

SCOPE OF THE NORTHWEST FISHERIES SCIENCE CENTER ECOSYSTEM SCIENCE REVIEW

The Northwest Fisheries Science Center (NWFSC) conducts research to conserve and manage living marine resources and their marine, estuarine and freshwater habitat. The NWFSC's research supports the National Marine Fisheries Service's West Coast Regional Office and other agencies in managing more than 90 commercially important fish species, recovering over 30 threatened and endangered fish and marine mammal species, and identifying and mitigating coastal and ocean health risks.

The NWFSC fills an important role in providing the scientific knowledge to inform management decisions on the stewardship of the California Current Large Marine Ecosystem (CCLME). The California Current encompasses a broad range of ecosystems, diverse habitats and biological communities from the watersheds that drain mountain ranges to marine waters far offshore. And, we consider humans to be an integral part of the ecosystem (Figure).

The breadth of ecosystem, the scope of the NWFSC's work, and the Terms of Reference for this Ecosystem Science Review required bounding the scope of what would be considered by this review. Below, we highlight the scope of the review, the rationale behind this, and what topics will not be part of this review.

THE REVIEW WILL FOCUS ON NON-SALMONID SPECIES.

While Pacific salmon is a focus of a significant amount of our ecosystem research, salmon, themselves, were the focus of a previous review (materials can be found here: <https://swfsc.noaa.gov/2015WestCoastProtecteFishReview/>). Information about climate, habitat, and estuarine and marine ecology covered in that review are available for your reference (<https://swfsc.noaa.gov/textblock.aspx?id=20262>).

While not the focus of the review, some salmon ecosystem science will be presented. Salmon are, of course, an important part of the ecosystem, and have been the subject of some innovative work. Thus, we will highlight some specific projects with the goal of salmon work that is particularly well integrated with other ecosystem components.



The NWFSC conceptualization of the California Current as an integrated social ecological system. From Levin et al. 2016. Coastal Management in press

THE REVIEW WILL FOCUS ON MARINE AND ESTUARINE ECOSYSTEMS.

Similarly, because the salmon review covered freshwater ecosystem science, we have omitted this from our review.

THE REVIEW IS FOCUSED ON WORK OF THE NWFSC, RATHER THAN ALL NMFS WORK IN THE CALIFORNIA CURRENT

Ecosystem research in the California Current is conducted by both the Southwest and Northwest Fisheries Science Centers. There is a great deal of collaboration with the SWFSC on ecosystem science, most notably on the California Current Integrated Ecosystem Assessment and on certain marine surveys. Nonetheless, the SWFSC focuses more effort on the Southern California Bight, and coastal pelagic species, highly migratory species and pinnipeds. Thus, some components of the system that we at the NWFSC do not work on will not be covered. You can examine materials from the recently conducted SWFSC ecosystem review here: <https://swfsc.noaa.gov/2016EcosystemReview/>

ECOTOXICOLOGY WORK IS NOT INCLUDED IN THIS REVIEW

The NWFSC conducts world-class ecotoxicology work that obviously is relevant to many ecosystem issues. Our scientists have worked on a wide range of topics from historically contaminated sites to major disasters (e.g., the *Exxon Valdez* and *Deepwater Horizon* oil spills) to contaminants of emerging concern for human health and fisheries and protected species. Details about the Ecotoxicology program can be found here: <https://www.nwfsc.noaa.gov/research/divisions/efs/ecotox/index.cfm>. Because this work has been featured in both the protected fish species review (i.e. salmon) and protected (not fish) species review (i.e. marine mammals and turtles), we will not include this work as part of this review.

SOCIAL SCIENCE RESEARCH WILL BE LARGELY COVERED IN A SEPARATE REVIEW.

Social science is deeply integrated into our ecosystem science. Indeed, the Ecosystem Science Program includes 12 social scientists (4 FTEs; 8 non-federal staff). Social science has also played an increasingly important role in the California Current IEA. We will present some social science work to highlight the degree to which we askew traditional disciplinary boundaries. Nonetheless, because there will be a separate Social Science and Economics review in 2017, the breadth and depth of social science we present will be limited.

OUR FOCUS: SCIENCE TO SUPPORT THE DEVELOPMENT AND IMPLEMENTATION OF ECOSYSTEM-BASED MANAGEMENT IN MARINE & ESTUARINE ECOSYSTEMS IN A CHANGING CLIMATE.

The major thrust of the review will be the data collection activities, analyses, and modeling activities that seek to inform ecosystem-based management (inclusive of ecosystem-based fisheries management) in the face of environmental change. The work we will present encompasses plankton to people (with the caveat about social science above), and is largely centered in the northern California Current.