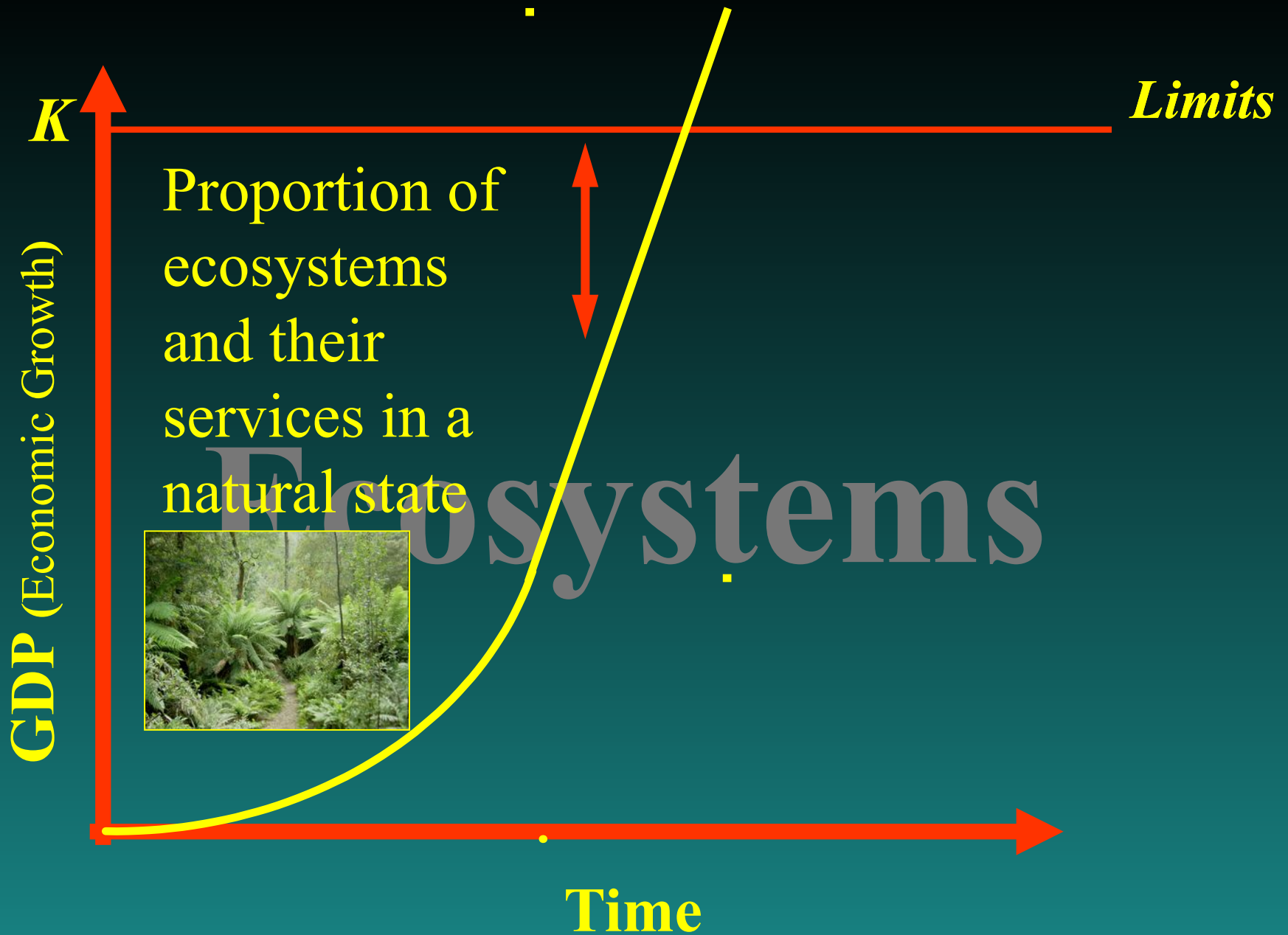
“This budget ... includes a series of initiatives to keep our economy strong and growing.

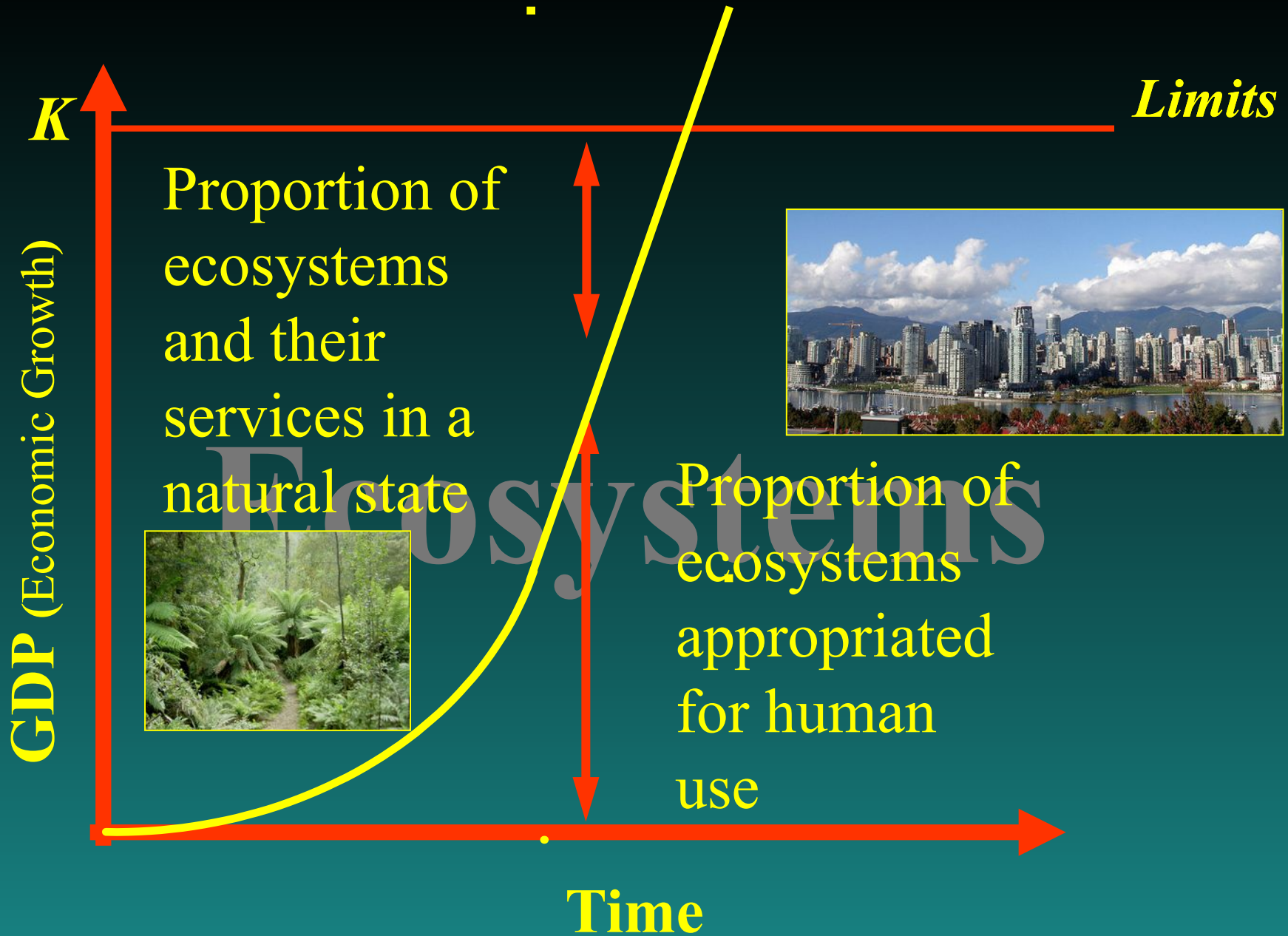
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## *A perennial goal of governments*

“Smart investments can strengthen and expand the middle class, reduce inequality among Canadians and position Canada for sustained economic growth in the years to come.” (mentioned 19 times)







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There is a *fundamental conflict* between economic growth and biodiversity conservation.

Economic growth is a  
*limiting factor*  
to conservation and  
sustainability.

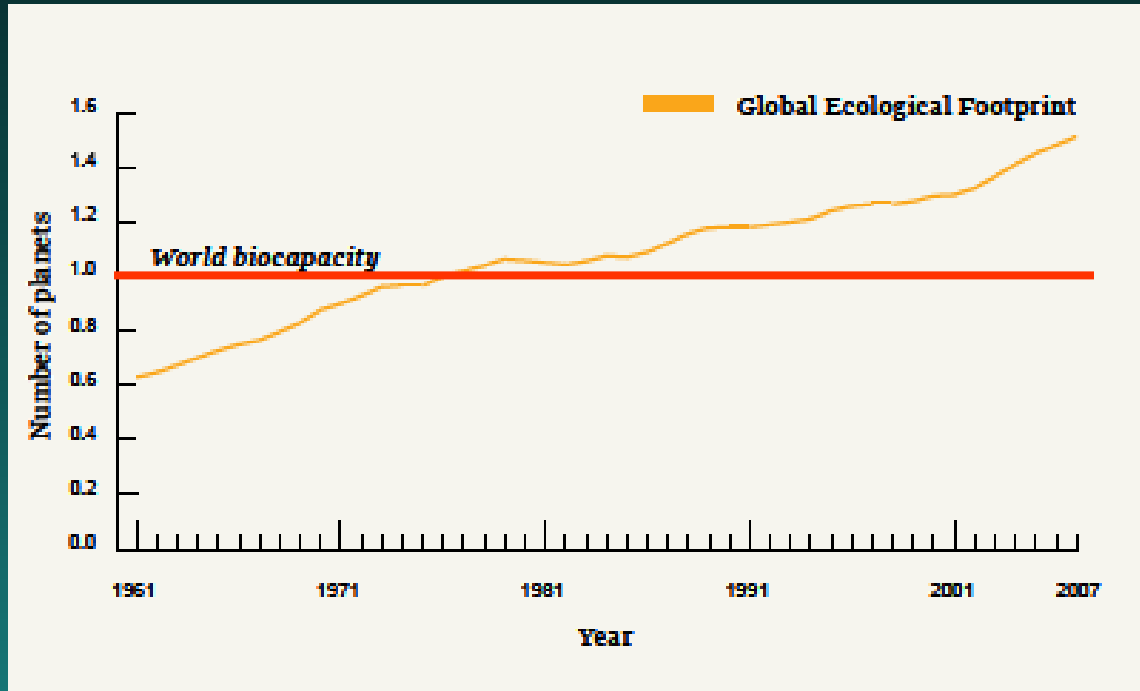
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Economic growth is a  
▪ *limiting factor* ▪  
to conservation and  
sustainability.



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## *Ecological Footprint Analysis*



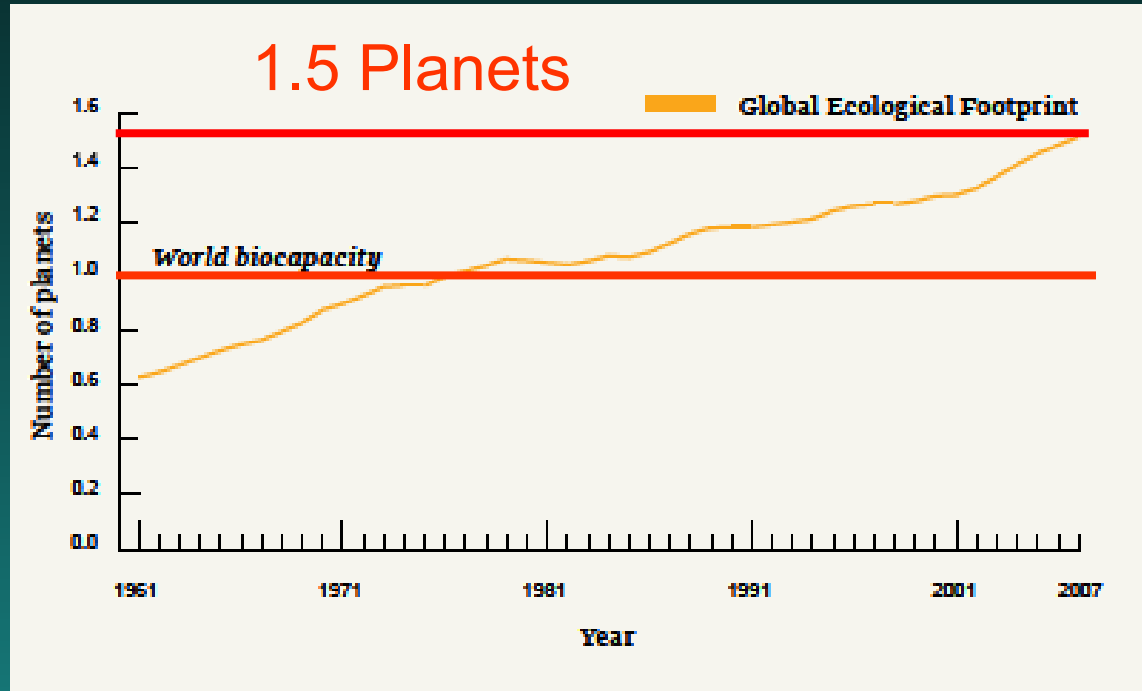
*Ecological  
Capacity*

*1.8*

*global  
hectares/  
person*

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## *Ecological Footprint Analysis*



*Ecological*

*Demand*

**2.7**

*global  
hectares/  
person*

# *Qualicum Institute*

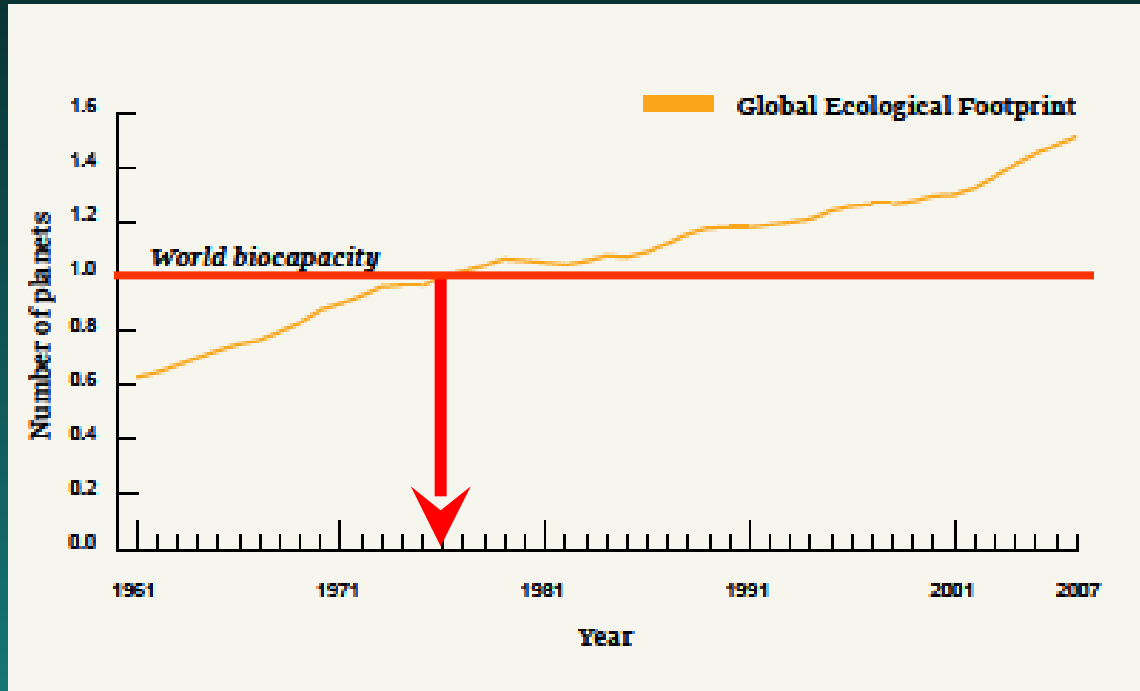
## *Ecological Footprint Analysis*

*Ecological*

*Demand*

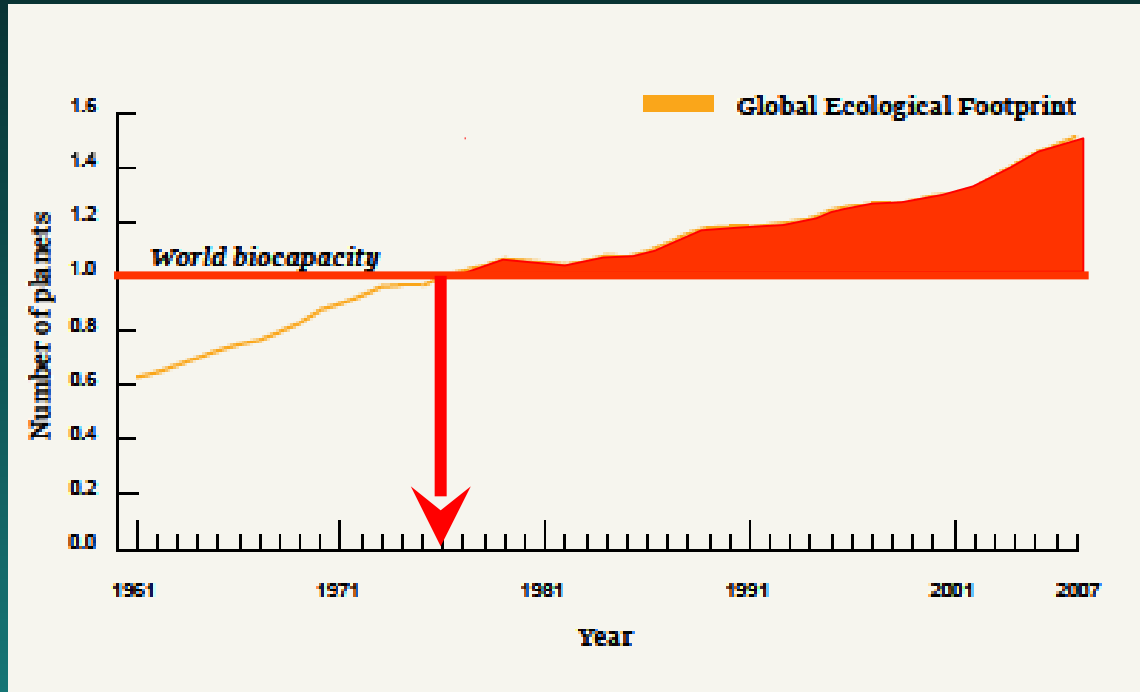
*2.7*

*global  
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person*



# *Qualicum Institute*

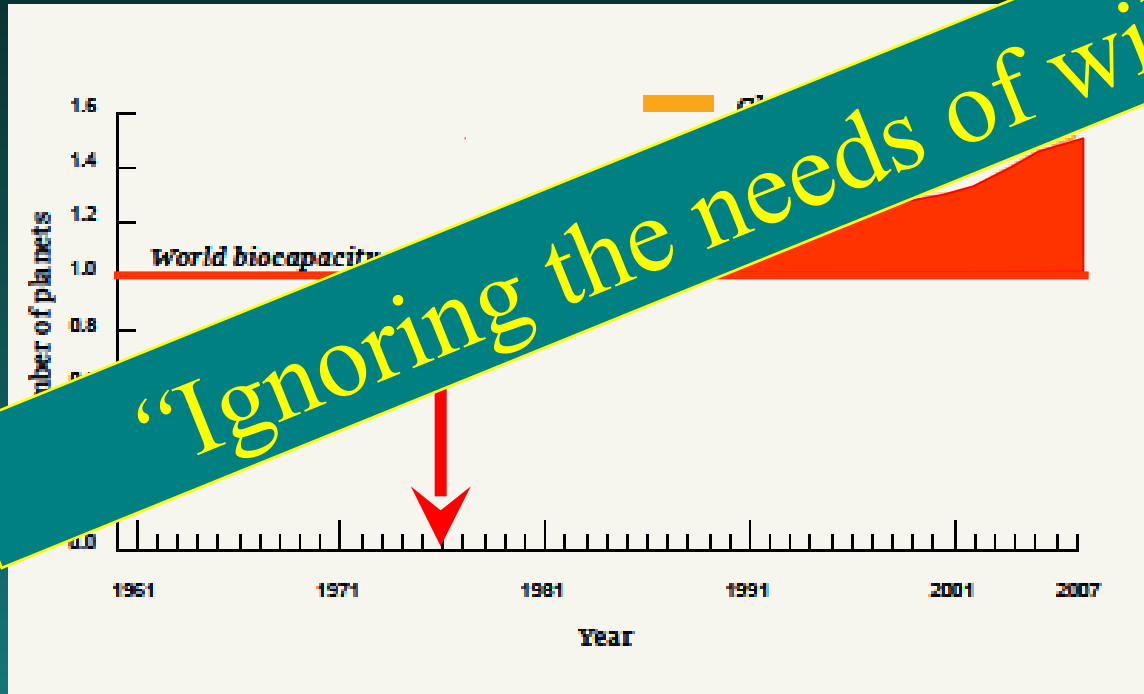
## *Ecological Footprint Analysis*



*ecological  
debt  
(overshoot)*

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## *Ecological Footprint Analysis*



*“Ignoring the needs of wild species”*

*ecological  
debt  
(overshoot)*

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## *Comox Valley Regional District*

Area: 170,100 ha

Population (2011): 63,538

Canada's EF: 8.2 gha/capita

521,012 gha (3.1 x)

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*The limits to growth*

*1972*

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## *The limits to growth*

Purpose: to explore how exponential growth interacts with finite resources



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## *The limits to growth—Stabilized World scenario*

Collapse could be avoided with a combination of changes in behaviour, policy, and technological progress in order to achieve equilibrium states for key factors.

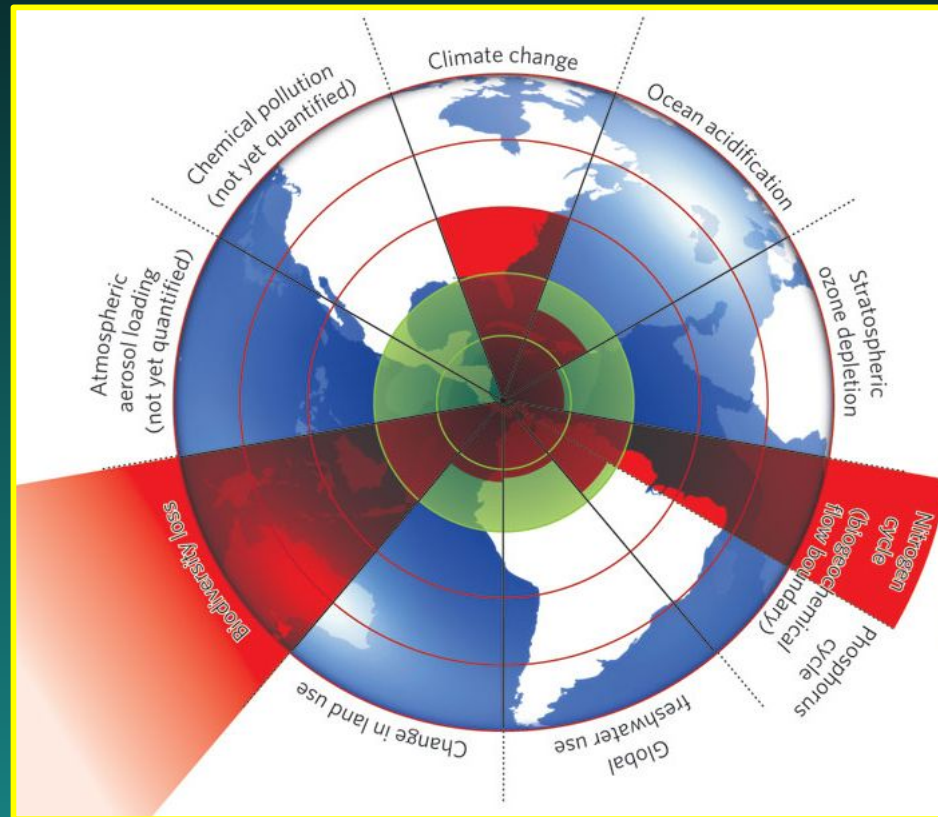
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## *The limits to growth—all other scenarios*

Continued growth in the global economy would lead to planetary limits being exceeded sometime in the 21<sup>st</sup> century, most likely resulting in the collapse of the population and economic system.

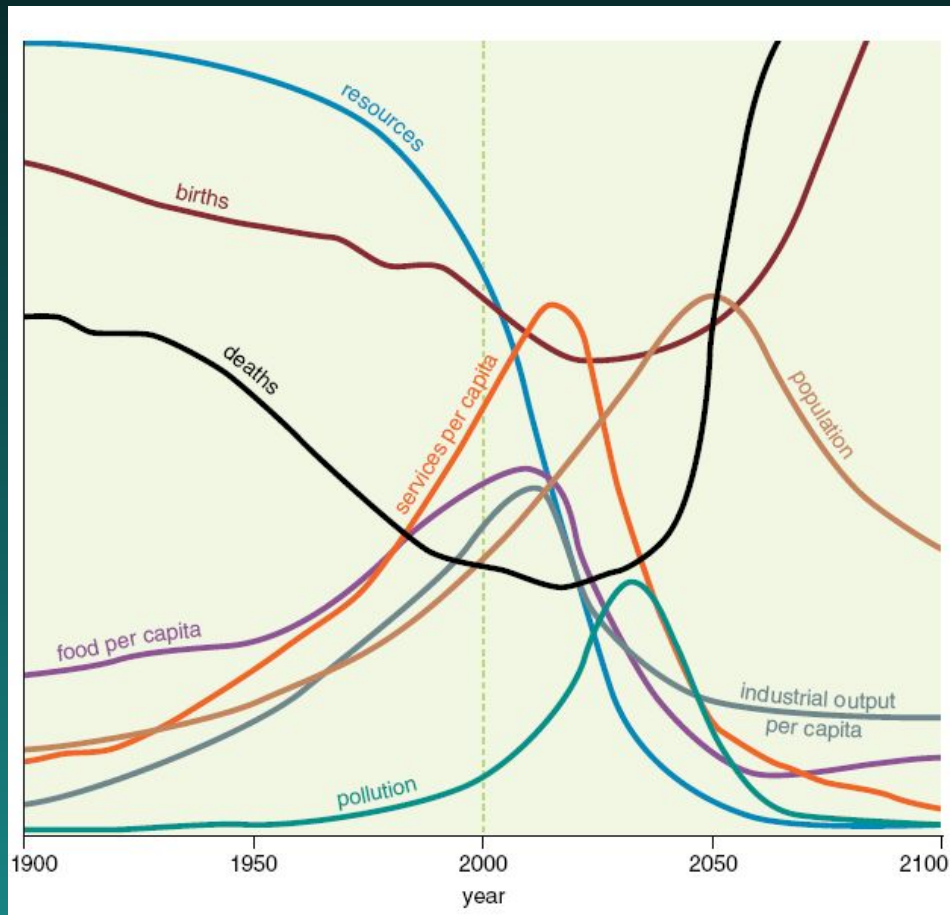
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## *Planetary boundaries (must not be transgressed)*



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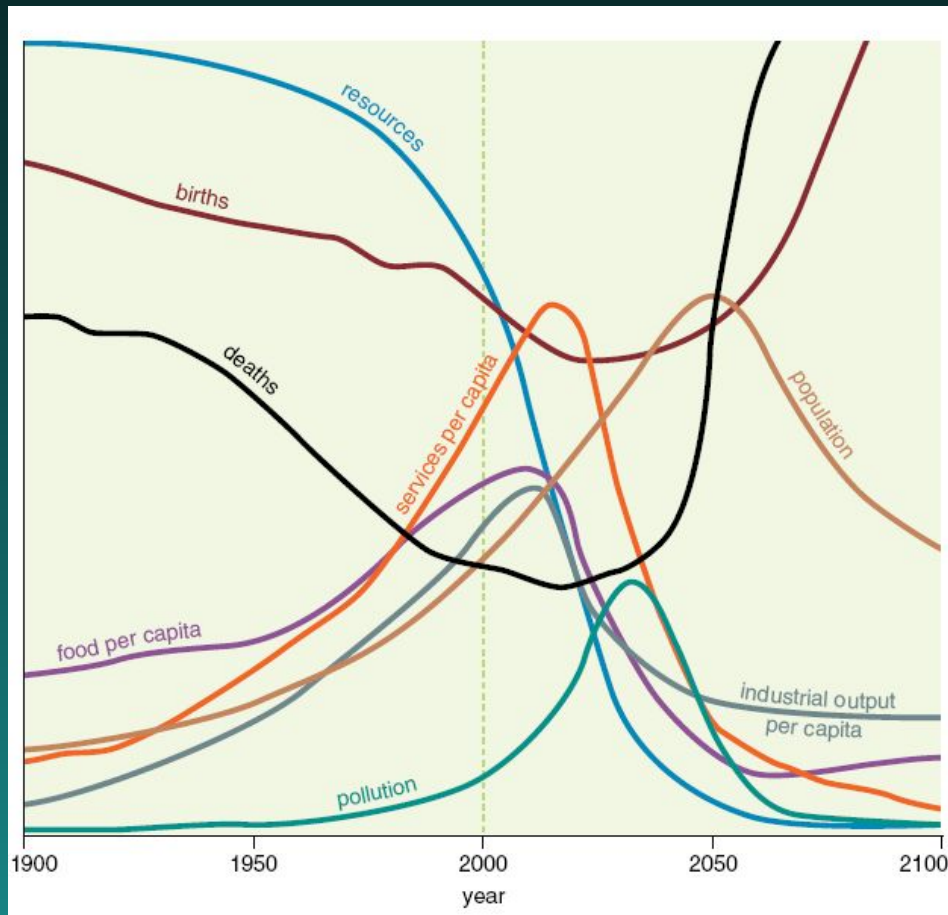
## *The limits to growth*



Standard  
Run

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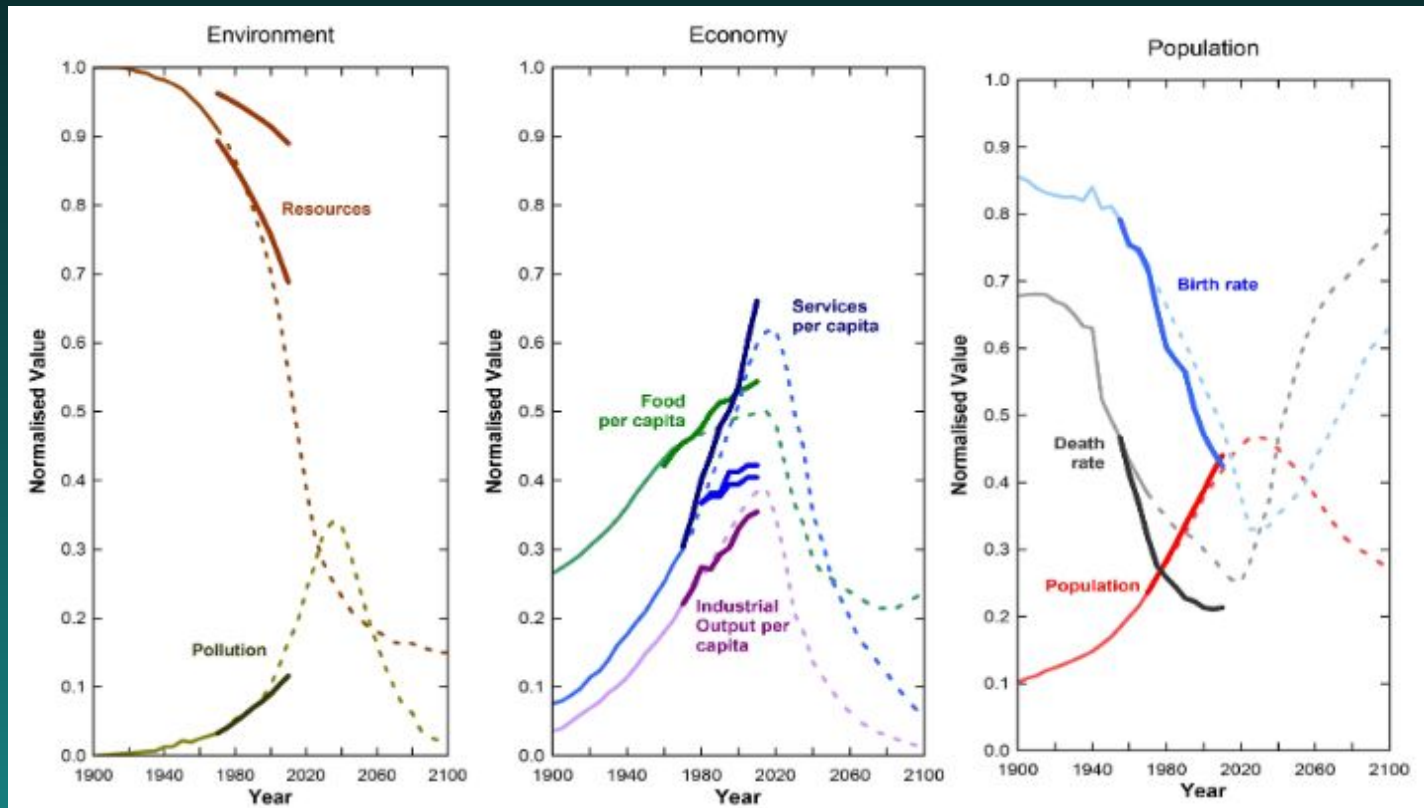
## *The limits to growth*



Collapse:  
diminishing  
resources and  
increasing  
ecological  
damage due  
to pollution

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## *The limits to growth*



Turner, G. (2014) 'Is Global Collapse Imminent?', MSSI Research Paper No. 4, Melbourne Sustainable Society Institute, The University of Melbourne.

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## *The limits to growth*

“...the model results are almost exactly on course some 35 years later in 2008...”

# ***Don't worry; The world is getting better!!!***

		1900	1980	2012
Health	1. Life Expectancy	32	63	70
	2. Infant Mortality	19.5%	7.64%	3.69%
Economics	3. Per Person Income	\$2000	\$5911	\$10,070
	4. % In Extr. Poverty	68.7% 1.1B	42.6% 1.9B	16.9% 1.2B
Education	5. Literacy Rate	42%	70%	84%
	6. Internet Access	0%	0%	34%
Environment	7. CO <sub>2</sub> ppm	295	334	396 (408)
	8. Land-Ocean Temp vs. Base	-0.08°C	+0.28°C	+0.63°C (+1.35°C)



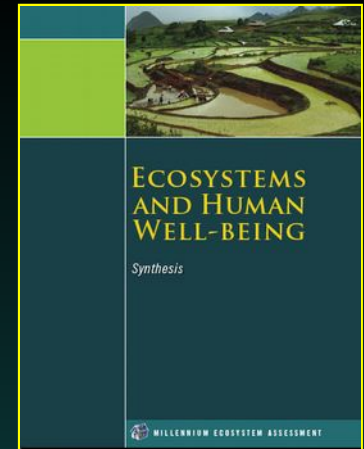
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## *Carrying capacity exceeded*

In the short term, you can have continuously improving lives for much of humanity while the source of that improvement— ecosystems and the natural resources that make up their structure—is being depleted and degraded.

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## *Millennium Ecosystem Assessment*



“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.”

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*“Know Nature and keep  
it worth knowing”*

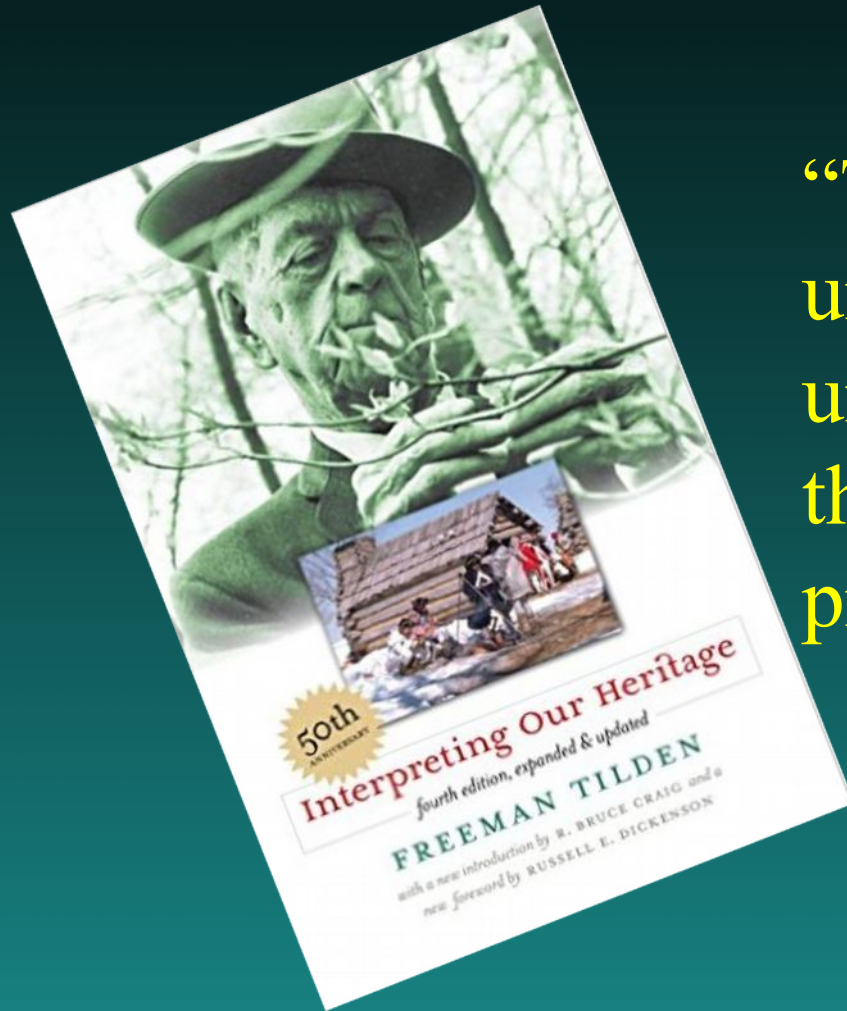
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*Symptoms*

versus

*Causes*

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“Through interpretation,  
understanding; through  
understanding, appreciation;  
through appreciation,  
protection.”—1957

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## *Evolution*

38% of Canadians and 69% of Americans do not think or were not sure that human beings evolved from less advanced life forms over millions of years

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## *Climate change*

In a recent 2016 poll, 39% of Canadians did not agree with the statement:

“Earth is getting warmer partly or mostly because of human activities.”

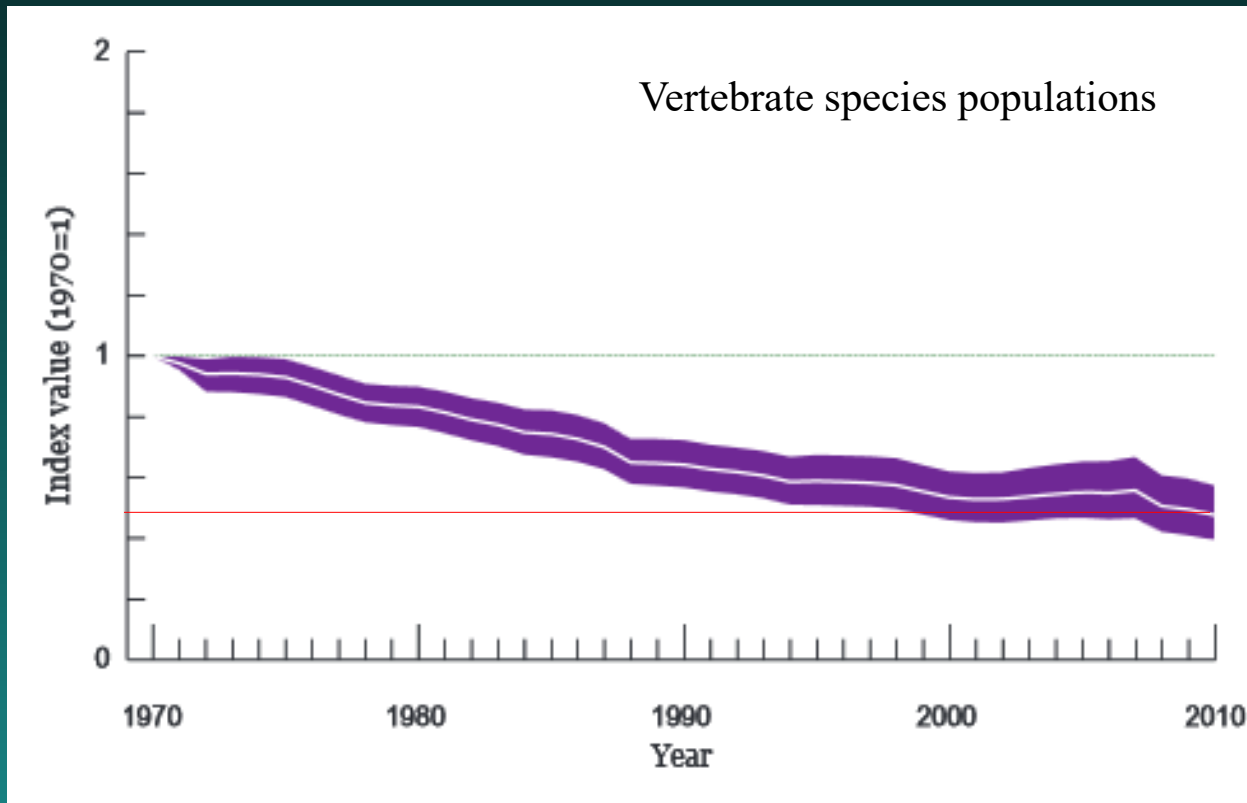
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Habitat degradation  
and loss!



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## *Living Planet Index*

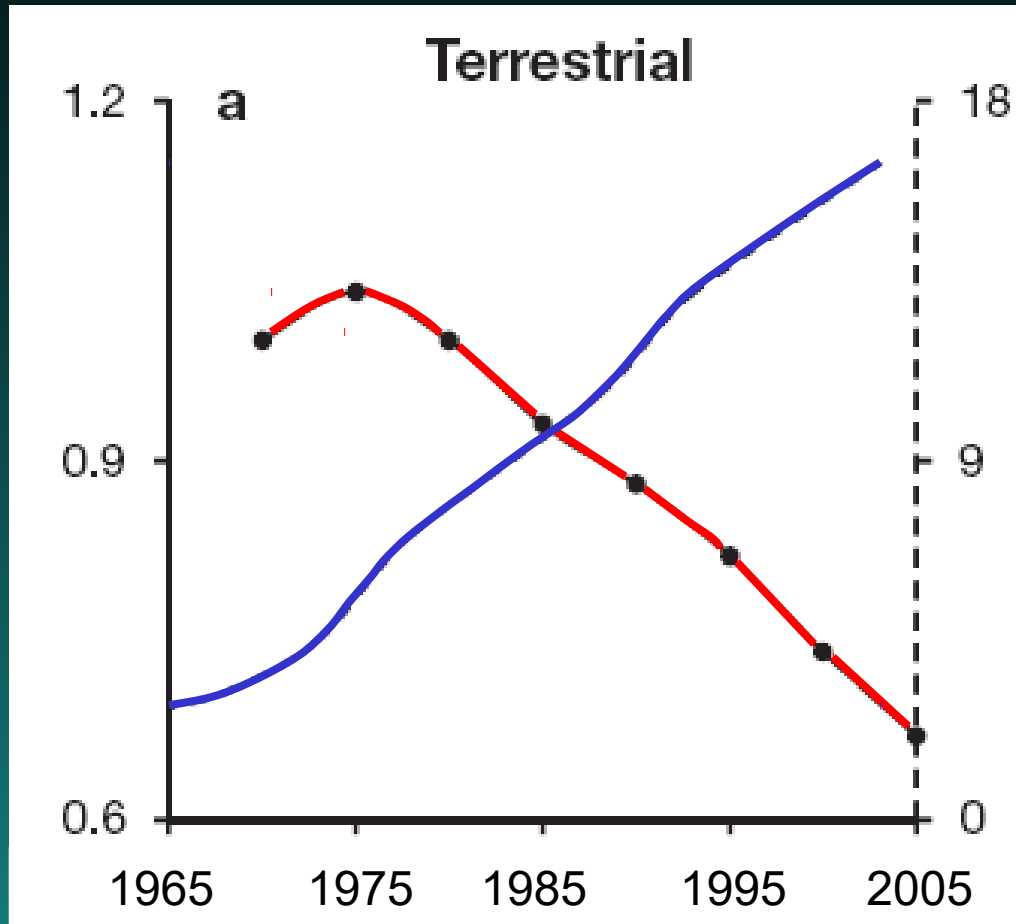


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Protected Areas!

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Biodiversity (Living Planet Index)



PA area ( $\times 10^6 \text{ km}^2$ )

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“Protected areas are a false hope in terms of preventing the loss of biodiversity.”

*Peter F. Sale*

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## *BC Nature position on economic growth*

- Include the position statement on economic growth as part of the BC Nature web site
- Educate the public and policy makers on this fundamental conflict
- Encourage member clubs to adopt the position statement

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## *BC Nature position on economic growth*

- Mention the root cause—economic growth—as part of routine conservation work
- Encourage Nature Canada to circulate position statement and encourage adoption by other provincial affiliates



Celebrate, Educate, Protect!

April 2, 2008

Vivian Birch-Jones,  
Box 1065,  
LILLOOET, BC, V0K 1V0

Dear Vivian,

At its meeting on March 30, 2008, the Board of Directors of Nature Canada decided to not accept your proposed resolution regarding economic growth.

The members took the time to read and discuss the resolution before and at the meeting. There were many views expressed. Anne Murray, as chair of the resolutions committee, diligently urged the Board to accept the resolution.

The Board held that the resolution is unusual since it is directed to Nature Canada and not to an external organization such as a government agency. Equally important is that the issue raised is not consistent with the fundamental goals and objectives of Nature Canada.

At our annual meeting in Wolfville Nova Scotia, I indicated to you that the resolution would be brought back to the Board prior to this year's annual general meeting in Montreal.

I appreciate your determination in raising this matter.

Yours truly,

Mark L. Dorfman, Chair

cc Anne Murray  
Carol Scott  
Richard Yank  
Julie Gelfand

“Equally important is that the issue raised is not consistent with the fundamental goals and objectives of Nature Canada.”



Celebrate, Educate, Protect

March 19, 2009

Ms. Bev Ramsey  
President  
c/o Parks Heritage Centre  
1620 Mount Seymour Road  
North Vancouver, BC  
V7G 2R9

Dear Ms. Ramsey,

On behalf of Nature Canada's Board of Directors, please accept our sincere appreciation of BC Nature's commitment to protecting and conserving our natural environment.

As per your request the Board has reconsidered the submission of your position statement on economic growth, and commends you for the work that you have done.

Nature Canada over the last few years has worked diligently to sharpen its focus to conserve and protect habitats through the lens of birds while building on our core competencies. Our efforts and resources must support our priority focus.

Although Nature Canada recognizes the need to change social attitudes and behaviors, unfortunately the BC Nature resolution falls outside of our area of focus. Regrettably we are not able to accept the resolution submitted by Vivian Birch-Jones on March 16, 2008 on the Steady State Economy as a Sustainable Alternative to Economic Growth.

Sincerely,

Richard Yank  
Chair  
Nature Canada  
Board of Directors

Focus: “to conserve and protect habitats through the lens of birds while building on our core competencies.”

“Although Nature Canada recognizes the need to change social attitudes and behaviours, unfortunately the BC Nature resolution falls outside of our area of focus.”



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*A Position statement* is only valuable if it guides the actions and direction of an organization. It must have a life beyond approval and adoption.

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“The world's current economic model is an environmental "global suicide pact" that will result in disaster if it isn't reformed.”

# *Qualicum Institute*

“The world's current economic model is an environmental "global suicide pact" that will result in disaster if it isn't reformed.”

—*Ban Ki-moon*

UN Secretary General

World Economic Forum, January 2011

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“What we are doing to the future of our children, and the other species on the planet, is a clear moral issue.”

—James Hansen

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“Lost rights are never regained by appeals to the conscience of the usurpers, but by relentless struggle.... Goats are used for sacrificial offerings ... not lions.”

—*B.R. Ambedkar*

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*la fin*

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- Center for the Advancement of the Steady State Economy – [steadystate.org/](http://steadystate.org/)
- Millennium Alliance for Humanity and the Biosphere – [mahb.stanford.edu/](http://mahb.stanford.edu/)

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“Once the population and economy have overshoot the physical limits of the Earth, there are only two ways back: Involuntary collapse caused by escalating shortages and crises, or controlled reduction of throughput by deliberate social choice.”

*Donella Meadows et al.  
Beyond the limits: confronting global collapse*

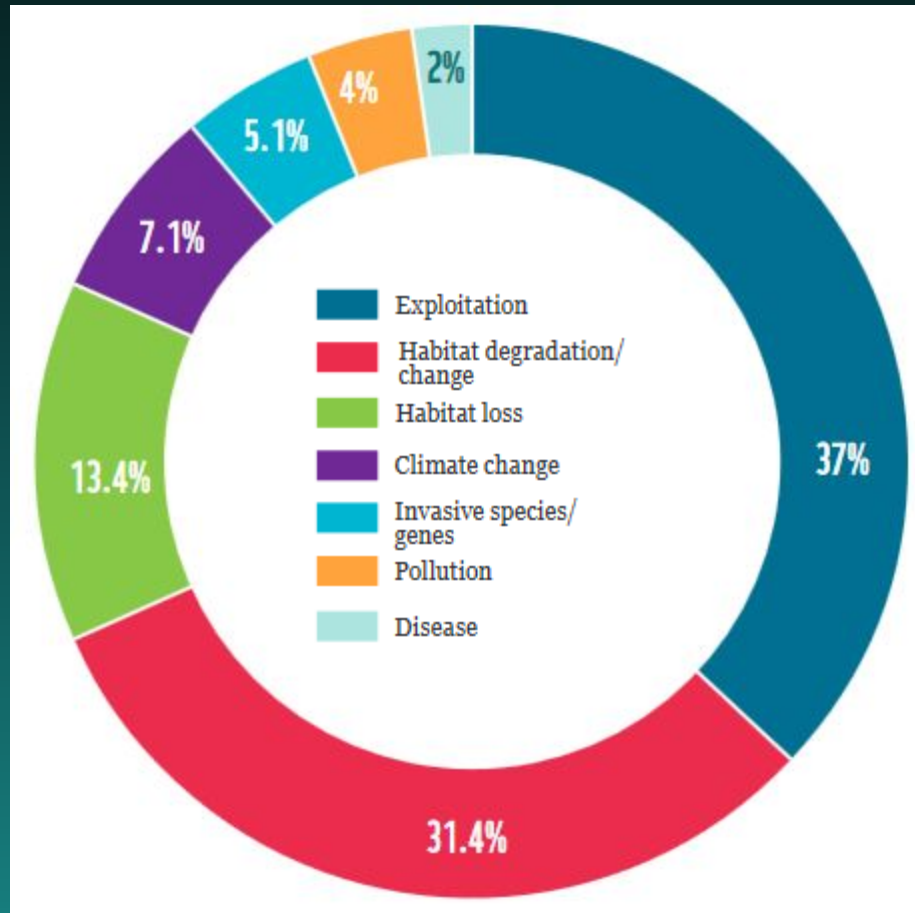
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$$\text{EF of Zambia} \quad \frac{1.0 \text{ gha/capita}}{7.4 \text{ billion}} = \frac{1.8 \text{ gha/capita}}{13 \text{ billion}}$$

$$\text{EF of Europe} \quad \frac{4.5 \text{ gha/capita}}{7.4 \text{ billion}} = \frac{1.8 \text{ gha/capita}}{3 \text{ billion}}$$

$$\text{EF of Canada} \quad \frac{8.2 \text{ gha/capita}}{7.4 \text{ billion}} = \frac{1.8 \text{ gha/capita}}{1.6 \text{ billion}}$$

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## *Economic sectors*

Transportation &  
international trade &  
commerce

Agro-extractive sector

Economic by-product

Service sectors

Economic infrastructure

Labor force, light  
manufacturing, service  
sectors

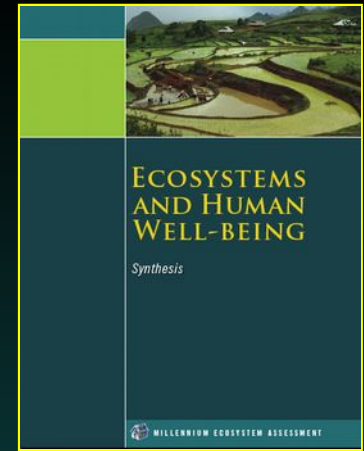
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“Cut down the last redwood for chopsticks, harpoon the last blue whale for sushi... Humanity can survive just fine in a planet-covering crypt of concrete and computers....”



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## *Millennium Ecosystem Assessment*



“Everyone in the world depends completely on Earth’s ecosystems and the services they provide, such as food, water, disease management, climate regulation, spiritual fulfillment, and aesthetic enjoyment.”



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*Impacts of a growth-  
based economy*

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As the economy grows it...

...removes structural  
elements of ecosystems.



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As the economy grows it...  
...depletes non-renewable  
resources.



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As the economy grows it.  
...displaces healthy  
ecosystems and services.



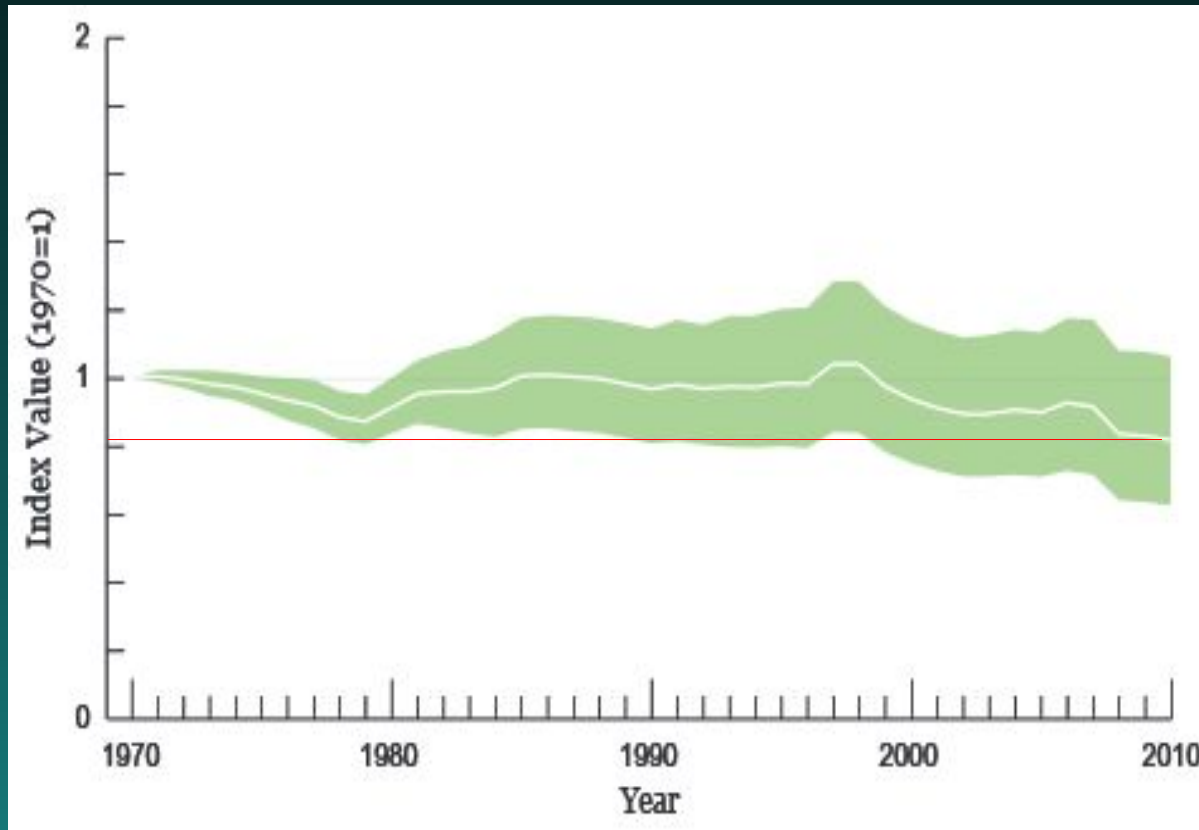


# *Qualicum Institute*

As the economy grows it  
...degrades remaining  
ecosystems with waste.



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*Protected areas*

# *Qualicum Institute*

“Political reality must be grounded in physical reality or it's completely useless.”

*John Schellnhuber*

Director of the Potsdam Institute for Climate Impact Research, 2009

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## *A perennial goal of conventional economics*

“It is really agriculture that is affected [by climate change]. But even if agricultural productivity declined by a third over the next half century, the per capita GNP we might have achieved by 2050 we would achieve only in 2051.”

*Thomas Schelling,*  
Nobel Laureate Economist  
Some Economics of Global Warming (1992)



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*Three processes account for the rapid increase of CO<sub>2</sub> emissions since 2000:*

1. Increase in carbon intensity (17%)
2. A decline in the efficiency of CO<sub>2</sub> sinks on land and oceans in absorbing anthropogenic emissions (18%).
3. Growth of the world economy (65%)

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To stabilize at 650 ppmv CO<sub>2</sub>e, the majority of OECD nations would have to begin “draconian” emission reductions within a decade. Thus, unless we can reconcile economic growth with unprecedented rates of decarbonisation—in excess of 6% per year—this would require *a planned economic recession*.

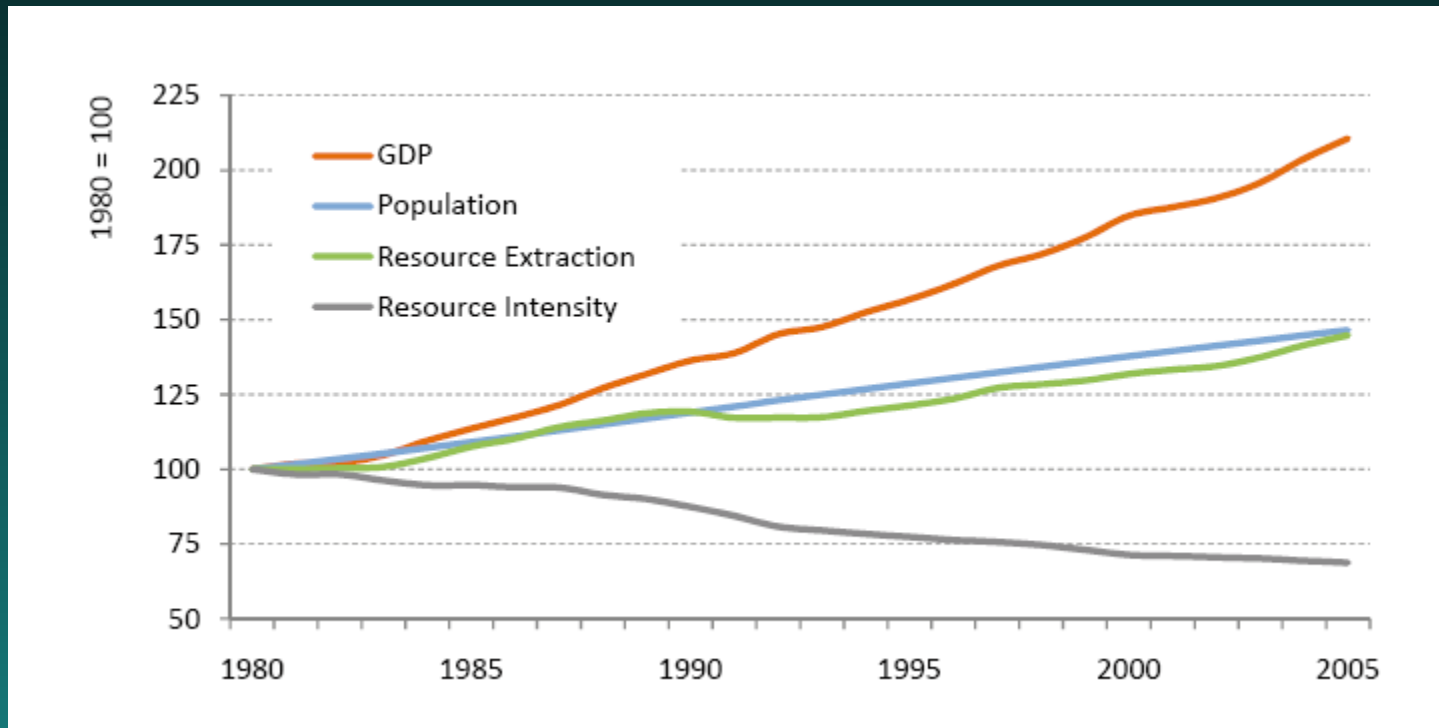
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## *Decoupling resource use from economic growth*

We can decouple economic growth from resource consumption and environmental degradation and continue to grow the economy.

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## *Decoupling resource use from economic growth*



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The scope for decoupling growth in production and consumption from environmental degradation is limited; the decoupling strategy is unable to keep up with unlimited growth.

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“You cannot depend on your eyes  
when your imagination is out of  
focus.”

—*Mark Twain*

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## *Conservation targets*

“Almost universally, when conservation targets are based on the research and expert opinion of scientists they far exceed targets set to meet political or policy goals.”

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“It’s not enough that we do our best;  
sometimes we have to do what is required.”

—*Sir Winston Churchill*



Prepared by

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by

**Neil K. Dawe, RPBio**

**Courtenay, B.C.**

**13 May 2016**

[www.qualicuminstitute.ca](http://www.qualicuminstitute.ca)

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***Growing, growing  
gone!***

*(Not with a steady state economy!)*

## ***Qualicum Institute***

### ***BC Nature Resolution (2008)***

Be it resolved that BC Nature support  
in principle the steady state economy  
as a sustainable alternative to  
economic growth.

# ***Qualicum Institute***

## ***Steady state economy***

A steady state economy aims for stability (sustainability) or mildly fluctuating levels in population and consumption of energy and materials.

What is a steady state economy?

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## *Goals of a SSE*

- Sustainable scale
- Just distribution
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- Maximize human well-being



Energy and  
material flows  
within ecological  
limits

Daly and Farley *Ecological Economics* 2004

Any sustainable economy must lie within the ecological limits of the biosphere.

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## *Sustainable scale*

1. maintain the health of ecosystems and the life-support services they provide in adequate amounts

But what are “adequate amounts?”

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### *Conservation targets*

The median protected proportion of a region's land base necessary to meet conservation objectives lies above 50 percent.

Pojar, J. 2010. *A new climate for conservation*. [http://cpaws.org/uploads/NewClimate\\_report\\_CPAWS.pdf](http://cpaws.org/uploads/NewClimate_report_CPAWS.pdf)

In order supply adequate ecosystem services and protect biodiversity, ecologists maintain we need to have at least 50% of the ecosystems in a region left in their natural state. Currently, the Federal Government has made a commitment to conserve 17% of our land and inland waters and 10% of our marine and coastal areas by 2020.

[http://biodivcanada.ca/9B5793F6-A972-4EF6-90A5-A4ADB021E9EA/3499%20-%202020%20Biodiversity%20Goals%20&%20Targets%20for%20Canada%20-%20%20Final%20Web\\_ENG.pdf](http://biodivcanada.ca/9B5793F6-A972-4EF6-90A5-A4ADB021E9EA/3499%20-%202020%20Biodiversity%20Goals%20&%20Targets%20for%20Canada%20-%20%20Final%20Web_ENG.pdf)

# *Qualicum Institute*

## *Conservation targets*

“From a precautionary perspective,  
50% is scientifically defensible as a  
global target.”



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### ***Sustainable scale***

2. extract renewable resources at a rate no faster than they can be regenerated

See: Daly, H.E. 2005. Economics in a full world; *Scientific American*, September 2005:100–107

## *Qualicum Institute*

### *Sustainable scale*

3. Consume non-renewable resources at a rate no faster than they can be replaced by the discovery of renewable substitutes

See: Daly, H.E. 2005. Economics in a full world; *Scientific American*, September 2005:100–107

## *Qualicum Institute*

### *Sustainable scale*

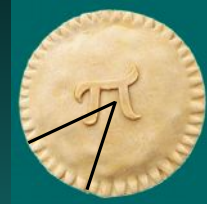
4. Deposit wastes in the environment at a rate no faster than they can be safely assimilated by the ecosystems

See: Daly, H.E. 2005. Economics in a full world; *Scientific American*, September 2005:100–107

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- Sustainable scale
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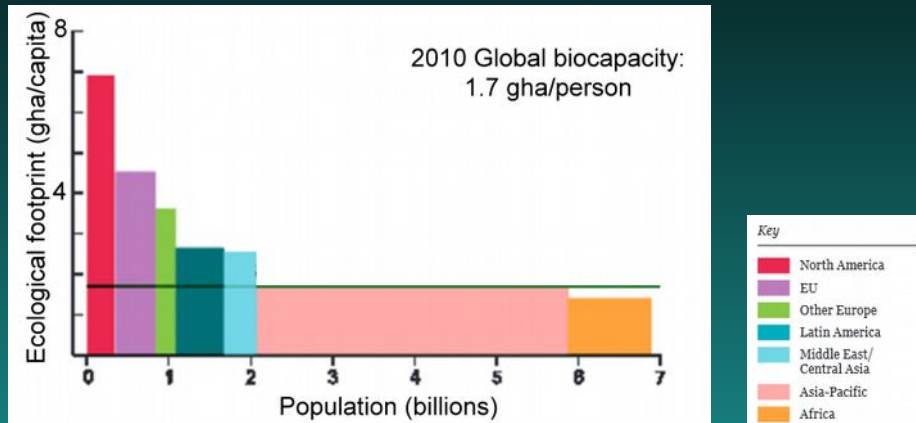
Limits to  
inequality

Daly and Farley *Ecological Economics* 2004

A rising tide hasn't seemed to float all boats: currently 80% of the global population make less than \$10 a day. However, we tell the poor and destitute that, while they only have a tiny piece of the economic pie, with more economic growth their share of the pie will grow. So we haven't really had to **do** anything. In a SSE, we could no longer tell them that, since the economy wouldn't be growing; we'd actually have to do something to ensure just and equitable distribution of the planet's resources.

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## Ecological footprint



WWF. 2014. *The Living Planet Report*. [http://awsassets.panda.org/downloads/wwf\\_lpr2014\\_low\\_res\\_full\\_report.pdf](http://awsassets.panda.org/downloads/wwf_lpr2014_low_res_full_report.pdf)

If all 7.4 billion people on Earth shared resources equally, we'd each have 1.7 global ha (now modified to 1.8) of productive lands and waters to allow us to live our collective lives on a sustainable basis. But we have inequality shown by global footprint analyses, where a small proportion of the global population, e.g., North America and Europe, uses 4-times their equitable allotment of the productive lands and waters globally to maintain their standard of living while countries in, e.g., sub-Saharan Africa, use less than their equitable allotment.

# *Qualicum Institute*

## *Goals of a SSE*

- Sustainable scale
- Just distribution
- Efficient allocation
- Maximize human well-being



Use markets only  
where appropriate;  
avoid externalities

*Daly and Farley Ecological Economics 2004*

Market forces only apply effectively to commodities that are excludable and rival. For example, if you have bicycles for sale, they work well within markets. They are excludable, i.e. you can exclude me from using them so that if I want one, I have to pay you the market price. And the bicycle is rival: when I am using it no one else can use it. But ecosystems and biodiversity don't fit well in markets. If I own a woodlot, I can stop you from using the trees in my woodlot and when you're using the trees as lumber or for heating your home, no one else can use those trees. However, I can't stop you from using the clean air my woodlot provides and you using that air doesn't stop anyone else from using it. Same with the water my woodlot stores and cleans. So these ecosystem services don't fit into the market and thus become externalities, often ignored by our current economy.

# ***Qualicum Institute***

## ***Market forces & externalities***

Climate change is “the greatest and widest-ranging market failure the world has seen.”

*Nicholas Stern, 2007*

*Author of the STERN REVIEW: The Economics of Climate Change*

<http://www.guardian.co.uk/environment/2007/nov/29/climatechange.carbonemissions>

# *Qualicum Institute*

## *Market forces & externalities*

“The externalities [affecting ecosystems and their life-support services] are the fate of the species. If [the externalities are] disregarded in the operations of the market system, there’s nobody around who is going to bail you out from that. So this is a lethal externality.”

*Noam Chomsky*  
MIT Professor Emeritus

Text of a speech delivered at the University of North Carolina, Chapel Hill, on September 30, 2010



# *Qualicum Institute*

## *Goals of a SSE*

- Sustainable scale
- Just distribution
- Efficient allocation
- Maximize human well-being



Health, time,  
prosperity,  
and community

## *Qualicum Institute*

The steady state economy aligns with  
basic, universal human values we cherish:

- Life
- Respect
- Equality
- Justice
- Happiness
- Safety
- Nature
- Freedom

# *Economic Growth*



So what is economic growth and how does it differ from the Steady State economy?

*Economic Growth*  
is not  
irrelephant!



# *Qualicum Institute*

## *Economic growth*

An increase in the production and consumption of goods and services in the aggregate (increase in GDP).

Daly and Farley, 2004. *Ecological Economics*

Economic growth is a continual increase in the production and consumption of goods and services, usually indicated by an increase in GDP, whether or not that GDP increase is beneficial to humanity. Thus, when there's a disaster, such as an earthquake that kills and injures thousands, GDP usually goes up (coffin sales, hospital stays, rebuilding houses, etc.). Increasing GDP is not a good indicator of human well-being.

## *Qualicum Institute*

### *Economic growth*

An increase in throughput, or flow of natural resources from ecosystems through the economy and back to the environment as waste.

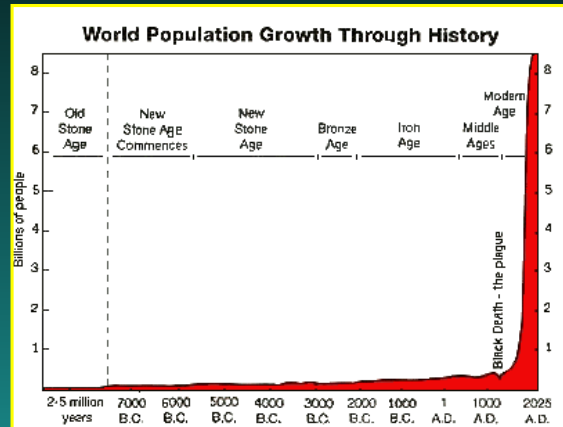
Daly and Farley, 2004. *Ecological Economics*

But here's how economic growth should be looked at. This definition shows the impacts of economic growth to the structure of ecosystems and thus to the biodiversity within those systems.

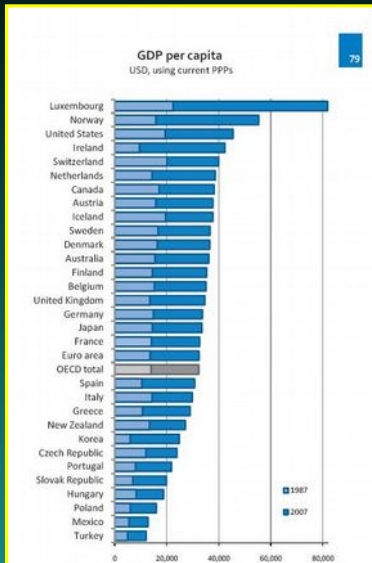
# *Qualicum Institute*

Facilitated by:

- increasing population



# Qualicum Institute



- increasing per capita consumption



## *Qualicum Institute*

### *A perennial goal of governments*

“[Budget 2008] completely overturns the outdated notion that you have to choose either a healthy environment or a strong economy. That is simply not the case. That either/or thinking belongs to the past.”

“This budget ... includes a series of initiatives to keep our economy strong and growing.

Hon. Carole Taylor, Minister of Finance, British Columbia, Budget Speech, 19 February 2008

With all due respect, Minister Taylor is absolutely wrong. While we can have a healthy economy and a healthy environment, we can't have a healthy *growing* economy and a healthy environment.

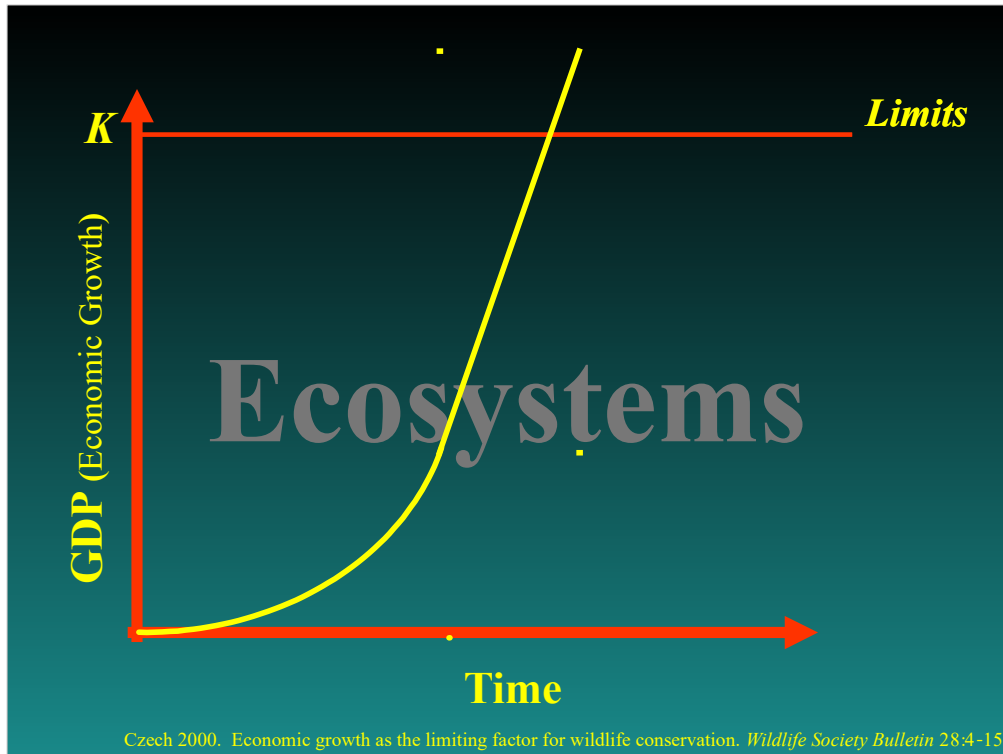
## ***Qualicum Institute***

### ***A perennial goal of governments***

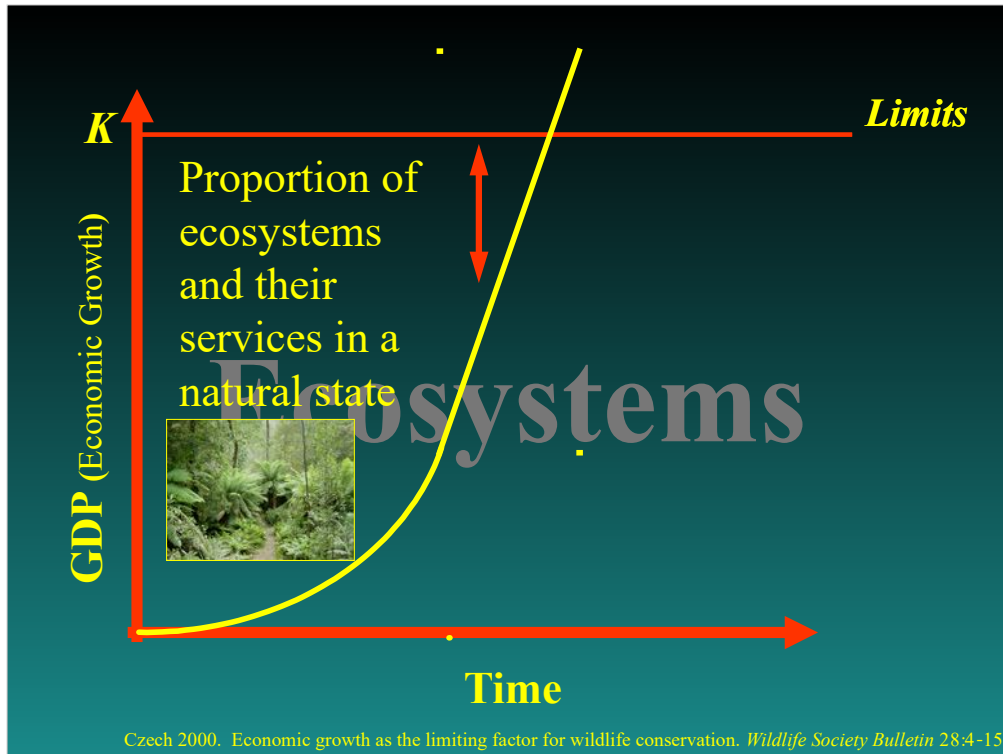
“Smart investments can strengthen and expand the middle class, reduce inequality among Canadians and position Canada for sustained economic growth in the years to come.” (mentioned 19 times)

*A new approach – Federal Budget 2016*

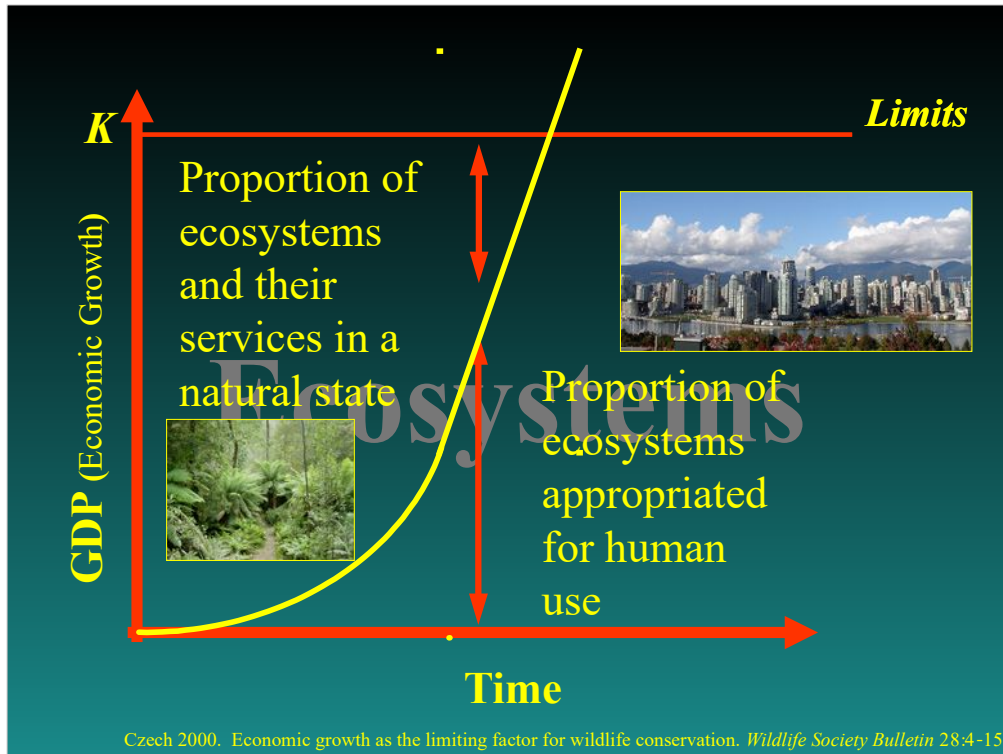
While economic growth may improve the lives of Canadians in the short term, it does so perniciously and unsustainably, at the expense of the very source of that improvement—the ecosystems and their life-support services. And “sustained economic growth” on a planet with finite resources is physically impossible!



Here's a graphical way to see the impacts of economic growth on biodiversity. The economy is a subset of the biosphere, the source of our real wealth. As the economy grows (exponentially) over time...



...it degrades or eliminates the structure of ecosystems in greater and greater amounts...



as more and more of the ecosystems are appropriated for human use.

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There is a *fundamental conflict* between economic growth and biodiversity conservation.

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Economic growth is a  
*limiting factor*  
to conservation and  
sustainability.

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

*Qualicum Institute*

Economic growth is a  
*limiting factor*  
to conservation and  
sustainability.

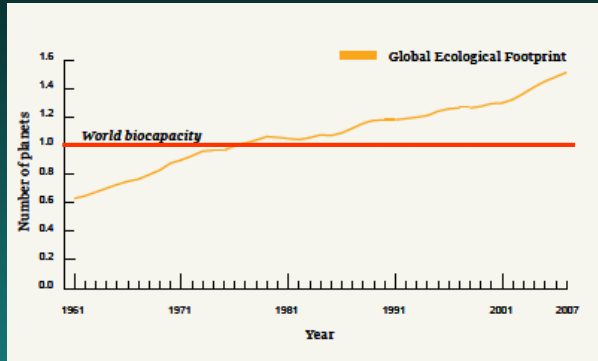
Czech 2000. Economic growth as the limiting factor for wildlife conservation. *Wildlife Society Bulletin* 28:4-15

Recall that a limiting factor is a factor that, if not addressed, makes reaching a goal virtually impossible **no matter what other wonderful things you do!**



# *Qualicum Institute*

## *Ecological Footprint Analysis*



*Ecological  
Capacity*

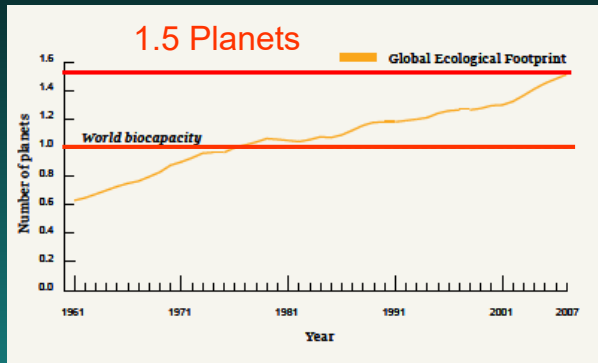
**1.8**  
*global  
hectares/  
person*

WWF. 2014. *The Living Planet Report*. [http://awsassets.panda.org/downloads/wwf\\_lpr2014\\_low\\_res\\_full\\_report.pdf](http://awsassets.panda.org/downloads/wwf_lpr2014_low_res_full_report.pdf)

The total amount of productive land and water on the planet equals the world biocapacity. Divided by the population on an equitable basis, it would give every person 1.8 global ha with which to live her or his life.

# *Qualicum Institute*

## *Ecological Footprint Analysis*



*Ecological  
Demand*

**2.7**

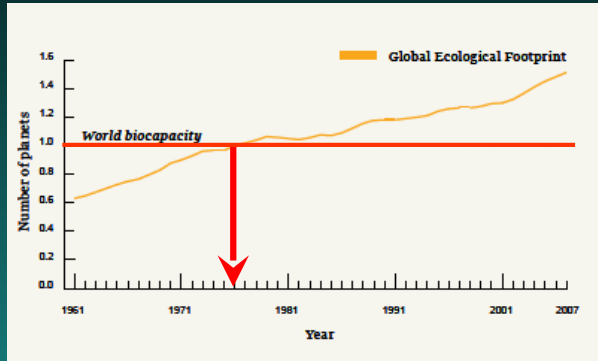
*global  
hectares/  
person*

WWF. 2014. *The Living Planet Report*. [http://awsassets.panda.org/downloads/wwf\\_lpr2014\\_low\\_res\\_full\\_report.pdf](http://awsassets.panda.org/downloads/wwf_lpr2014_low_res_full_report.pdf)

However, collectively we're using an average of 2.7 global ha/person, which means it would take the productive lands and waters of one and a half Earth to provide the resources to maintain our population on a sustainable basis.

# *Qualicum Institute*

## *Ecological Footprint Analysis*



*Ecological  
Demand*

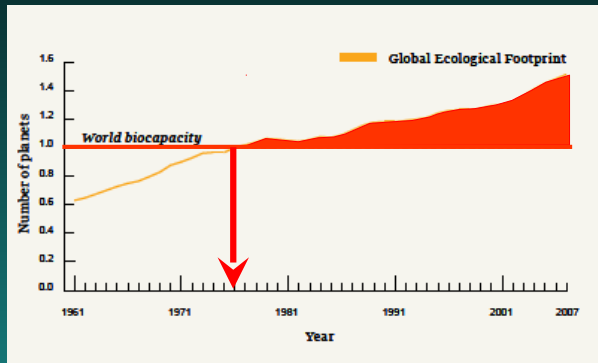
**2.7**  
*global  
hectares/  
person*

WWF. 2014. *The Living Planet Report*. [http://awsassets.panda.org/downloads/wwf\\_lpr2014\\_low\\_res\\_full\\_report.pdf](http://awsassets.panda.org/downloads/wwf_lpr2014_low_res_full_report.pdf)

Humanity exceeded the carrying capacity of the biosphere back in the mid-1970s.

# *Qualicum Institute*

## *Ecological Footprint Analysis*



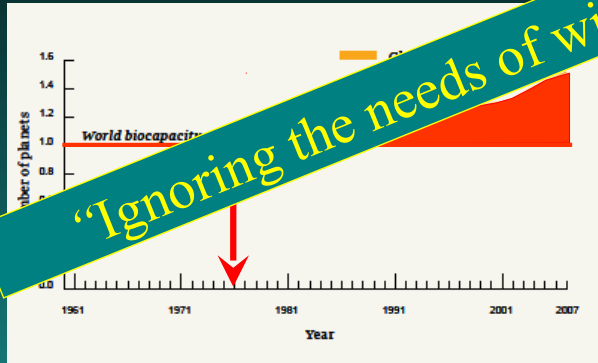
*ecological  
debt  
(overshoot)*

WWF. 2014. *The Living Planet Report*. [http://awsassets.panda.org/downloads/wwf\\_lpr2014\\_low\\_res\\_full\\_report.pdf](http://awsassets.panda.org/downloads/wwf_lpr2014_low_res_full_report.pdf)

And since the mid-1970s we have been amassing a significant ecological debt. We've gone into overshoot and as our population continues to grow this overshoot will also increase causing an even greater ecological debt since the Earth's productive lands and waters are finite and are being continuously degraded through economic growth.

# *Qualicum Institute*

## *Ecological Footprint Analysis*



*ecological  
debt  
(overshoot)*

WWF. 2014. *The Living Planet Report*. [http://awsassets.panda.org/downloads/wwf\\_lpr2014\\_low\\_res\\_full\\_report.pdf](http://awsassets.panda.org/downloads/wwf_lpr2014_low_res_full_report.pdf)

But it's actually much worse than this because the figures used to calculate the world biocapacity ignore the needs of wild species, which we cannot do because it's all these wild organisms simply living out their daily lives within the ecosystems that facilitate ecosystem functioning and the provision of the life-supporting ecosystem services. Ecologists now figure we need to conserve 50% of all the ecosystems within a region in order to protect biodiversity and ecosystem services in adequate amounts.

# *Qualicum Institute*

## *Comox Valley Regional District*

Area: 170,100 ha

Population (2011): 63,538

Canada's EF: 8.2 gha/capita

# 521,012 gha (3.1 x)

To give you a rough idea of where the Comox Valley Regional District stands in terms of sustainability you can calculate the productive land and water requirements to maintain the CVRD population at Canada's average ecofootprint (in this case in 2012; [http://www.footprintnetwork.org/ecological\\_footprint\\_nations/ecological\\_per\\_capita.html](http://www.footprintnetwork.org/ecological_footprint_nations/ecological_per_capita.html)). Simply multiply their population by the ecofootprint/capita and compare that to the areal extent of the CVRD. Here the population of the CVRD is using over 3-times the actual amount of land they're living on. Note: This is a very rough indicator and likely quite low for a number of reasons. For example, the area of the CVRD used would include non-productive lands and waters. Also, half the ecosystems within the CVRD region should be left in their natural state to maintain the biodiversity of the region and that is not factored in.

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*The limits to growth*  
*1972*

If you haven't read *The limits to growth*, you can find the full book here:  
<http://www.donellameadows.org/wp-content/userfiles/Limits-to-Growth-digital-scan-version.pdf>

# *Qualicum Institute*

## *The limits to growth*

Purpose: to explore how exponential growth interacts with finite resources



## ***Qualicum Institute***

### ***The limits to growth—Stabilized World scenario***

Collapse could be avoided with a combination of changes in behaviour, policy, and technological progress in order to achieve equilibrium states for key factors.

Turner, G.M. 2008. A comparison of *The Limits to Growth* with 30 years of reality.  
*Global Environmental Change* 18: 397-411

## ***Qualicum Institute***

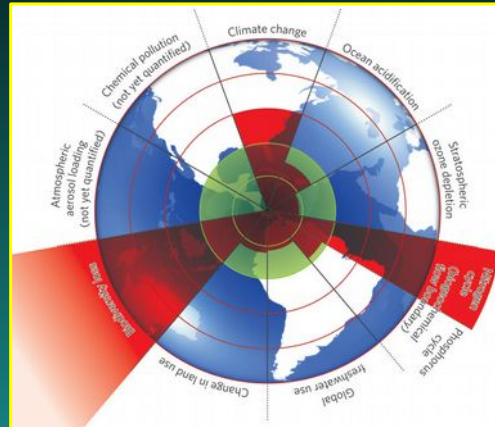
### ***The limits to growth—all other scenarios***

Continued growth in the global economy would lead to planetary limits being exceeded sometime in the 21<sup>st</sup> century, most likely resulting in the collapse of the population and economic system.

Turner, G.M. 2008. A comparison of *The Limits to Growth* with 30 years of reality.  
*Global Environmental Change* 18: 397-411

# *Qualicum Institute*

## *Planetary boundaries (must not be transgressed)*

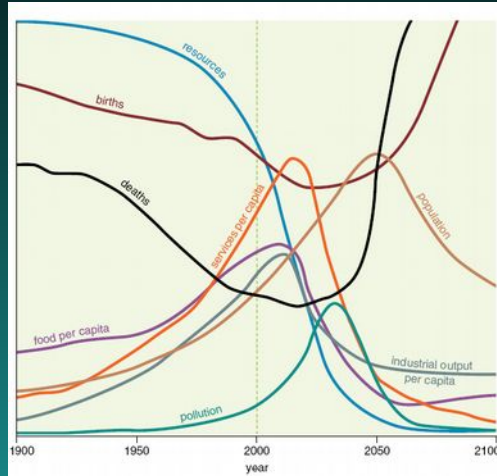


Rockström et al. 2009. A safe operating space for humanity. *Nature* 461: 472-475

A number of studies show that we've already transgressed planetary boundaries. The two most significant are biodiversity and climate change, as the latter affects the former.

# *Qualicum Institute*

## *The limits to growth*



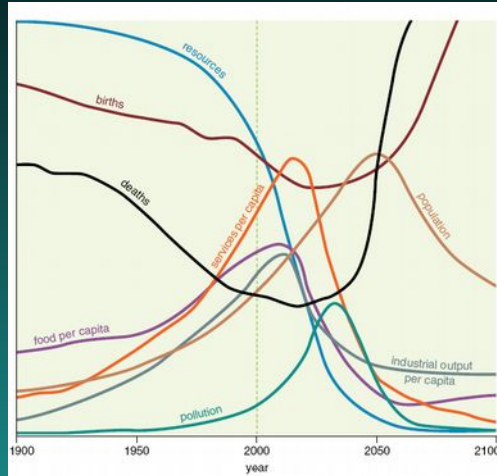
Meadows D. et al. 1972. *The Limits to Growth*.

## Standard Run

This graph shows the *Limits* Standard Run scenario. That scenario assumes “no major change in the physical, economic, or social relationships that have historically governed the development of the world system” and results in collapse of the global economy and environment sometime this century.

# *Qualicum Institute*

## *The limits to growth*



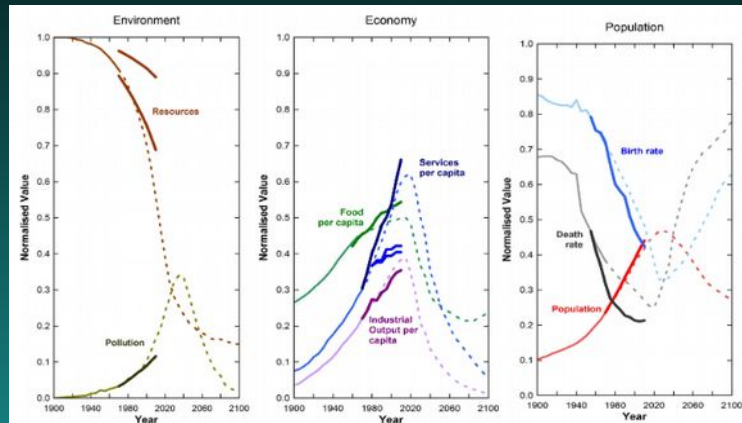
Meadows D. et al. 1972. *The Limits to Growth*.

**Collapse:  
diminishing  
resources and  
increasing  
ecological  
damage due  
to pollution**

Collapse is projected to be primarily due to diminishing resources and increasing ecological damage due to pollution (e.g. the release of CO<sub>2</sub> and other greenhouse gas emissions into the atmosphere). Today, more and more of our capital is being diverted from health care, education, infrastructure maintenance, to get at those diminishing resources (e.g., fracking).

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## The limits to growth



Turner, G. (2014) 'Is Global Collapse Imminent?', MSSI Research Paper No. 4, Melbourne Sustainable Society Institute, The University of Melbourne.

A number of independent studies, using real data since 1972 indicate that we're closely aligned with the *Limits* Standard Run. See, e.g.,

[http://sustainable.unimelb.edu.au/sites/default/files/docs/MSSI-ResearchPaper-4\\_Turner\\_2014.pdf](http://sustainable.unimelb.edu.au/sites/default/files/docs/MSSI-ResearchPaper-4_Turner_2014.pdf)

(scientific paper) or

<http://www.theguardian.com/commentisfree/2014/sep/02/limits-to-growth-was-right-new-research-shows-were-nearing-collapse>

(popular account)

See also: <http://www.esf.edu/efb/hall/2009-05Hall0327.pdf> and

<http://www.thesolutionsjournal.com/node/569>

# ***Qualicum Institute***

## ***The limits to growth***

“...the model results are almost exactly on course some 35 years later in 2008...”

Hall and Day, 2009, Revisiting the Limits to Growth after peak oil. *American Scientists* 97:230-237.

## ***Don't worry; The world is getting better!!!***

		1900	1980	2012
Health	1. Life Expectancy	32	63	70
	2. Infant Mortality	19.5%	7.64%	3.69%
Economics	3. Per Person Income	\$2000	\$5911	\$10,070
	4. % In Extr. Poverty	68.7% 1.1B	42.6% 1.9B	16.9% 1.2B
Education	5. Literacy Rate	42%	70%	84%
	6. Internet Access	0%	0%	34%
Environment	7. CO <sub>2</sub> ppm	295	334	396 (408)
	8. Land-Ocean Temp vs. Base	-0.08°C	+0.28°C	+0.63°C (+1.35°C)

Allis, R. 2016. The world is getting better. <http://hive.org/world/the-world-is-actually-getting-better/>

Recently there has been a lot of “Don't worry, the world is actually getting better!” chatter backed up by statistics of the human condition, such as life expectancy and per person income. The environment is mentioned only as an afterthought and, although it's usually bad news, the solution is simply to keep growing and we'll grow our way out of the problems.



## ***Qualicum Institute***

### ***Carrying capacity exceeded***

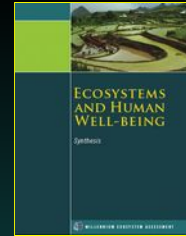
In the short term, you can have continuously improving lives for much of humanity while the source of that improvement— ecosystems and the natural resources that make up their structure—is being depleted and degraded.

It's important to understand ...

An analogy: If you have a million dollars getting 5% interest, you can have a standard of living that \$50,000 a year will get you and you can have that for your lifetime and your childrens' lifetimes (a steady state economy). But if you spend 20% more (\$60,000) per year you can improve your standard of living BUT you'll run out of money in 38 years (our conventional economy).

# *Qualicum Institute*

## *Millennium Ecosystem Assessment*



“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.”

*Millennium Ecosystem Assessment, 2005, p. 5*

We've been warned by scientists many times and yet we continue to listen to politicians and conventional economists rather than ecological economists and ecologists and other scientists. The Millennium Ecosystem Assessment resulted from over 1,300 scientists reviewing the state of the planet's ecosystems and the effects of human activity on the environment.

See also the 1992 World Scientists' Warning to Humanity:  
<http://www.ucsusa.org/about/1992-world-scientists.html#.V2BVE-Bf2Uk>

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*“Know Nature and keep  
it worth knowing”*

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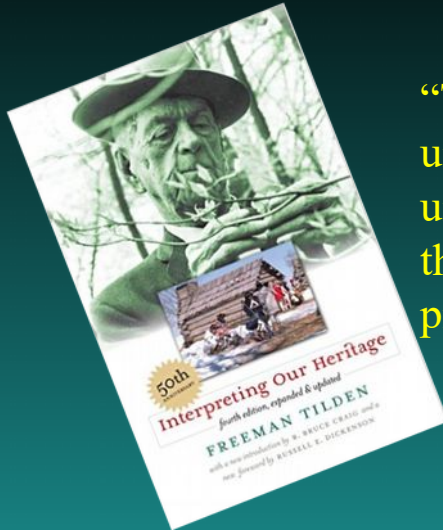
*Symptoms*

versus

*Causes*

From cleaning streams, conserving lands, and dealing with climate change and biodiversity loss, we have been dealing only with the symptoms, not the causes.

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“Through interpretation,  
understanding; through  
understanding, appreciation;  
through appreciation,  
protection.”—1957

We've spent time interpreting Nature to those who would listen but we now know that simply giving people facts and showing them how beautiful Nature is does not necessarily cause them to change their behaviour. We need to somehow break through our human abilities to deny reality, discount the future, and our tendencies to expand and over-consume, and deal with our “malignant social constructs” such as economic growth that continue to drive the “business as usual” condition.

# *Qualicum Institute*

## *Evolution*

38% of Canadians and 69% of Americans do not think or were not sure that human beings evolved from less advanced life forms over millions of years

[http://angusreidglobal.com/wp-content/uploads/2012/09/2012.09.05\\_CreEvo.pdf](http://angusreidglobal.com/wp-content/uploads/2012/09/2012.09.05_CreEvo.pdf)

Example 1:

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### *Climate change*

In a recent 2016 poll, 39% of Canadians did not agree with the statement:

“Earth is getting warmer partly or mostly because of human activities.”

The Distribution of Climate Change Public Opinion in Canada.  
[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2732935&download=yes](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2732935&download=yes)

Example 2:

***Qualicum Institute***

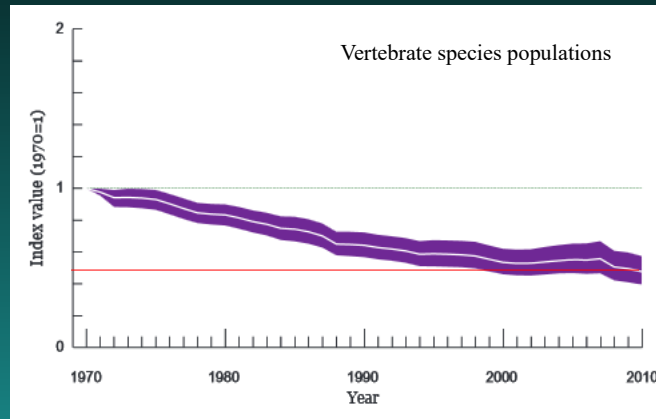
## Habitat degradation and loss!

Despite protecting many important areas for biodiversity preservation, biodiversity on the planet continues to decline. What we're doing isn't working!



# *Qualicum Institute*

## *Living Planet Index*



WWF. 2014. *The Living Planet Report*. [http://awsassets.panda.org/downloads/wwf\\_lpr2014\\_low\\_res\\_full\\_report.pdf](http://awsassets.panda.org/downloads/wwf_lpr2014_low_res_full_report.pdf)

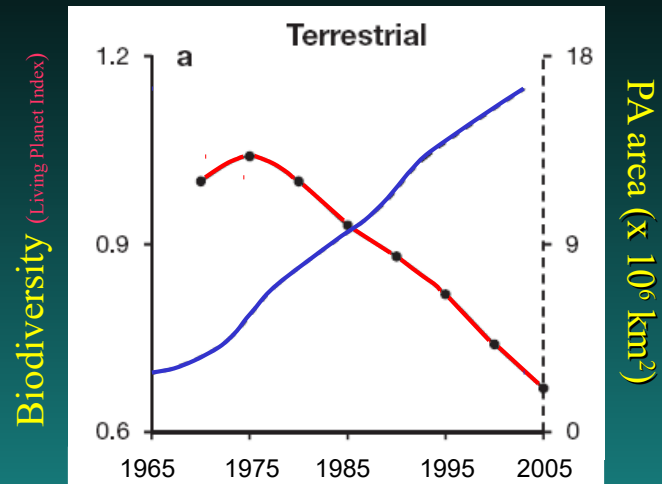
Since 1970, vertebrate species population have, on average, declined by 50%.

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## Protected Areas!

We thought protected areas would be the solution to biodiversity loss.

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Mora and Sale. 2011. Marine Ecology Progress Series 434: 251–266

Biodiversity continues to be lost, even in protected areas.

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“Protected areas are a false hope in terms  
of preventing the loss of biodiversity.”

*Peter F. Sale*

Leahy, S. 2011. Data Show All of Earth's Systems in Rapid Decline. <http://ipsnews.net/news.asp?idnews=56685>

## ***Qualicum Institute***

### ***BC Nature position on economic growth***

- Include the position statement on economic growth as part of the BC Nature web site
- Educate the public and policy makers on this fundamental conflict
- Encourage member clubs to adopt the position statement

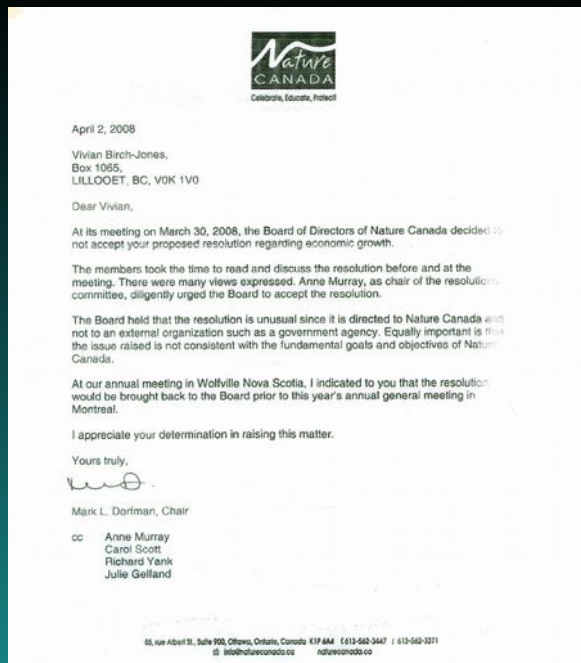
The other parts of the resolution on economic growth adopted in 2008...

## ***Qualicum Institute***

### ***BC Nature position on economic growth***

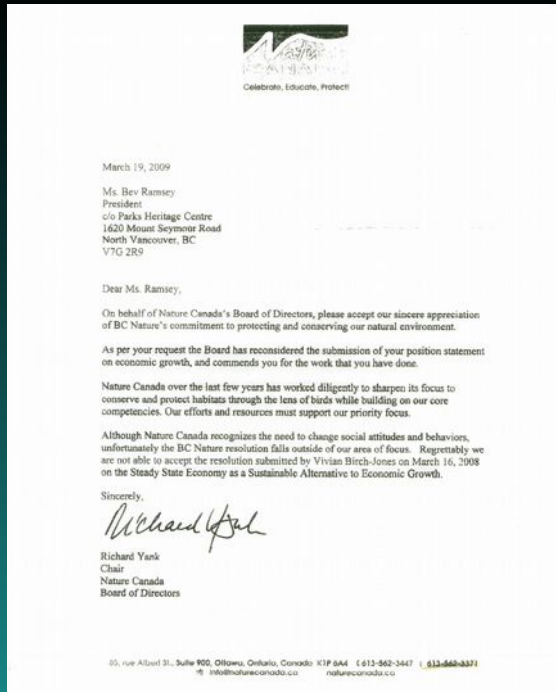
- Mention the root cause—economic growth—as part of routine conservation work
- Encourage Nature Canada to circulate position statement and encourage adoption by other provincial affiliates

...Continued.



“Equally important  
is that the issue  
raised is not  
consistent with the  
fundamental goals  
and objectives of  
Nature Canada.”

Nature Canada wouldn't even allow a similar resolution on the floor for member clubs to vote on!



Focus: “to conserve and protect habitats through the lens of birds while building on our core competencies.”

“Although Nature Canada recognizes the need to change social attitudes and behaviours, unfortunately the BC Nature resolution falls outside of our area of focus.”

Presented to Nature Canada again in 2009 with the same results. They're saying here that dealing with the fundamental conflict between economic growth and biodiversity conservation falls outside their area of focus, which is conservation!



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A ***Position statement*** is only valuable if it guides the actions and direction of an organization. It must have a life beyond approval and adoption.

## *Qualicum Institute*

“The world's current economic model is an environmental "global suicide pact" that will result in disaster if it isn't reformed.”

Sounds like something a rabid environmentalist would say!

## *Qualicum Institute*

“The world's current economic model is an environmental "global suicide pact" that will result in disaster if it isn't reformed.”

—*Ban Ki-moon*  
UN Secretary General  
World Economic Forum, January 2011

Not so!

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“What we are doing to the future of our children, and the other species on the planet, is a clear moral issue.”

—James Hansen

This is both a moral and environmental issue.

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Change seldom comes from the top down but rather from the grass roots up...

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## *Qualicum Institute*



## *Qualicum Institute*





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“Lost rights are never regained by appeals to the conscience of the usurpers, but by relentless struggle.... Goats are used for sacrificial offerings ... not lions.”

—*B.R. Ambedkar*

Perhaps it's time we became lions!

*Qualicum Institute*

*la fin*

*[www.qualicuminstitute.ca](http://www.qualicuminstitute.ca)*

## ***Qualicum Institute***

- Center for the Advancement of the Steady State Economy – [steadystate.org/](http://steadystate.org/)
- Millennium Alliance for Humanity and the Biosphere – [mahb.stanford.edu/](http://mahb.stanford.edu/)

Learn more about the steady state economy and consider joining MAHB both as an individual member and an organization.

What follow are some sundry slides that may be of interest.

## ***Qualicum Institute***

“Once the population and economy have overshoot the physical limits of the Earth, there are only two ways back: Involuntary collapse caused by escalating shortages and crises, or controlled reduction of throughput by deliberate social choice.”

*Donella Meadows et al.  
Beyond the limits: confronting global collapse*

## *Qualicum Institute*

$$\text{EF of Zambia} \quad \frac{1.0 \text{ gha/capita}}{7.4 \text{ billion}} = \frac{1.8 \text{ gha/capita}}{13 \text{ billion}}$$

$$\text{EF of Europe} \quad \frac{4.5 \text{ gha/capita}}{7.4 \text{ billion}} = \frac{1.8 \text{ gha/capita}}{3 \text{ billion}}$$

$$\text{EF of Canada} \quad \frac{8.2 \text{ gha/capita}}{7.4 \text{ billion}} = \frac{1.8 \text{ gha/capita}}{1.6 \text{ billion}}$$

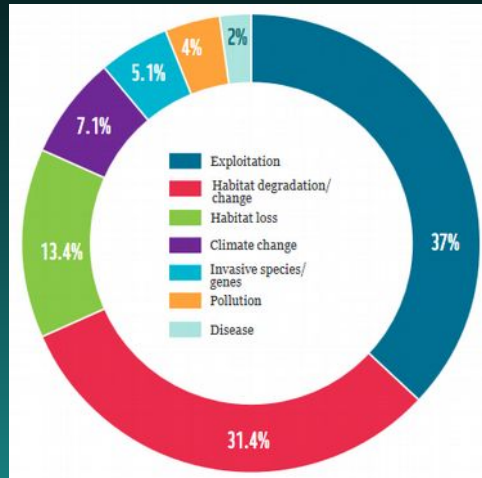
Simple ratio calculations using ecological footprints to determine a sustainable global population at various standard of livings (SoL).

The ratio is:

$$\frac{\text{Current Eco-footprint of Country}}{\text{Current Population}} = \frac{\text{Global Biocapacity}}{\text{Sustainable Population at that country's SoL}}$$

For example, if everyone had Zambia's SoL the Earth could sustainably support 7.5 billion people (13 billion/2 to allow for 50% of the ecosystems to be left untouched to maintain biodiversity). A sustainable global population with Canada's SoL would be 0.8 billion.

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### *Economic sectors*

Transportation &  
international trade &  
commerce

Agro-extractive sector

Economic by-product

Service sectors

Economic infrastructure

Labor force, light  
manufacturing, service  
sectors

WWF. 2014. *The Living Planet Report*. [http://awsassets.panda.org/downloads/wwf\\_lpr2014\\_low\\_res\\_full\\_report.pdf](http://awsassets.panda.org/downloads/wwf_lpr2014_low_res_full_report.pdf)

## *Qualicum Institute*

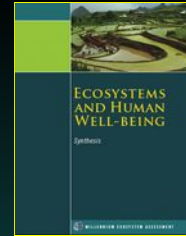
“Cut down the last redwood for chopsticks, harpoon the last blue whale for sushi... Humanity can survive just fine in a planet-covering crypt of concrete and computers.... ”



*Peter Huber, 2000 Senior Fellow, Manhattan Institute for Policy Research*

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***Millennium Ecosystem Assessment***



“Everyone in the world depends completely on Earth’s ecosystems and the services they provide, such as food, water, disease management, climate regulation, spiritual fulfillment, and aesthetic enjoyment.”

*Millennium Ecosystem Assessment, 2005, p. 5*



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*Impacts of a growth-  
based economy*

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As the economy grows it...

...removes structural  
elements of ecosystems.



## *Qualicum Institute*

As the economy grows it...  
...depletes non-renewable  
resources.



## *Qualicum Institute*

As the economy grows it.

...displaces healthy  
ecosystems and services.

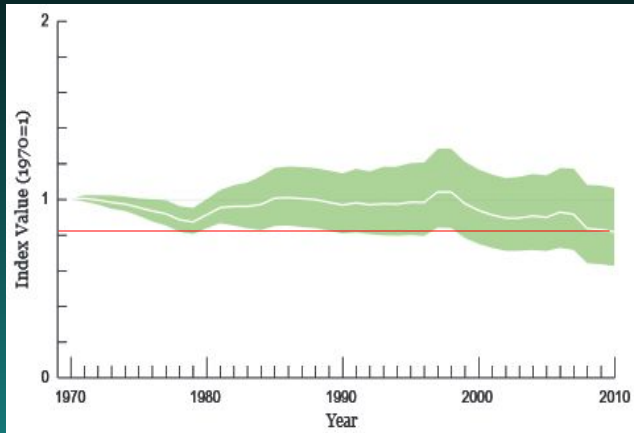


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As the economy grows it  
...degrades remaining  
ecosystems with waste.



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*Protected areas*

WWF. 2014. *The Living Planet Report*. [http://awsassets.panda.org/downloads/wwf\\_lpr2014\\_low\\_res\\_full\\_report.pdf](http://awsassets.panda.org/downloads/wwf_lpr2014_low_res_full_report.pdf)

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“Political reality must be grounded in physical reality or it's completely useless.”

*John Schellnhuber*

Director of the Potsdam Institute for Climate Impact Research, 2009

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### *A perennial goal of conventional economics*

“It is really agriculture that is affected [by climate change]. But even if agricultural productivity declined by a third over the next half century, the per capita GNP we might have achieved by 2050 we would achieve only in 2051.”

*Thomas Schelling,*  
Nobel Laureate Economist  
Some Economics of Global Warming (1992)

What he's saying is that we needn't be concerned about climate change because our per-capita GDP would only be slowed down by one year. Oh, by the way, we'd also lose one-third of our food production! This current economic model cares not a whit about people or communities ... only the allocation of resources through market forces and economic growth.



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***Three processes account for the rapid increase of CO<sub>2</sub> emissions since 2000:***

1. Increase in carbon intensity (17%)
2. A decline in the efficiency of CO<sub>2</sub> sinks on land and oceans in absorbing anthropogenic emissions (18%).
3. Growth of the world economy (65%)

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To stabilize at 650 ppmv CO<sub>2</sub>e, the majority of OECD nations would have to begin “draconian” emission reductions within a decade. Thus, unless we can reconcile economic growth with unprecedented rates of decarbonisation—in excess of 6% per year—this would require *a planned economic recession*.

Anderson and Bows. 2008. Reframing the climate change challenge in light of post-2000 emission trends.  
*Philosophical Transactions of the Royal Society A*. 366:3863–3882

Better we plan to have an economic recession and build in safeguards than to have Nature evoke the recession.

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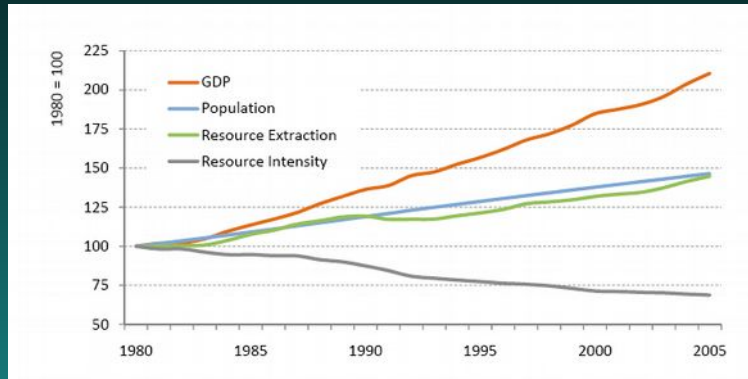
### ***Decoupling resource use from economic growth***

We can decouple economic growth  
from resource consumption and  
environmental degradation and  
continue to grow the economy.

A myth that current economists are now trying to use to continue to sell economic growth.

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### *Decoupling resource use from economic growth*



Sustainable Europe Research Institute, 2009. *OVERCONSUMPTION? Our use of the world's natural resources.*

In order for us to see a technological solution we would have to see resource extraction going down in line with technological progress (resource intensity). However, even though we are becoming more efficient with our resource use (intensity of use is dropping) our resource extraction from the structure of ecosystems still keeps climbing thus impacting biodiversity.

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The scope for decoupling growth in production and consumption from environmental degradation is limited; the decoupling strategy is unable to keep up with unlimited growth.

Næss and Hoyer. 2009. 'The Emperor's Green Clothes: Growth, Decoupling, and Capitalism. *Capitalism Nature Socialism*, 20:3, 74-95.

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“You cannot depend on your eyes  
when your imagination is out of  
focus.”

—*Mark Twain*

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## *Conservation targets*

“Almost universally, when conservation targets are based on the research and expert opinion of scientists they far exceed targets set to meet political or policy goals.”

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“It’s not enough that we do our best;  
sometimes we have to do what is required.”

—*Sir Winston Churchill*