



## Putting a Price Tag on Nature: Part 2

July 21, 2014

In our last Fish Report, we discussed [a new approach to conservation](#) that highlights [the benefits](#) of natural resources by calculating their economic value. Millions of dollars are spent each year on fisheries monitoring

programs along the West Coast of the U.S. It is critical to monitor species and their interactions with environmental and anthropogenic factors to understand changes in their population over time. This information is necessary to effectively manage recovery, conservation and viability of a given species. Similarly, it would make sense that a conservationist or resource manager would also want to collect data on the economic factors underlying any major [restoration](#) or [conservation](#) project to understand the long-term benefits and drawbacks of a potential management decision.

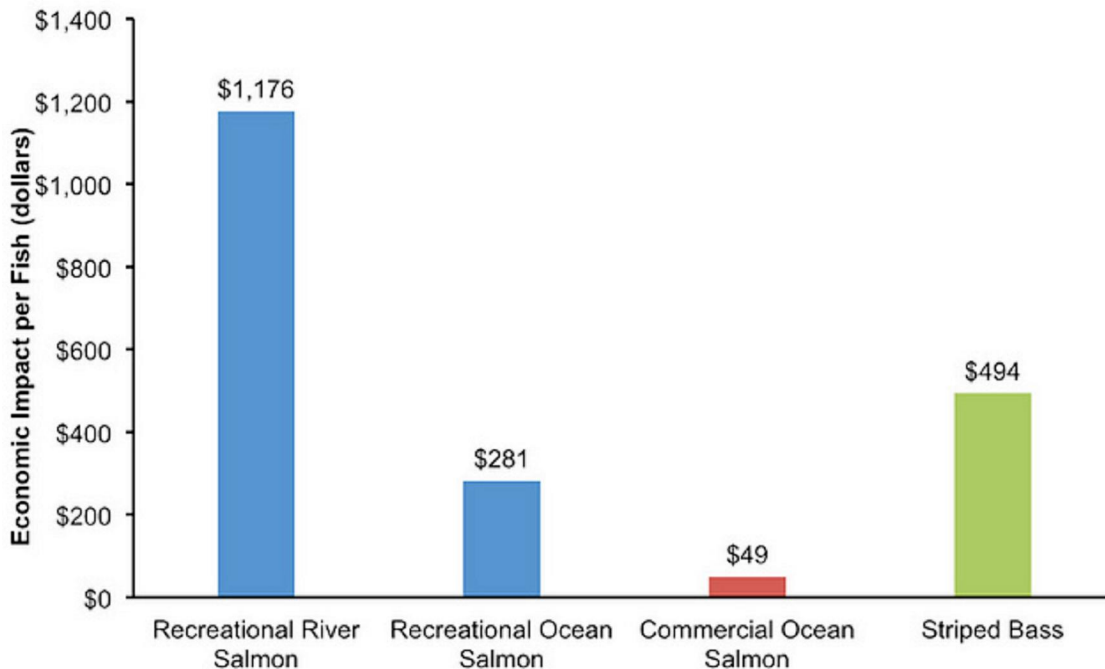
One would think that information on the economic impact of commercial and recreational fishing would be widely available for a species like Chinook salmon, considering all of the monitoring, regulations, research, hatchery supplementation and conservation projects that are carried out each year on their behalf. However, a literature review

revealed a general lack of suitable analyses specific to West Coast fisheries. While some data are available, an array of different reporting metrics, numerous extrapolation factors and limited overlap in comparable data presented many obstacles to providing a clear and concise calculation of economic impact. In an effort to understand the economic impacts, we've been analyzing available data to develop meaningful comparisons between different datasets.

We used harvest data obtained from the Pacific Fishery Management Council (PFMC), the National Marine Fisheries Service (NMFS) and the California Department of Fish and Wildlife (CDFW), along with metrics provided by a state economist with the U.S. Department of Agriculture's Natural Resource Conservation Service. We generated a per-fish estimate of economic impact for each salmon and striped bass caught in the state depending on type and location of harvest.

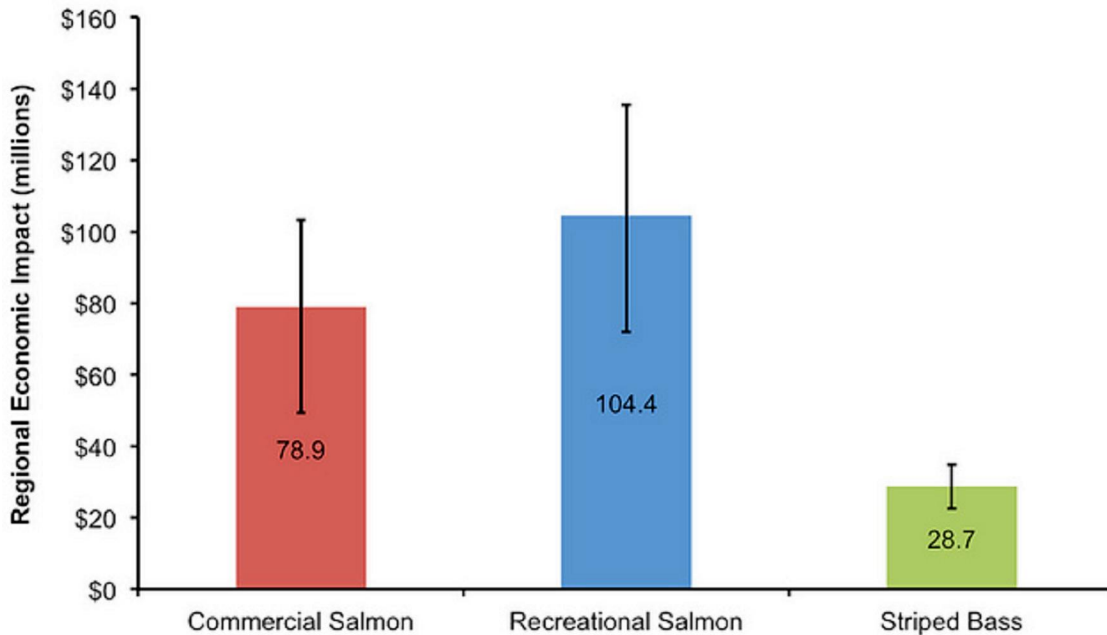
Each salmon caught in-river in 2013 had an economic impact of approximately \$1,176 for California in terms of jobs, sales, gross regional product, and ripple effects to the economy (Figure 1). Each recreationally caught ocean salmon in 2013 had an economic impact of approximately \$281 for the state. Comparatively, each commercially caught salmon had an economic impact of only \$49. Striped bass, while not as valuable as salmon caught in-river, still provided an economic impact of approximately \$494 for each fish caught in the state.

These economic impacts are a result of expenditures on any number of the following: fees/licenses, boat maintenance, fuel, bait/tackle, food/beverage, travel costs, lodging, and any other associated goods and services used by recreational anglers. The relatively low economic impacts of a commercially caught salmon are primarily a function of fishing effort and the necessarily higher efficiency of commercial fishing. One day of commercial fishing yields many more fish than one day of recreational fishing.



**Figure 1. Estimated regional economic impacts of fish caught in California. Economic impact includes jobs, sales, income, value added and ripple effects to the economy. Ransom, M.M. 2001. *Economic Impacts of Salmon Fishing*; CDFG. 2001. *California's Living Marine Resources*; CDFW. 2010. *Central Valley Angler Survey*.**

The 2013 recreational salmon fishery in California produced an overall economic impact of approximately \$104.4 million for the state, while the commercial salmon industry produced approximately \$78.9 million (NMFS 2013, PFMC 2014, Ransom 2001). In 2010 (most recent available estimate), the California striped bass fishery had an estimated economic impact of \$28.7 million (Figure 2). In 2013, a total of 297,409 salmon were harvested by the commercial salmon industry, while recreational anglers harvested 113,635 salmon from the ocean, and 61,672 salmon from freshwater, as reported by PFMC (2014). Between July 2009 and June 2010, a reported 58,116 striped bass were harvested in California based on creel surveys performed by CDFW (CDFW 2010). Despite lower harvest numbers, the increased economic value of a recreationally caught fish contributed to the greater impact of the recreational salmon fishery in California.



**Figure 2. Estimated California commercial and recreational economic impact of marine and in-river harvest of salmon and striped bass. PFMC. 2014. *Review of 2013 Ocean Salmon Fisheries*; Ransom, M.M. 2001. *Economic Impacts of Salmon Fishing*; CDFG. 2001. *California's living Marine Resources*; CDFW. 2010. *Central Valley Angler Survey*. Note: Error bars represent upper and lower estimates of Regional Economic Impact.**

Viewing salmon through the prism of economics allows one to see not only the cultural and iconic value of the fish, but also the tangible and significant economic contribution to California. This is an important consideration in the ongoing discussion over the many millions of dollars spent each year on stream restoration, hatcheries and monitoring programs for salmon.

While some people believe that it is absurd to spend so much money to conserve any single species, it can be argued that these projects may actually make financial sense in the long term. One such project is the [Northern Pikeminnow Management Program](#), an ongoing effort to reduce predation by northern pikeminnow of downstream migrating juvenile salmonids in the Columbia River. The program, with an annual budget of between \$2.0 to \$6.4 million, provides a reward to recreational anglers for catching and removing larger size class pikeminnow. Despite the large annual budget, a [program review](#) conducted in 2004 by Radke and others, found that the economic impacts from this program may be as high as \$13.4 million annually, indicating a net benefit for the economy.

The economic impact estimates that we have produced represent our best assessment based on the available data and, while not perfect, we hope they will stimulate discussion about the economic and intrinsic value of California's fishes. Knowing the economic benefits of salmon conservation can only help in a culture that is all too often concerned with the bottom line.