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San Diego Bay Fish Consumption Study

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EXECUTIVE REPORT

The California Regional Water Quality Control Board, San Diego Region considers San Diego Bay one of the most important and valuable resources in the Southern California region. The bay provides multiple beneficial uses for both human use and natural services including habitat for fish and wildlife, extensive commercial and industrial economic benefits, and recreational opportunities to residents and visitors. It is imperative to protect its chemical, physical, and biological integrity so the many benefits of San Diego Bay may be enjoyed by future generations.

We undertook this study to gain a more comprehensive understanding of fishing activity and consumption than previously available for San Diego Bay. This information may be useful in supporting a future assessment of human health risks associated with consumption of fin fish from the bay. In 2013, the Office of Environmental Health Hazard Assessment (OEHHA) released their health advisory and consumption guidelines for San Diego Bay (OEHHA 2013). However, at the time of these recommendations, no recent study of fishing activity was available that provided a current understanding of how many anglers were consuming fish from the bay, and, if so, in what amounts. In particular, we sought to differentiate how many anglers are fishing for recreation (anglers practicing catch and release) versus those who keep and consume some portion of their catch.

This study was designed to interview a representative sample of anglers fishing in San Diego Bay from May 1, 2015 through April 30, 2016. We conducted field interviews of anglers at common fishing locations (boat landings, piers, and shoreline locations) surrounding the bay. The study design accounted for both geographically and culturally relevant site selection to ensure adequate coverage of all areas of the bay. Our objective was to provide consumption data specifically for fin fish consumed from San Diego Bay and to provide a basis for developing locally relevant recommendations. Additionally, the findings of this study provide valuable information for improving outreach and education to specific, higher risk segments of the fishing population and for guiding contaminant studies to monitor fish that people consume. In developing this study of fishing activity and consumption in San Diego Bay we focused on three key questions:

What are the consumption rates for anglers in San Diego Bay and how do they relate to advisory recommendations?

How do socio-economic differences relate to differences in consumption rates?

How do catch and consumption rates vary in space and time by location around the bay and time of year?

We reviewed survey questions and methods used in prior consumption studies conducted in California (San Diego County Department of Health Services 1990, SCCWRP 1994, Environmental Health Coalition 2005, SFEI 2000, Shilling et al. 2010, Shilling et al. 2014, EHIB 1994 and OEHHA 1994) to ensure data comparability wherever possible. Additional questions were added to capture sociospatial

data to correlate with existing GIS-based data as an enhancement to the socioeconomic information for the study.

We approached a total of 1549 anglers in San Diego Bay. Overall, Pier Anglers were approached most often (62%), followed by Boat Anglers (24%) and Shoreline Anglers (15%). Nearly half of the surveys were completed at North Bay sites with Shelter Island representing the vast majority of responses (82.7%). Sites in the Mid Bay and South Bay zones provided similar approximately equal levels of the remaining responses. In Mid Bay the Embarcadero Marina Park Pier represented almost half of the responses (46.5%) and in South Bay the majority of responses came from Pepper Park (71.4%).
At least two-thirds of those surveyed indicated their residence was within San Diego County and about three-fourths were from within California.

The most identified ethnicity was White/Caucasian, followed by Hispanic, Asian, Native Hawaiian/Pacific Islander, Black/African American or American Indian (Figure 13). The self-reported ethnicities for San Diego County anglers approximate the general population of San Diego County as indicated by the US Census. Anglers were placed into median household income categories based on their reported ZIP codes and the census information on median household incomes (US Census 2015). The majority of the anglers were from areas that had ZIP codes indicating a median household income between $24,001 and $53,000. For 2015, the Federal poverty rate for a family of four was $24,250. Consumption rates by median household income category, as determined by home ZIP code and US Census data, are approximately the same for those making less than $50,000 a year but decrease as annual incomes exceed $50,000 (US Census 2015).

Anglers under 40 consumed fish at a lower level than the total percent of anglers in their age class. Anglers over 40 consumed fish at a slightly higher percentage compared to the overall percent for each age category. Anglers typically prepared and consumed fish fillets (67%) versus preparing/consuming the whole body (33%). The mean consumption rate (18.1 g) was higher than the geometric mean consumption rate (10.6 g) and both were higher than the median (8.5 g). These compare to reported 95% rates of 32 g/day (1 meal per week), in San Francisco Bay, a value which has been used to represent fish consumption statewide (SFEI 2000).

Consumption rates were examined to determine if significant differences were present among socioeconomic categories. Significant differences were found between anglers in the 61-70 and >70 age groups when compared to the younger age groups. Significant differences were also found between anglers who spoke Asian and other languages versus English and Spanish, and differences were found between anglers of different ethnicities. In particular, median consumption rates for Asians were significantly higher than all other ethnicities.

Anglers identified the species of fish they caught and kept for consumption during the previous week. The most common fish consumed was the Pacific Chub Mackerel which was caught slightly less than half of the time (48%). The California Halibut and spotted sand bass were caught and consumed a less than one fifth of the time (18% and 16%, respectively), the Bonito and shortfin corvina at slightly less (12% and 7%, respectively). Other fish species consumed, included several found on the advisory list including: round stingray; barred sand bass; gray smoothhound shark; yellowfin croaker; shovelnose guitarfish; leopard shark; and California lizardfish, each caught between 3% and 6% of the time.

Signs indicating consumption guidance are posted at locations frequented by anglers. Nonetheless, fewer than 50% of all anglers were aware of the consumption advisories. However, anglers who eat the fish had a slightly higher percentage of awareness of the advisories versus those that do not. No differences were found between angler awareness before and after the new signs were put into place and awareness of either the old or new signage did not appear to have a significant impact on consumption behavior.

Of anglers who consume fish they catch, approximately half eat it themselves while one-third share their catch with their families. Almost 70% of the anglers who consume the fish they catch do not share it with children. Of the anglers who share fish with their children (and indicated the portion of fish they ate), almost two thirds consumed fillets and about a third whole bodies.

Overall, consumption rates for anglers catching fish from San Diego Bay are fairly low, and for the majority of anglers, nowhere near the levels indicated by current consumption guidelines. Anglers consuming at rates in excess of guidance are typically middle-aged or older Asian men from socioeconomically disadvantaged communities. This is the single socioeconomic group which appears to indicate a pattern consumption which exceeds the current consumption guidelines.

Full text:
http://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/976_SanDiegoFishConsumptionStudy.pdf