Biodiversity
What exactly does biodiversity mean and what does it matter?

Biodiversity is a measure of the variety of organisms present in different ecosystems.

Why does it matter?

Excellent question.
Number and percentage of species in each IUCN Red List category for all mammal species.

- Least Concern: 3,109
- Vulnerable: 505
- Near Threatened: 323
- Endangered: 448
- Critically Endangered: 188
- Extinct: 76
- Data Deficient: 836

Number shown in white, percentage illustrated with color.
Terms:

• **Ecosystem diversity**: variation in ecosystems in a particular region or location.

• **Species diversity**: the variety and abundance of different species living in an ecosystem

• **Genetic diversity**: looks within a species at the variety of genes found in a population

• **Species richness**: the number of different species in a given area or ecosystem

• **Species evenness**: the relative abundance of each species
HIPPO: the big threat to biodiversity.

H: Habitat Destruction
I: Invasive Species
P: Pollution
P: (Human) Population Growth
O: Overharvesting
INVASIVE SPECIES – A GLOBAL THREAT

The Nature of the Problem
Invasive alien species are plants, animals, fungi, viruses, and bacteria that have been introduced to habitats outside their natural range. Where they establish and spread, these species cause harm to human livelihoods, health, biodiversity and ecosystems.

Pathways and Vectors
International trade, travel and transport of goods has brought tremendous benefits to many people. It has also resulted in an increase in the spread and establishment of invasive alien species, with major negative impacts.

The Global Invasive Species Programme – a Partnership in Action
The Global Invasive Species Programme’s mission is “to conserve biodiversity and sustain human livelihood by minimizing the spread and impact of invasive alien species.” It supports the implementation of Article 8(j) of the Convention on Biological Diversity (CBD), which calls on parties to “prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats, or species.”

The goals of the Global Invasive Species Programme are to:
1. Prevent the introduction of invasive species through:
   - Promotion of international cooperation for pathways/vector management;
   - Development and dissemination of risk-assessment tools;
   - Training of relevant authorities;
   - Provision of technical support to the drafting of invasive species prevention strategies;
2. Reduce the impact of established invasive species on natural ecosystems and human livelihoods across the globe to a minimum, through:
   - Dissemination of knowledge on land management practices;
   - Provision of technical support to the drafting of invasive species management plans;
   - Development of institutional, legal and technical capacity in countries and regions;
   - Monitoring of invasive species threat to relevant sectors;
3. Create a supportive environment for improved management of invasive species, through:
   - Awareness and capacity building initiatives;
   - Exchange of information;
   - Networks of invasive species specialists and managers.

The Global Invasive Species Programme: Current and planned activities
Joint Global Work Programme
In collaboration with the Convention on Biological Diversity, the Global Invasive Species Programme is coordinating the development of a Joint Global Work Programme amongst relevant international organizations. The work Programme is intended to improve coordination, and to chart a way forward in terms of addressing identified gaps in the invasive species management framework.

Implementation of Target 10 of the Global Strategy for Plant Conservation
Target 10 envisages putting in place management plans for the top 100 invasive species affecting plants. The Global Invasive Species Programme has been facilitating consultations aimed at identifying the key invasive species, globally through regional workshops, and subsequently through regional/national workshops based on a matrix approach. Next steps will involve the assessment of existing management plans, development of generic plans as necessary, adaptation of those for local conditions, and implementation.

An assessment of the links between invasive species and poverty
While there is a growing body of information on the economic impacts of invasive species at the macro-economic level, little is known about impacts at the household and community level. The Global Invasive Species Programme has therefore initiated a study on the impacts of invasive species on livelihood strategies of the rural poor.

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Pollution

Number of dead zones

Dead zone location

0  1  2  3  4  5
Human Population Growth

Does this correlation surprise anyone? Is this the cause for all the other issues? Isn’t this the HIPPO?
Overharvesting

Species Collapses in Large Marine Ecosystems, 1950 - 2003

Collapsed taxa (%)

Species richness of LME (log scale)


Figure adapted from Worm et al. (2006) "Impacts of biodiversity loss on ocean ecosystem services." Science 314:787-790 (September 2006)
What’s all the fuss?

• How do we benefit from biodiversity?
• Biodiversity provides food and medicine
• Biodiversity builds more resilient ecosystems
• Biodiversity supports ecosystem services
• Biodiversity is beautiful
Conservation

The endangered species act was established in 1973. It represents one way we have enacted governmental action to protect our nation’s biodiversity.

Total U.S. Species is 1264. Numbers are not additive, a species often occurs in multiple states.
What are some other ways to approach conservation?

Catch limits?

Species-specific protection?

keystone species: plays an important role in the ecosystem
indicator species: limited to specific aspect of ecosystem
umbrella species: requires a large amount of land to survive
flagship species: cute and cuddly
Instead of focusing on one specific species, what about preserving entire ecosystems?