
Sockeye Salmon (Snake River)

Oncorhynchus nerka

Actinopterygii — Salmoniformes — Salmonidae

CONSERVATION STATUS / CLASSIFICATION

Rangewide: Critically imperiled population (G5T1)
Statewide: Critically imperiled (S1)
ESA: Endangered
USFS: Region 1: No status; Region 4: Endangered
BLM: Threatened, Endangered, Proposed, and Candidate (Type 1)
IDFG: Game fish; Endangered

BASIS FOR INCLUSION

Endangered under the U.S. Endangered Species Act; declining population trend and loss of habitat.

TAXONOMY

Sockeye salmon were originally described by Walbaum in 1792 (Nelson et al. 2004, Scott and Crossman 1973). Resident life history forms are called kokanee. Taxonomically, the kokanee and sockeye salmon do not differ.

DISTRIBUTION AND ABUNDANCE

The natural range of sockeye salmon was associated with lake systems accessible to the ocean around the northern Pacific rim from northern California to Japan (Scott and Crossman 1973). In Idaho, sockeye salmon historically spawned and reared in the large lakes accessible to the ocean (Payette and Salmon River drainages). The Payette Lake population was eliminated in the early 1900s due to dam construction on the Payette River. Currently sockeye salmon are only found in lakes in the Stanley basin of the upper Salmon River, primarily Redfish and Alturas lakes. Additionally, they migrate to and from the ocean through the Salmon, Snake and Columbia rivers. Sockeye salmon in the Snake River drainage were listed as endangered under ESA in 1991 (Federal Register Vol 56, No. 224, p 58618). At the time of listing, the Snake River sockeye salmon ESU was limited to Redfish Lake but enhancement has increased distribution to Alturas and Pettit lakes.

POPULATION TREND

Counts of adult sockeye salmon at the Redfish weir in the 1950–60s average over 1000/yr but decreased to years with no adult returns in the early 1990s. With the assistance of a conservation hatchery program, recent returns to the Stanley Basin have averaged 20 fish/yr, primarily of hatchery origin, in 2001–2004 (IDFG, unpublished data, Willard et al. in press).

HABITAT AND ECOLOGY

Sockeye salmon in the Snake River basin are an anadromous species which have life history patterns that depend on the fresh water lakes and access to the ocean. They

spawn in gravel areas in lakes, where the juveniles rear for 1 to 3 years prior to migrating to sea. There are also 2 resident life forms, 1 more closely resembles sockeye salmon life history traits in that it spawns in lakes in late fall with most juveniles remaining in the lake, maturing and spawning without rearing in the ocean. Additionally, the more common resident form known as kokanee spawns in tributary streams to the lake during late summer\early fall. While in freshwater lakes, sockeye salmon prefer temperatures near 10 C (50 F). Juvenile sockeye salmon (smolts) migrate to the ocean at ages 1–3 and sizes of 7–18 cm (3–7 in) (Wydoski and Whitney 2003). After 1–3 years in the ocean, they return as mature adults reaching the upper Salmon River lakes in mid summer. Adults returning to Idaho weigh 1–2 kg (3–5 lbs). During their freshwater life, juveniles feed largely on zooplankton, in the ocean they feed upon marine zooplankton and small fish.

ISSUES

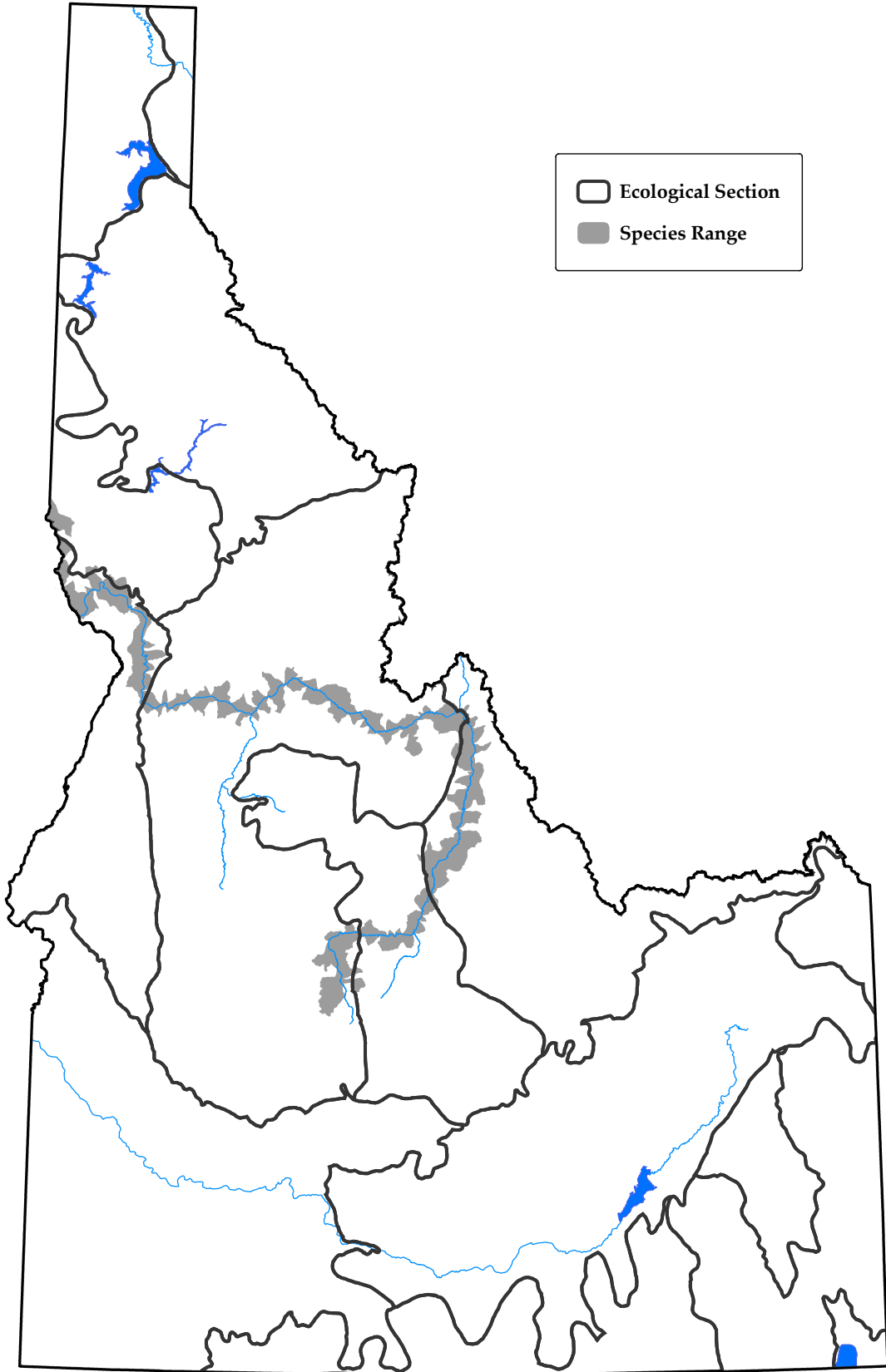
The construction of present and past dams for hydropower or water diversions on the Columbia, Snake and Salmon rivers has adversely affected survival during migration to and from the ocean. Reductions in returning adults have also resulted in lower levels of nutrients in lakes for juvenile life stages. Genetic concerns exist for conservation hatchery programs as well as increased disease concerns. The impacts of harvest of juvenile sockeye salmon in the kokanee fisheries are a concern. Introductions of non–native fish in some waters are a concern.

RECOMMENDED ACTIONS

Continue to work with federal action agencies, and Bonneville Power Administration to improve passage conditions in the lower Snake and Columbia rivers. Continue to maintain a conservation hatchery program to protect the remaining population of Snake River sockeye salmon. Continue working with federal, tribal and state agencies in the evaluation of population numbers, nutrient enrichment programs, kokanee harvest fisheries, and on genetic and disease prevention programs. Effects to sockeye salmon and kokanee need to be considered in managing non–native species.

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10 August 2005
Fish information is from Idaho Fish and Wildlife Information System, Idaho Department of Fish and Game and displayed at the 6th code hydrologic unit.

