Intro to Conservation Biology

Preview

1. Coming to Terms
2. History of Conservation
3. Conservation Ethics
4. Conservation Biology

Coming to Terms

- Humans interact with the environment
  - Food
  - Water
  - Shelter
  - Space

Images: www.wikipedia.org

Coming to Terms

- How humans DO interact:
  - Biology: diet, body size
  - Behavior: social, nonmigratory
  - Technology: tools, energy sources
  - **Ecologist:** study of human-environment interactions

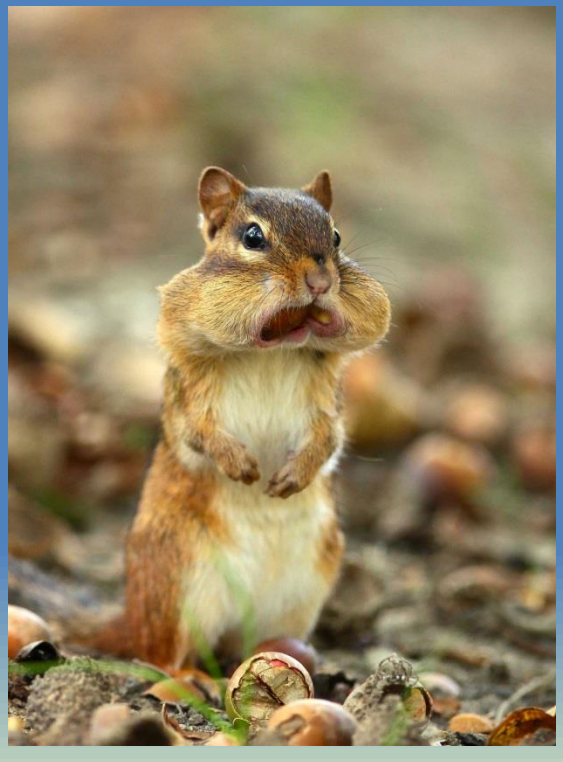
Coming to Terms

- How humans SHOULD interact:
  - **Conservationist:** use resources wisely
  - **Preservationist:** protect areas from human interference
  - **Environmentalist:** limit our impact
  - Terms are not mutually exclusive

2.

History of Conservation

- Conservation in nature



blog.nwf.org

2.

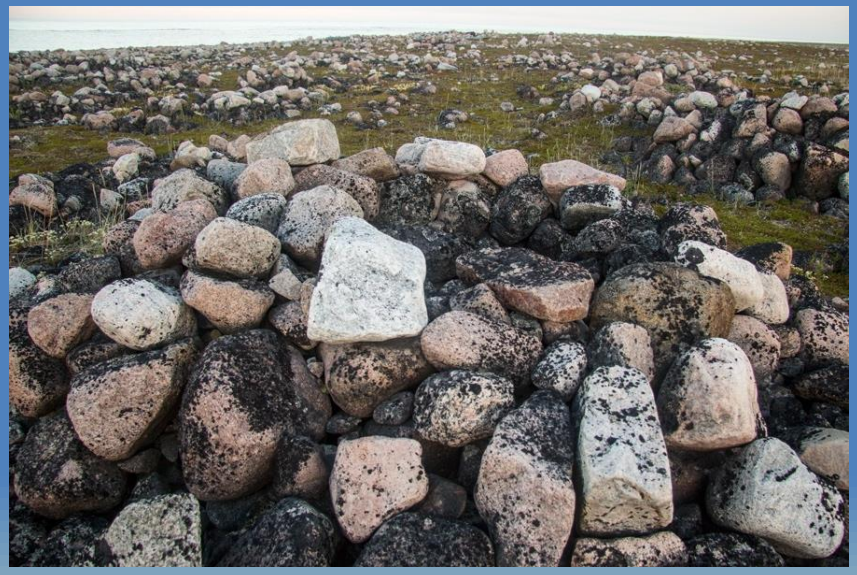
History of Conservation

- Conservation among humans

whc.unesco.org

Storage of corn, squash, and beans
Oaxaca, Mexico (~10,000 BP)

Inuit food cache
Manitoba, Canada (~1,000 BP)

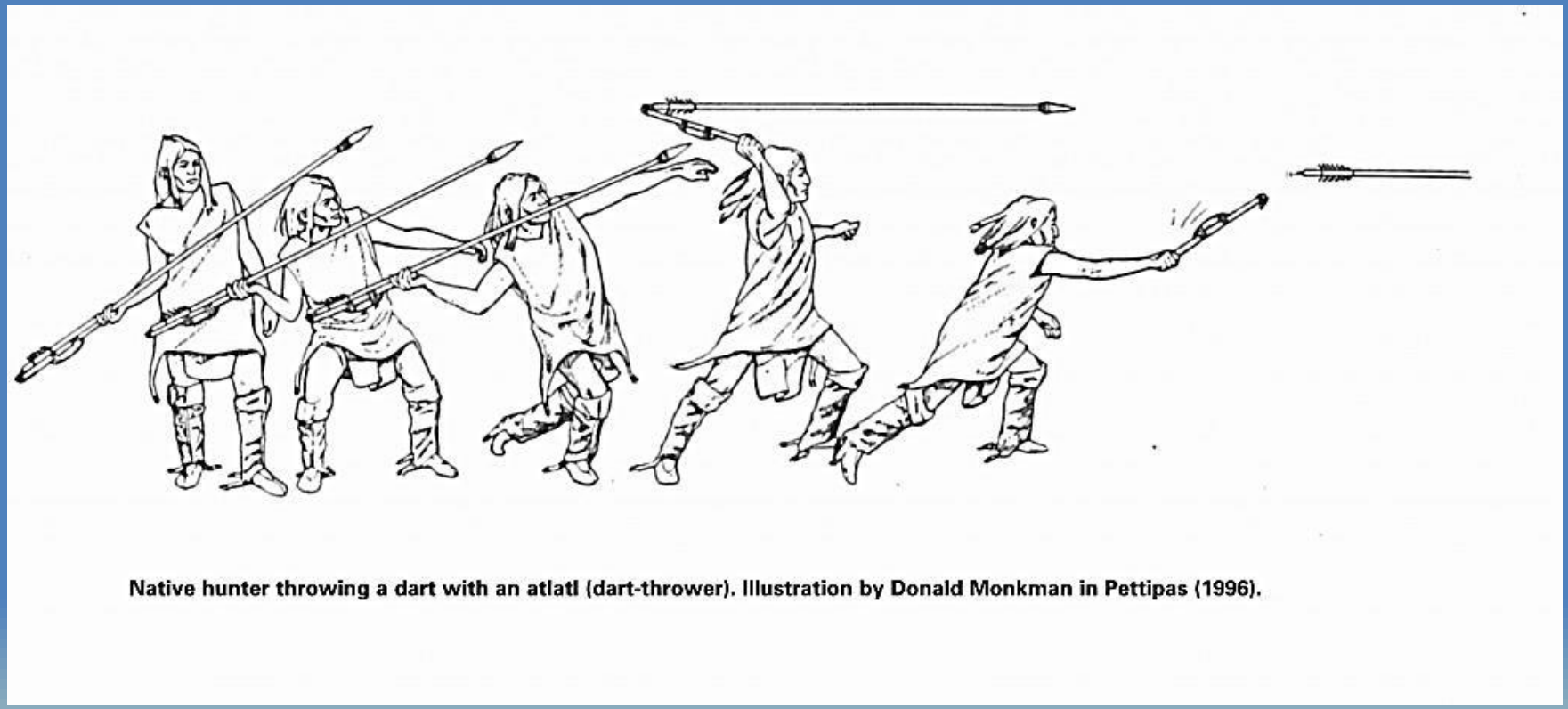


www.cbc.ca

2.

History of Conservation

- Humans and technology



Native hunter throwing a dart with an atlatl (dart-thrower). Illustration by Donald Monkman in Pettipas (1996).

manitobamuseum.ca

2.

History of Conservation

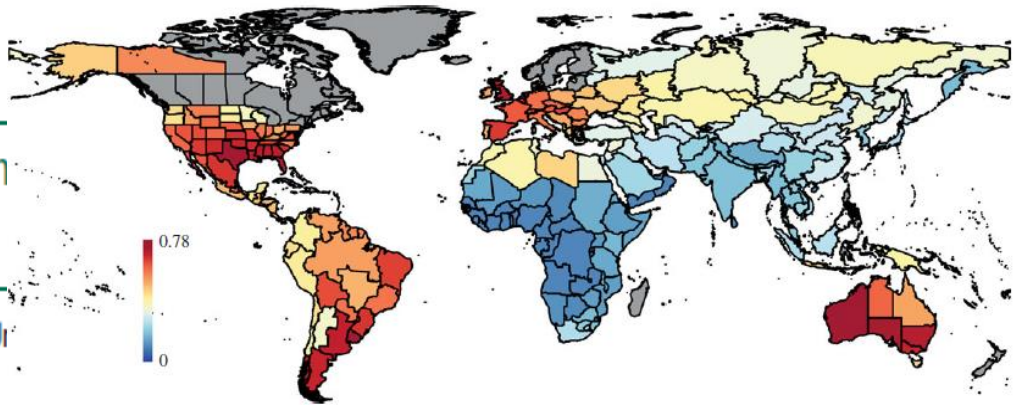
Global late Quaternary megafauna extinctions linked to humans, not climate change

Christopher Sandom†, Søren Faurby†, Brody San
and Jens-Christian Svenning

Ecoinformatics and Biodiversity, Department of Bioscience, Aarhus U
Aarhus C 8000, Denmark

The late Quaternary megafauna extinction was
Two factors, climate change and modern humar
port as the primary drivers, but their absolu
remains controversial. To date, focus has been c

Proportion of extinct animals



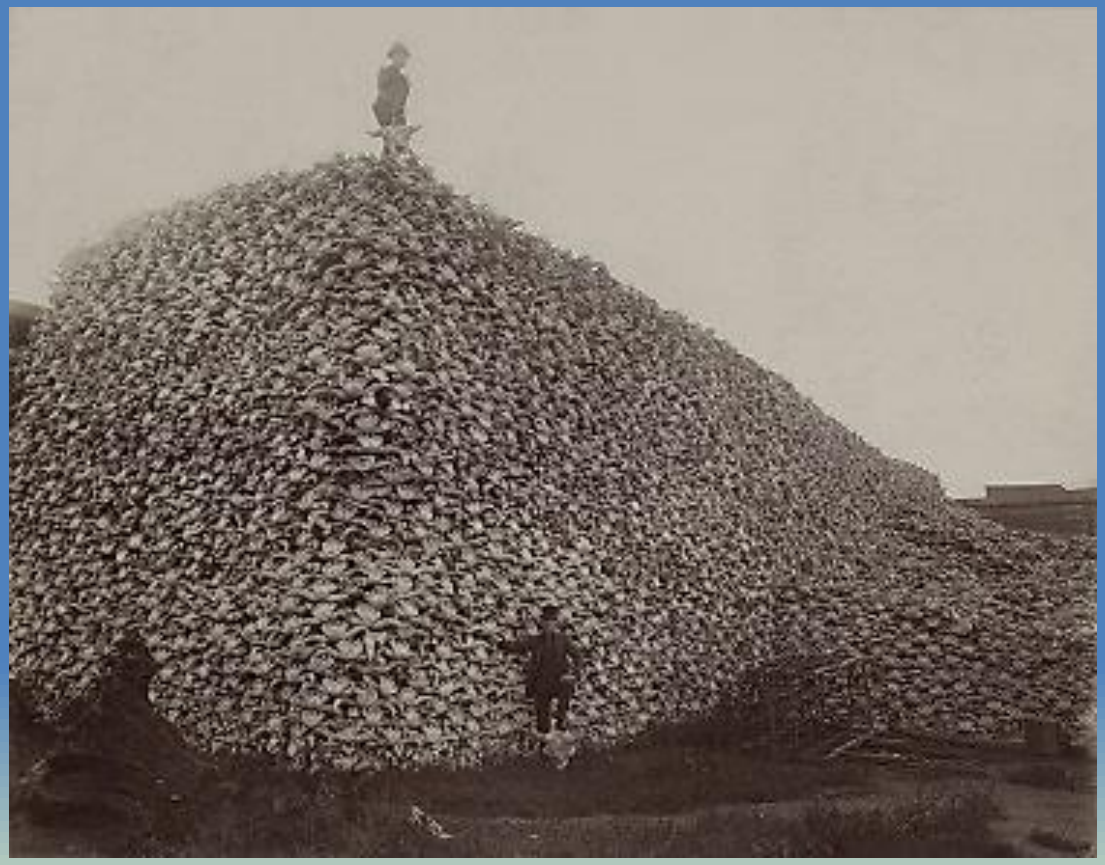
Areas of human influence

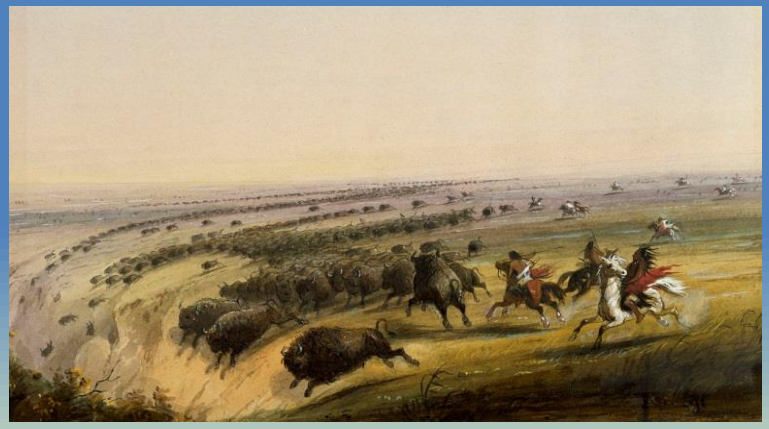
Sandom et al. 2014

2.

History of Conservation

- Large-scale hunting (1800s)





Images: www.wikipedia.org

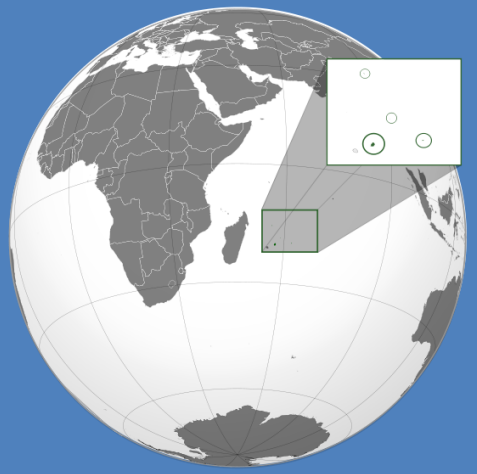
2.

History of Conservation

- Pattern
  - Human population growth/expansion
  - New technology
  - Overexploitation of resources
  - Conservation response

2.

History of Conservation



- Mauritius
  - –Isolated, volcanic origin
  - –Many endemic species
  - –Discovered by Portugese in 1500s; used by Dutch as penal colony
    - Introduced species
    - Overhunting

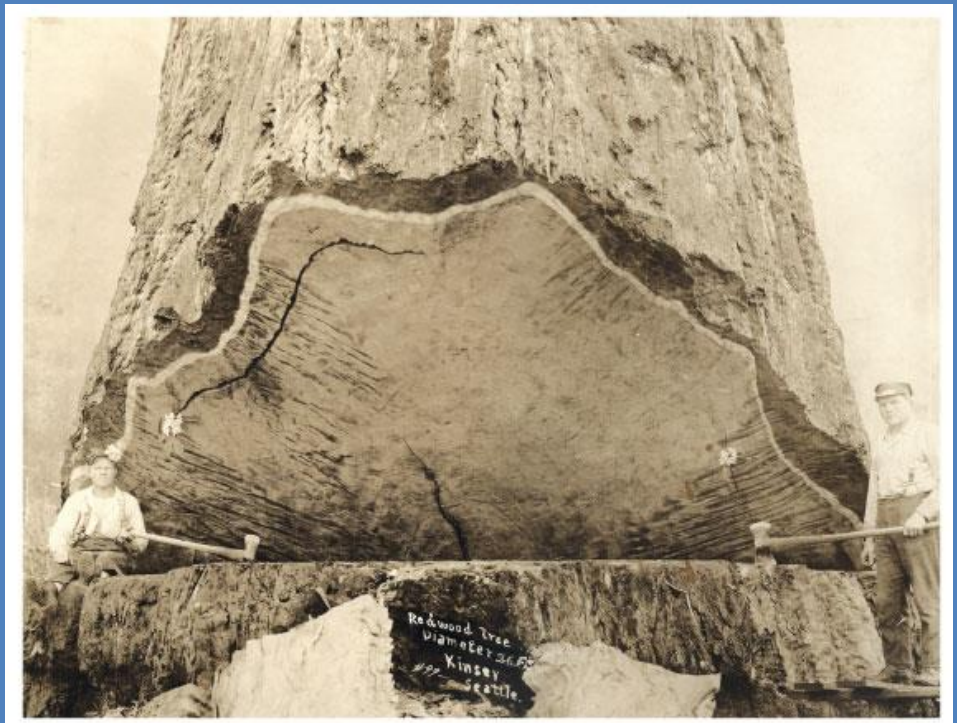
Dodo

Images: www.wikipedia.org

History of Conservation

- Environmental Policy in the USA
  - Colonialism
    - No attachment to land
    - Propaganda of abundance
  - Bag limits on deer as early as 1639

2.



(c) Loggers felling an old-growth tree, Washington

Withgott and Laposata 2012

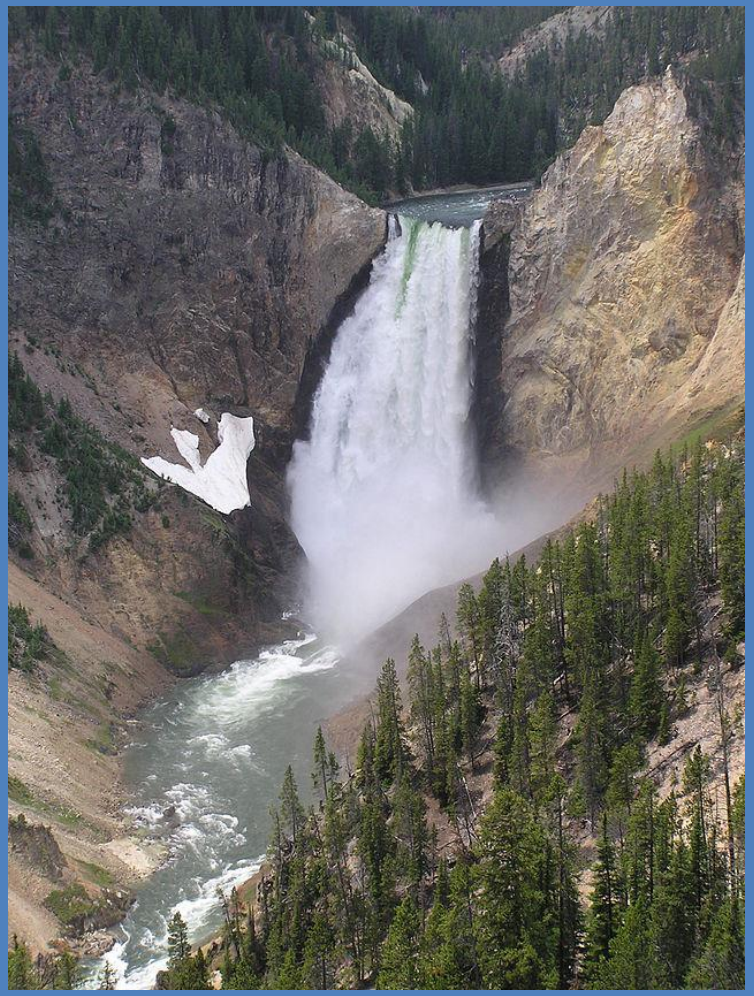
Timber Culture Act (1873): encouraged the timber industry to clear-cut ancient trees with little government policy to limit logging or encourage conservation

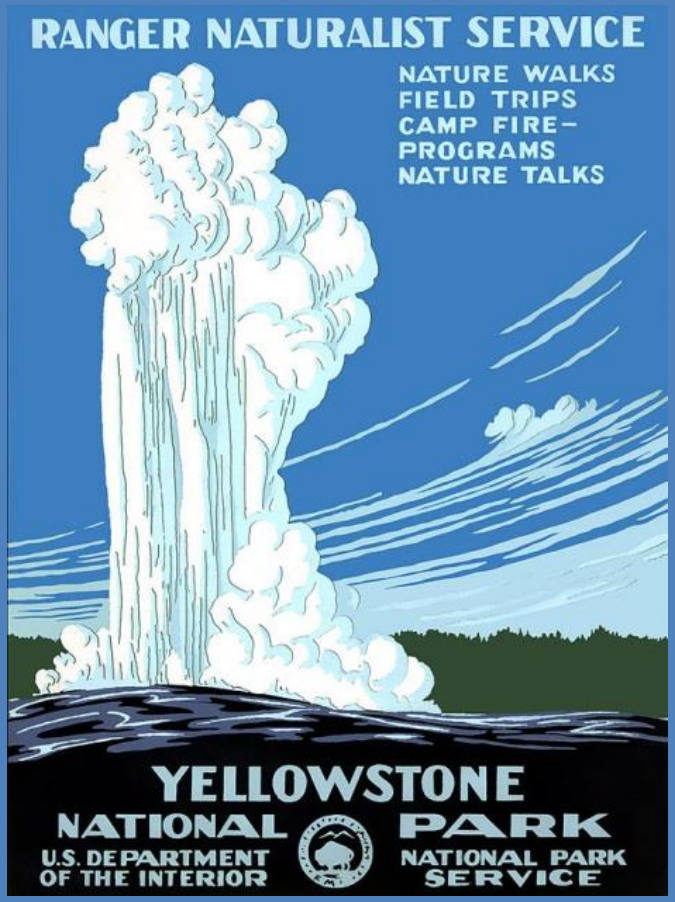
2.

Withgott and Laposata 2012

1900s: Nature is important for humans; deserves protection

2.





1872: Yellowstone National Park established

1916: National Park Service created

www.wikipedia.org

2.

Withgott and Laposata 2012

1900s: Conservation ("wise use") provides the greatest good for the most people for the longest time

2.

1903: Pelican Island National Wildlife Refuge established

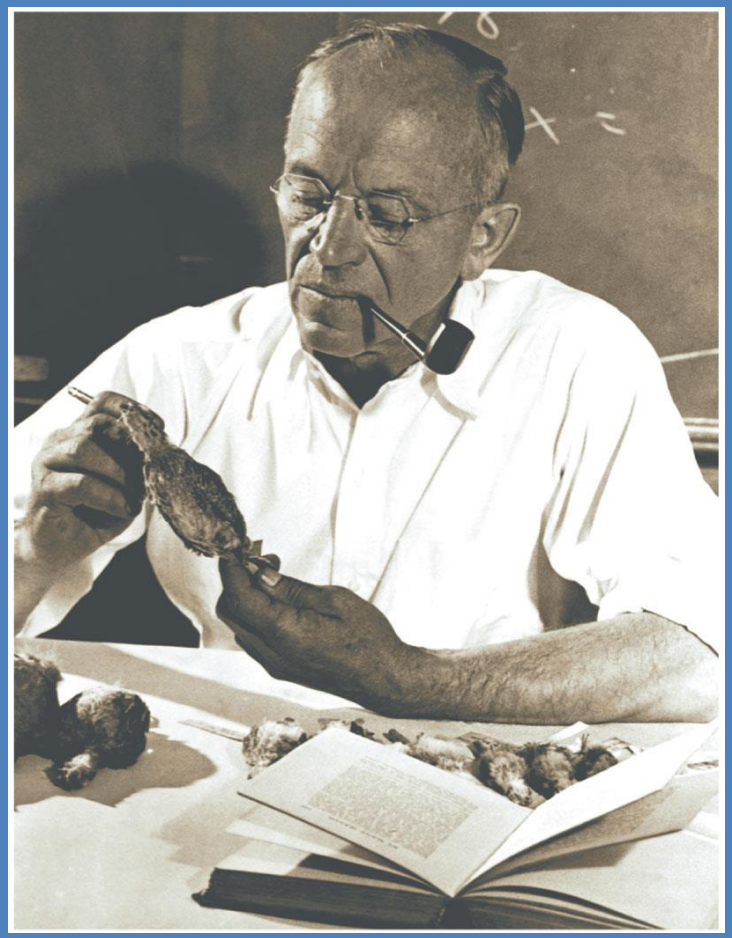
www.wikipedia.org

2.

1905: US Forest Service established

www.wikipedia.org

2.



Withgott and Laposata 2012

1940s: Healthy ecological systems depend on protecting all parts

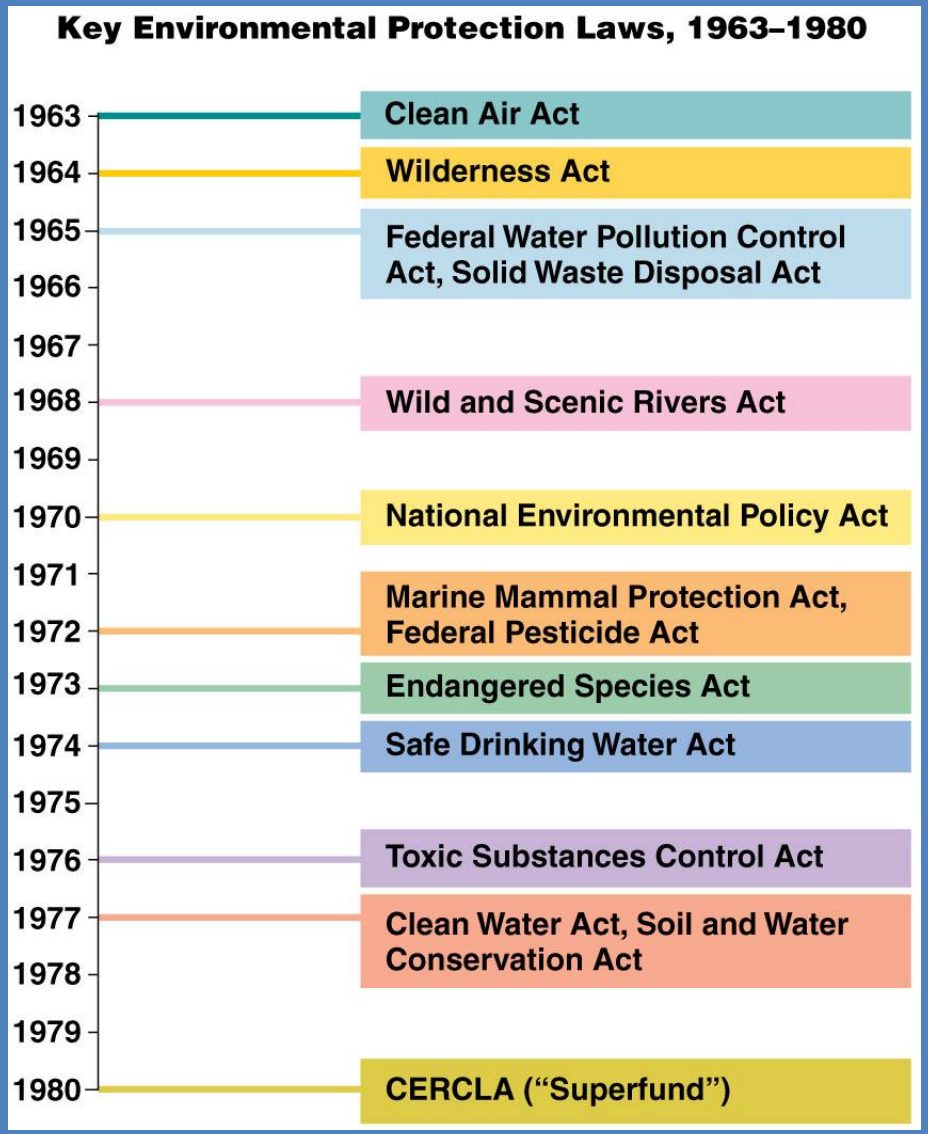
2.

Withgott and Laposata 2012

1962: Rachel Carson's *Silent Spring* described the ecological and health effects of pesticides and chemicals

Silent Spring

2.



Withgott and Laposata 2012

1960s-1970s: Increased environmental activism and legislation

Conservation Ethics

- Three approaches to conservation
  - Romantic-Transcendental Preservation
  - Resource Conservation
  - Evolutionary-Ecological Land Ethic

Conservation Ethics

- Romantic-Transcendental Preservation
  - –Nature as a temple

    "places for rest, inspiration, and prayers" –John Muir
  - –Spiritual uses vs. economic uses

John Muir

Conservation Ethics

- Resource Conservation
  - –Natural resources
    - Economic benefit
    - Ecosystem services
    - Aesthetic value

Fig. 1.3

Gifford Pinchot

Conservation Ethics

- Muir and Pinchot
  - Different ethics, same justification
  - Anthropocentric view
    - Emphasis on instrumental value (resources, inspiration)
    - Less emphasis on intrinsic value

Conservation Ethics

- Evolutionary-Ecological Land Ethic
  - Emphasized intrinsic value of species
  - Humans and nature are not separate; but together

Green Fire Search

4.

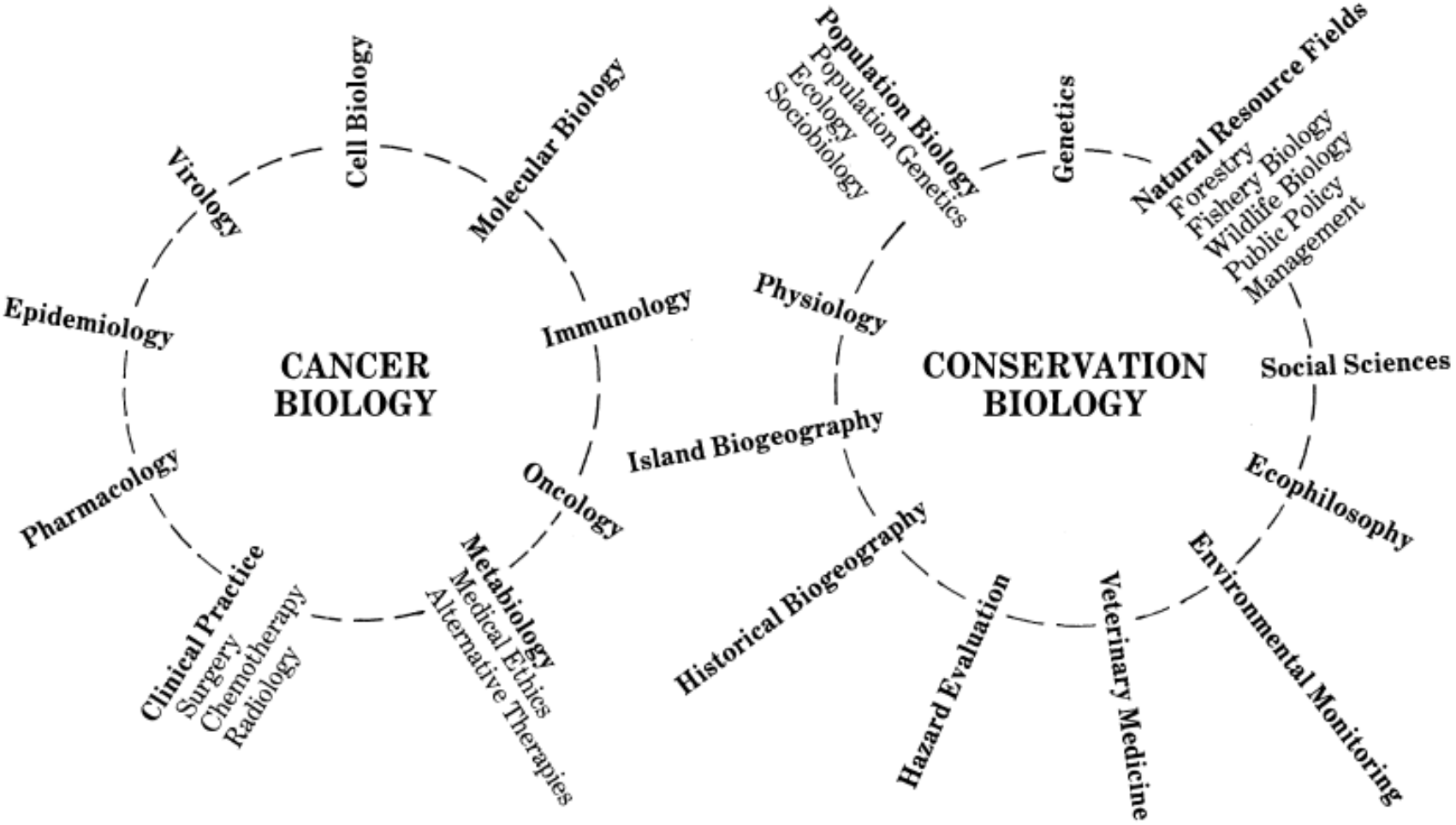
Conservation Biology

- Different from other types of biology
- It is goal-oriented and applied

www.nps.gov

Conservation Biology

- Soule (1985)
  - Goal: to provide principles and tools for preserving biological diversity
  - Crisis discipline
  - Tend to think of systems, not:
    - "our" resources
    - Individual species



Soule 1985

A Multidisciplinary Field

Conservation Biology

- Soule (1985) cont'd
  - Diversity is good
  - Complexity is good
  - Evolutionary potential is good
  - Biotic diversity has intrinsic value

Conservation Biologist

Conservation Biology

- Often involves political advocacy
- Not “value-neutral”
- Different from natural resource management

4.

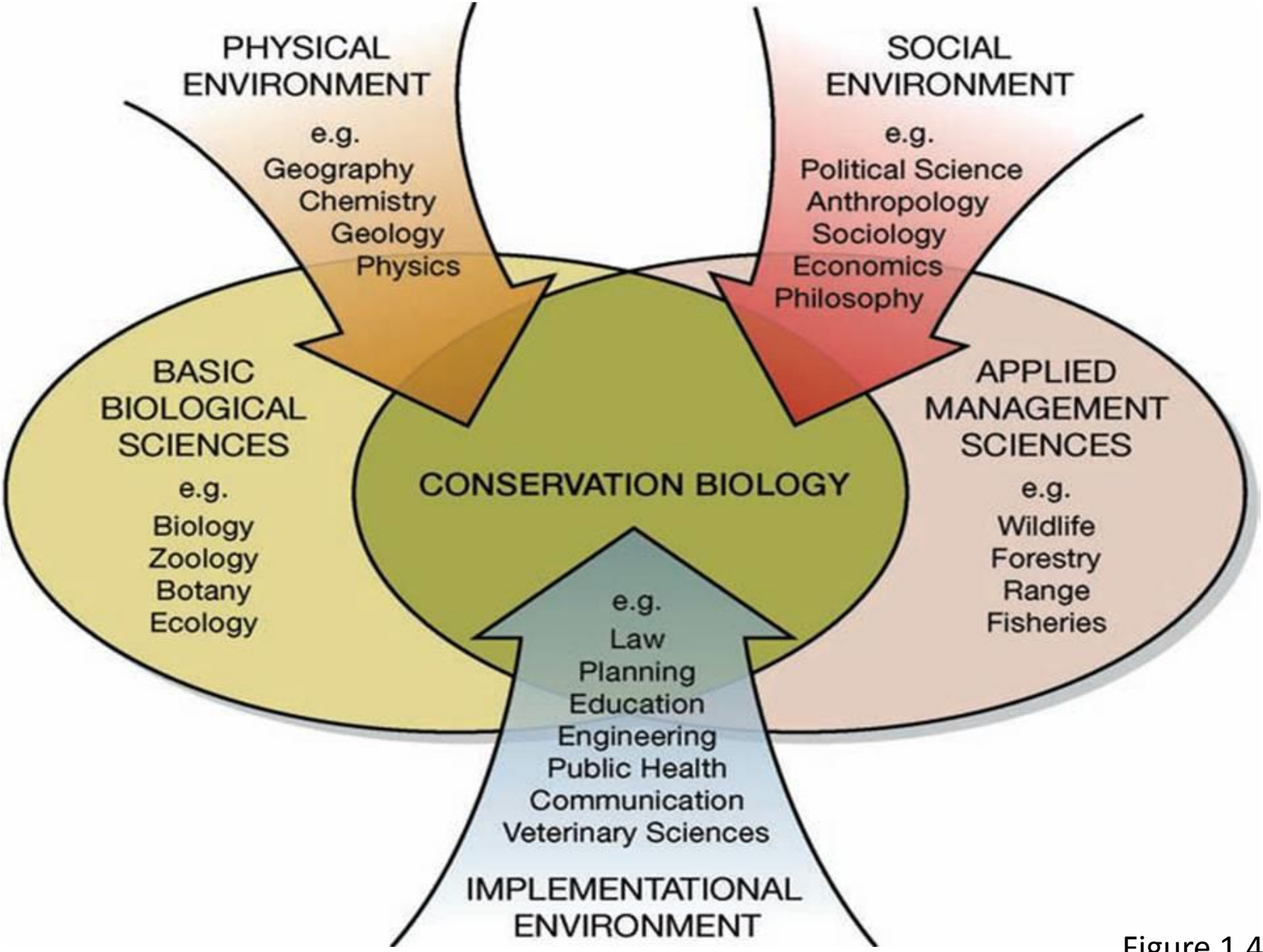
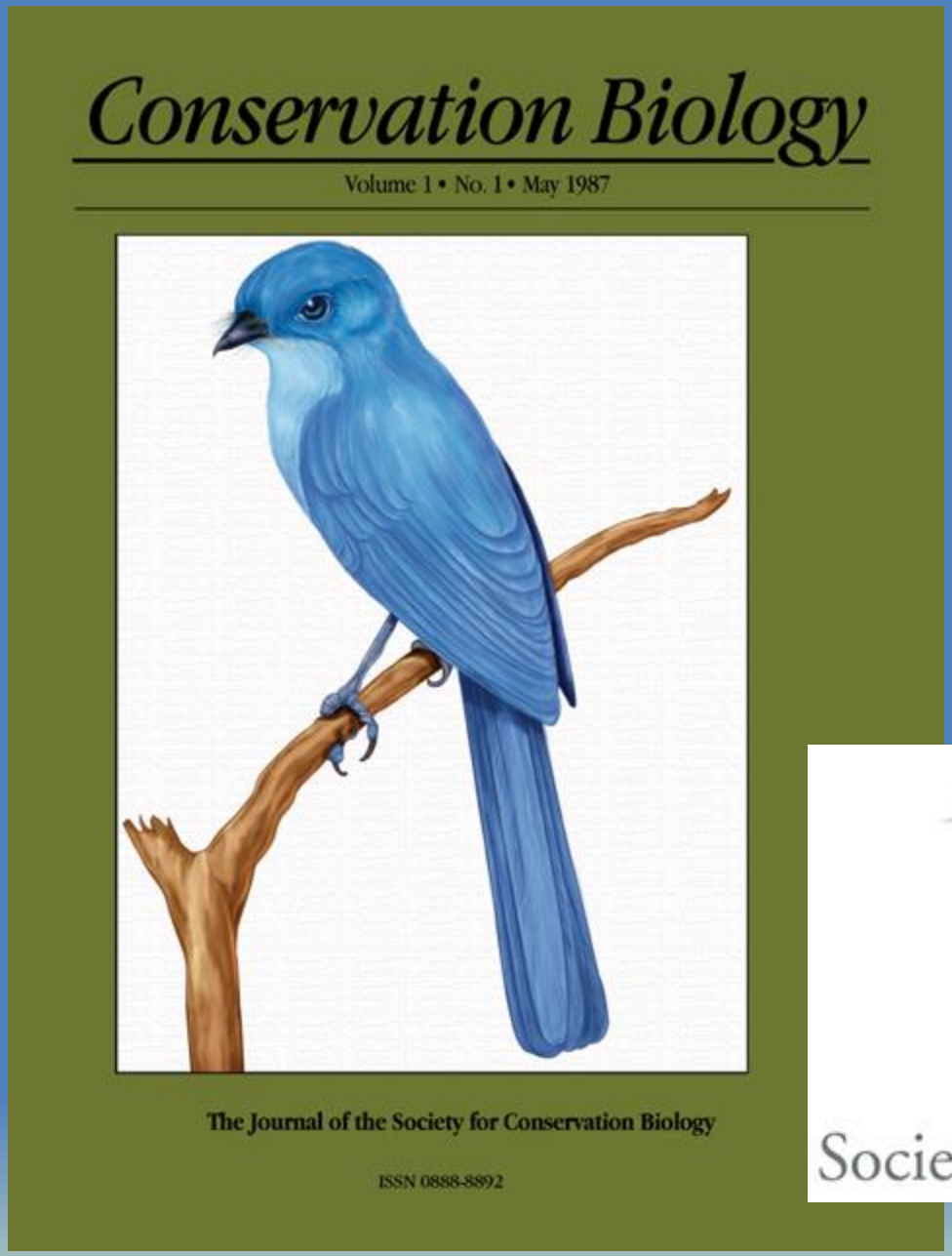

PHYSICAL ENVIRONMENT
e.g.
Geography
Chemistry
Geology
Physics
SOCIAL ENVIRONMENT
e.g.
Political Science
Anthropology
Sociology
Economics
Philosophy
BASIC BIOLOGICAL SCIENCES
e.g.
Biology
Zoology
Botany
Ecology
CONSERVATION BIOLOGY
APPLIED MANAGEMENT SCIENCES
e.g.
Wildlife
Forestry
Range
Fisheries
e.g.
Law
Planning
Education
Engineering
Public Health
Communication
Veterinary Sciences
IMPLEMENTATIONAL ENVIRONMENT

Figure 1.4

Conservation Biology

- A Brief History
  - 1978: First international conference on conservation biology
  - 1980: First textbook, *Conservation Biology*, by Soule and Wilcox
  - 1987: First professional society and journal

4.



Society for Conservation Biology

conbio.org

Figure 1.5

Resources

Publications

Hunter Jr., M. L., and J. Gibbs. 2007. Fundamentals of Conservation Biology, 3rd Edition. Blackwell, Malden.

Sandom, C., Faurby, S., Sandel, B., and J-C. Svenning. Global late quaternary megafauna extinctions linked to humans, not climate change. Proceedings of the Royal Society B 281:20133254.

Soule, M. E. 1985. What is conservation biology? BioScience 35(11):727-734.

Withgott, J. and M. Laposata. 2012. Essential Environment: The Science behind the Stories, 4th Edition. Pearson, New York.

Media

Society for Conservation Biology: conbio.org

Nearly complete dodo skeleton sold at auction:

http://www.bbc.com/news/uk-england-sussex-38068828