



Alagnak

Aniakchak

Katmai

Kenai Fjords

Lake Clark

Recent Trends in Southwest Alaska Salmon Stocks

Each year, millions of sockeye salmon (*Oncorhynchus nerka*) return to Bristol Bay, infusing life into the culture, economy, and ecosystem at large. Sockeye salmon have sustained people living in the region and provided for the majority of their subsistence diet for hundreds of years. In addition to the sockeye caught by local residents, the Bristol Bay commercial fleet harvests around 20 million sockeye salmon valued at more than \$100 million annually, 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. This is apparent each fall when rivers and lakes become hubs of activity with bears, wolves, eagles, and trout feasting on spawning salmon and their eggs.

Findings—Bristol Bay

The number of migrating adult salmon that “escape” the commercial fishery to spawn in their native stream is commonly referred to as *escapement*. According to the Alaska Department of Fish and Game (ADFG), the annual escapement of sockeye salmon to Bristol Bay in 2015 was 22,366,676 fish. An additional 35,672,859 sockeye salmon were harvested, yielding a total run of 58,039,535 fish, the largest run since 1995.



NPS/Dan Young



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Sockeye salmon return to natal waters to spawn and die, providing important resources for aquatic and terrestrial ecosystems. Escapement data are critical for the sustainable management of commercial, subsistence, and recreational fisheries.

Findings—Katmai

The estimated annual escapement of sockeye salmon for the Naknek River in 2015 was 1,920,954 fish, or 13% above

the average escapement from 2000 to 2014 (1,698,635 fish; Figure 1). The timing of the return in 2015 was six days later than the average for recent years (Figure 1).

Findings—Lake Clark

The estimated annual escapement of sockeye salmon for the Kvichak River in 2015 was 7,341,612 fish and 730,338 fish for the Newhalen River (Figure 1). For both rivers, escapement in 2015 was more than twice the average from 2000 to 2014 (2,748,012 and 358,717 fish for the Kvichak and Newhalen, respectively). Salmon counted in the Newhalen River are a subset of those counted in the Kvichak River further downstream, thus the smaller size and later timing of the Newhalen peaks in daily escapement (Figure 1).

Monitoring Approach

Counting towers are one of several methods for monitoring escapement. ADFG currently operates counting towers on the Naknek River downstream of the Katmai boundary and on the Kvichak River downstream of the Lake Clark boundary (Figure 2). NPS staff operate counting towers on the Newhalen River, upstream of ADFG's Kvichak towers, but downstream of the Lake Clark boundary (Figure 2). At each tower, observers count migrating salmon for a portion of every hour from approximately mid-June to mid-August. Counts are multiplied to yield hourly estimates, and then summed to arrive at daily or annual escapement. 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).

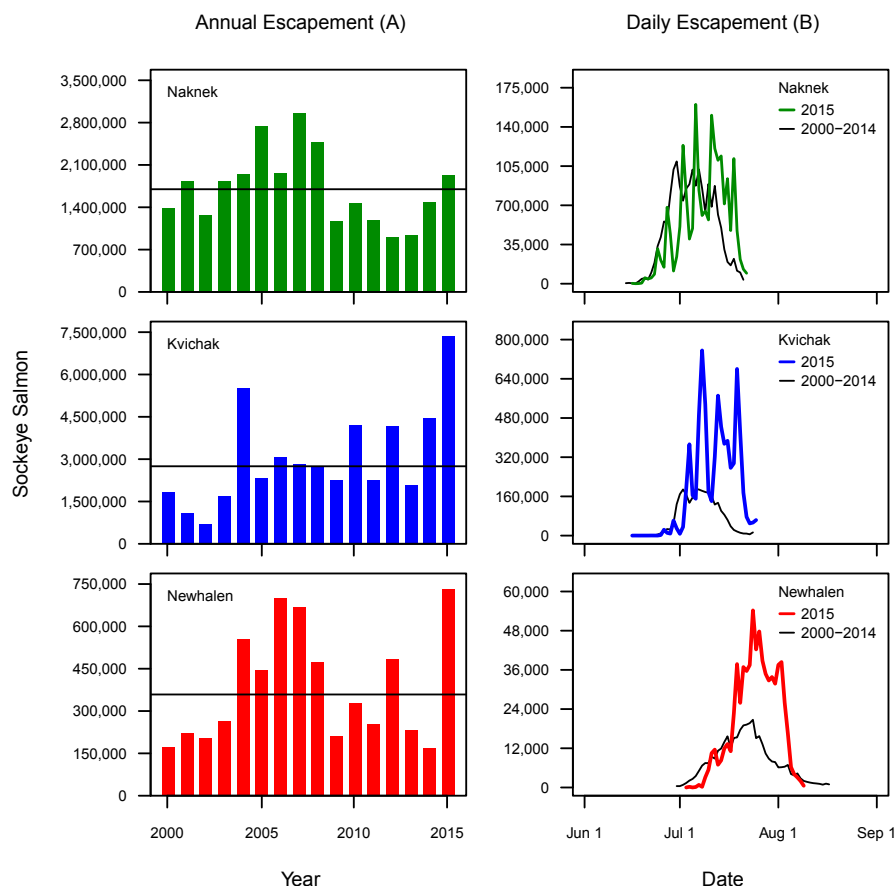


Figure 1. Sockeye salmon escapement estimated annually (A) and daily (B) at counting towers on the Naknek, Kvichak, and Newhalen Rivers. Black lines represent the average escapement for the years 2000-2014. Note the differences in y-axis scales among the graphs. Naknek and Kvichak data are from <http://www.adfg.alaska.gov/>.

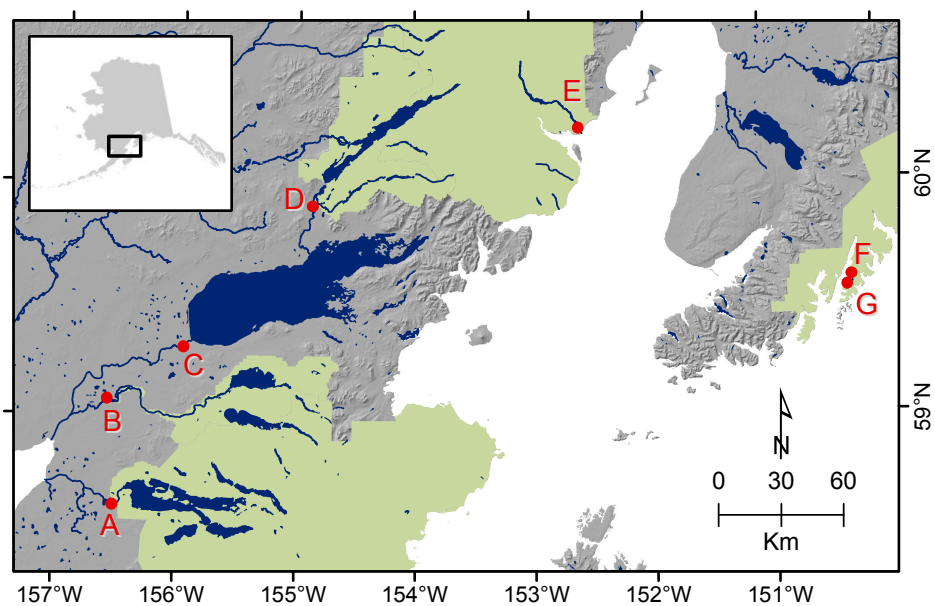


Figure 2. Sites where salmon escapement is monitored near southwest Alaska parks: Naknek (A), Alagnak (B), Kvichak (C), Newhalen (D), and Crescent (E) Rivers, and Desire (F) and Delight (G) Lakes.