

How Valuable are the Pedro Bay Rivers of Lake Iliamna to Bristol Bay Commercial Fishermen?

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Bristol Bay fleet waiting to fish at the mouth of the Kvichak River

Bob Waldrop

Upwards of 57% of the Sockeye salmon that return to Lake Iliamna spawn and rear in the Pedro Bay Rivers in the Northeast section of Lake Iliamna. From 2014 to 2018 Sockeye from these rivers paid an estimated \$107,000,000 to Bristol Bay Commercial Fishermen, or a yearly average of \$21,425,000.

How Do We Know?

The Genetics

Over the last two decades fisheries scientists at the Alaska Department of Fish & Game (ADF&G), have been able to parse the genetics of Sockeye salmon returning to Bristol Bay. Genetic research helps ADF&G manage the annual commercial fishery. This research is also a useful tool to help the Bristol Bay Heritage Land Trust (BBHLT) identify the most critical and potentially threatened salmon habitat. Recently, genetic research on juvenile Sockeye in Lake Iliamna directed the attention of the BBHLT to the Pedro Bay Rivers.



Genetic analysis has identified four distinct stock groups of Sockeye salmon that return to Lake Iliamna. These genetic groups are designated: Lake Clark, Northeast Iliamna, Iliamna Islands and Iliamna Tributaries. The map prepared by ADF&G shows the general spawning locations for each of these genetic groups.

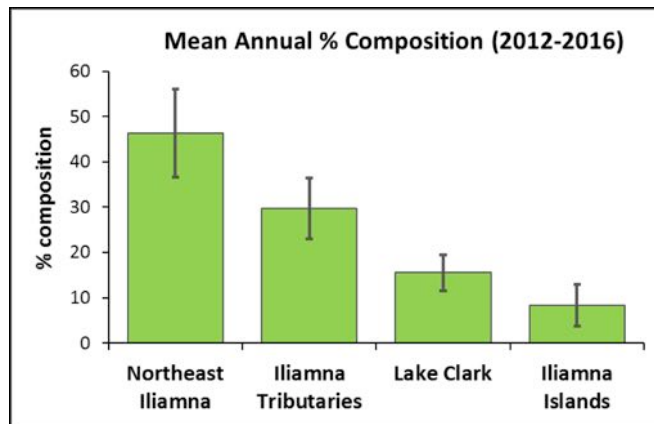
Of the four genetic groups, the Northeast Iliamna group of Sockeye (blue on the map) return to spawn exclusively in waters within habitat owned by Pedro Bay Corporation. These lands were conveyed to Pedro Bay Corporation as part of its entitlement under the Alaska Native Claims Settlement Act.

In 2017 BBHLT and its partner, The Conservation Fund, began discussions with the leadership of Pedro Bay Corporation to explore options for preventing development on those lands that could detrimentally affect the Sockeye of the Northeast Iliamna stock group. The result is the Pedro Bay Rivers Conservation Project in which the Alaska Native shareholders of Pedro Bay Corporation voted by a margin of 90% to convey to BBHLT a conservation easement retiring forever development rights over 44,170 acres of critical habitat in the Pedro Bay rivers in exchange for \$18.4 million dollars. The acreage to be protected encompasses the drainages of Knutson Creek, the Pile and Iliamna Rivers, and the spawning beaches of Knutson Bay.

The Smolt Research

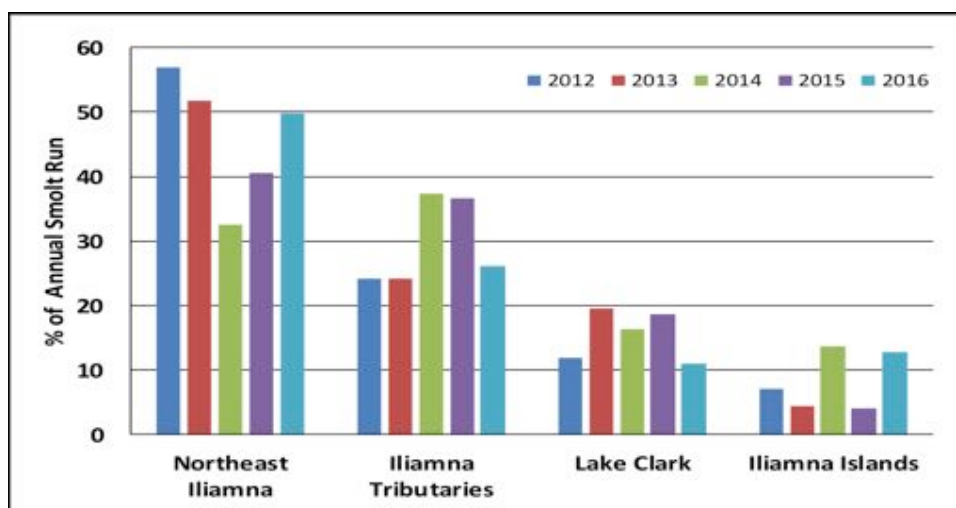
In 2012 ADF&G, with help from the Bristol Bay Science and Research Institute, initiated a research program to apportion the annual juvenile salmon production (smolt) into the four identified genetic stock groups. For a period of five years, 2012 through 2016, tissue samples were collected from smolt as they migrated out of Lake Iliamna, and genetic methods

were used to apportion the annual smolt runs into the four stock-specific genetic groups. The results identified the Northeast Iliamna group as the most productive in Lake Iliamna during the five-year period. Half of Lake Iliamna’s juvenile Sockeye production during the study period was contributed by the Northeast Iliamna group emerging from the Pedro Bay Rivers (46% annual average, with a range of 32% to 57%)



Ex-Vessel Value of the Pedro Bay Rivers to Bristol Bay Commercial Fishermen

Adult Sockeye returning to Lake Iliamna generally spend two years at sea with some spending three years. As can be seen in the following graph, the Northeast Iliamna genetic group annually provided more juvenile salmon leaving Lake Iliamna than any other group, except in 2014. Additional research by ADF&G finds similar ratios for adult returns two years later. As such, the Northeast Iliamna genetic group likely provided more adult returns than any other group within the Kvichak drainage during the five-year research period, except in 2016.



Assuming most of the juvenile Lake Iliamna Sockeye return as adults in two years, ADF&G's smolt research allows us to make a reasonable estimate of how much money each stock group put into the pockets of Bristol Bay commercial fisherman from 2014 to 2018 (the ex-vessel value). For the Northeast Iliama genetic stock group the estimated pay out to commercial fishermen was in the neighborhood of \$107 million dollars.

Estimated Ex-Vessel Value of Northeast Iliamna Genetic Stock Group to Commercial Fishermen

Return Year	Kvichak River Harvest*	NE Iliamna Contribution		Weight *** (millions lbs)	Price \$/lb.	Value (\$)
		Percent**	# fish			
2014	13,141,528	57.0%	7,490,671	35,206,154	\$1.34	\$47,176,246
2015	15,371,626	51.8%	7,962,502	37,423,761	\$0.64	\$23,951,207
2016	9,732,721	32.5%	3,163,134	14,866,732	\$0.96	\$14,272,063
2017	4,086,925	40.6%	1,659,292	7,798,670	\$1.31	\$10,216,258
2018	3,067,972	49.9%	1,530,918	7,195,315	\$1.60	\$11,512,504
Averages	9,080,155	46.4%	4,361,304	20,498,127	\$1.17	\$21,425,656
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Total, 2014-2018	45,400,773		21,806,518	102,490,633		\$107,128,278

* Based on the portion of the Naknek-Kvichak District catch that was Kvichak River origin.

**Assumes that annual NE Iliamna catch is same fraction of smolt run 2 years earlier.

*** Assumes a 4.7 lb. average weight per fish.

The Bottom Line

While the calculation above is approximate, it nevertheless highlights the huge commercial value of the Sockeye genetically adapted to the habitat on lands privately owned by Pedro Bay Corporation. The value is clearly in the millions of dollars, and in two of the five years between 2014 and 2018 its value in just one fishing season was more than the \$18.4 million dollars needed to protect the habitat in perpetuity.

Pedro Bay Corporation is a for-profit entity and has no legal obligation to use its land assets to protect a public good like salmon. In fact, the opposite is true: it is obliged to use its assets to make money and pay dividends to its shareholders. Whether the Northeast Iliamna genetic group of Sockeye continue to put millions of dollars annually into the pockets of Bristol Bay commercial fishermen depends upon the future restraint of a few hundred Pedro Bay Corporation shareholders. In exchange for a one-time payment of \$18.4 million to the their corporation those shareholders have agreed by an overwhelming margin to restrain themselves forever from developing the habitat of the Northeast Iliamna genetic group, or leasing that habitat for an industrial road to access the proposed Pebble Mine. For less than the average annual income the Pedro Bay Rivers produce for the commercial fishermen of Bristol Bay, the Pedro Bay Rivers Conservation Project, if successful, can protect that income stream forever.



Sockeye from the Northeast Iliamna genetic stock group spawning in the Iliamna River in 2014. In 2014 Sockeye from the Pedro Bay Rivers contributed 7.5 million fish to the commercial fishery harvest providing over \$47 million to Bristol Bay Commercial fishermen.

Notes and Acknowledgments

This report has been prepared by the Bristol Bay Heritage Land Trust with assistance from the Bristol Bay Science & Research Institute, an independent regional non-profit organization that has been conducting fisheries research and management programs in Bristol Bay for two decades.

Data regarding harvest, escapement, and ex-vessel value is taken from the annual Bristol Bay Salmon Season Summaries prepared by the Alaska Department of Fish & Game: www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.main, and from information available on the website of the Bristol Bay Regional Seafood Development Association: www.bbrsda.com/market-value-info

Information and data regarding the Kvichak smolt research of the Alaska Department of Fish & Game is available at the following sites:

<http://www.akssf.org/Default.aspx?Id=2488>

<http://www.akssf.org/Default.aspx?Id=3282>

<http://www.akssf.org/Default.aspx?id=3454>

