

**Odd topics** (or, “stuff that doesn’t really fit in anywhere else”).

## **I. Why conserve?**

We saved this topic up for the end of class - most classes start with this. After all, if we can’t answer this question, why bother with anything else we’ve done?

As biologists, the answer might seem obvious, but let’s delve into this issue a little. We’ll start by looking at some history of conservation.

The very beginnings are lost, but some very early records of conservation exist:

Bible (Deuteronomy 22:6-7): A prohibition on killing “mother birds”

India (aprx. 274 B.C.): Emperor Asoka prohibited the killing of a long list of animals including parrots, gees, bats, tortoises and others.

Many other civilizations have records showing the concern with conservation, often setting aside protected lands.

The point being that conservation has a long history.

But in more modern times, we could probably pick up the thread in 1872 with the establishment of Yellowstone National Park.

- Even back then it was recognized that some natural resources were of such splendor that they should be protected from development.

- Incidentally, part of the decision to protect this land was based on numerous paintings made by Thomas Moran, a fairly prominent American artist (his paintings showed people back east what the place was like). Some of his paintings are at the National Gallery.

Environmentalism, too, is part of this, and has a long history (water pollution, closed sewer systems, etc. were all concerns thousands of years ago).

A couple of folks important in the conservation movement (we could pick lots, but I’m just picking the ones that are best known and most often pointed to):

**John Muir** - helped people realize the importance of nature. He was particularly inspired by God’s handiwork, and considered nature “God’s temple”, which shouldn’t be despoiled by economics.

- his writings helped influence many people, and in later years he went on to help found the Sierra Club, the first organization

dedicated to using and *preserving* nature.

- his view of nature makes conservation very important.

Gifford Pinchot - had a rather different view of things.

- nature needs to be conserved so that future generations can still “exploit” nature.

- This does require, however, very careful management of resources. After all, these resources should be around for the longest time possible to serve as many people as possible.

- As such he was responsible for the restoration of many lands that had been clear-cut or otherwise damaged.

Aldo Leopold - brought ecology into all this.

- He realized the importance of individual species, and their connections to other species.

- Wilderness should be preserved intact since many things are interconnected. A direct argument is made to biodiversity.

- Helped organize the Wilderness Society, co-founded the Wildlife society.

- “A Sand Country Almanac”, is probably his most famous book.

Together, they gave us three “reasons” for conservation:

1) For the sake of nature - an aesthetic argument.

2) For the sake of sustainability - resources should be around for future generations.

3) For the sake of ecology - everything is interconnected.

Finally, let’s mention Teddy Roosevelt.

- avid outdoorsman & hunter (traveled all over the world, camping, hunting, and enjoying the outdoors).

- was strongly influenced by Pinchot (a good friend).

- expanded the U.S. forest service (increased national forest system by 400%), set up the national refuge system, set up the first Governor's conference dedicated to conservation issues, used the 1906 Antiquities act to set up National Monuments (including the Grand Canyon), and generally set a high standard for future presidents to follow (not all did, of course). [Oh, yes - he was, of course, also partly responsible for Teddy Bears!].

There are numerous other folks we could mention:

Rachel Carson - the importance of not polluting (DDT in particular)

Henry Thoreau - writings on wild places

Singers, writers, activists, etc., but let's stop - we've got the basics.

Using this context we have several very powerful arguments for conservation.

## **II. More reasons for conservation - or why are species important?**

### A. Economic values:

Food. Particularly domesticated species. Without other species (wheat, corn, etc.) the human species would go extinct.

- Note that maintaining genetic diversity is important here - we need a wide variety of different strains to deal with different conditions, etc. The original wild strain may also have potentially very useful genes.

- Note that we often don't know the potential food value of wild species. Perhaps some might work well as a new food source.

- Even wild species are often used as food.

Medicine. Most medicines have their origin in other organisms.

- This is particularly (and obviously) true for traditional medicines (sometimes this is a real cause of exploitation, however).

- Herbal medicines in the U.S. are a huge industry (billions of dollars every year are spent on herbal medicines).

- many of these might be sheer "quackery", but some are

probably reasonably effective. The point is they're economically very important.

- Many modern medicines are derived from chemicals first found in other organisms.
- Others are obtained from other organisms - antibiotics are a clear example.
- Other examples:
  - periwinkle from Madagascar, used to treat cancer.
  - taxol, derived from the Pacific yew, used to treat breast and ovarian cancer (the yew was considered a trash tree until taxol was found).
  - anticoagulants derived from bat or leech saliva.
- This is an oft cited argument for preserving nature - we don't know what useful medicines might be lurking in unexplored areas (or even in explored areas - the yew tree from above).

Clothing, shelter, tools, trinkets.

- Perhaps not as important as the above but let's not forget wood (for construction), or leather (for clothes), or sisal (for rope), etc.

Recreation.

- Parks are big business. Birdwatching, hiking, camping, hunting, fishing, photography, etc. are huge industries. A 1996 estimate puts their value at 87.8 *billion* dollars.

B. Other values (non-economic):

Spiritual values

- People derive pleasure from wildlife - one can't put a number on this, but it's important. It can motivate people to participate in "save the seal" campaigns or other things.
- More directly, many indigenous peoples have an obvious religious connection individual species.

## Scientific and Educational

- Often we learn from nature:
  - birds inspired flight (it took a couple of thousand years, but we did it!)
  - Mendel's peas helped explain genetics
  - Darwin learned from finches and other animals about evolution.
  - You're sitting in this class because you want to learn something about nature.

## Ecological values

- Species interact with each other - if one species disappears, this can have profound effects on the rest of the ecosystem (e.g., the California Sea Otter and its effect on kelp beds).

## Strategic values

- Some species have strategic values that can be used by conservationists:
  - Remember Giant Panda's vs. Giant Anacondas?
  - species such as tigers, whales, gorillas evoke a certain response in people and can be used to help build up concern about certain ecosystems (or even the species itself).
  - this is often helped by publicity campaigns (the yellow-tailed woolly monkey was used to set up a conservation campaign in Peru - people started realizing the monkey was special, and this was used to protect other biota as well).

## C. More values (not at the species level)

- Most of the above is at the species level, but we should realize that ecosystems, too, can have value. Some examples:

Wetlands can be used to treat waste water (not raw sewage, but partially treated sewage for instance)

Forests can help ensure high water quality in streams

Dunes and salt marshes can buffer coastal areas from storms (do we need to discuss barrier islands?)

Many areas have high religious importance (Sinai, Ayers rock, etc.)

- There is some overlap with the above, but we're now looking at conservation from an ecosystem perspective rather than a species perspective.

- Remember ecology - we need healthy ecosystems to get healthy species!