

Environmental Impacts of Fishing: Summary

Ecosystem Impacts

1. Fishing down the food web. (top down)

Loss of top predators results in a change in community structure.

-loss of keystone species

-surge of herbivores and scavengers

-change of habitat structure

As species are over harvested, the buffer of redundancy is lost, causing the ecosystem balance to become unstable

2. Bottom Up Effects

Removal of large quantities of small prey species leaves a hole in the trophic structure. The small schooling fish, like herring, that eat larvae and plankton and are primary prey for larger fish like cod and bass are at the base of the food web. Remove them and you have nothing left for the larger fish to eat.

Habitat Destruction

1. Trawling activities destroy hard structures and interrupt the evolution of community structure. It may also remove species necessary to colonize hard structure (which are necessary if more hard substrate returns)

2. Pollution from run-off, aquaculture, garbage, and oil leaking vessels.

3. Dredging/filling activities (scalping, beach renourishment, harbor channels) remove substrates and turn over sediment, forcing the community to start over again at stage 1. May also cover productive habitat.

4. Deforestation of Mangroves/Estuaries removes essential habitat needed for juvenile fish nurseries. Deforestation occurs generally for aquaculture, farming, or coastal sprawl.

5. Hypoxic areas (dead zones) are created when there is an over abundance of nutrients in the water, causing lethal plankton blooms that use up all the oxygen. Common from farming run-off, but can also have small hypoxic areas where loads of fish remains are dumped overboard (shucking, bycatch, inards).

Bycatch

When untargeted fish are thrown back overboard dead, it is referred to as bycatch. Bycatch can also include marine mammals, large predators, and turtles. It can also include target fish when the fishermen catch more than their trip limit. Often, marketable fish are killed as bycatch if the fisherman doesn't have the proper permits to catch the fish or if there are regulations preventing it from being landed during certain times.

Species Decline

Overfishing any one species, or overfishing the prey of a species, will cause there to be a decline in the abundance of fish. If this decline is so great that the stock collapses or becomes commercially extinct, there are impacts on the whole community.

Exotic Species from Mariculture

The introduction of exotic species can cause natural species to go extinct or change functions. When they invade, they often irreparably disrupt the community.