



# Environmental Impacts of the Action Alternatives

The Draft EIS/EIR analyzed the impacts of four action alternatives as well as any mitigation measures that might reduce negative impacts. After all ways to avoid impacts were explored, the analysis found major impacts from both temporary construction-related changes and more permanent changes from dam removal, the draining of reservoirs, and installation of fish passage facilities (i.e. fish ladders) for all of the alternatives.

Below is a summary of the major environmental impacts identified. For a full account of the impacts, please see table ES-4 in the executive summary of the Draft EIS/EIR.

## ➤ Major Short-term Impacts of Alternatives 2, 3, and 5

### Water Quality and Sediment

Removal of the dams for Alternatives 2, 3, and 5 would mobilize up to two-thirds of the 13.1 million cubic yards of sediment currently stored within the reservoirs and transport it downstream to the Pacific Ocean. The majority of material behind the dams is fine grained and would not be deposited in the river channel or estuary. Chemical testing of reservoir bottom sediments indicate human health is not at risk due to contact with the sediment.

This sediment release, though relatively free of harmful chemicals, would have major short-term impacts on water quality, (suspended sediment and dissolved oxygen) and aquatic resources (coho salmon, steelhead, pacific lamprey, green sturgeon, freshwater mussels, and macro invertebrates) downstream of the reservoirs. Sediment transport modeling indicates that high concentrations of suspended sediments would occur immediately downstream of Iron Gate Dam for two-to-three months during reservoir drawdown under the proposed action. Sediment concentrations could result in lethal and sub lethal effects on some of the coho salmon smolts and steelhead in the river. However, coho salmon, steelhead, and other fish populations would quickly return to 2012 population numbers, and increase in abundance and viability after dam removal.



*The plan for reservoir drawdown in a winter of a single year (2020) was designed to minimize negative effects on sensitive fish species, particularly California and federally listed coho salmon. As part of this plan, sensitive species would be relocated before and while sediment is released from the reservoirs.*

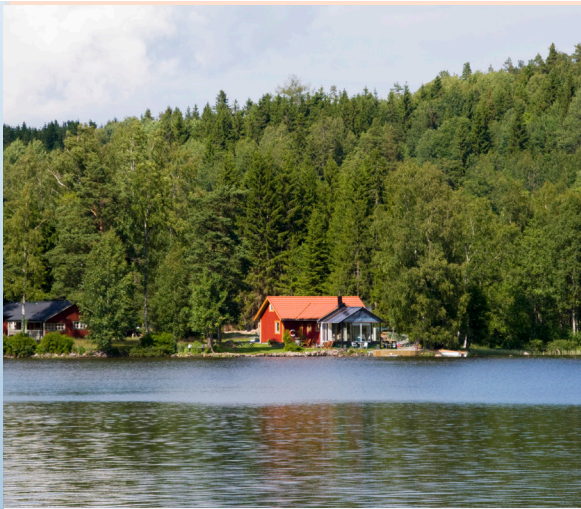
### Air Quality, Noise and Vibration

Construction equipment and activities may cause notable impacts from sound, vibration and air emissions.

## ➤ Major Long-term Impacts of Alternatives 2, 3, and 5

### Cultural Resources

Dam removal and reservoir drawdown could affect Native American cultural resources sites reported to be currently submerged beneath the reservoirs. Human remains may be associated with these sites. Plans to identify cultural resources and to avoid, minimize, or mitigate impacts to those resources would be developed in consultations with the appropriate State Historic Preservation Office, Tribes, and other Native American organizations.



## Real Estate

The loss of reservoirs and reservoir recreation would affect property values in varying ways. Upstream of Iron Gate Dam, the Real Estate Evaluation report identified 668 parcels near Copco and Iron Gate Dam which either had reservoir frontage, access or views of reservoirs. Of these 668 parcels, 127 include single family homes. Land that currently has reservoir views could decline in value due to the loss of reservoir access and view. Land values of parcels downstream of Iron Gate Dam with river views and river access would likely increase because of restoration of the river, including improved water quality and more robust anadromous fish runs. The overall effect of these changes is difficult to forecast. Dam removal was considered as an adverse impact on real estate values.

## Reservoir Recreation

Recreational flat-water boating in the Klamath River reservoirs as well as the non-native bass and yellow perch fishery would be nearly eliminated. There would be a loss of flat-water fishing and boating opportunities on the reservoirs and a loss of up to 4 average annual jobs related to reservoir recreation.



## Socioeconomics

Some jobs would be lost including up to 49 average annual jobs related to operations and maintenance of the PacifiCorps facilities and 14 average annual jobs related to white-water rafting.

## Water Temperature and Algae

Dam removal and conversion of the reservoir areas to a free-flowing river would decrease fall water temperatures and change daily variation in water temperature. These changes would mean that water temperature patterns below the site of Iron Gate Dam would be more typical of a free-flowing river and better for salmon migration. Similarly, dam removal would shift the dominant algae from noxious, and at times toxic, lake algae to algae found in moving water. Dam removal would also reduce the problem of low dissolved oxygen concentrations in the fall below Iron Gate Dam. These water quality changes would improve conditions for salmonids below the dams. Moreover, converting reservoirs to rivers reestablishes the environment that supported healthy more robust populations of fish such as steelhead and coho.

## ➤ Major Long-term Impacts of all Action Alternatives (2–5)

### White Water Rafting

Whitewater rafting opportunities upstream on J.C. Boyle Dam would be reduced due to changes in water flows, especially during the summer months. There would be little to no impact to whitewater rafting downstream of Iron Gate Dam.

### Greenhouse Gases

Removal of the four dams will result in the loss of renewable power under all four action alternatives. The direct removal of the dams would reduce power generation and the required additional water flows to allow for fish passage under Alternative 4 would limit the amount of power produced. To estimate the potential amount of carbon dioxide (CO<sub>2</sub>) produced from replacement power sources, a model was developed of what the effects would be if this hydropower was replaced with PacifiCorp's current power supplies as well as those supplies after complying with requirements in California and Oregon to increase renewable energy. For the Proposed Action the amount of CO<sub>2</sub> generated from replacement power is in the range of 341,539 to 396,575 metric tons of CO<sub>2</sub> equivalent per year (MTCE/yr) and for Alternative 4 the range is 75,431 to 87,525 MTCE/yr.

### Scenic

All of the action alternatives alter the scenic character of the four dam sites and reservoirs. Whether one considers a scenic vista to be a view of a free-flowing river or a view of a dam or reservoir, there will be a visual change in the landscape.

