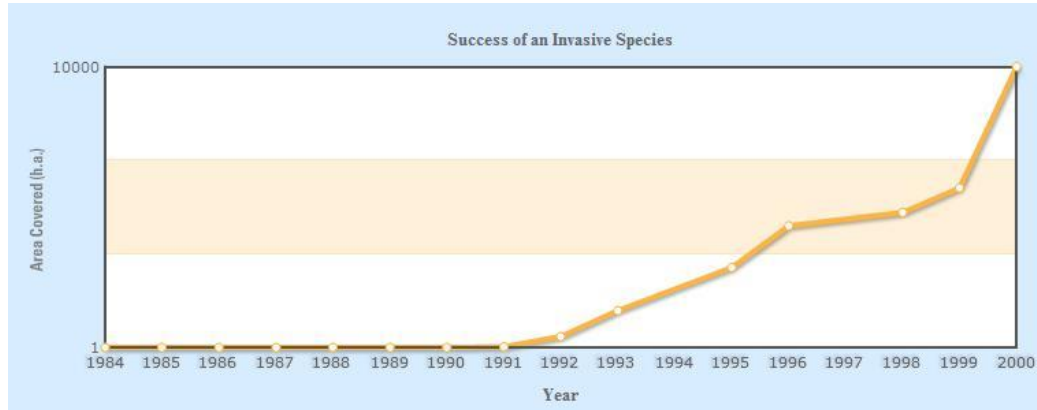


The variety of organisms, their genetic differences, and the communities and ecosystems in which they occur is termed biodiversity. Biodiversity is a measure of both the number of different species in a community (species richness) and the relative numbers of each of the species (species diversity). Some of the most diverse communities are those living in tropical rainforests.

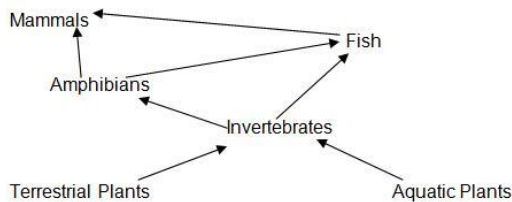
Over the last 50 years, about half of the world's tropical rainforests have been burned to make pasture and farmland or have been cut for timber. Many thousands of square miles more will be destroyed this year. The people responsible, often poor farmers, view the forest lands as a resource to be developed, much as Americans viewed North American forests a century ago. The problem is that as the rainforests disappear, so do their inhabitants. No one knows how many species are being lost. To find out, scientists carefully catalogue all of the residents of one small segment of forest and then extrapolate their data. That is, scientists use what they know to predict what they don't know. The resulting estimates vary widely, but it is clear Earth is losing many species. Some 10 percent of well-known species teeter on the brink of extinction. Worst-case estimates are that we will lose up to one-fifth of the world's species of plants and animals—about 1 million species—during the next 50 years. An extinction of this size has not occurred in at least 65 million years, since the end of the age of dinosaurs.

The tragedy of extinction is that as species disappear, so do our chances to learn about them and their possible benefits. This situation is comparable to burning a library before reading the books—we lose forever the knowledge we might have gained. Also, experiments have clearly demonstrated that an ecosystem's biodiversity and productivity are related. That is, increased species richness leads to greater productivity.

1. **Create a vocabulary burrito** with the following terms: biodiversity, introduced species, climate change, habitat fragmentation, invasive species.
2. An organism will thrive or fail when introduced into a new environment. A tropical seaweed, *Caulerpa taxifolia*, was bred in Europe for aquarium use. However, in 1984 the alga was accidentally released into the Mediterranean Sea off the coast of France. Shortly afterward the release was discovered. Researchers started tracking the seaweed to determine its success and its effects on its new environment.



- a. Describe the growth rate of *Caulerpa* from 1984 to 1990:
 - b. Describe the growth rate of *Caulerpa* from 1991 to 2000:
 - c. Has the *Caulerpa* been successful in the Mediterranean Sea off the coast of France? Explain.
 - d. What impact do you think the *Caulerpa* has had on the native algae?
 - e. What impact do you think the *Caulerpa* has had on the native plants?
 - f. What impact do you think the *Caulerpa* has had on the native animals?
3. Through the process of biomagnification certain pollutants build up at each link of a food web. The food web below is located next to a factory which makes the river heavily polluted.



At what link would the pollutant concentrations be at the highest?

- a. Amphibians
 - b. Aquatic Plants
 - c. Fish
 - d. Invertebrates
4. As an increasing amount of carbon dioxide is sent into the atmosphere by burning fossil fuels, the oceans absorb more and more of the excess carbon. Some of the carbon reacts chemically in seawater to form an acid. The more carbon the ocean takes in, the more acidic the water becomes. If the water becomes too acidic, tiny organisms that make up plankton may not be able to make protective shells. One of the areas that would be greatly affected is the Antarctic. What effect, if any, might this harm to plankton have on an Antarctic marine food web?

F. It would have no effect, because the organisms in plankton include algae, which do not have shells.

G. It would be beneficial, because consumers in the third trophic level could more easily eat zooplankton that do not have protective shells.

H. Damage to the Antarctic ecosystem would be extensive but could be repaired as new plankton drifts south to replace the plankton that died off.

I. The dying off of these tiny organisms would be disastrous, because zooplankton is a major source of food for small and large marine organisms.