

Saving Salmon in the Pacific Northwest Sydney Smith

Salmon are synonymous with the Pacific Northwest. Once they leave the Northwest's rivers and swim to the ocean, they are on their own and few will return. Ocean conditions greatly impact the chances of salmon returning to the rivers to spawn. With increasing carbon dioxide in our atmosphere causing ocean warming and acidification, the future of our beloved salmon is becoming increasingly uncertain.

Ocean warming harms our oceans and the creatures living there. Increased carbon dioxide in the earth's atmosphere is trapping heat, and the ocean is absorbing more than 93% of this heat (1). This is called the greenhouse effect. Over the past 100 years, the ocean has warmed by about 0.13°C (0.234°F) every decade (1). Salmon eat copepods and the species of copepods that live in cold water, the northern copepods, are larger and a better food source than those that thrive in warmer waters, the southern copepods (2). With the ocean warming, southern copepods are more plentiful than northern copepods and therefore the quality of salmon's food source is decreased.

Another problem is ocean acidification. The ocean is absorbing carbon dioxide from the atmosphere due to the greenhouse effect and becoming more acidic. In the past 200 years, the pH of surface waters "has fallen by 0.1 pH units ... [representing] approximately a 30 percent increase in acidity" (3). Increased acidity reduces the carbonate ions in the water that are the building blocks for the shells and skeletons of shellfish (4). Shellfish are the basis of the marine food chain and without them salmon suffer. Predators that consume salmon along with shellfish will more readily rely on salmon. Ocean acidification also interferes with how the salmon brain processes smell, which decreases salmon's avoidance behavior (5). This will cause salmon to be at a higher risk of being eaten by predators. Not only will the salmon have less prey, but they will become prey more often.

The best way to fix ocean acidification and ocean warming is at the source. Decreasing the amount of carbon dioxide we put in the atmosphere will decrease the rate at which the ocean is absorbing carbon dioxide as well as reducing the greenhouse effect. The combustion of fossil fuels produces carbon dioxide. If we switch from fossil fuels to clean energy sources such as hydropower and nuclear energy, we can reduce our carbon dioxide emissions. Not only is hydropower clean and reliable base load power, it is also very affordable (6). Hydropower already "[provides] more than 4,000 terawatt hours of electricity globally every year... [And] has helped to avoid more than 100 billion tonnes of carbon dioxide in the past 50 years alone" (7). If we continue to use hydropower, we can minimize the amount of fossil fuels we burn. This will greatly reduce the amount of carbon dioxide we put into the atmosphere, slowing ocean warming and acidification, and saving our salmon.

Bibliography

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