



## The Beautiful Undammed

### OVERVIEW

*The Beautiful Undammed* follows the ecological rebirth of the Elwha River in Washington state after the removal of hydroelectric dams. The Lower Elwha Klallam Tribe, which led the effort to remove the dams, and its partners are chronicling and supporting the remarkable recovery of the Elwha River. Additional information can be found on [this episode's webpage](#).

### KEY CONCEPTS

- Keystone species, such as salmon, perform critical functions in their ecosystems.
- Human activities, such as damming, can have significant repercussions for both wild ecosystems and human communities.
- Nutrient cycling is crucial for many ecosystems — for example, the “nutrient express” where salmon bring nutrients from the ocean into rivers.
- Local, historical, and cultural knowledge play an important role in conservation efforts.

### BACKGROUND

The Elwha River runs 71 km (43.4 miles), from the Olympic Mountains to the Strait of Juan de Fuca. It was once the largest fish producer on the Olympic Peninsula and supported five major Pacific salmon species: Chinook (*Onchorhynchus tshawytscha*), coho (*O. kisutch*), chum (*O. keta*), pink (*O. gorbuscha*), and sockeye (*O. nerka*).

The salmon are anadromous — they hatch in the river, migrate to the ocean (which has more nutrients) to get bigger, and later return to the river to spawn and die. After they return, the salmon die and decay in the river or are consumed by hundreds of nearby species. These processes transfer critical nutrients from the ocean into freshwater and forest ecosystems. As drivers of this “nutrient express,” the salmon are considered **keystone species**: species that play an “oversized” role in their environments.

In the early 1990s, the Elwha River was dammed to generate more hydroelectric power. The dams disrupted the river’s flow, temperature, and ecology. These changes made it difficult for salmon and other fish (such as rainbow/steelhead trout) to spawn and caused their populations to decline — negatively impacting both wild habitats and human communities, such as the Lower Elwha Klallam Tribe. For thousands of years, the Lower Elwha Klallam Tribe depended on fish from the Elwha River, carefully and sustainably harvesting each salmon species during its season. The forests supported by the river also provided them with elk, deer, small game, and plant resources.

Thanks to the efforts led by the Lower Elwha Klallam Tribe, the dams on the Elwha were finally removed in 2011 — the largest dam removal project in history at that time. Since then, the Tribe has been working with government agencies, conservation organizations, and scientists to track the Elwha’s recovery. They have found many promising signs, such as more spawning areas, more salmon and steelhead/rainbow trout, and more species that eat salmon. They are also removing invasive plants and replanting native vegetation to support the Elwha ecosystem. The Elwha’s recovery can provide a model for dam removals across the country.

People/groups highlighted in the film include:

- The Lower Elwha Klallam Tribe, who led the dam-removal effort and are supporting the river’s recovery.
- Various members and employees of the tribe, including biologists, wildlife managers, and educators.

## 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:** Damming the Elwha led to habitat loss and degradation for many animal species, including salmon and rainbow/steelhead trout.
- **Invasive species:** Invasive plants, which reproduce and grow very quickly, encroach on the habitat of native plants near the Elwha.
- **Population growth:** The dams were built to generate more hydroelectric power for growing human populations and industries.

## DISCUSSION QUESTIONS

- (*Before the film*) How might changes in an environment (whether natural or human-caused) cause some species to decline and others to become more common?
- How did damming affect the Elwha River and its associated ecosystems?
- Create a conceptual model of the salmon “nutrient express” that brings ocean nutrients into the Elwha River ecosystem. Include the essential plants and animals.
- The film provides an example of **rewilding**: a conservation approach that replaces human influences with natural ecological processes. What might be some pros and cons of rewilding? Where do you think rewilding might be more or less effective?

## REFERENCES

Duda, Jeffrey J., Jonathan A. Warrick, and Christopher S. Magirl. *Elwha River Dam Removal, Rebirth of a River*. US Department of the Interior, US Geological Survey, 2011.

Wunderlich, Robert C., Brian D. Winter, and John H. Meyer. “Restoration of the Elwha River Ecosystem.” *Fisheries* 19, 8 (1994): 11–19. [https://doi.org/10.1577/1548-8446\(1994\)019%3C0011:rotere%3E2.0.co;2](https://doi.org/10.1577/1548-8446(1994)019%3C0011:rotere%3E2.0.co;2).

## CREDITS

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