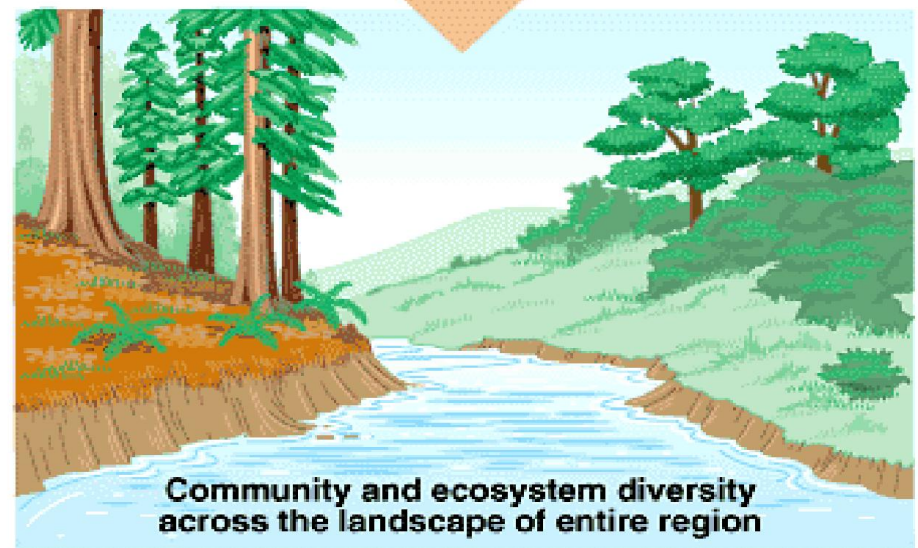
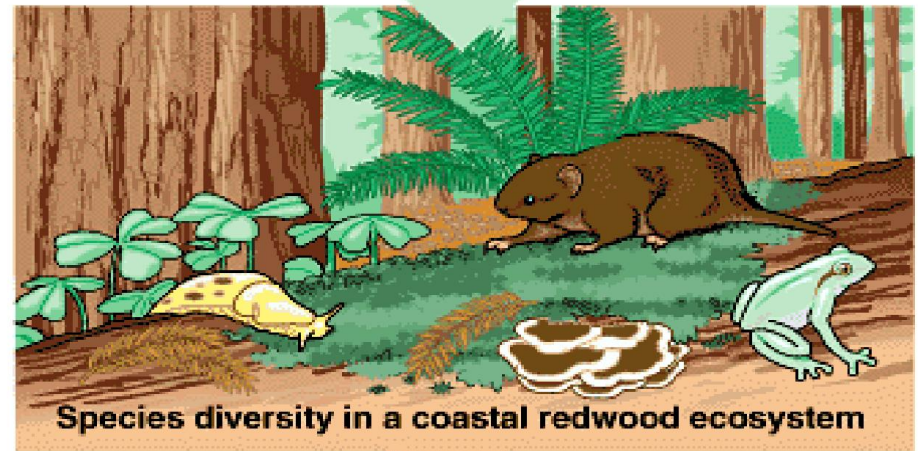
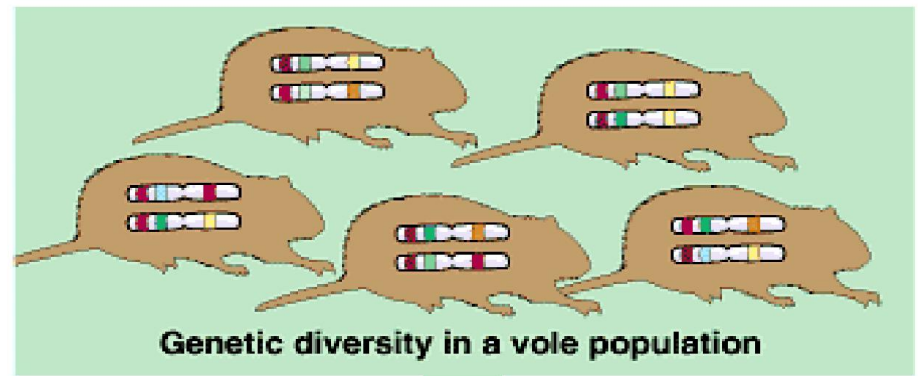


Sustaining Biodiversity

Biodiversity

- The number and variety of species in an ecosystem.
- A healthy ecosystem includes a wide variety of species.
- There are now an estimated 13 million species of living organisms on Earth.

**The three
levels of
biodiversity
are
genetic,
species, and
ecosystem
diversity**



Factors that increase biodiversity

- Diverse habitat
- Nutrients, Rain, Temperature
- Survival



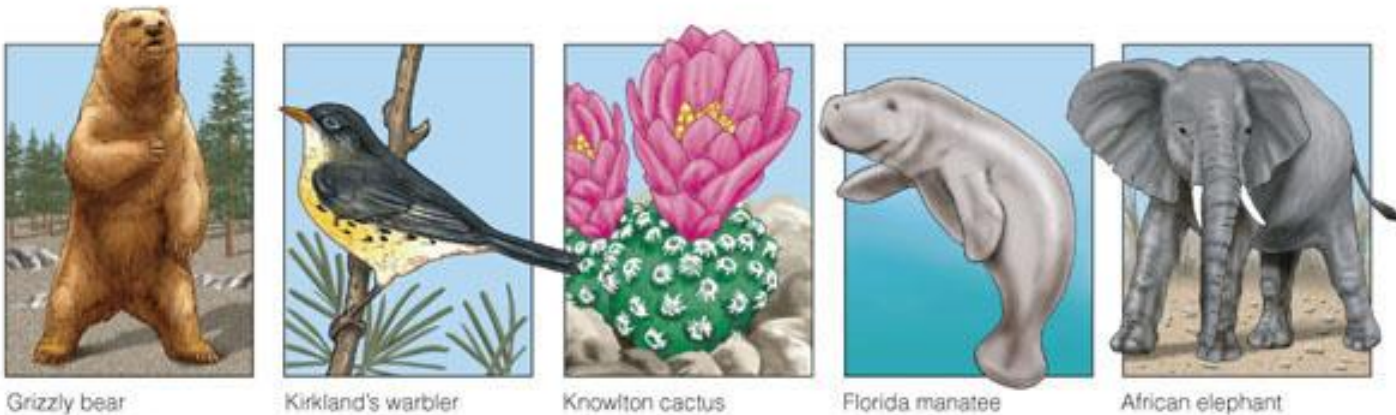
Factors that decrease biodiversity

- Environmental stress
- Limitation of nutrients or habitat
- Introduction of invasive species
- Geographic isolation



Endangered and Threatened Species:

- ***Endangered species*** - a species of animal or plant that is seriously at risk of extinction.
- ***Threatened species*** - any species which are vulnerable to endangerment in the near future.



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Figure 11-3

Global Extinction



Passenger pigeon



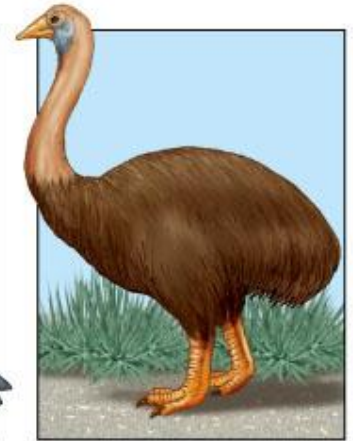
Great auk



Dodo



Dusky seaside sparrow



Aepyornis
(Madagascar)

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➤ Result from human activities.

Characteristic

Low reproductive rate
(K-strategist)

Specialized niche

Narrow distribution

Feeds at high trophic
level

Fixed migratory patterns

Rare

Commercially valuable

Large territories

Examples

Blue whale, giant panda,
rhinoceros

Blue whale, giant panda,
Everglades kite

Many island species,
elephant seal, desert pupfish

Bengal tiger, bald eagle,
grizzly bear

Blue whale, whooping crane,
sea turtles

Many island species,
African violet, some orchids

Snow leopard, tiger,
elephant, rhinoceros,
rare plants and birds

California condor, grizzly
bear, Florida panther

SPECIES EXTINCTION

➤ Some species are more prone because of what they do or where they live.

SPECIES EXTINCTION



Fish



34% (51% of freshwater species)

Mammals



25%



Reptiles



20%



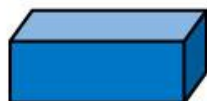
Plants



14%



Birds



12%



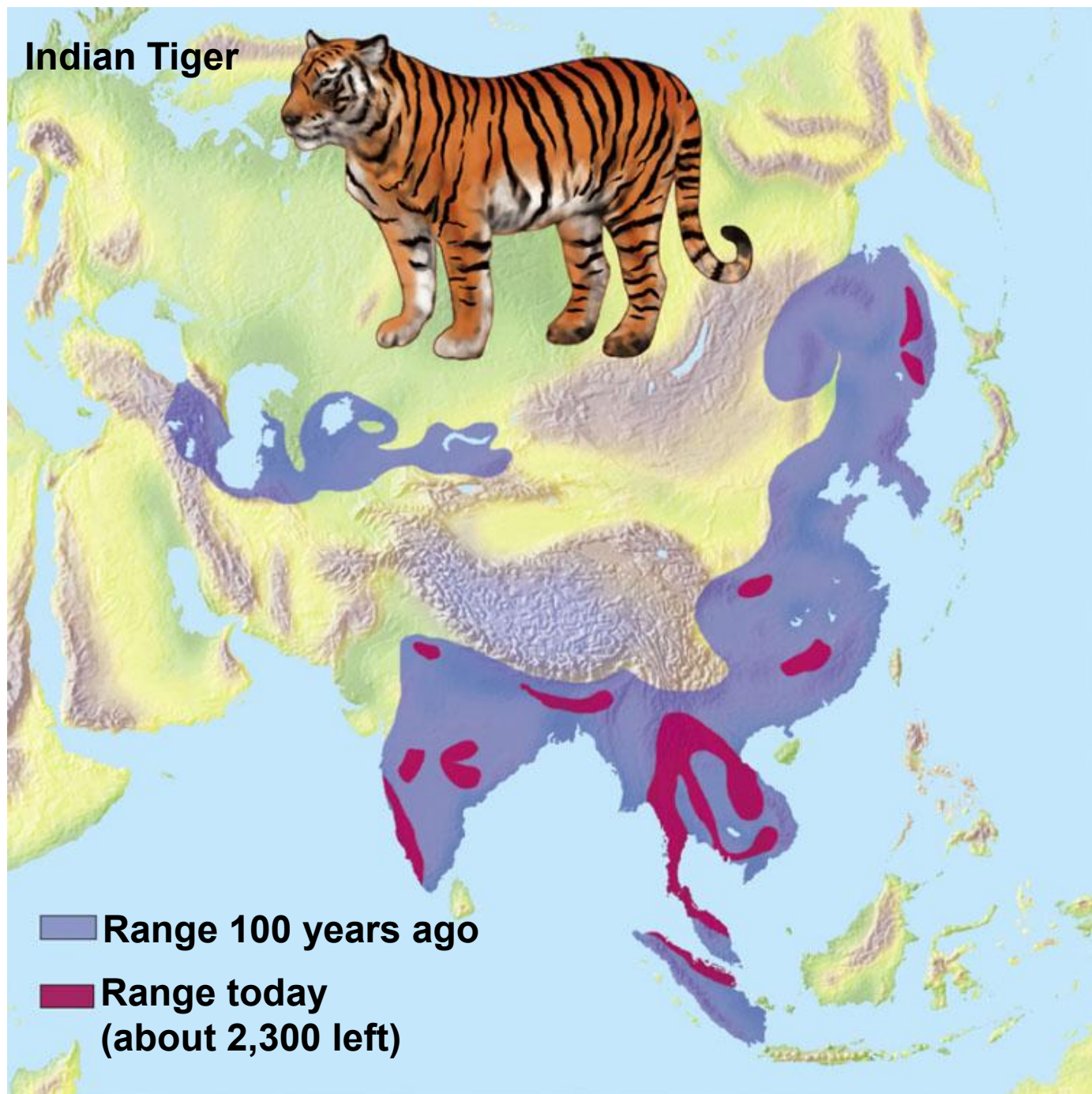
One reason to be concerned

- Many species have practical value to humans as medicines and foods.
- Quinine (used to treat malaria) comes from the cinchona plant.
- Digitalis (used to treat heart disease) comes from foxglove.
- Taxol (Potential anti-cancer drug) from the Pacific yew plant.

“HIPPO”

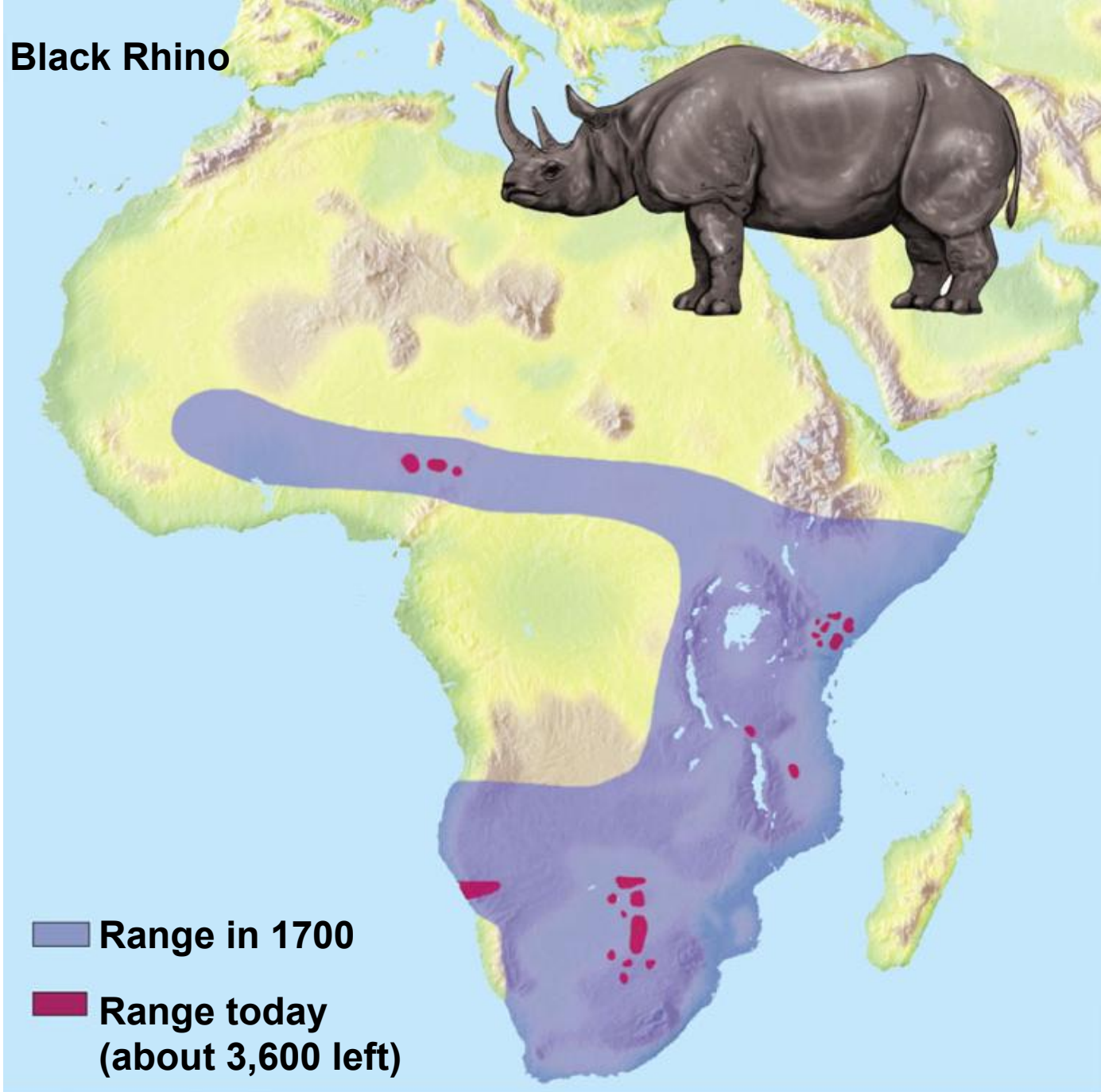
- Way to remember species extinction
 - Habitat destruction, degradation, and fragmentation
 - Invasive species
 - Population growth of humans
 - Pollution
 - Overharvest

Habitat Loss



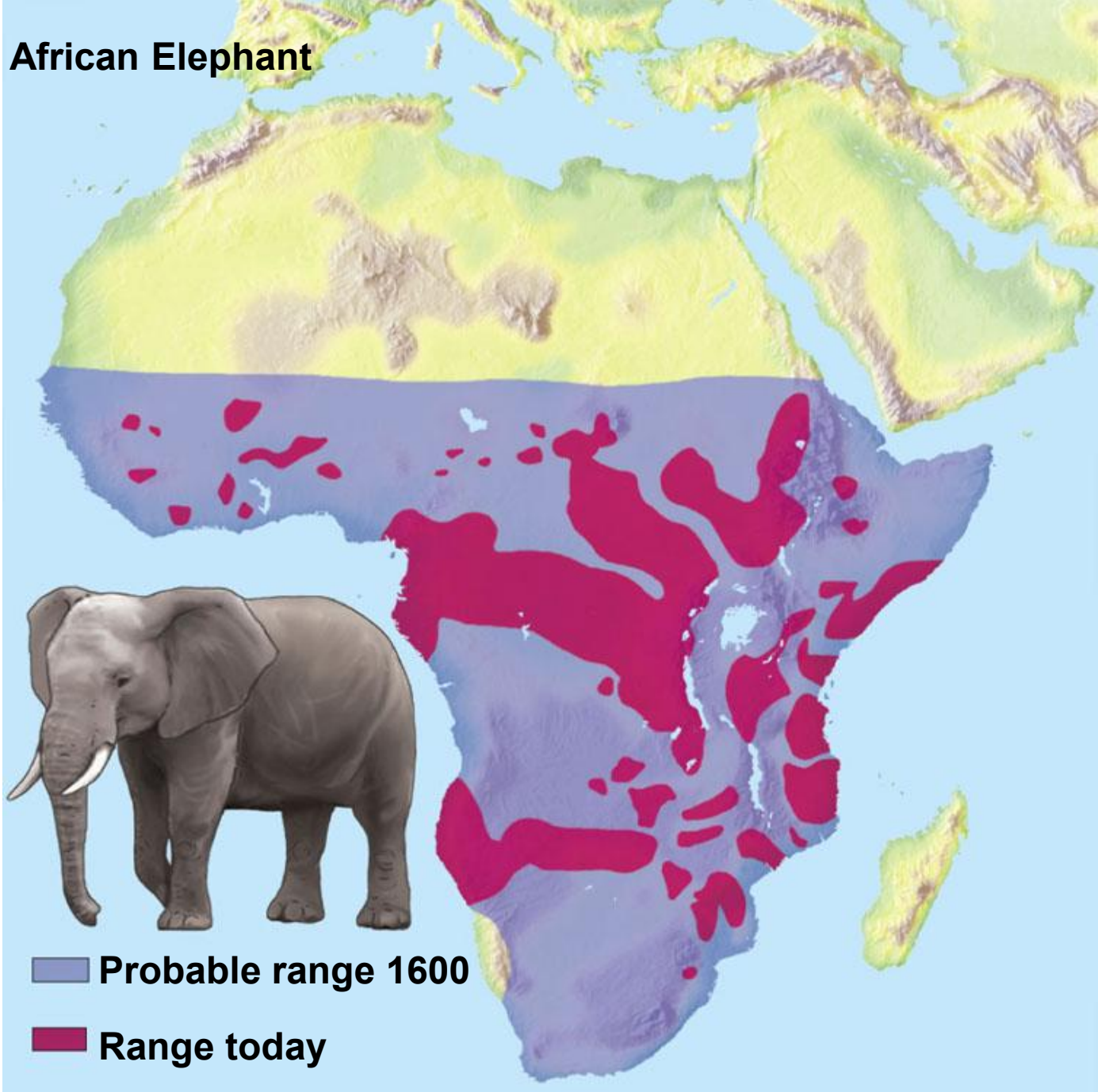
Habitat Loss

Black Rhino



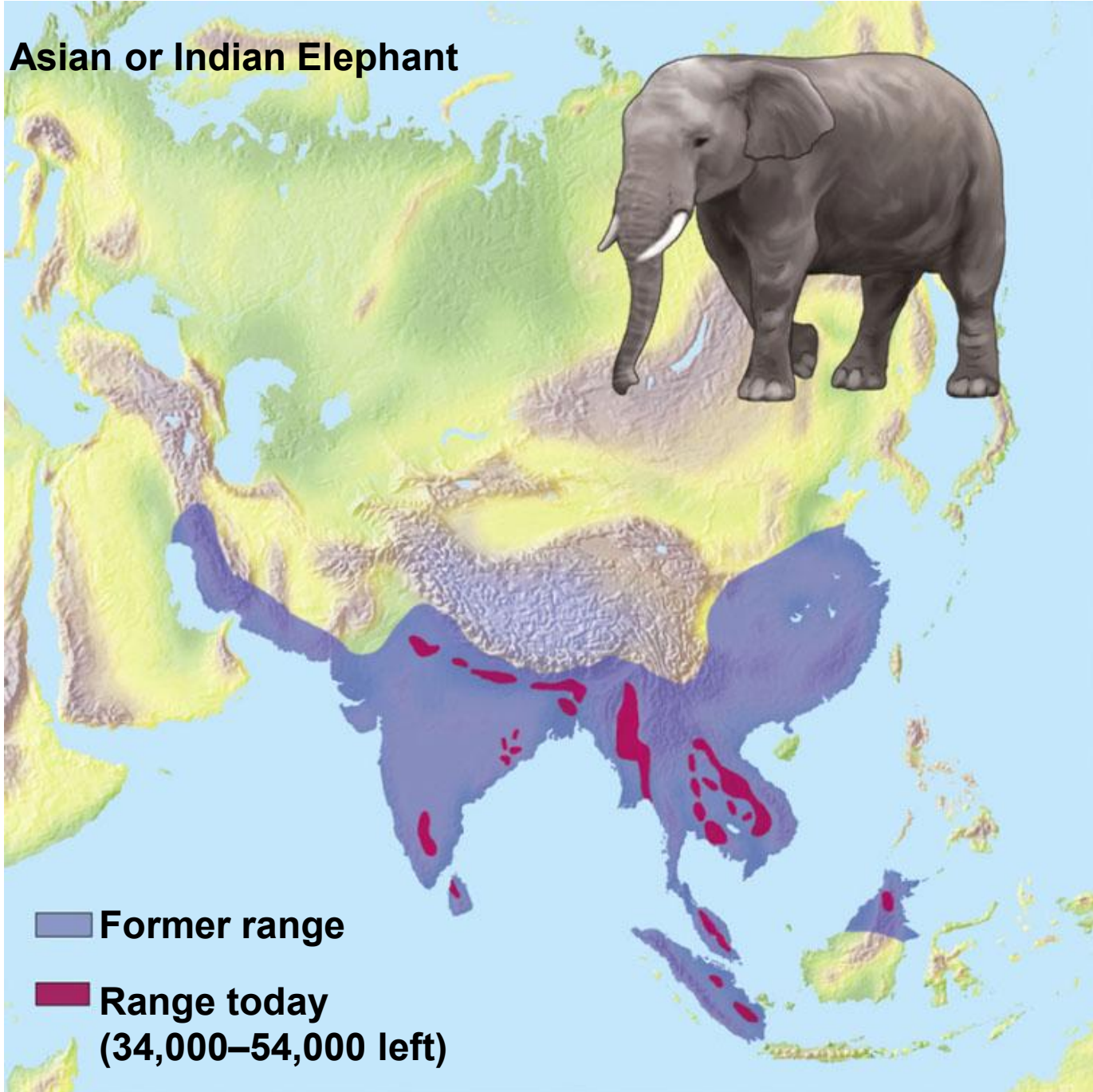
Habitat Loss

African Elephant



Habitat Loss

Asian or Indian Elephant



INVASIVE SPECIES

- An organism that is not native and has negative effects on our economy, our environment, or our health.
- Example: Kudzu vine was introduced in the southeastern U.S. to control erosion.

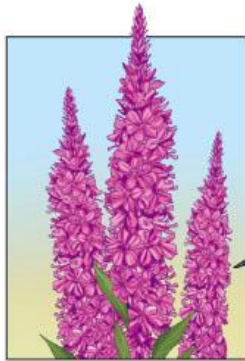


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Figure 11-A

INVASIVE SPECIES

Deliberately Introduced Species



Purple loosestrife



European starling



African honeybee
("Killer bee")



Nutria



Salt cedar
(Tamarisk)



Marine toad
(Giant toad)



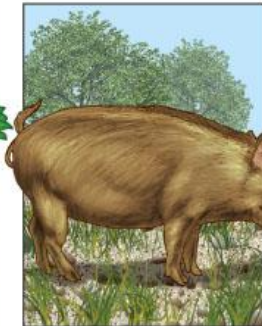
Water hyacinth



Japanese beetle



Hydrilla



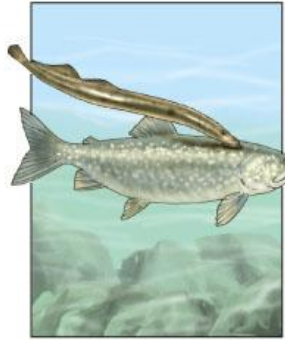
European wild boar
(Feral pig)

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➤ Some invasive species were introduced intentionally.

INVASIVE SPECIES

Accidentally Introduced Species



Sea lamprey
(attached to lake trout)



Argentina fire ant



Brown tree snake



Eurasian ruffe



Common pigeon
(Rock dove)



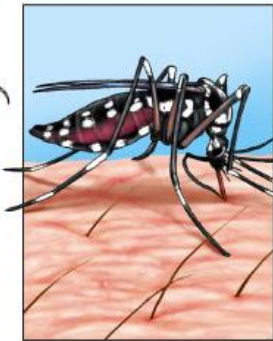
Formosan termite



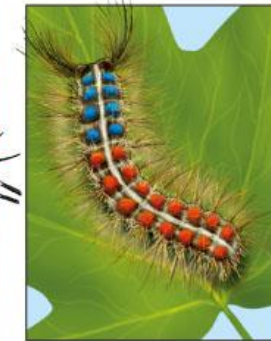
Zebra mussel



Asian long-horned beetle



Asian tiger mosquito

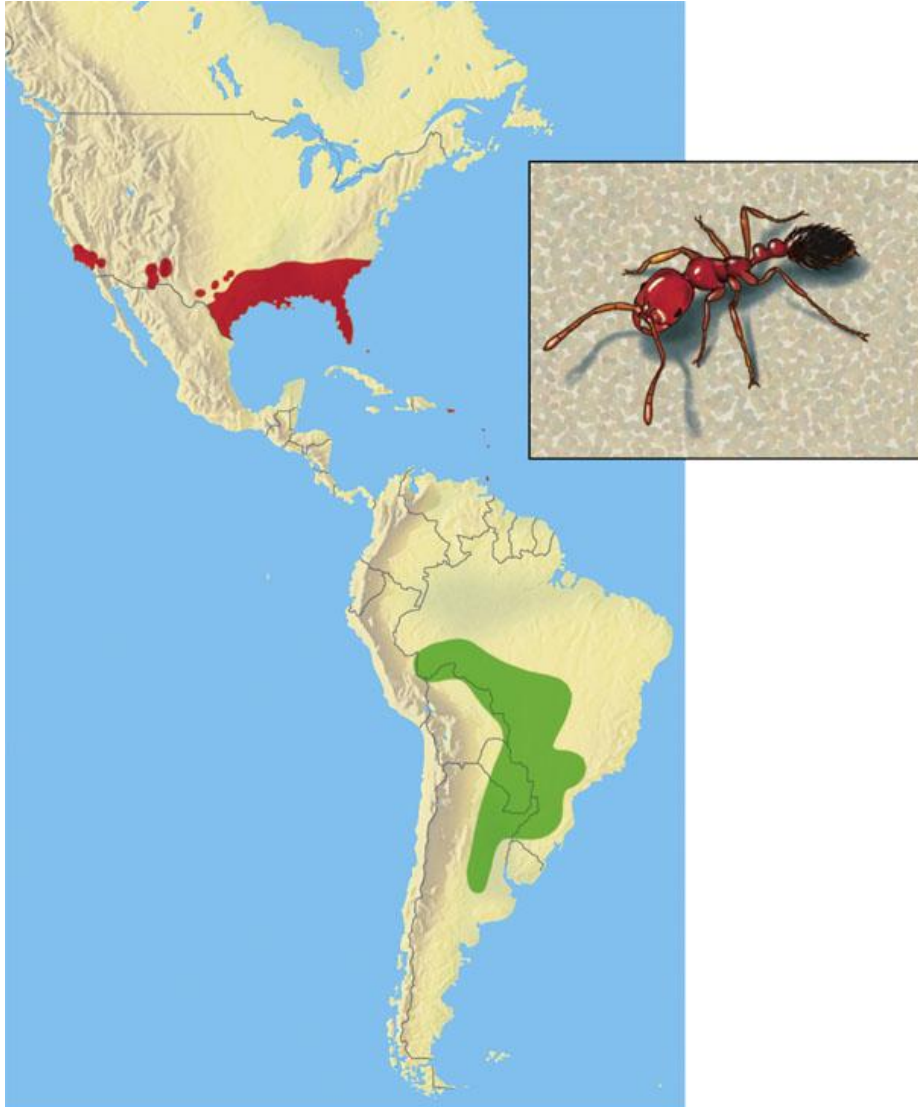


Gypsy moth larvae

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➤ But many invasive species have been introduced unintentionally.

INVASIVE SPECIES



➤ Example:
Argentina fire ant
was introduced to
Mobile, Alabama in
1932 from South
America.

- Most probably from ships.
- No natural predators.

INVASIVE SPECIES

- Prevention is the best way to reduce threats from invasive species, because once they arrive it is almost impossible to slow their spread.
- Do not spread wild plants to other areas.
- Do not dump the contents of an aquarium into waterways, wetlands, or storm drains.
- When camping use wood near your campsite instead of bringing firewood from somewhere else.

POPULATION GROWTH

- In the year 1800, there were fewer than 1 billion people on earth, and today there are over 7 billion.
- Increasing human populations have led to increasing threats to biodiversity.



POLLUTION

- The discharge of toxic synthetic chemicals and heavy metals into the environment has a huge impact on species abundance, and can lead to extinctions.
- It's important to remember that substances that are “natural” can become pollution when they are too abundant in a certain area.
- Example: nitrogen and phosphorous leading to algae blooms and dead zones

OVEREXPLOITATION

- Some protected species are killed for their valuable parts
- Killing predators and pests
- Legal and illegal trade in wildlife species used as pets or for decorative purposes



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NC Endangered Species



Flying Squirrel



Red-Cockaded
Woodpecker



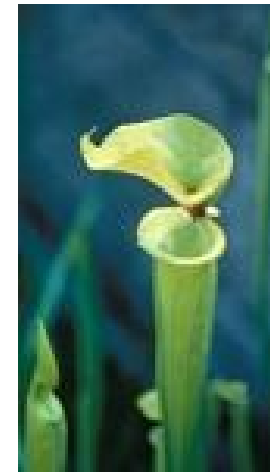
Green Turtle



Red Wolf

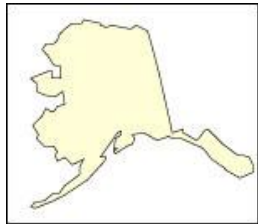


Atlantic Sturgeon



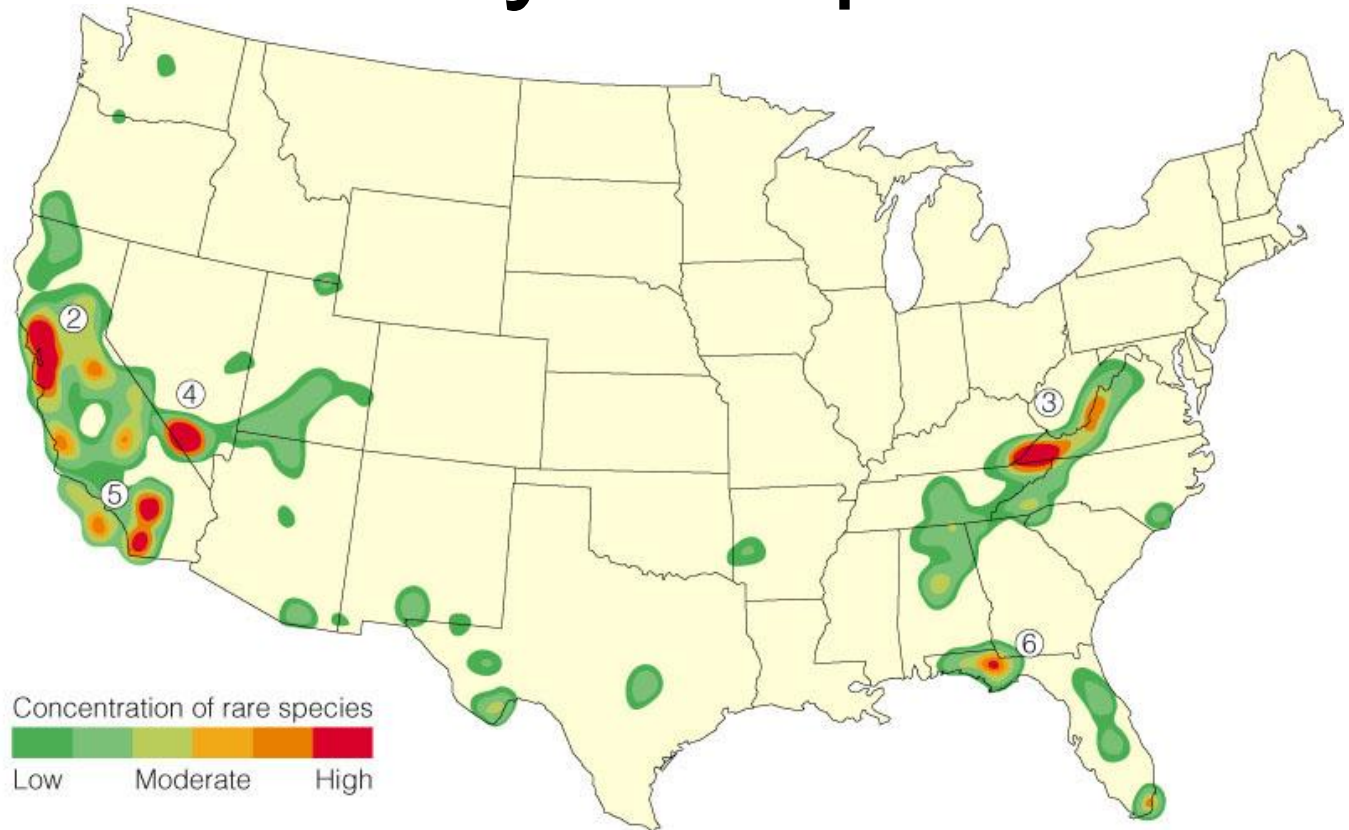
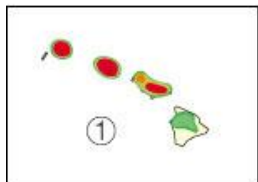
Pitcher Plant

Biodiversity Hotspots



Top Six Hot Spots

- 1 Hawaii
- 2 San Francisco Bay area
- 3 Southern Appalachians
- 4 Death Valley
- 5 Southern California
- 6 Florida Panhandle



Concentration of rare species

Low Moderate High

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➤ Biodiversity hotspots in relation to the largest concentrations of rare and potentially endangered species in the U.S.

Efforts to Help

- Endangered Species Act
- Sanctuaries
- Promoting Habitats
- Advocacy
- Purchases



Promoting Habitats

- Putting up bluebird boxes with holes too small for (nonnative) competitors in areas where trees have been cut down have helped reestablish populations.



Review Questions

- What are the 3 levels of biodiversity?
- What are factors to increase biodiversity?
- What can decrease biodiversity?
- What does HIPPO stand for?
- What are some ways to protect biodiversity?