Salmon

Escapement data are critical for the sustainable management of subsistence, commercial and recreational fisheries. Photo: A. Kirby/NPS.

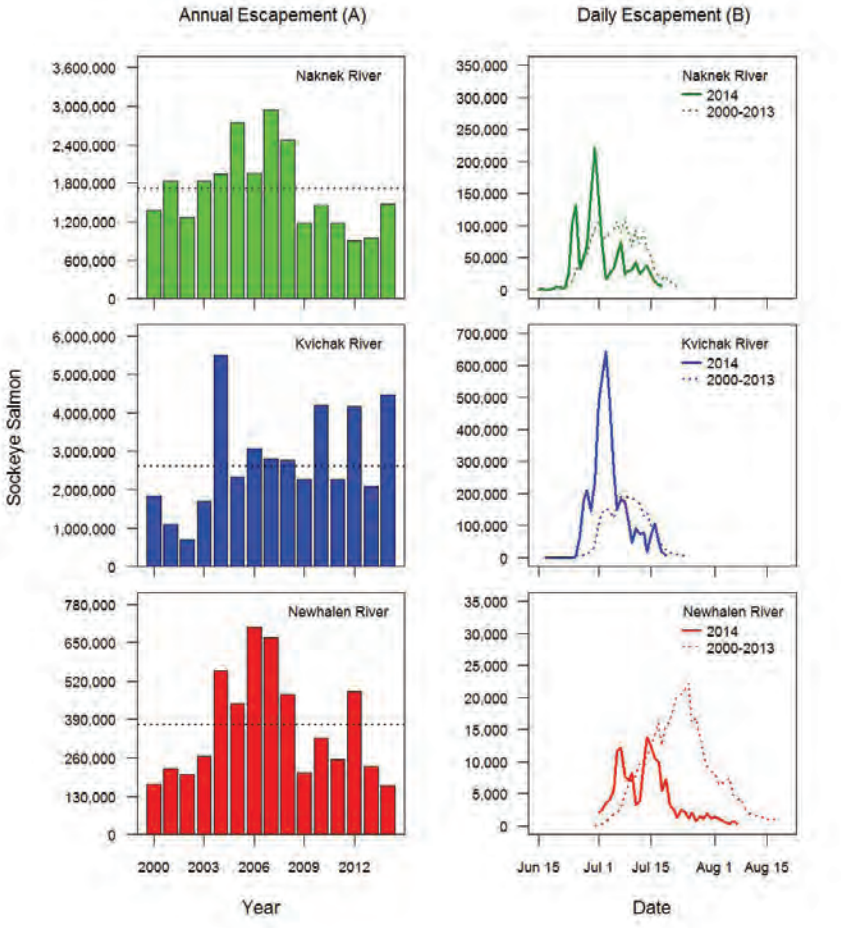

Figure 1. Sockeye salmon escapement estimated annually (A) and daily (B) at counting towers on the Naknek, Kvichak, and Newhalen Rivers. Dotted lines represent the average escapement for the years 2000 - 2013. Note the differences in y-axis scales among the graphs. Naknek and Kvichak data are from http://www.adfg.alaska.gov/.

Recent Trends in Southwest Alaska Salmon Stocks

Overall :Bristol Bay trends

The number of migrating adult salmon that "escape" the fishery to spawn is commonly referred to as *escapement*. According to the Alaska Department of Fish and Game (ADF&G), the total annual escapement of sockeye salmon (*Oncorhynchus nerka*) to Bristol Bay in 2014 was 11.8 million fish. An additional 28.8 million sockeye salmon were harvested, yielding a total run of 40.6 million fish.

Katmai (KATM)

The estimated annual escapement of sockeye salmon for the Naknek River in 2014 was 1.5 million fish, or 14% below the average escapement from 2000 to 2013 (1.7 million fish; Fig. 1A). Peaks in daily escapement in 2014 tended to be earlier than in recent years (Fig. 1B).

Lake Clark (LACL)

The estimated annual escapement of sockeye salmon for the Kvichak River in 2014 was 4.5 million fish, 70% above the average from 2000 to 2013 (2.6 million; Fig. 1A). For the Newhalen River, the estimated annual escapement in 2014 (0.17 million fish) was 55% below the average from 2000 to 2013 (0.37 million; Fig. 1A). 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 (Fig. 1B). Less easily explained is the disparity between the relatively strong Kvichak and relatively weak Newhalen returns in 2014. This disparity illustrates what some have called the "biocomplexity" of Bristol Bay fish stocks, suggesting that such differences maintain stock resilience over time.

Monitoring Approach

In Alaska, salmon are managed by ADF&G, with assistance from the U.S. Fish and Wildlife Service (USFWS). NPS staff supplement ADF&G and USFWS management through salmon-related research and monitoring in parks. Counting towers, aerial surveys, weirs, and sonar are common tools used to estimate escapement. Currently, ADF&G operates counting towers on the Naknek River downstream of the KATM boundary (Fig. 2), and on the Kvichak River downstream of the LACL boundary (Fig. 2). NPS staff operate counting towers on the Newhalen River, upstream of ADF&G's Kvichak tower but downstream of the LACL boundary (Fig. 2). The Kvichak and Naknek watersheds comprise the majority of the land area of SWAN parks draining into Bristol Bay. Thus, monitoring escapement within these systems provides a good estimate of the abundance of salmon returning to large portions of LACL and KATM.

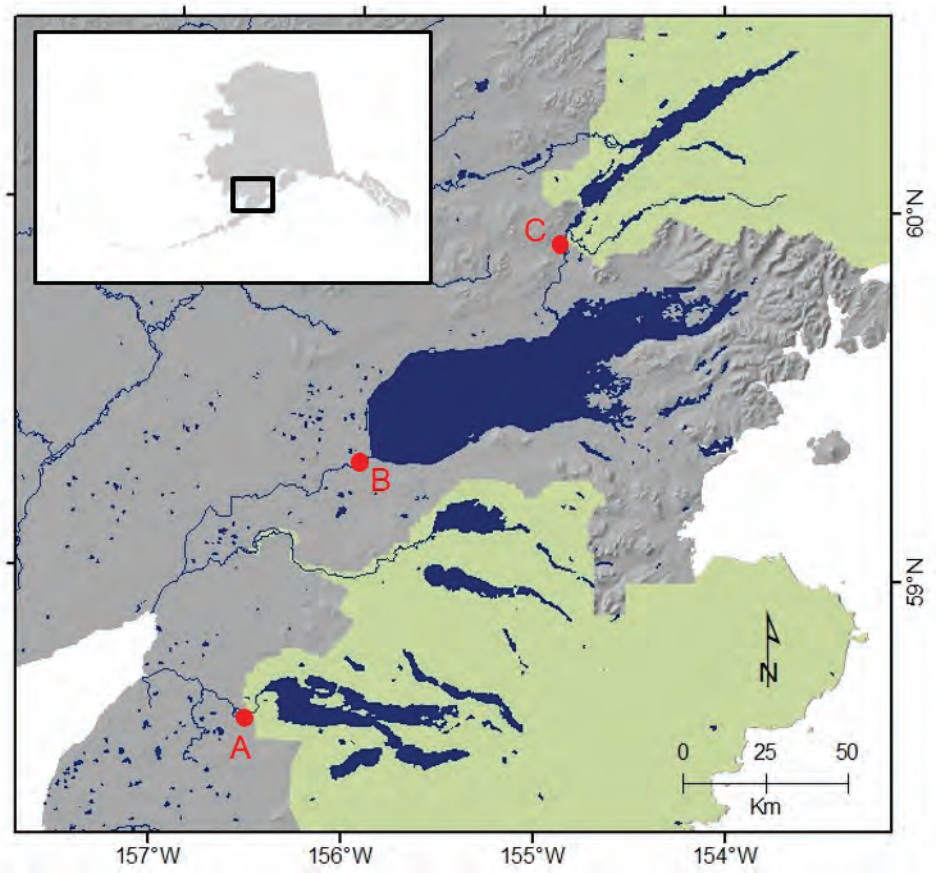

Figure 2. Locations of counting towers on the Naknek (A), Kvichak (B), and Newhalen (C) Rivers downstram of park boundaries in southwest Alaska (map inset).

Yuzhun Evanoff, an intern with the Bristol Bay Native Association, counts salmon migrating upstream on the Newhalen River. Photo: D. Young/NPS.

Sockeye salmon return to natal waters to spawn and die, providing important resources for aquatic and terrestrial ecosystems. Photo: D. Young/NPS.

Importance

Sockeye salmon are the life blood of the Bristol Bay region in southwestern Alaska. This species' importance in structuring the ecological framework of aquatic ecosystems is rivaled only by its storied history in Native Alaskan culture and today's commercial and subsistence fisheries. The Alaska National Interest Lands Conservation Act (ANILCA) of 1980 specifically established LACL for the following purpose, among others: "To protect the watershed necessary for perpetuation of the red salmon fishery in Bristol Bay…" Additionally, ANILCA expanded Katmai National Monument (redesignated as KATM) and created Katmai National Preserve "...to maintain unimpaired the water habitat for significant salmon populations…" Maintaining healthy runs of sockeye salmon is critical to the ecological, economic, and social integrity of the Bristol Bay region.

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