

Wild Species: Biodiversity and Protection

Chapter 11

Value of Wild Species

Biological Wealth

1.75 million species of plant, animals, and microbes have been examined, named, and classified

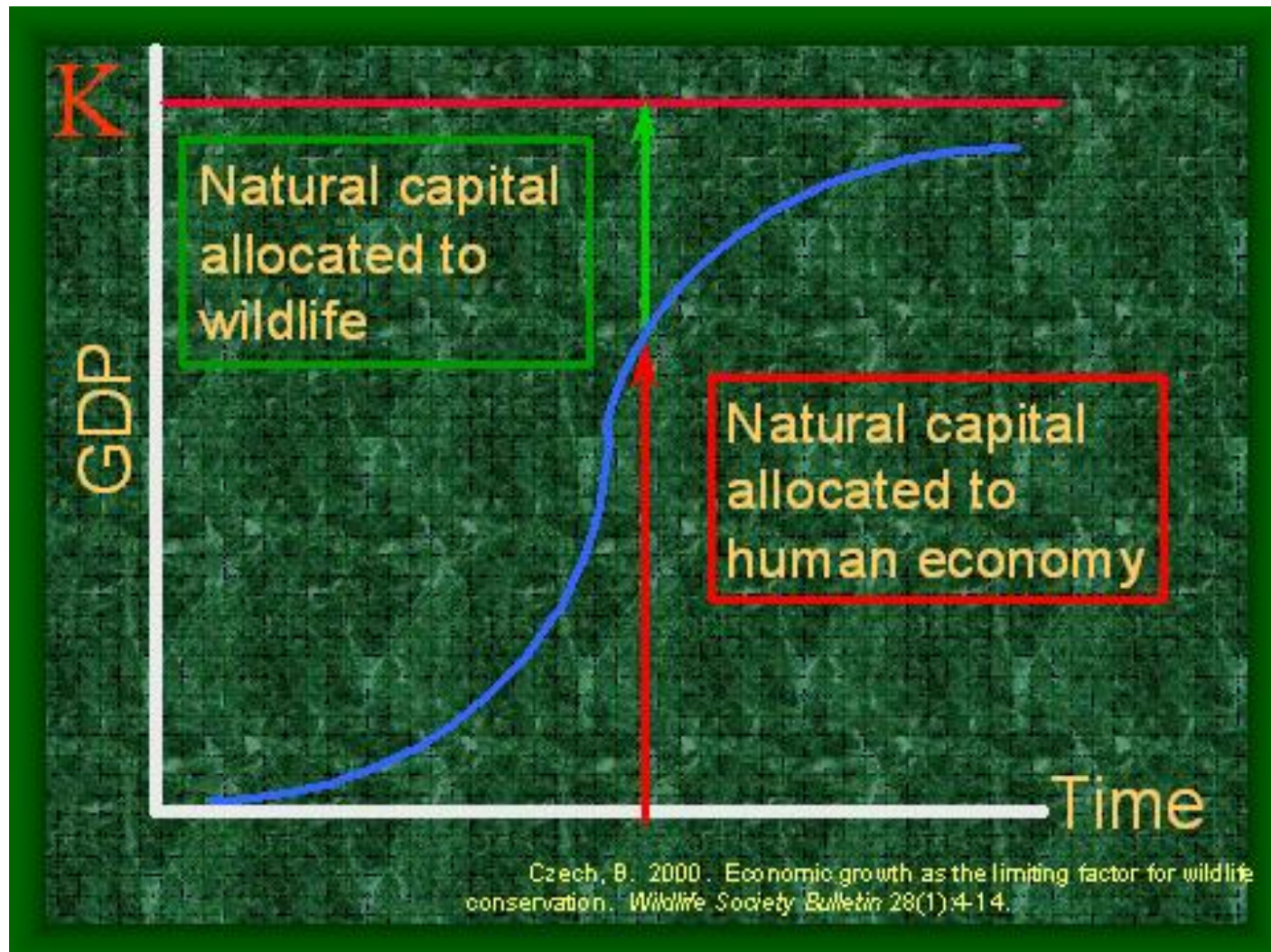
Estimated that 13 million actually exist



Biological Wealth - The life sustaining combination of commercial, scientific, and aesthetic values imparted to a region by its biota



Natural Capital - The natural assets and the services they perform. One form of the wealth of a nation is its complement of natural capital.



Biodiversity - the diversity of living things found in the natural world. The concept usually refers to the different species, but also includes ecosystem and the genetic diversity within a given species



2 Kinds of Value - Instrumental and Intrinsic

Instrumental value - the value that living organisms or species have in virtue of their benefit to people; the degree to which they benefit humans



Intrinsic Value - the value that living organisms or species have in their own right; in other words, organisms and species do not have to be useful to have value (*contrast instrumental value*)



The value of natural species can be categorized into four areas:

- **Sources for agriculture, forestry, aquaculture, and animal husbandry**
- **Sources for medicines and pharmaceuticals**
- **Recreational, aesthetic, and scientific value**
- **Intrinsic value**

Game Animals in the United States

Traditionally hunted for sport, meat, or pelts with no restrictions

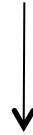
Hunted to extinction were:

Great Auk (extinct since 1844)

Heath Hen (last seen 1932)

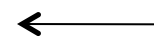
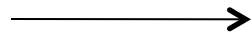


**Passenger Pigeon
(1914)**



Hunted to near extinction:

Canada Geese



Bison

Measures taken to avoid extinction of endangered species

Wild Turkey had population of 30,000 in 1930
Now over 4.5 million found in 49 states



Regulations enacted by state and federal governments:

- Established hunting seasons
- Set bag limits
- Hired game wardens

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"It's hunting season again.
Got anything that smells
like fresh venison?"



Sources of Revenue

- **Hunting and trapping fees**
- **Excise taxes placed on hunting, fishing, and boating equipment**

License Number	License Type	Minimum Age	Fee
000	DNR Sportcard		\$1.00
Deer*			
140	Resident Firearm Deer	12	\$15.00
141	Senior Firearm Deer (residents only)	65	\$6.00
142	Nonresident Firearm Deer	17 ¹	\$138.00
145	Resident Archery Deer	17	\$15.00
146	Senior Archery Deer (residents only)	65	\$6.00
147	Junior Archery Deer	10-16	\$7.50
148	Nonresident Archery Deer	17 ¹	\$138.00
340	Combination Deer Resident	17	\$30.00
341	Combination Deer Senior	65	\$12.00
342	Combination Deer Junior	10-16 ²	\$15.00
343	Combination Deer Nonresident	17 ¹	\$276.00
Fur Harvester-Valid through March 31, 2009			
190	Resident Fur Harvester	17 ¹	\$15.00
191	Senior Fur Harvester (residents only)	65	\$6.00
192	Junior Fur Harvester	10-16	\$7.50
195	Junior Fur Harvester (trap only)	up to 16	\$7.50
193	Nonresident Fur Harvester	17 ¹	\$150.00
Small Game-Valid through March 31, 2009 except 3-day licenses			
130	Resident Small Game	17	\$15.00
131	Senior Small Game (residents only)	65	\$6.00
132	Junior Small Game	10-16	\$1.00
133	Nonresident Small Game	17 ¹	\$69.00
134	3-Day Nonresident Small Game	17	\$30.00
Gamebird Hunting Preserve-Valid through March 31, 2009			
139	Gamebird Hunting Preserve	10	\$15.00

Michigan

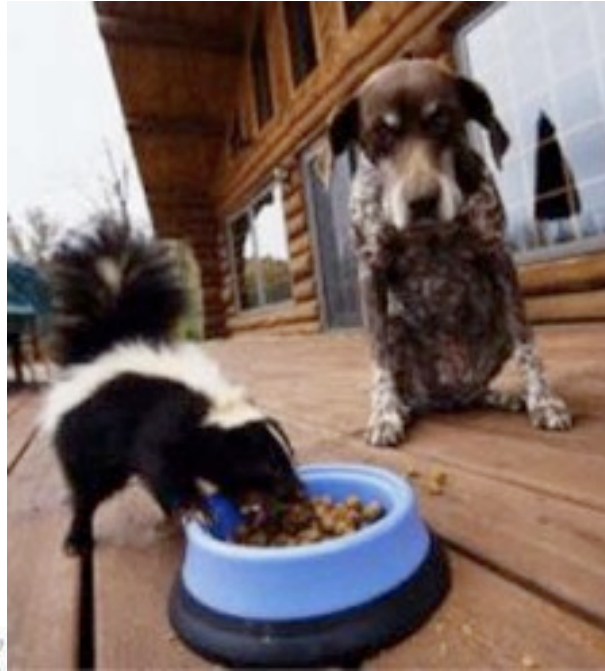
Problems have occurred due to protection from overhunting and animals adapting to suburban environments



**Number of animals
killed on roadways
exceeds number killed
by hunters**



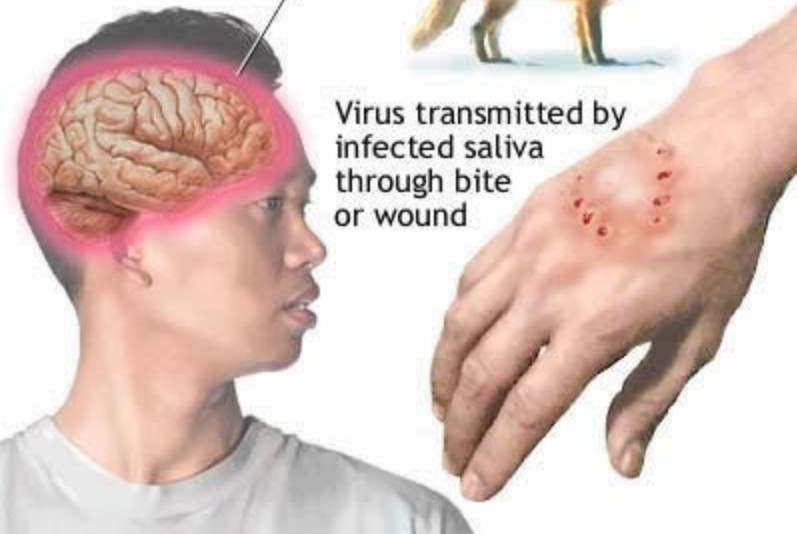
Many nuisance animals create health hazards in urbanized areas



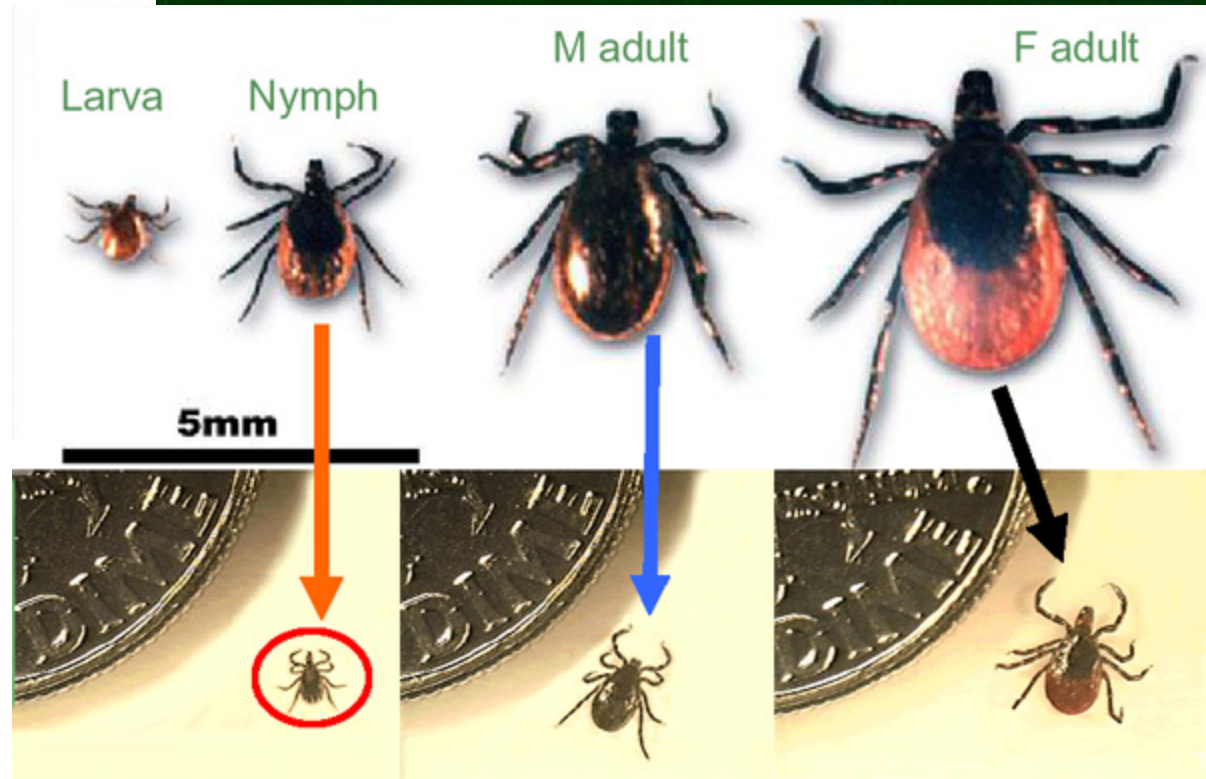
Brain inflammation



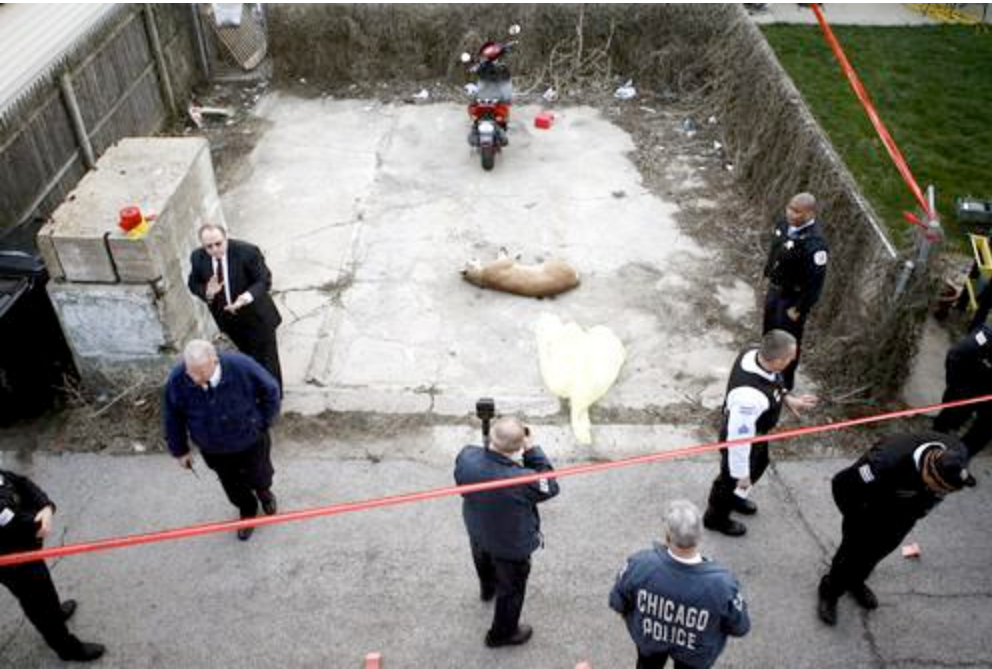
Virus transmitted by infected saliva through bite or wound



**Some game animals
have no predators
except hunters pushing
them into suburban
areas**



Suburbanites have been increasingly attacked by cougars and mountain lions



Coyotes are now found in every state and will eat almost anything- cats, small dogs, and garbage



Exploding populations of Canada geese found on golf courses, parks, lawns, and campuses



Animal Damage Control (AKA Wildlife Services) –
responds to requests
from livestock owners,
farmers, and others
concerned with human
health and safety to
remove nuisance animals
and birds



The Lacey Act – Passed in 1990, the first national act that gave protection to wildlife by forbidding interstate commerce in illegally killed animals

U.S. Fish and Wildlife Service

Injurious Wildlife A Summary of the Injurious Provisions of the Lacey Act

Wildlife Species Wildlife:
 The Lacey Act prohibits the importation, exportation, and interstate commerce of wildlife and fish that are injurious to humans or the environment. This includes species that are listed as injurious under the Act.

Wildlife Species Wildlife Permitted Sale:
 The Lacey Act allows for the sale of wildlife and fish that are not listed as injurious. However, the sale must be legal under the laws of the state where the animal was taken.

Wildlife Species Wildlife:
 The Lacey Act also prohibits the sale of wildlife and fish that are taken in violation of the laws of the state where they were taken. This includes species that are listed as injurious under the Act.



U.S. Fish and Wildlife Service

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Plants and wood products are now also protected from being illegally taken or traded

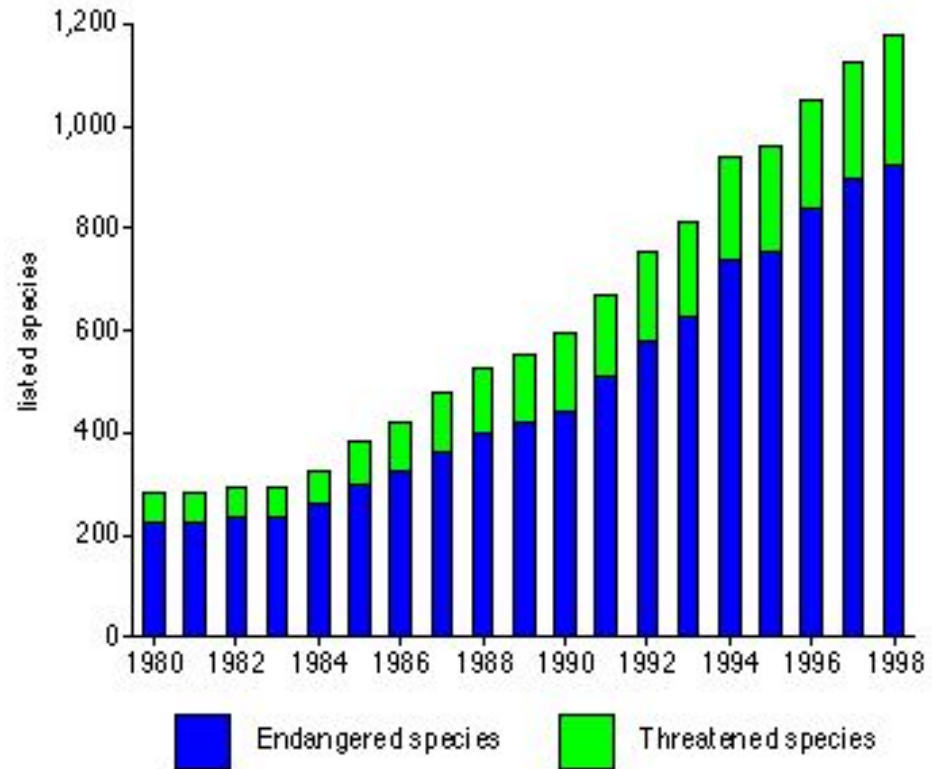


Non-human primates recently protected by act

Endangered Species Act – the federal legislation that mandates the protection of species and their habitats which are determined to be in danger of extinction



Figure 4.2 Threatened and Endangered U.S. Plant and Animal Species, 1980-1998



Source: U.S. Department of the Interior, Fish and Wildlife Service, Endangered Species Bulletin (DOI, FWS, Washington, DC, bimonthly) and Internet accessible "Box Score" from the Threatened and Endangered Species System (TESS).

Note: Data are year-end cumulative totals. There are 1,821 total U.S. listings. A listing is an E or a T in the status column of 50 CFR 17.11 or 17.12 (The Lists of Endangered and Threatened Wildlife and Plants).

On thin ice

The U.S. Interior Department has announced it will protect the polar bear as a threatened species because of the decline in Arctic sea ice due to global warming.

Arctic giant

Polar bears are the largest member of the bear family and live only in the Northern Hemisphere

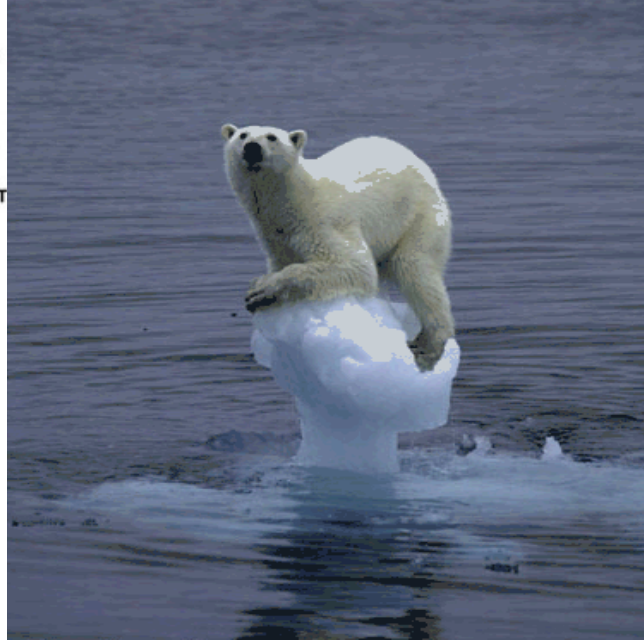
- Diet** Carnivore; mainly seals
- Lifespan** 25-30 years
- Height** 5 ft. (1.5 m)
- Standing height** 8-11 ft. (2.4-3.4 m)
- Weight** 880-990 lb. (399-449 kg)



□ Polar bear range

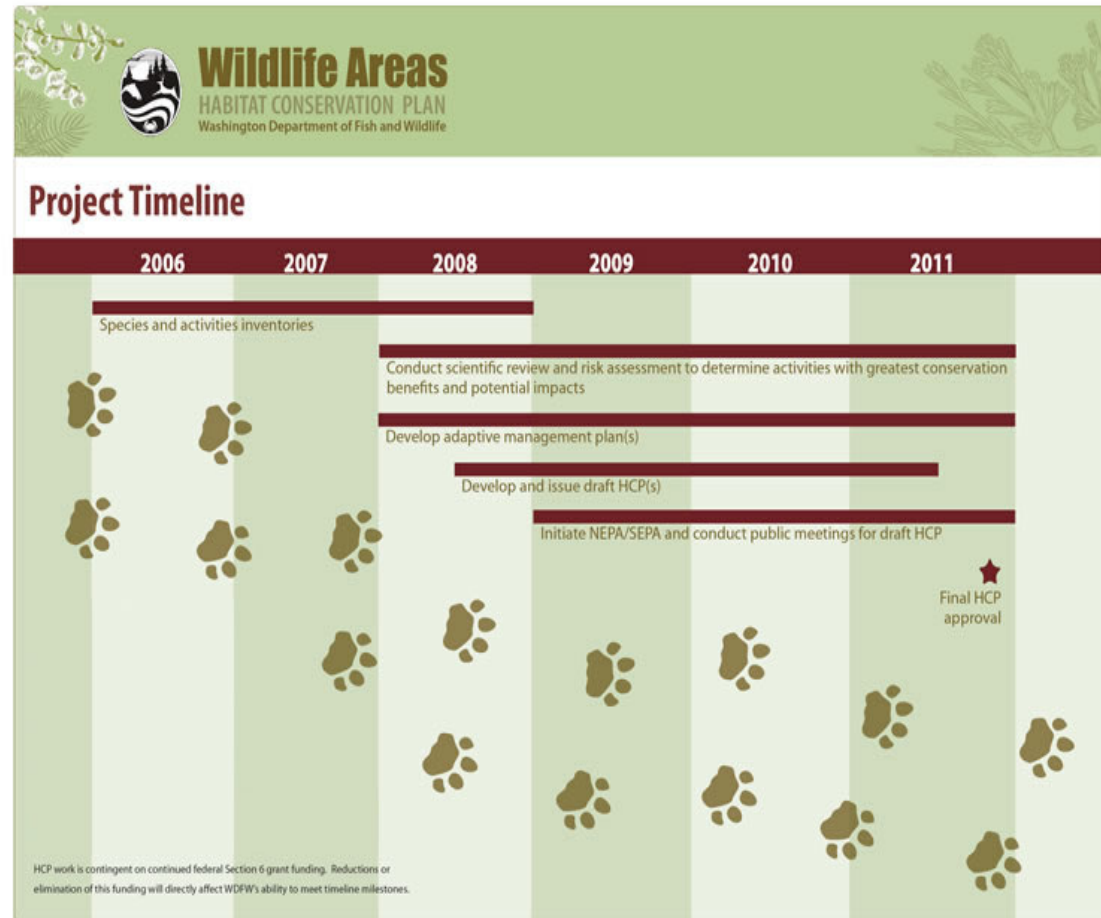


- Approximately 20,000-25,000 polar bears worldwide; some areas have shown a 22 percent decrease in population
- Polar bears are strong swimmers and use large, slightly-webbed front paws; known to swim more than 100 miles (160 km) from land



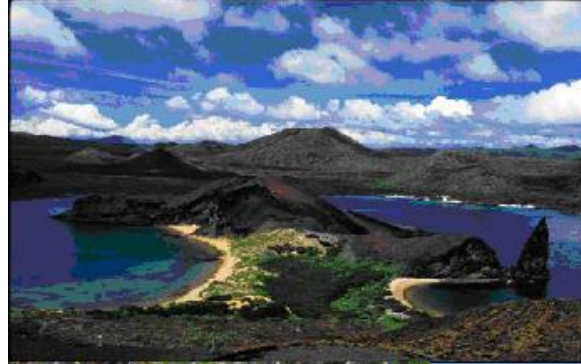
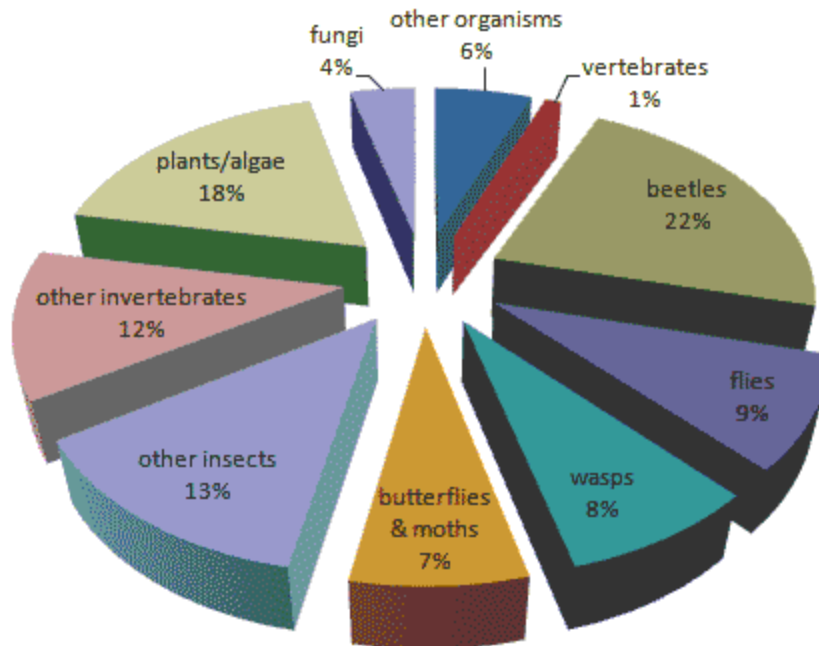
Source: National Geographic, U.S. Fish and Wildlife Service, World Wildlife Fund
Graphic: Melina Yingling © 2008 MCT

Habitat Conservation Plan – amendment to the ESA, a plan drafted by the US Fish and Wildlife Service in working with landowners to help mitigate conflicts. Landowners set aside small amounts of land to protect endangered species



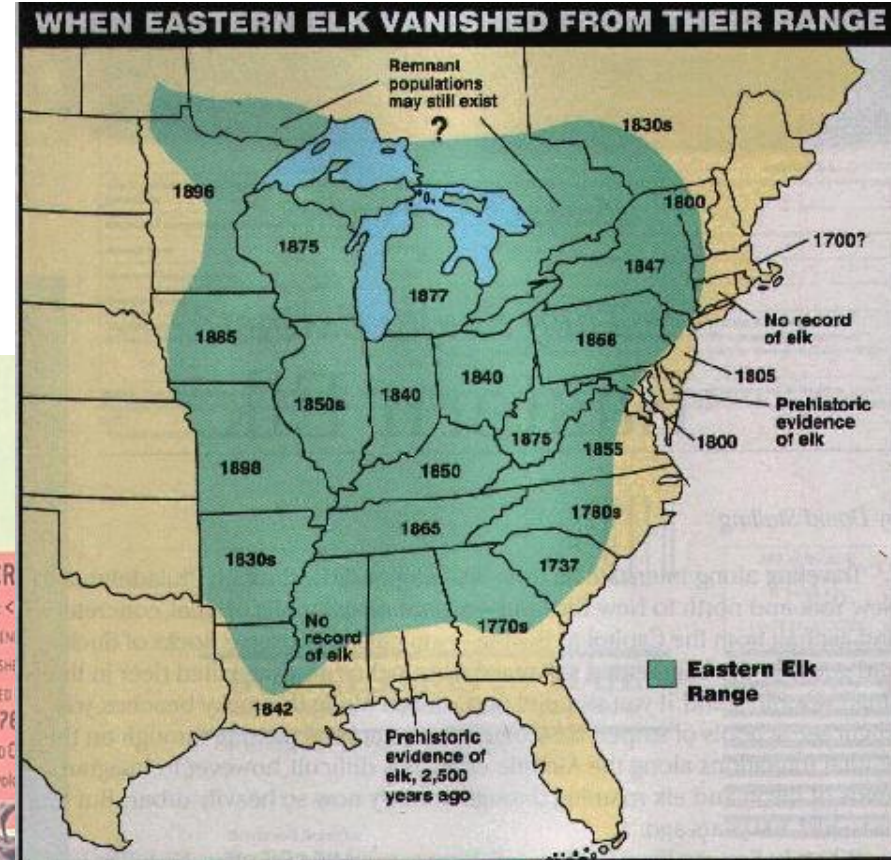
Biodiversity – The diversity of living things found in the natural world. The concept usually refers to the different species, but also includes ecosystems and the genetic diversity within a given species

RELATIVE NUMBERS OF NAMED SPECIES



The Decline of Biodiversity

At least 500 species native to the United States are known to have become extinct since early days of colonization



Mass Extinctions Past—and Present?

TIMELINE OF EXTINCTION marks the five most widespread die-offs in the fossil history of life on Earth.

END ORDOVICIAN
 DURATION: 10 million years (my)
 MARINE GENERA OBSERVED EXTINGUISHED: 60%
 CALCULATED MARINE SPECIES EXTINCT: 85%
 SUSPECTED CAUSE: Dramatic fluctuations in sea level



LATE DEVONIAN
 DURATION: <3 my
 MARINE GENERA OBSERVED EXTINGUISHED: 57%
 CALCULATED MARINE SPECIES EXTINCT: 83%
 SUSPECTED CAUSES: Impact, global cooling, loss of oxygen in oceans



END PERMIAN
 DURATION: Unknown
 MARINE GENERA OBSERVED EXTINGUISHED: 82%
 CALCULATED MARINE SPECIES EXTINCT: 95%
 SUSPECTED CAUSES: Dramatic fluctuations in climate or sea level; asteroid or comet impacts; severe volcanic activity



END TRIASSIC
 DURATION: 3 to 4 my
 MARINE GENERA OBSERVED EXTINGUISHED: 53%
 CALCULATED MARINE SPECIES EXTINCT: 80%
 SUSPECTED CAUSES: Severe volcanism; global warming



END CRETACEOUS
 DURATION: <1 my
 MARINE GENERA OBSERVED EXTINGUISHED: 26%
 CALCULATED MARINE SPECIES EXTINCT: 76%
 SUSPECTED CAUSES: Severe volcanic activity; asteroid impact



Loss of Biodiversity

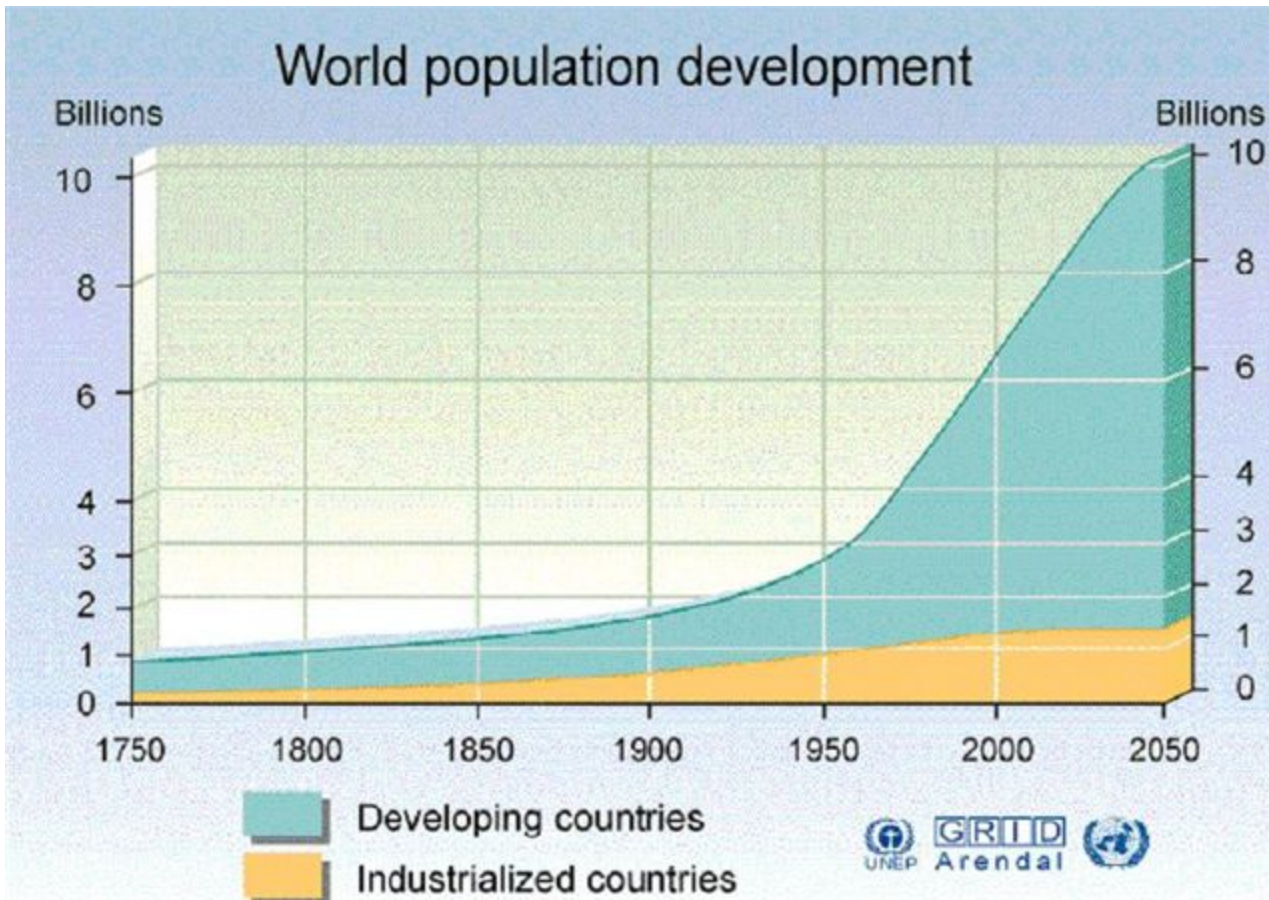
Physical Alteration of Habitats

Habitat destruction has been responsible for 36% of known extinctions

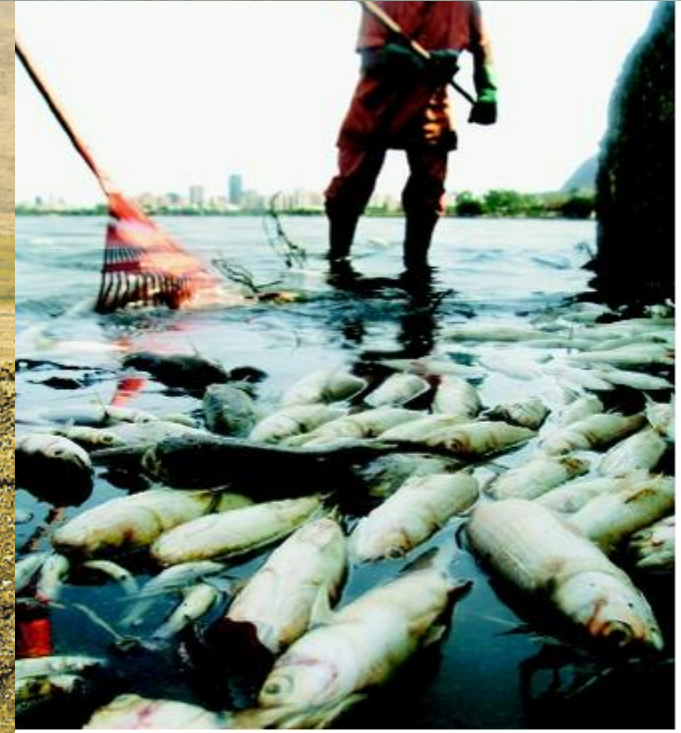


Figure 9

The Population Factor – continuing human population growth will bring on continued alteration of natural ecosystems and the inevitable loss of more wild species



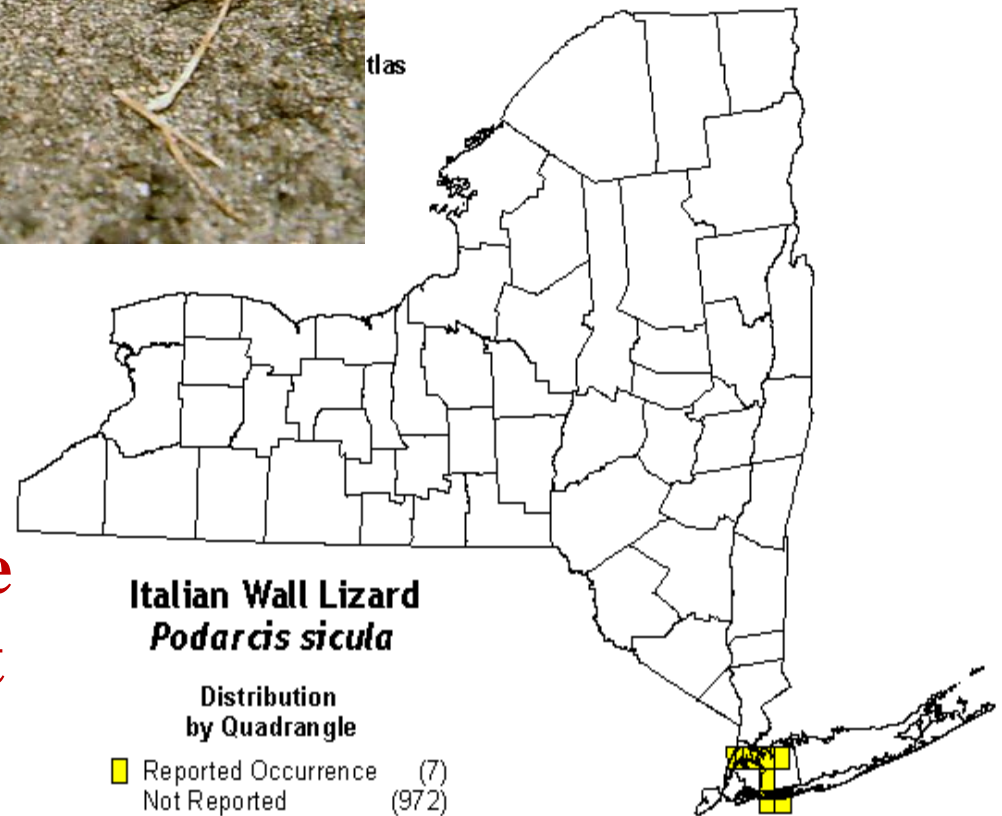
Pollution- can directly kill many kinds of plants and animals, seriously reducing their populations





Exotic Species

**Introduced to an area.
Many non-native species
cannot establish a viable
population although some
thrive in their new habitat**



Introduced plants can be aggressive, destroying native plants, many that are valuable to wildlife



Introduced species:

- Create competition with native species
- Dine on Native species
- Often have no natural predators
- Spread disease to native species

Number of exotic species in US

Plants	3723
Terrestrial vertebrates	142 + 51 within US
Insects and arachnids	>2000
Fishes	75 + 203 within US
Mollusks (nonmarine)	91
Plant pathogens	239
TOTAL	>6271



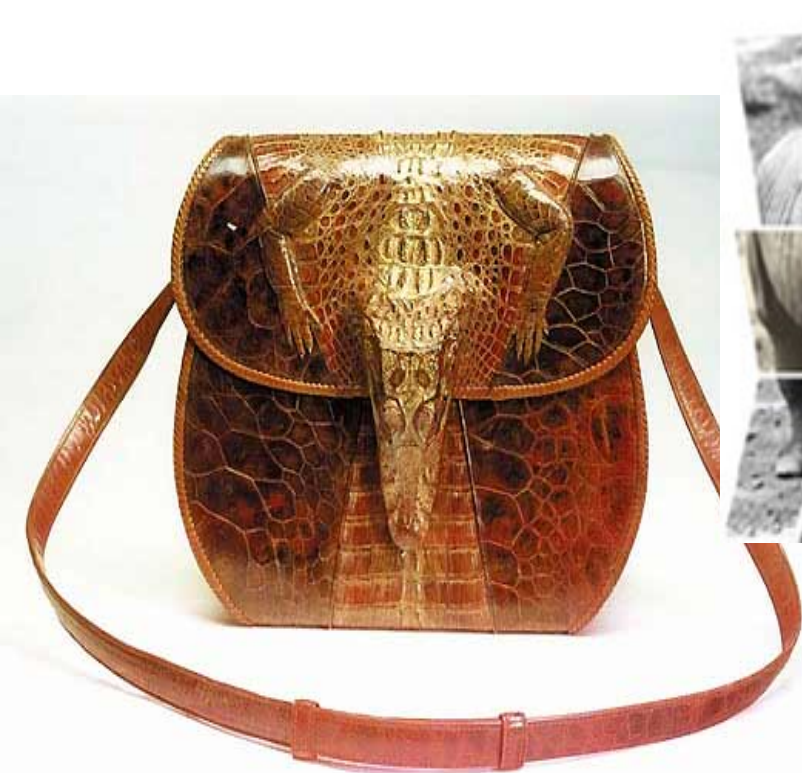
Overuse

Killing whales, trees, or fish faster than they can reproduce will lead to extinction

Trafficking of wildlife and products considered luxury items

Killing animals for 'medicinal' properties

Growing fad for exotic pets and plants

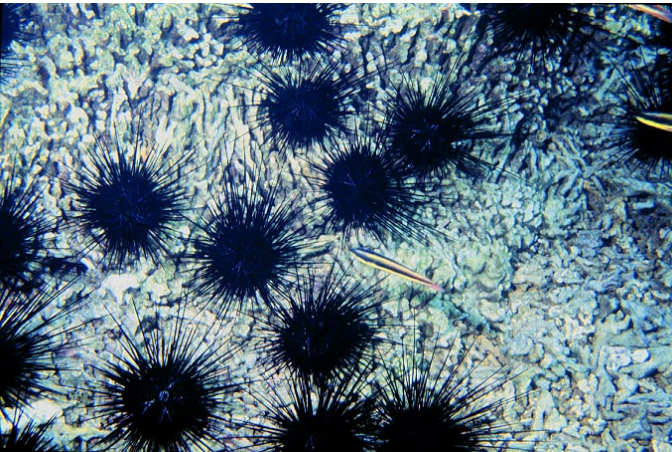


how 100 million sharks
die per year by humans

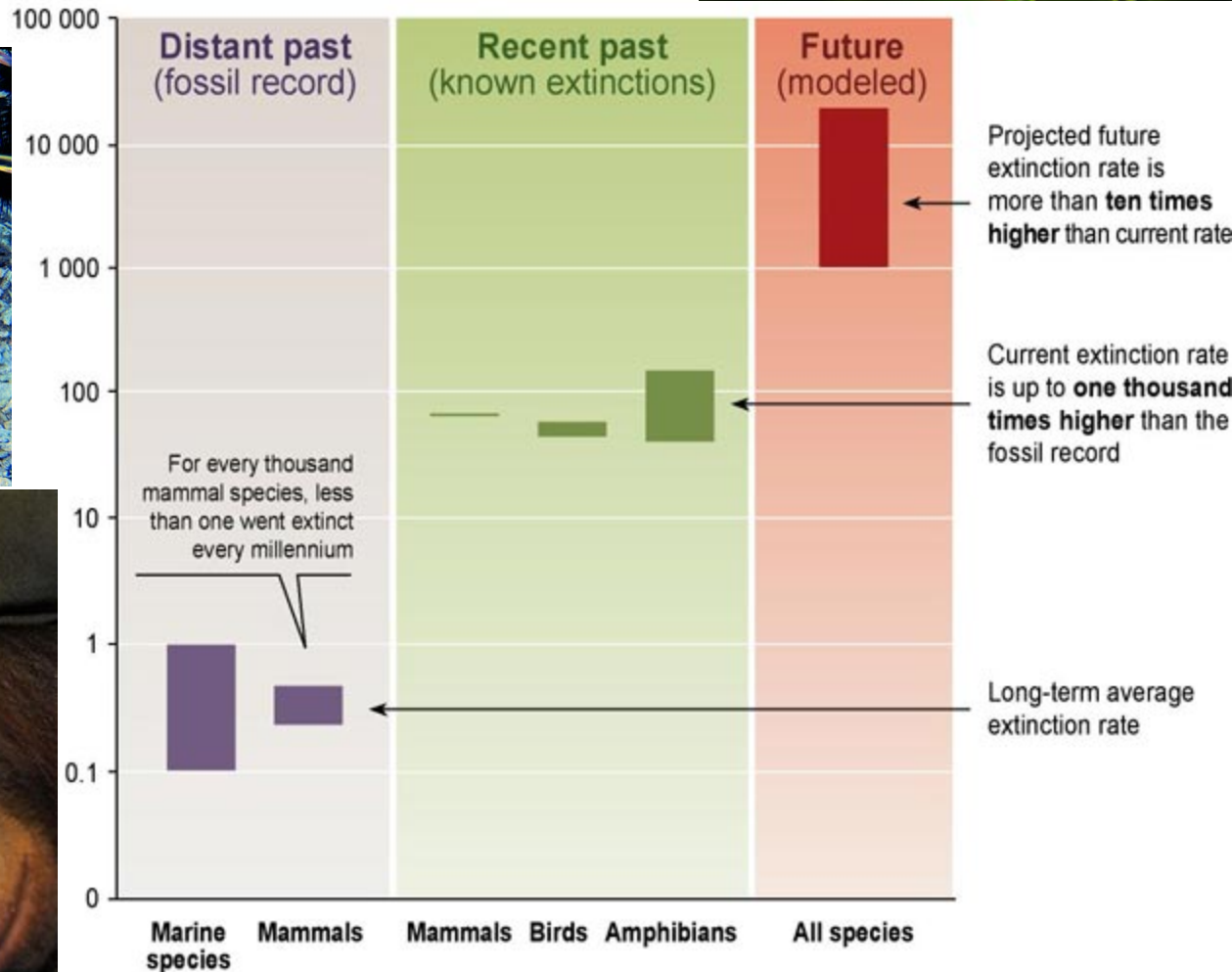
**Stop
Shark
Finning
Don't Eat
Fin Soup!**

Consequences of Losing Biodiversity

Can ecosystems lose some species and still remain productive?

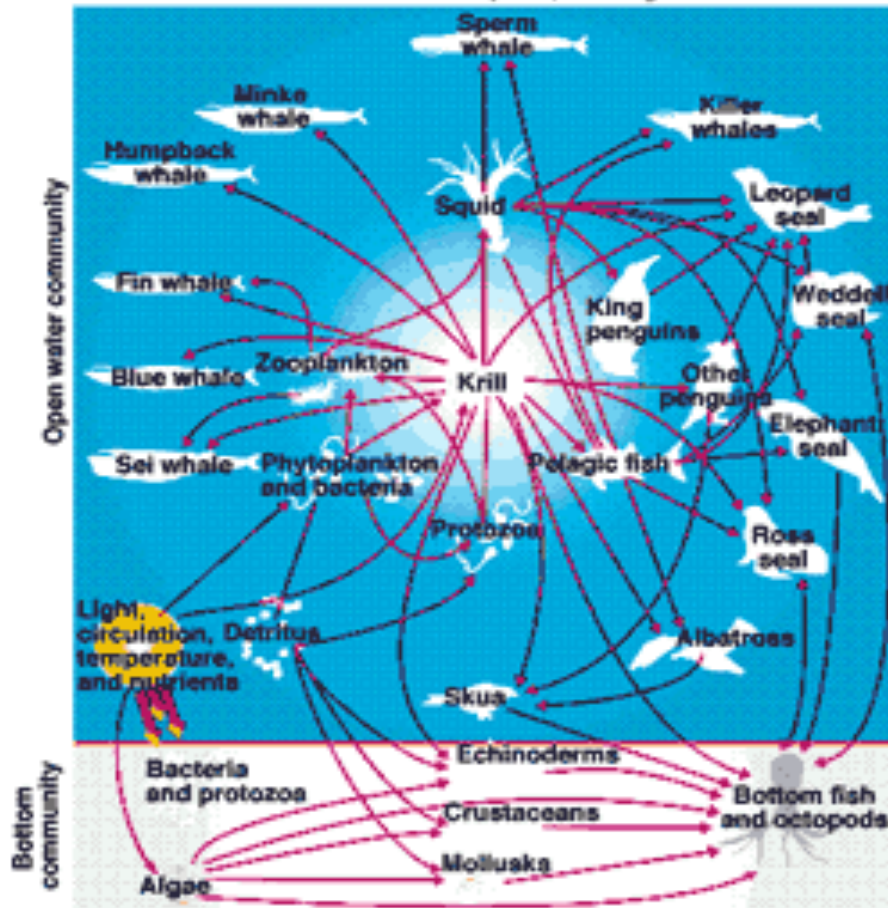


Extinctions per thousand species per millennium



Keystone Species – species whose role is absolutely vital for the survival of many other species in an ecosystem

Cunningham/Salvo, Environmental Science: A Global Concern, 8th ed.
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Biodiversity Hot Spots -regions in which 60% of the biodiversity has been located in just 1.4% of Earth's land surface

