



The Big Oyster

OVERVIEW

The Big Oyster explores ongoing community-wide efforts to restore wild oysters to New York Harbor. Restoring the oysters, a keystone species, will benefit humans and many other species. The film highlights the contributions of high school students, biologists, architects, restaurateurs, and thousands of hopeful and motivated New York City citizens. Additional information can be found on [this episode's webpage](#).

KEY CONCEPTS

- Keystone species, such as oysters, perform critical functions in their ecosystems.
- Ecosystem services, ways in which humans benefit from ecosystems, are essential for human health and well-being.
- Collaboration between different people and groups is essential for effective conservation.

BACKGROUND

Oysters are filter feeders that help keep the water clean: a single oyster can filter 12.5 gallons of dirty water a day. Oysters also build giant reefs, which provide habitats for hundreds of other species and protect shorelines from erosion and flooding (by absorbing wave energy, especially during intense storms). Because of the biodiversity they support, oysters are often considered **keystone species**: species that play an “oversized” role in their environments.

However, about 85% of the world’s oyster habitats have disappeared over the last 200 years, largely due to overharvesting, disease, declining water quality, and human population growth in coastal areas. Some human activities like dredging (excavating material from the water) are particularly destructive by removing not only live oysters but also old oyster shells, which oyster larvae use to settle and grow.

The film focuses on wild eastern oysters (*Crassostrea virginica*) in New York Harbor. This area was originally one of the most productive temperate estuaries in the world, largely due to the oysters. However, as the human population grew and demand for eating oysters increased, people decimated the oyster population and destroyed the oyster reefs. This overharvesting was followed by unregulated dumping of sewage, trash, and industrial chemicals into the harbor. By the middle of the last century, the oyster reefs and much of the biodiversity they supported had disappeared.

Government regulations, such as the Clean Water Act in 1972, have since helped reduce pollution in New York Harbor. Multiple groups are also working together to restore the harbor’s oyster reefs, the biodiversity they support, and the ecosystem services they provide. People/groups highlighted in the film include:

- A teacher and students at a local public high school. They helped found the Billion Oyster Project (BOP) in 2014, which aims to restore 1 billion oysters to the harbor through education initiatives.
- Restaurateurs who donate discarded oyster shells to the BOP. These shells can be used as building blocks for restoring oyster reefs.
- A landscape architecture firm that is building a reeflike structure, augmented with living oysters from the BOP, to provide shoreline protection for Staten Island.

BIODIVERSITY THREATS

Five of the biggest threats to biodiversity are represented by the acronym **HIPPO**: **h**abitat loss, **i**nvasive species, **p**ollution, **p**opulation growth (of humans), and **o**verharvesting. The HIPPO threats shown in this film include:

- **Habitat loss:** Many species lost their habitats when the oyster reefs were destroyed.
- **Pollution:** Sewage, trash, and industrial chemicals were dumped into the harbor.
- **Population growth:** The growing New York City population exacerbated overharvesting of the oysters and pollution.
- **Overharvesting:** Oysters were overharvested from the harbor to be used as food.

DISCUSSION QUESTIONS

- (*Before the film*) Ecosystem services, ways in which humans benefit from ecosystems, are essential for human health and well-being. Examples include when bees pollinate crops or when wetlands clean water. What ecosystem services do you think are provided by oysters?
- What is a keystone species, and why are oysters an example of one?
- Create a conceptual model that illustrates how restoring oysters to New York Harbor might affect wildlife biodiversity, water quality, and the New York shoreline.
- Describe three specific species that could benefit from restoring oysters.
- Collaboration between different people and groups is essential for effective conservation. Describe some specific examples of collaboration in the film and how they have been successful.

REFERENCES

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CREDITS

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