NO PREP

Human Influences on Marine Ecosystems

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Name: Period: Date:

Human Influences on Marine Ecosystems

The Impact of Human Activity

Marine ecosystems provide food, oxygen, climate regulation, and cultural value. However, human influences are altering these systems at an unprecedented rate. Activities such as overfishing, pollution, coastal development, and introduction of invasive species threaten the delicate balance of the ocean. Unlike natural disturbances, human impacts are often widespread and long-lasting, leaving ecosystems less resilient to

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Habitat Destruction and Overfishing

One of the greatest human threats is habitat destruction. Coral reefs are damaged by dredging, anchoring, and destructive fishing practices. Mangroves are cut down for development, reducing nursery areas for fish. Seagrass beds are torn up by boats, decreasing habitats that stabilize coastlines. Overfishing further destabilizes marine ecosystems. Removing too many predators or herbivores disrupts food webs. For example, when shark populations decline, mid-level predators increase, consuming too many herbivorous fish. Without herbivores, algae can overgrow reefs, leading to collapse. These effects ripple through entire ecosystems, showing how human actions can magnify imbalance.

Pollution and Climate Change

Pollution also harms marine life. Plastic waste clogs waterways and is ingested by fish, turtles, and seabirds. Oil spills poison habitats, while agricultural runoff causes dead zones by fueling algal blooms that deplete oxygen. Chemical pollutants

accumulate in food webs, threatening human health through seafood consumption. Climate change compounds these problems. Rising sea temperatures lead to coral bleaching, while ocean acidification weakens shell-forming organisms like oysters and corals. Melting ice changes habitats for polar species. Human-driven climate change magnifies every stress marine ecosystems already face.

Key Information: Table: Human Impacts on Marine Ecosystems

Impact	Cause	Effect on Ecosystem
Habitat loss	Coastal development, dredging	Decline of reefs, mangroves, seagrass
Overfishing	Excessive harvest	Disrupted food webs
Invasive species	Species moved by humans	Reduced biodiversity
Pollution	Plastics, runoff, oil spills	Habitat poisoning, dead zones
Climate change	Rising CO_2, warming seas	Coral bleaching, acidification

Case Study: Lionfish Invasion in the Atlantic (Excerpt)

Invasive species represent another human-driven threat. The lionfish, native to the Indo-Pacific, was introduced to the Atlantic Ocean through the aquarium trade. With no natural predators in the region, lionfish populations exploded. They consume large numbers of juvenile fish, including commercially important species. Their voracious feeding habits reduce biodiversity, threaten fisheries, and disrupt coral reef recovery. Efforts to control lionfish include organized culling, fishing tournaments, and promoting them as a food source. While these measures help, the invasion demonstrates how easily humans can alter ecosystems by moving species outside their natural range. It also illustrates the difficulty of restoring balance once invasives are established.

1. Why are lionfish a problem in the Atlantic Ocean?

_____

_____

2. What strategies have been used to control lionfish populations?

_____

_____

Multiple Choice

1. What is one effect of overfishing?
    a) Greater biodiversity on overfished reefs
    b) Coral reef recovery
    c) Increase in mid-level predators
    d) More balanced food webs

2. Why are lionfish invasive in the Atlantic?
    a) They only eat algae and marine plants
    b) They cannot reproduce quickly
    c) They improve coral reef health
    d) They have no natural predators there

3. Which pollutant causes dead zones in marine ecosystems?
    a) Agricultural runoff
    b) Heavy metal accumulation
    c) Plastics
    d) Oil spills

Matching

Write the letter of the correct definition on the line next to each term.

Term	Definition
1. ___ Habitat loss	A) Reduced biodiversity from lionfish
2. ___ Overfishing	B) Coral bleaching, weaker shells
3. ___ Invasive species	C) Overgrowth of algae, disrupted webs
4. ___ Pollution	D) Decline of reefs and nurseries
5. ___ Climate change	E) Plastics, oil spills, and dead zones

Fill-in-the-Blank

1. When predators are removed by overfishing, _____ predators often increase.

2. Plastic waste and oil spills are examples of marine _____.

3. Rising carbon dioxide leads to ocean _____, which weakens coral skeletons.

Short Answer

Answer each question in 2-4 complete sentences.

1. Why does habitat destruction reduce biodiversity in marine ecosystems?

_____

_____

_____

2. How does climate change intensify the problems caused by pollution and overfishing?

_____

_____

_____

3. What lesson does the lionfish invasion teach us about human influence on ecosystems?