

CH11 - Sustaining Aquatic Biodiversity

Human Impacts: Species Loss

- Species Loss and Endangerment
 - Many marine species are disappearing due to _____, pollution and habitat destruction and degradation
 - Freshwater species are more at risk: 33-50% are threatened with _____
 - Aquatic invertebrates and amphibians are also at great risk

Human Impacts: Habitat Loss

- Marine Habitat Loss and Degredation
 - Half of the worlds coastal _____ have disappeared since 1800
 - 70% of coral reefs could be gone by 2050 due to increasing ocean temperature, ocean acidification, sediment runoff and overfishing.
 - _____ habitats the combined size of Brazil & India are being disturbed or destroyed by trawling and dredging every year (150 times larger than annual forest clear cut)

Human Impacts: Overfishing

- Freshwater Habitat Loss and Degredation
 - 60% of the worlds large rivers are strongly or moderately fragmented by dams, diversions, or canals
- Overfishing
 - Tragedy of the _____ (Hardin, 1968)
 - _____: unintentionally caught species
 - Trawling, Drift Nets & Longlines are particularly destructive

Human Impacts: Pollution

- Nonnative Species - displacement of native species by exotic species
- Pollution
 - 80% of marine pollution comes from _____
 - Ocean Acidification as a result of CO₂ absorption

Important Examples of Freshwater Biodiversity Loss

- Florida _____ due to water diversion, development, agricultural runoff and introduced species (burmese python)
- The Great Lakes due to introduced species (zebra mussel & sea lamprey)
- Lake _____, in east Africa, due to introduced species (Nile Perch), agricultural runoff and overfishing.

Sustaining Wetlands, Lakes, and Rivers

- In order to protect and sustain waterways, several strategies may be used
 - Use comprehensive land-use planning
 - Prevent and control invasion of _____ species
 - Minimize disruption of water flow
 - Protecting and creating _____ sites

Fishing Sustainability

- Methods for using fisheries more sustainably
 - Fishery regulations: set, monitor, and enforce _____
 - Economic approaches: reduce or eliminate _____
 - Bycatch: reduce bycatch levels
 - Protected areas: establish no-fishing marine areas
- Methods for using fisheries more sustainably continued
 - Nonnative invasions: reduce invasions by exotic species
 - Consumer information: use labels that allow consumers to identify fish that have been harvested sustainably
 - Aquaculture: restrict location of fish _____ to reduce damage to coastal environments

Fisheries

- The major fisheries are concentrated in the waters overlying the continental shelves around the world. This occurs for several reasons:
 - inshore waters have much higher _____
 - shallow waters are more accessible to humans
 - _____ waters cannot sustain large fish populations
- The largest catches of fishes occur on the continental shelves of northwest Europe, western South America and Japan.

Major Commercial Species

- Among the thousands of species of marine fishes, only a very few make up the majority of catches in fisheries throughout the world.
- The herrings, sardines, and anchovies account for the largest tonnage of fishes, accounting for almost half the catch. Why?

Maximum Sustainable Yield

- The maximum sustainable yield is the largest number of fishes that can be harvested year after year without diminishing the _____. Over 80% of the world's fisheries are overexploited and the global fishing fleet is 250% larger than needed to catch what the oceans can sustainably produce.

Magnuson-Stevens

- U.S. fisheries are governed by the Magnuson-Stevens Fishery Conservation and Management Act of _____. It states that "Conservation and management measures shall prevent over fishing while delivering optimum yield from each fishery on a continuing basis. _____ is the maximum sustainable yield modified by any relevant economic, social or ecological factors."

Major Commercial Fishing Methods

Bycatch

- Another source of destruction in fisheries is the bycatch. Bycatch refers to _____ organisms and undersized target organisms that are captured by the fishing gear.
- In the shrimp industry, up to 10 pounds of bycatch are discarded for every pound of shrimp caught.

Ghost Fishing

- A largely overlooked problem that contributes to the death of huge numbers of marine organisms is lost fishing gear. Lost _____ or _____ may continue to capture in what is termed ghost fishing. As an example, in the North Pacific, some 30,000 to 40,000 km (~20,000 mi.) of nets are set per day with a daily loss rate of 20%.

Aquaculture

- Aquaculture is the rearing of selected aquatic plants and animals under controlled conditions to increase the amount of food available to humans. The term for marine aquaculture is _____. Aquaculture is an efficient and growing method for food production, but can lead to water pollution and increase in disease.
 - Fish farming involves cultivating fish in a controlled environment
 - Fish ranching involves holding _____ species (live part of their lives in fresh water and part in salt water) in captivity for the first few years, releasing them, and then harvesting them as adults.

Sustainable Seafood Choices