

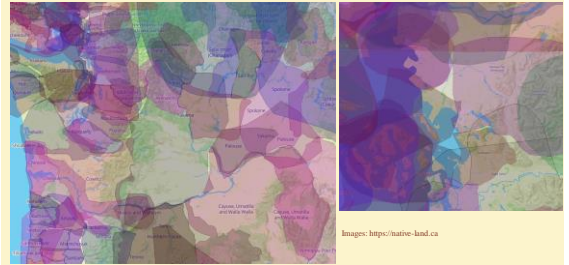
ESCI 439/539 Conservation of Biological Diversity

http://faculty.wvu.edu/jmcl/Conservation/syl_2021.htm

Tue, Thur 12-2 pm online & local field sites

Society for Conservation Biology <http://conbio.org/>

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Introductions

Name or preferred epithet

What hope to gain from course?

Greatest hope for fall 2021

Greatest concern

If had power to change something (College WWU), what?

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COVID safety Policies & Practices

All in-person meetings outside, at field sites.

Stay home if sick or symptomatic, even mild cold.

WWU COVID-19 policy compliance required.

Wash hands before and after field trips.

Travel to/from field sites individually.

Face masks required.

Physical spacing (> 2 meters) at all times.

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The Extinction Crisis

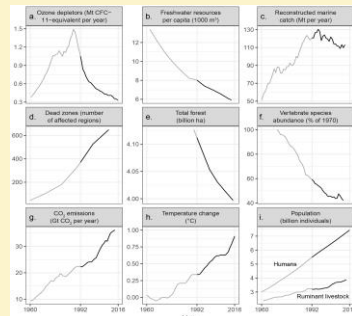
Ehrlich's "rivets"



Karner Blue
Lycaeides melissa

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Figure 1. Trends over time for environmental issues identified in the 1992 scientists' warning to humanity. The years ...



BioScience, Volume 67, Issue 12, December 2017, Pages 1026–1028. <https://doi.org/10.1093/biosci/bix125>
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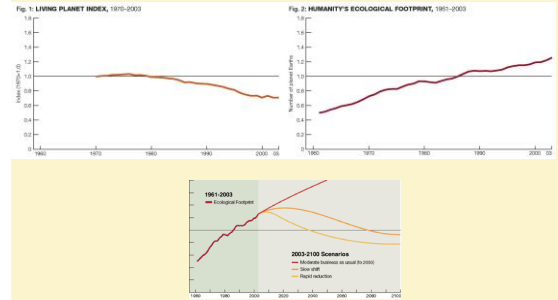
OXFORD
UNIVERSITY PRESS

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Environmental problems = symptoms

- Mass extinction
- Soil erosion
- Desertification
- Altered hydrological cycles
- Altered fire regimes
- Altered nitrogen cycle (local & global)
- Biotic mixing and homogenization
- Climate change
- Human migrations

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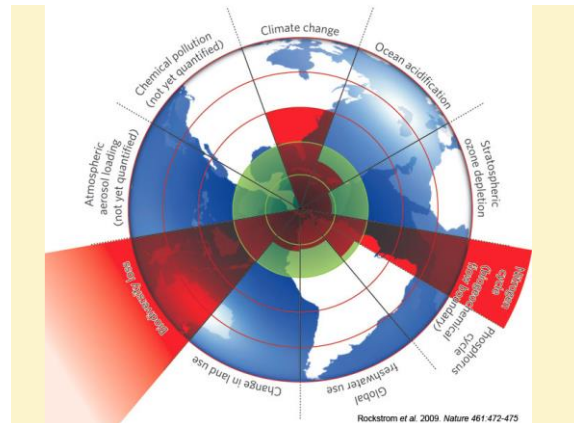
Living Planet Report 2006
http://www.footprintnetwork.org/newsletters/gfn_blast_0610.html

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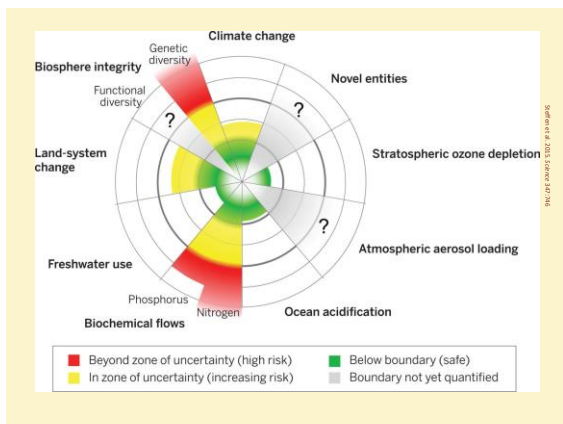
Humanity exceeded Earth's limits?

- Rockstrom et al. 2009. A safe operating space for humanity. *Nature* 461:472-475.
- Barnosky et al. 2012. Approaching a state shift in Earth's biosphere. *Nature* 486:52-58.
- Steffen et al. 2015. Planetary boundaries: guiding human development on a changing planet. *Science* 347:1259855.
- Scientists' warnings:
<https://academic.oup.com/bioscience/article/67/12/1026/4605229>
<https://scientistswarning.forestry.oregonstate.edu/>

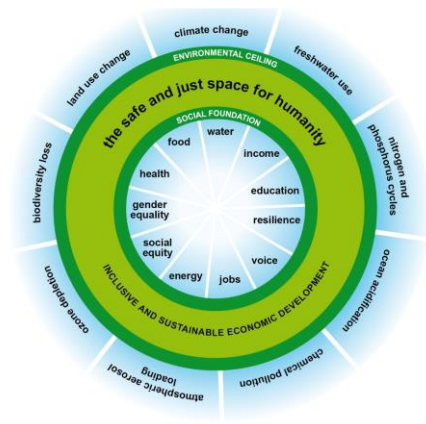
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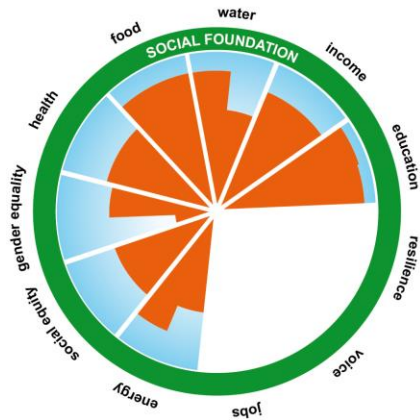


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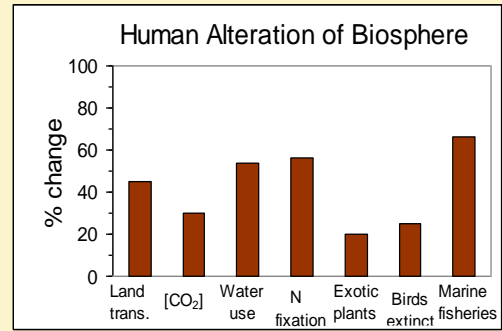
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Rockstrom, K. 2012. <http://ga.umiacs.com/147931>



Raworth, K. 2012. <http://gofigure.com/1010961>

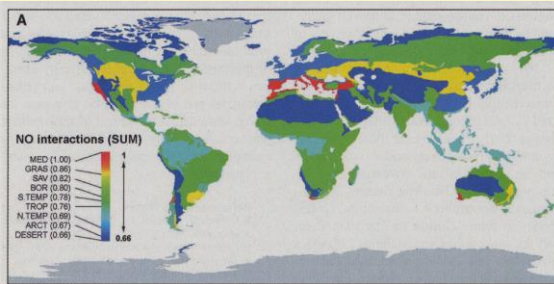
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adapted from: Vitousek, et al. 1997. *Science* 277:494-499.

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Biodiversity change, year 2100



Sala, et al. 2000. *Science* 287:1770-1774

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Conservation Biology

Definition:

science of preserving biological diversity

Synthetic discipline:

basic + applied sciences

ecology, genetics

forestry; range, wildlife, & fisheries management

natural sciences + social sciences

economics, anthropology, sociology, philosophy

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Critical Timing

Pivotal period in Earth's biotic history

"end game"

⇒ unique responsibility

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Two Traditional Emphases

Preserve rare elements (species)

narrow focus

traditional role

Maintain system

broad focus

contemporary bandwagon

Recent Emphases

Equity, Inclusion, Justice

Indigenous rights and roles

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Non-traditional Aspects of Conservation

Science

development of theory
"pure" vs. "applied" research

Shift from utilitarian view

(= management for select species)
interest in all species
shift from species to ecosystems

Embrace of non-scientists

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Characteristics

Crisis discipline

Multidisciplinary

Young, dynamic

Inexact

Value-laden

Evolutionary time scale

Applications require eternal vigilance

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Guiding Principles

- 1 Evolutionary change structures ecol. systems
- 2 Ecological systems are dynamic
- 3 Cons. planning must consider human presence
- 4 Human-dominated planet
⇒ emphasize managing human influence,
less on managing nature

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Conclusions

No easy answers

(memorization not an effective strategy)

Ecol. systems: idiosyncratic & dynamic

Emphasis on processes and mechanisms

Transition to equity, collaboration

Goal:

ability to develop conservation solutions

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