



Salmon

Sockeye salmon (*Oncorhynchus nerka*) are critical to the cultural, economic, and ecological integrity of the Bristol Bay region in Alaska. Sockeye salmon have sustained people living in the region and provided for the majority of their subsistence diet for centuries. In addition to the sockeye caught by local residents, the Bristol Bay commercial fleet harvests around 20 million sockeye salmon annually valued at more than \$100 million, making it the world's largest and most valuable commercial sockeye fishery. Ecologically, sockeye salmon returning from the sea provide energy and nutrients vital to the freshwater ecosystems in which they spawn, as well as the neighboring riparian and terrestrial ecosystems.

The number of migrating adult salmon that “escape” harvest to spawn in their natal habitat is commonly referred to as *escapement*.

Findings—Bristol Bay

According to the Alaska Department of Fish and Game (ADFG), the annual escapement of sockeye salmon to Bristol Bay in 2017 was 18.8 million fish. An additional 37.7 million sockeye salmon were harvested, yielding a total run of 56.5 million fish, the second-largest run of the last 20 years.



NPS/Katie Junghans

Sockeye salmon return to their natal waters to spawn and die, providing important resources for aquatic and terrestrial ecosystems. Quantifying the number of salmon that return each year is essential for the sustainable management of fisheries.

Findings—Katmai

The estimated annual escapement of sockeye salmon for the Naknek River in 2017 was 1.9 million fish, or 11% above the average annual escapement from 2000 to 2016 (1.7 million fish; Figure 1A). The timing of the midpoint of the return in 2017 was identical to the average for the years 2000 to 2016 (July 5; Figure 1B).

Findings—Lake Clark

The estimated annual escapement of sockeye salmon for the Kvichak River in 2017 was 3.2 million fish; for the Newhalen River, it was 0.43 million fish (Figure 1A). For both rivers, escapement in 2017 was slightly above the mean from 2000 to 2016 (3.1 million and 0.40 million fish for the Kvichak and Newhalen, respectively). The midpoint of the

return to the Kvichak River in 2017 (July 11) was four days later than the average for recent years, while that for the Newhalen River (July 20) was one day earlier (Figure 1B). Salmon counted in the Newhalen River are a subset of those counted in the Kvichak River further downstream, comprising 15% of the Kvichak escapement, on average.



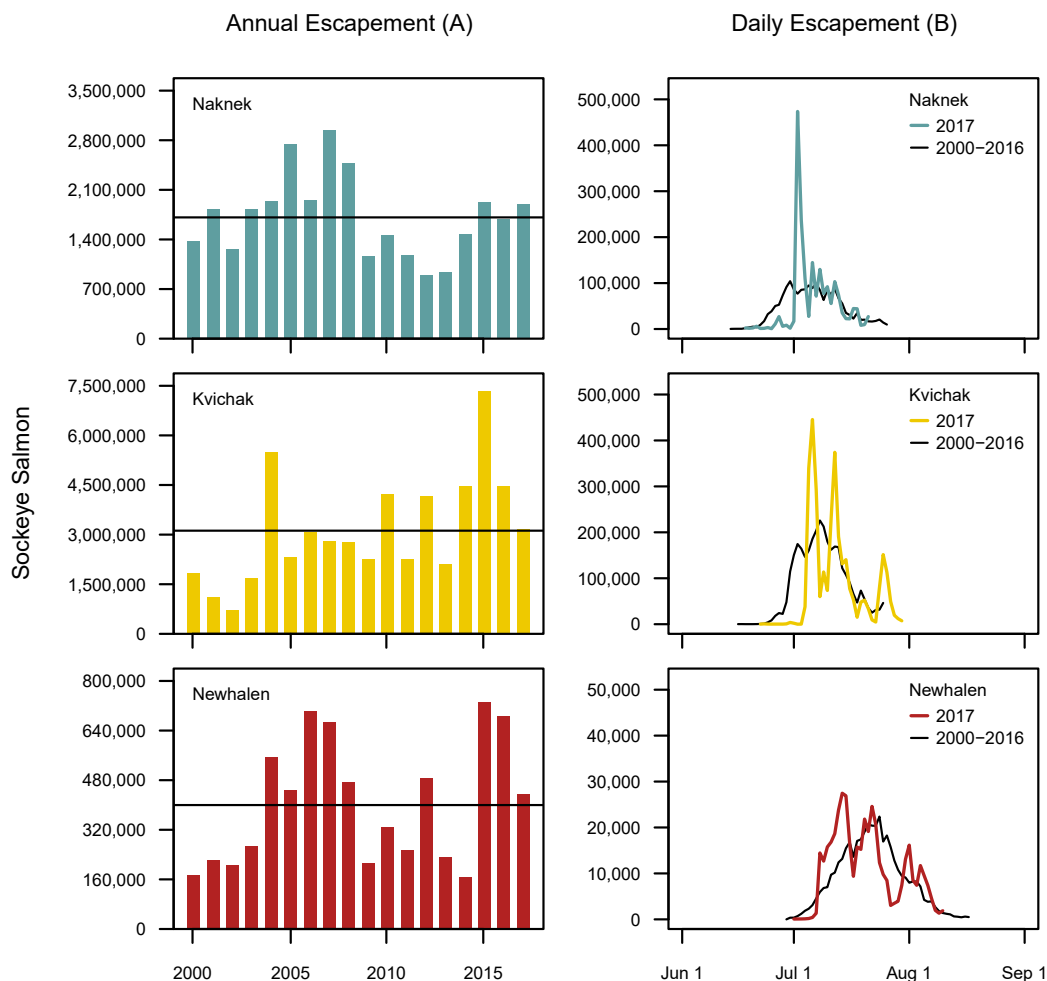


Figure 1. Sockeye salmon escapement estimated annually (A) and daily (B) at counting towers on the Naknek, Kvichak, and Newhalen rivers. Black lines represent the average escapement for the years 2000-2016. Note the differences in y-axis scales among the graphs. Naknek and Kvichak data are from <http://www.adfg.alaska.gov/>.

Methods

Counting towers are one of several methods for monitoring escapement. ADFG currently operates counting towers on the Naknek River downstream of the boundary of Katmai National Park and Preserve and on the Kvichak River downstream of the Lake Clark National Park and Preserve boundary (Figure 2). National Park Service staff operate counting towers on the Newhalen River, upstream of ADFG's Kvichak towers, but downstream of the Lake Clark boundary (Figure 2). Other methods for monitoring escapement include aerial surveys, weirs, and sonar. ADFG escapement data using these methods are available for the Alagnak River, Crescent River (Lake Clark), and Delight and Desire Lakes (Kenai Fjords National Park).

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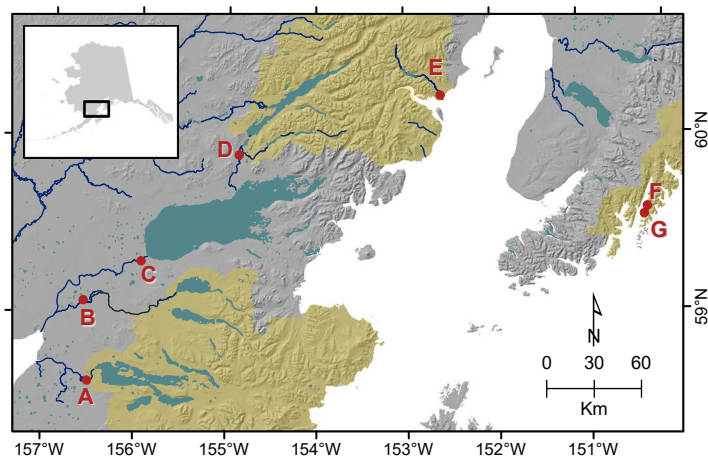


Figure 2. Sites where salmon escapement is monitored near southwest Alaska parks: Naknek (A), Alagnak (B), Kvichak (C), Newhalen (D), and Crescent (E) Rivers, and Desire (F) and Delight (G) Lakes.