

## Snake River Dams & Salmon

Over the years there have been countless trials determining whether or not breaching the Snake River Dams would positively impact the rates of salmon survival. Though this action may slightly increase the numbers of salmon returning, there have been a plethora of ways on how oceanic conditions more heavily correlate to the chances of an increased salmon species within Washington State. This can be shown throughout several investigations where it is clearly acknowledged how the change in water temperature affects the number of salmon that return in the same year in which they migrated to sea. To obtain greater and sustainable results in salmon survival, we could utilize flow augmentation. Flow augmentation is the release of water from various storage reservoirs to increase instream flows, which are purposeful in reestablishing suitable migrating conditions for salmon. This process in time will lower water temperatures and improve the overall living conditions for adult salmon since the lower water temperatures will result in a greater dissolved oxygen content, which is how salmon survive underwater.

For many years, the Columbia River system attempted to manage flood control, irrigation, and hydroelectric power. It was not until later years when flow augmentation was developed, demonstrating tremendous improvement in salmon survival in just a short time period. This process not only lowers water temperature but also increases discharge, which results in higher water velocity through reservoirs. The lower temps and higher discharge velocities increase the migration speed of salmon in the impoundments of the Lower Snake and the Columbia River.<sup>1</sup> Over time, this process has shown growth rates of salmon survival and can continue to restore their oceanic ecosystem as we move forward. An example of this is off the coasts of British Columbia, Washington, as well as Oregon where salmon survival is constantly under investigation. Groups of marine biologists are able to identify how, if the ocean water warms slightly, salmon survival can be greatly reduced. Possible causes include reduction in various food sources, increases in predation, and changes to fish metabolism.<sup>2</sup> This is another reason why flow augmentation is significant in determining salmon survival in the Pacific Northwest, since this process can maintain cooler water temperatures for the salmon returning from sea.

Looking back on the studies that have been done previously with regard to improving salmon survival, it is evident that flow augmentation can not only greatly improve the survival rates in salmon, but can also provide this marine species with a better ecosystem over time. Throughout the years, slight changes in water temperature have been one of the leading factors in declined salmon rates in the Pacific Northwest. This issue can be reversed with flow augmentation, since this process increases the flow of water instream to dramatically improve salmon migration, lower water temperatures, as well as aid in food supply.

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<sup>1</sup> National Research Council, *Managing the Columbia River: Instream Flows, Water Withdrawals, and Salmon Survival*. (Washington DC: The National Academies Press, 2004), 84.

<sup>2</sup> Bonneville Power Administration, *Understanding Salmon Survival in the Ocean*. (2010), 1.

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