47.3B: Overharvesting

Overharvesting threatens biodiversity by degrading ecosystems and eliminating species of plants, animals, and other organisms.

Learning Objectives

• Explain why overharvesting is a threat to biodiversity

Key Points

• Until recently, human populations harvested resources in limited quantities. Today, new methods of harvest and capture contribute to overharvesting and overexploitation.
• Overharvesting stems from several factors, including an exponential increase in the human population, expanding markets, increasing demand, and improved access and techniques for capture.
• Overharvesting natural resources for extended periods of time depletes these resources until they cannot recover within a short period of time; some may never recover.
• Overharvesting is one of five primary activities threatening global biodiversity; others include pollution, introduced species, habitat fragmentation, and habitat destruction.
• Aquatic species are especially threatened by overharvesting, due to a situation known as the tragedy of the commons.

Key Terms

• overexploitation: Excessive and damaging use of natural resources, including plants and animals.
• **trawler**: A fishing boat that uses a dragnet, or “trawl net,” to catch fish.

• **apex predator**: An animal at the top of the food chain, preying on other species but not prey itself.

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**Overharvesting**

Overharvesting, also called overexploitation, refers to harvesting a renewable resource to the point of diminishing returns. Ecologists use the term to describe populations that are harvested at a rate that is unsustainable, given their natural rates of mortality and capacities for reproduction. The term applies to natural resources such as wild medicinal plants, grazing pastures, game animals, fish stocks, forests, and water aquifers. Sustained overharvesting can lead to the destruction of the resource, and is one of the five main activities – along with pollution, introduced species, habitat fragmentation, and habitat destruction – that threaten global biodiversity today.

All living organisms require resources to survive. Overharvesting these resources for extended periods of time can deplete natural resources to the point where they are unable to recover within a short time frame. Humans have always harvested food and other resources they have needed to survive; however, human populations, historically, were small and methods of collection limited to small quantities. Exponential increase in human population, expanding markets, and increasing demand, combined with improved access and techniques for capture, are causing the exploitation of many species beyond sustainable levels.

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**Effects of overharvesting**

As mentioned above, sustained overharvesting is one of the primary threats to biodiversity. Overharvesting can lead to resource destruction, including extinction at the population level and even extinction of whole species. Depleting the numbers or amount of certain resources can also change their quality; for example, the overharvesting of footstool palm (a wild palm tree found in Southeast Asia, the leaves of which are used for thatching and food wrapping) has resulted in its leaf size becoming smaller.

Overharvesting not only threatens the resource being harvested, but can directly impact humans as well – for example by decreasing the biodiversity necessary for medicinal resources. A significant proportion of drugs and medicines are natural products which are derived, directly or indirectly, from biological sources. However, unregulated and inappropriate harvesting could potentially lead to overexploitation, ecosystem degradation, and loss of biodiversity; further, it can negatively impact the rights of the communities and states from which the resources are taken.

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**Tragedy of the commons**

Overharvesting is a serious threat to many species, especially aquatic ones. Common resources – or resources that are shared, such as fisheries – are subject to an economic pressure known as “the tragedy of the commons,” in which essentially no harvester has a motivation to exercise restraint in harvesting from a certain area, because that area is not owned by that harvester. The natural outcome of harvesting common resources is their overexploitation.

For example, most fisheries are managed as a common resource even when the fishing territory lies within a country’s territorial waters; because of this, fishers have very little motivation to limit their harvesting, and in fact technology gives
fishers the ability to overfish. In a few fisheries, the biological growth of the resource is less than the potential growth of the profits made from fishing if that time and money were invested elsewhere. In these cases (for example, whales) economic forces will always drive toward fishing the population to extinction.

Figure 1: Cod trawler and net: Overharvesting fisheries is an especially salient problem because of a situation termed the tragedy of the commons. In this situation, fishers have no real incentive to practice restraint when harvesting fish because they do not own the fisheries.

Cascade Effects

Overexploitation of species can also result in cascade effects, particularly if a habitat loses its apex predator. Because of the loss of the top predator, a dramatic increase in their prey species can occur. In turn, the unchecked prey can then overexploit their own food resources until population numbers dwindle, possibly to the point of extinction.