FEATURE

Decommissioning the Four Lower Snake River Dams

Lucy Martin

Lower Monumental Dam and Lake West on the lower Snake River. Source: Courtesy of U.S. Army Corps of Engineers Northwest Division.

BEFORE I BEGAN MY UNDERGRADUATE DEGREE, THE decommissioning of dams was an abstract topic about which I had only peripheral knowledge. As an outsider, I saw it as an issue that lawmakers and environmentally minded people would discuss for a time and then drop. Recently, though, I have learned that this is not necessarily the case. Public discussion surrounding dam removal has increased significantly, and so has action. On Washington's Olympic Peninsula, the Elwha and Glines Canyon Dams have been removed from the Elwha River. In Oregon and California, four hydroelectric dams on the Klamath River are scheduled for removal in the coming year—a significant decision with many social, economic, and environmental impacts.

Now under discussion is the removal of four U.S. Army Corps of Engineer dams on the lower Snake River in Washington State: Ice Harbor, Lower Monumental, Little Goose, and Lower Granite. This idea is highly controversial, but with the recent passage of the Biden administration's infrastructure legislation, the idea of removing these dams has suddenly become more realistic.

Coming Down: Dream On?

Imagine these dams coming down. The romantic environmentalist in me visualizes the river in its pristine state. I see author Edward Abbey rafting through Glen Canyon mere hours before it was dammed. What would it be like to be one of the first generations to see the unfettered Lower Snake River or the return of the salmon? Unfortunately for the dreamer in me, dam removal is not this simple. Both sides of this controversial issue raise reasons for concern.

How will dam removal affect local farmers and communities that rely on the reservoirs for water supply and transportation? What source will replace dam hydroelectricity? Will it be "green"? What consequences

The Columbia-Snake River Basin. The four Lower Snake River dams are the four red dots in the center of the map, terminating just before the Idaho state line: Ice Harbor, Lower Monumental, Little Goose, and Lower Granite. Source: Courtesy of U.S. Army Corps of Engineers Northwest Division.

will arise if no action is taken? In such a large-scale restoration project, every potential solution has some negative implications. In assessing which course of action to take, these negative consequences must be weighed against the positive outcomes they may create.

Dams have a lifespan during which they are functional. If a dam remains in service for too long without significant repairs or decommissioning, chances are that it will eventually catastrophically fail. The average life expectancy of a dam is about 50 years. The lower Snake River dams were all built between 1957 and 1975. They have reached the end of their lives or will soon do so. As they age, they become more expensive to maintain. Many have wondered whether it would be more affordable to switch to other greener power sources such as wind or solar power.

One of the most compelling arguments for dam removal comes from a restoration perspective. The placement of a semi-impassable barrier in a river can significantly alter the surrounding ecosystems. Historically, one of the most affected species is salmon, which must migrate from their stream of origin to the sea, where they live out most of their adult years. Eventually, salmon return to their birthplace to spawn and die.

Even in the absence of dams, this journey is perilous enough for the salmon. They face predators, fishermen, and a multitude of environmental unknowns. But dams pose challenges on a completely different level. Not only do dams create a physical barrier but they also can create lethal stretches of warm water that impede juvenile migrants headed seaward and adult salmon attempting to find a suitable habitat to lay their eggs. After the Snake River dams were installed, wild salmon returns fell by more than 90 percent, according to American Rivers.

Cultural and Ecological Considerations

It might seem surprising that the welfare of fish threatens to topple feats of human engineering, but there are a few reasons why salmon are worth saving. To begin with, salmon are protected by the Endangered Species Act. In addition, salmon are an integral part of the cultural and spiritual identity of Indigenous people in the Pacific Northwest. Wanami Ala of a local Corvallis, Oregon, indigenous peoples' tribe visited my class as a cultural ambassador to discuss the importance of salmon to her people. Salmon, she said, are prevailing

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characters in her people's legends. In these stories, the salmon and the people have entered into a sort of contract—the salmon offer their own bodies as sustenance for the people and in return receive protection and stewardship. Salmon are a touchstone of Native cultures: they not only are a primary food source but also teach lessons in morality. With the rapid decline in salmon populations, Wanami Ala expressed the fear that a critical part of her people's identity could be lost.

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Salmon are also ecological keystones, playing an integral role in trophic webs in the Pacific Northwest. Whether a salmon dies of natural causes or is consumed by a larger animal, the nutrients locked away in its tissues are ultimately returned to the ecosystem. But the declining population of salmon has created a disturbance in nutrient cycling in ecosystems. Furthermore, because salmon are a food source for a variety of larger animals, food webs are at risk of being irreversibly damaged.

The more I delved into the various perspectives regarding the Snake River dam removal proposals, the more I came to realize just how complex this issue actually is. Unfortunately, removing the dams would also create a multitude of issues on both human and environmental scales.

Energy Considerations

The lower Snake River dams can generate more than 3,000 megawatts of energy. For reference, a typical lightbulb is about 60 watts; therefore these dams produce enough energy to illuminate about 50 million light bulbs. What energy source will replace the dams? At the moment, the answer is not entirely certain. According to a report by the Northwest Energy Coalition, a mix of renewable energy projects, including wind, solar, and batteries, could be the way forward. However, others fear that the removal of these hydroelectric dams will ultimately force people to resort to less desirable forms of energy such as oil, natural gas, or coal.

If removing these dams means resorting to fossil fuels, would progress on habitat restoration outweigh the environmental dangers of hydrocarbons or coal? Concerns about replacement energy sources are warranted. I would not support the decommissioning of these dams unless I knew that the replacement energy sources are steps to a more sustainable future.

Economic and Social Costs

The economic and social costs of this project are not insignificant. According to the Pacific Northwest Waterways Association (PNWA), the cost of decommissioning the dams would be around $2.3 billion over 30 years. Federal funding and subsidies could offset the economic strain of the removal.

Dam removal would lead to the drainage of the reservoirs created by the dams, opening up more land for human activities. However, this change could spell disaster for farmers living near the reservoirs who ship their crops cheaply by barge. According to the PNWA, if the dams were breached, maintaining current shipping levels would require at least 201 additional trains and 23.8 million truck miles a year. Because shipping by rail is more expensive than by barge, local communities would take a tremendous economic hit. If no assistance is given, hundreds of farmers could go bankrupt and many communities could be threatened.

A recent study commissioned by Governor Jay Inslee and U.S. Senator Patty Murray of Washington State estimated that replacing the benefits of the deactivated dams—including electricity, irrigation, and commerce, especially barge traffic—would cost between $10.3 billion and $27.2 billion. Inslee and Murray aim to release their own plan in July 2022.

Last Words

Given this litany of issues, many see the removal of the lower Snake River dams as simply too radical and expensive. That said, the dam removal proposal is by no means dead in the water. In fact, there is now more momentum from the federal government to take action on these issues than ever before.

So would the dam removal be worth the cost to society? Who decides? We have estimates of the loss of benefits if the dams are removed, but what about an assessment of the value of environmental gains provided by removal? There are no quick and easy answers. However, I believe that the idea of decommissioning the lower Snake River dams holds merit and should be examined in more detail. Perhaps within this coming year we will finally hear in detail what the decommissioning of the lower four Snake River dams entails and a full estimate of the costs and benefits.

Then bring on the stakeholders! ■

Lucy Martin (martiluc@oregonstate.edu) is a second-year undergraduate student studying environmental sciences at Oregon State University, where she is researching the biodiversity of ground beetles. She hopes this research might yield interesting topics of study for a potential honors thesis. She also enjoys language learning, in particular Japanese, and hopes to work abroad one day.