

*D. Northern California Regional Study*

## 1. Background: Marine Fisheries of Northern California

The Northern California NMFS region extends from Point Conception north to the Oregon border. The oceanic transition zone off Point Conception creates a natural ecological separation between northern and southern California. North of Point Conception, coastal waters are cold and oceanic conditions are harsh, whereas to the south waters are warmer and conditions are moderate. As a result, the fish species composition differs between the two regions (Leet *et al.*, 2001). Fisheries of the Northern California Region are managed by the Pacific Fishery Management Council (PFMC), which governs commercial and recreational fisheries in federal waters from 3–200 nautical miles off the coasts of Washington, Oregon and California. The NMFS Northwest Fisheries Science Center provides scientific and technical support for management, conservation and fisheries development.

There are 83 species of groundfish included under PFMC's Groundfish FMP, including nearly 50 species of rockfish (*Sebastes* spp.) (Table 3 in NMFS, 2002). Pacific whiting (*Merluccius productus*) dominates the commercial catch, accounting for 78% of Pacific Coast landings (NMFS, 1999a). During the 1990's a major fishery developed for nearshore species, including rockfishes, cabezon, and sheephead (Leet *et al.*, 2001). Rockfishes are important for both commercial and recreational fisheries (NMFS, 1999a). In 1994, a limited entry program was

implemented for the groundfish fishery due to concerns about overfishing (NMFS, 1999a).

There are five species of anadromous Pacific salmon supporting coastal and freshwater commercial and recreational fisheries along the Pacific Coast, including chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), sockeye (*O. nerka*), pink (*O. gorbuscha*), and chum (*O. keta*) salmon (NMFS, 1999a).

Since 1991, NMFS has listed 20 Evolutionary Significant Units (ESU's)<sup>22</sup> of Pacific Coast salmon and steelhead trout (*O. mykiss*) under the federal Endangered Species Act (ESA) (NMFS, 1999b). In NMF's Northern California region, listed species include steelhead, coho salmon, and chinook salmon of the central California Coast and steelhead and chinook salmon of California's Central Valley.

Ocean fisheries for chinook and coho salmon are managed by the PFMC under the Pacific Coast Salmon FMP. In Puget Sound and the Columbia River, chinook and coho fisheries are managed by the states and tribal fishery agencies. Declines in chinook and coho salmon coast-wide have led to reductions and closures of ocean fisheries in recent years (NMFS, 1999a).

The Pacific Salmon FMP contains no fishery management objectives for sockeye, chum, even-year pink, and steelhead stocks because fishery impacts are considered inconsequential (Table 3 in NMFS, 2002). Pink, chum, and sockeye salmon are managed jointly by the Pacific Salmon Commission, Washington state, and tribal agencies (NMFS, 1999a).

Pacific Coast pelagic species managed by the PFMC include Pacific mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), Pacific sardine (*Sardinops sagax*), northern anchovy (*Engraulis mordax*), and California market squid (*Loligo opalescens*) (NMFS, 2002). These species typically fluctuate widely in abundance, and currently most stocks are low relative to historical levels (NMFS, 1999a). Pacific mackerel and Pacific sardine are not overfished, but the stock size of the other species governed by the Coastal Pelagic FMP is unknown (Table 3 in NMFS, 2002). Due to increases in abundance in recent years, Pacific mackerel now accounts for over half of recent landings of Pacific Coast pelagic species (NMFS, 1999a).

Pacific Coast shellfish resources are important both commercially and recreationally (NMFS, 1999a). Shrimps, crabs, abalones, and clams command high prices and contribute substantially to the value of Pacific Coast fisheries, even though landings are small.

## 2. Impingement and Entrainment Results

Table X–18 provides a list of impingement and entrainment species in the Northern California region and the species groups that were evaluated in EPA's analysis of regional impingement and entrainment. The life history data used in EPA's analysis and associated data sources are provided in "Appendix 2: Life History Parameter Values Used to Evaluate I & E in the Northern California Region."

TABLE X–18.—SPECIES GROUPS AND ASSOCIATED SPECIES FOR THE NORTHERN CALIFORNIA REGIONAL STUDY

Group evaluated	Species	Commercial	Recreational	Forage	Special status
Anchovies .....	Northern anchovy .....	X	X	.....	
Bay shrimps .....	Bay shrimp .....	.....	X	.....	
	Other bay shrimp <sup>a</sup> .....	.....	X	.....	
Cabezon .....	Cabezon .....	X	X	.....	
California halibut .....	California halibut .....	X	X	.....	
Drums/croakers .....	Queenfish .....	X	X	.....	
	White croaker .....	X	X	.....	
	Other croakers .....	.....	X	.....	
Dungeness crab .....	Dungeness crab .....	X	X	.....	
Flounders .....	Dover sole .....	X	X	.....	
	English sole .....	X	X	.....	
	Pacific sanddab .....	X	X	.....	
	Rock sole .....	X	X	.....	
	Sand sole .....	X	X	.....	
	Starry flounder .....	X	X	.....	
	Other flounders <sup>B</sup> .....	X	X	.....	
Gobies .....	Bay goby .....	.....	.....	X	
	Blackeye goby .....	.....	.....	X	
	Blind goby .....	.....	.....	X	
	Longjaw mudsucker .....	.....	.....	X	

<sup>22</sup> An Evolutionarily Significant Unit (ESU) is a term introduced by NMFS in 1991 to refer to the Endangered Species Act (ESA) interpretation of

"distinct population segment." A stock must satisfy two criteria to be considered an ESU: (1) "it must be substantially reproductively isolated from other

conspecific population units," and (2) "it must represent an important component in the evolutionary legacy of the species."