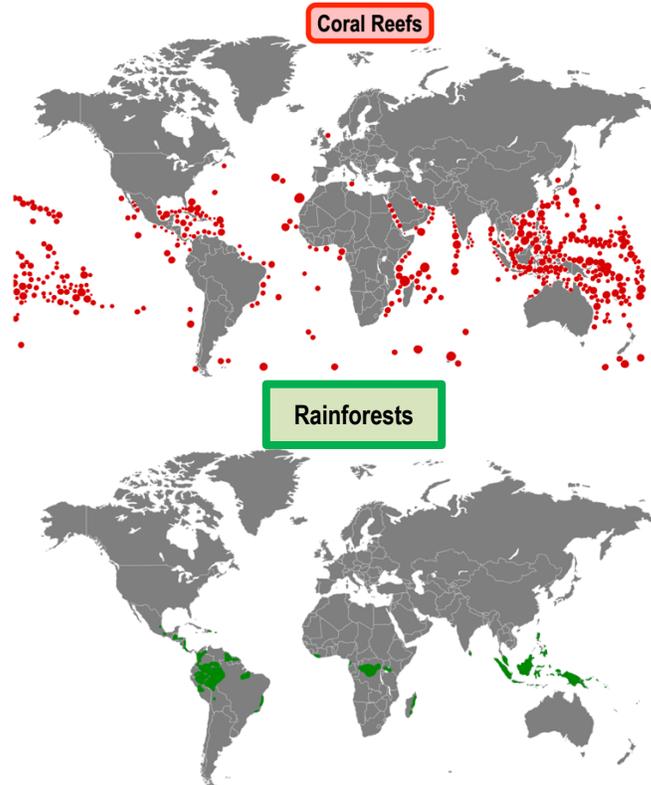


CONCEPT: CONSERVATION BIOLOGY

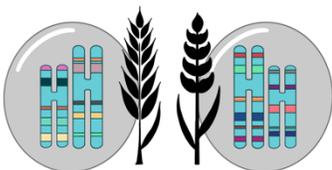
- **Conservation biology** – protecting species, habitats, and ecosystems to preserve Earth's biodiversity
- **Biodiversity** – biological diversity including variation within species, number of species, and ecosystem variety
 - Genetic diversity in a population, species diversity in an ecosystem, and community and ecosystem diversity

EXAMPLE:



- **Genetic diversity** – total genetic information contained in the individuals of a species
 - Variation between individuals within a population, and between populations
- **Species diversity** – measure of species richness, and relative abundance
 - **Species richness** – number of species present in a community
 - **Endemic species** – species unique to a specific geographic location
- **Bar coding** – taxonomic analysis that uses short genetic markers to determine if it belongs to a particular species

EXAMPLE:



CONCEPT: CONSERVATION BIOLOGY

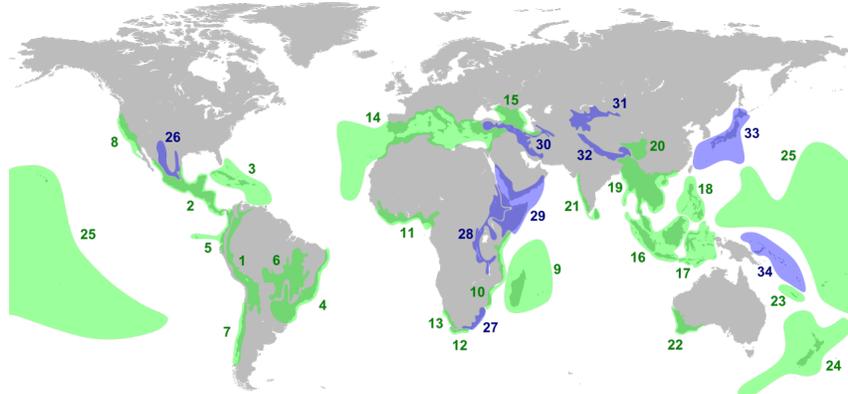
- **Ecosystem diversity** – variation in ecosystems over the planet, and variation between ecosystems in a region
 - **Ecosystem function** – biological, geochemical, and physical processes that occur in an ecosystem
- **Ecosystem services** – ways in which humans benefit from ecosystems

EXAMPLE:



- Threats to biodiversity are found at the local, regional, and global levels, and involve habitat loss, introduced species, overharvesting of natural resources, and global climate change
- **Biodiversity hotspot** – biogeographic region that is rich in biodiversity and threatened with destruction
 - Tropical rainforests are thought to contain half the world's species, and only covers <10% of Earth's land surface

EXAMPLE:



- **Endangered species** – species that is likely to become extinct
- **Threatened species** – species that are at risk of becoming endangered
- **Introduced species** – species living outside its natural range due to human activity
- **Invasive species** – exotic species that spreads in a new environment, and competes with local flora and fauna

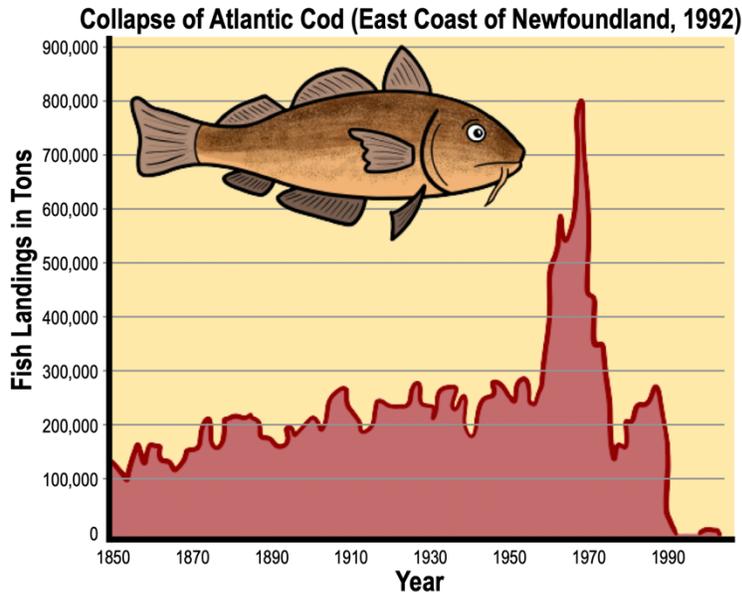
EXAMPLE:



CONCEPT: CONSERVATION BIOLOGY

- **Overexploitation** (overharvesting) – harvesting a renewable resource to the point of diminishing returns
 - Majority of harvestable species in marine ecosystems are considered overexploited

EXAMPLE:



- **Habitat destruction** – habitats are rendered unable to support the species present
 - Humans cause vast amount of habitat destruction
 - Deforestation removes primary forests, reducing biodiversity, globally one of the most destructive practices
 - Tropical rainforests are particularly vulnerable to deforestation, nearly 1/2 could disappear in your lifetime
- **Habitat degradation** – reducing the quality of a habitat
 - **Habitat fragmentation** – fragmenting a contiguous habitat into smaller, more isolated pockets
 - Can force populations into metapopulations; smaller populations are at greater risk of extinction
 - **Edge effects** – changes in population or community that occur at the boundary between two habitats
 - Habitat fragmentation pronounces edge effects

EXAMPLE:



CONCEPT: CONSERVATION BIOLOGY

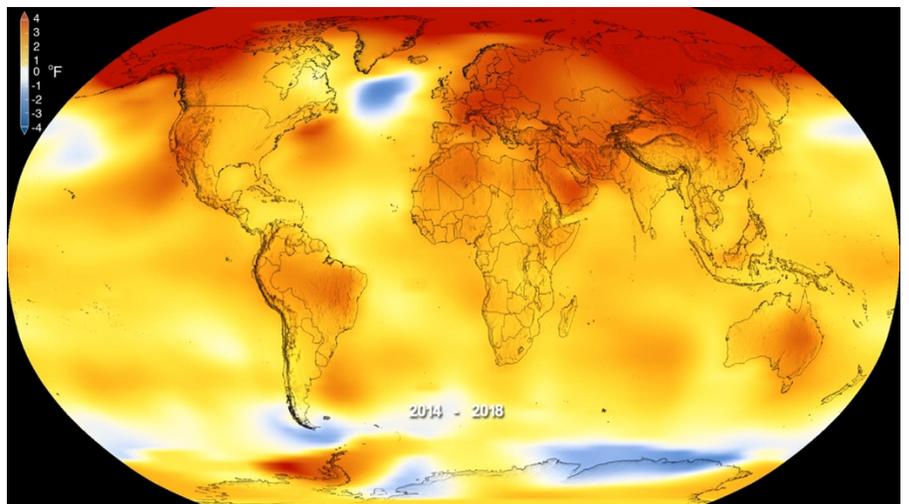
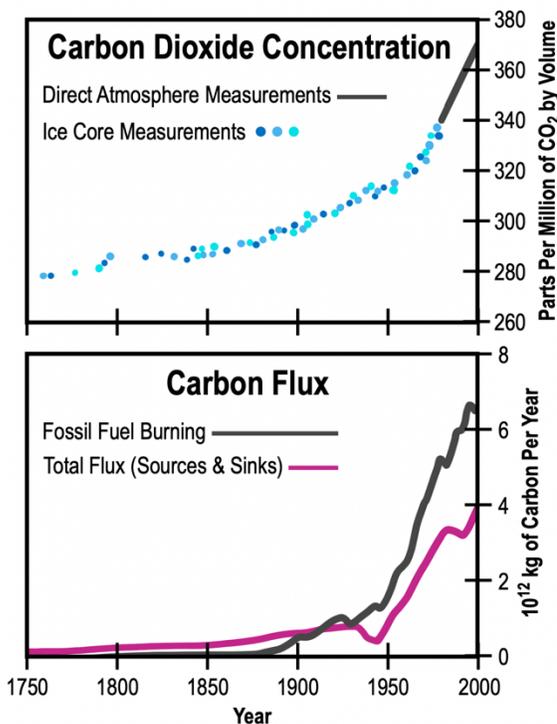
- **Pollution** – introduction of contaminants into the natural environment
 - Critical load of nutrients – amount that can be absorbed without damage to the ecosystem
 - **Biological magnification** - molecules that accumulate in biomass, concentrate at higher levels of the food web

EXAMPLE:



- **Climate change** – long-term change in the statistical distribution of weather patterns
 - **Global warming** – long-term rise in global temperatures of Earth's climate
 - **Greenhouse gases** – gases in the atmosphere that absorb and emit thermal radiation
- Depletion of ozone in atmosphere allows more UVB light to pass through; separate from climate change/global warming

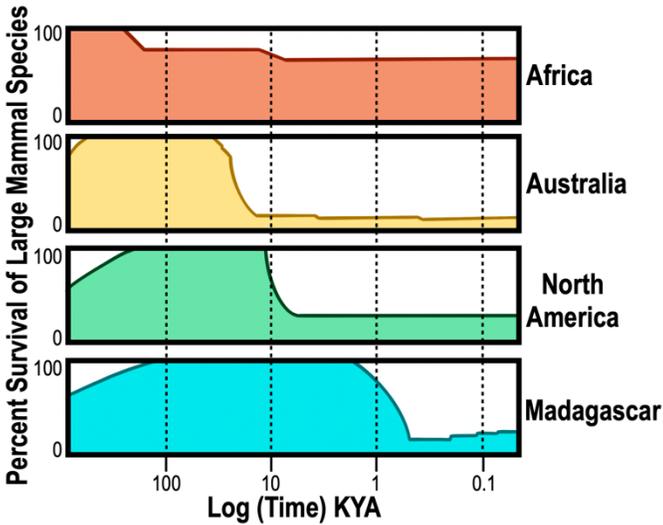
EXAMPLE:



CONCEPT: CONSERVATION BIOLOGY

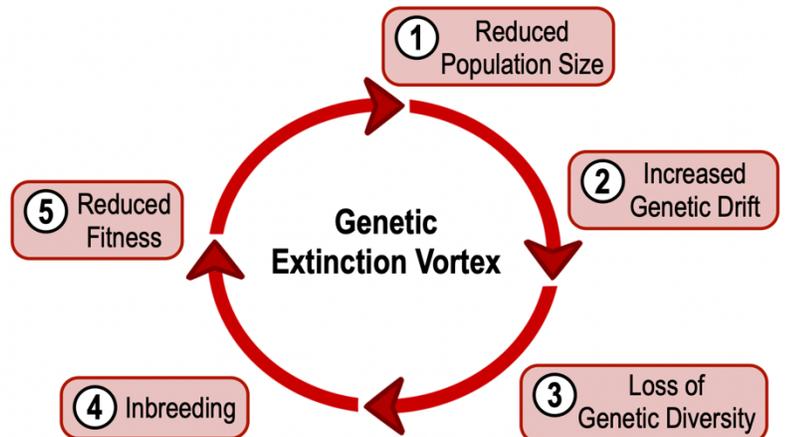
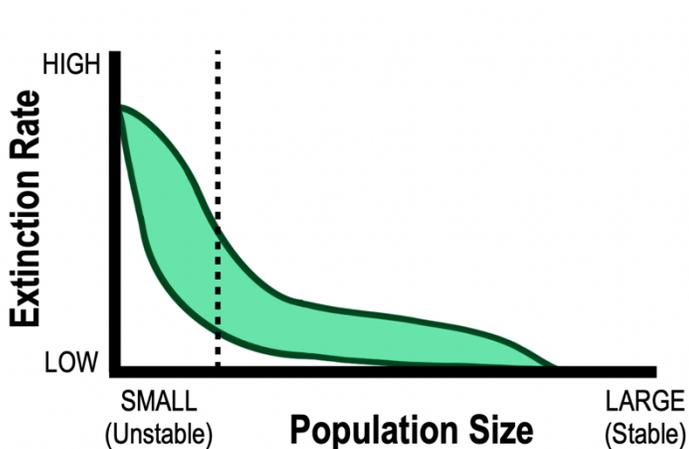
- **Mass extinctions** – widespread rapid decrease in Earth’s biodiversity, five are thought to have occurred in the past
 - We are in the midst of the sixth mass extinction (Holocene extinction) mainly due to human activity

EXAMPLE:



- **Extinction vortex** – downward spiral of smaller, and smaller population size
 - Small populations are vulnerable to inbreeding and genetic drift, which can lead to an extinction vortex
- **Minimum viable population** – smallest population size that can exist without facing extinction
- **Effective population size** – number of members of a population that will contribute offspring to the next generation
- Species-area relationships can help determine biodiversity loss and extinction rates based on species-area curves

EXAMPLE:



CONCEPT: CONSERVATION BIOLOGY

- Biodiversity increases productivity in many different ways, and helps prevent extinction
 - Increases the efficiency of resource use, more species to take advantage of every possible resource and niche
 - Greater net resource use leads to greater net production of biomass
 - **Facilitation** – presence of certain species allows other species to grow and thrive
 - **Resistance** – degree to which a community is affected by a disturbance
 - **Resilience** – rate at which a community recovers from a disturbance

EXAMPLE:



- **Sustainability** – property of biological systems that allows them to remain productive and diverse
 - Sustainable practices by humans require using resources only at the rate at which they can be replaced
- Seed banks – long-term seed storage in order to preserve genetic diversity of plants
- Ex situ conservation – preservation of endangered species outside their natural habitat
- Nature reserve – protected area of biological importance
 - Zoned reserve – large region mostly undisturbed by humans
- Wildlife movement corridor – connects habitats separated by human activity, connected populations to increase diversity
- Assisted migration – deliberately moving plants or animals to a different habitat

EXAMPLE:

