

# Fish Contamination in Southern California

July 2007

*In 2002, the Montrose Settlements Restoration Program (MSRP) and the U.S. Environmental Protection Agency (EPA) Superfund Program began a comprehensive, updated survey of marine fish along the Southern California coast to provide reliable information on the current status of contamination in the area, with particular emphasis on fish commonly caught by subsistence and sport anglers.*



## How was the survey conducted?

Biologists surveyed 24 coastal segments from Ventura to Dana Point, collecting over 2,500 samples of 23 species of fish, including:

- Barred sandbass
- Black croaker
- California corbina
- California halibut
- California sheephead
- California scorpionfish (sculpin)
- Chub (Pacific) mackerel
- Halfmoon
- Jacksmelt
- Kelp (calico) bass
- Pacific barracuda
- Pacific sardine
- Opaleye
- Queenfish
- Rockfishes
- Sargo
- Shovelnose guitarfish
- Surfperches
- Topsmelt
- Yellowfin croaker
- Yellowtail
- White croaker
- White seabass

Approximately 1000 fish samples were analyzed for DDTs, PCBs, dieldrin, chlordane and mercury.

Most fish were collected in late 2002, with additional white croaker samples taken into 2004 to evaluate a white croaker commercial catch ban currently in effect off the coast of the Palos Verdes Peninsula.

Analysis was generally conducted on skin-off filets (muscle tissue, with the belly flap removed). Most samples were analyzed as single-fish samples, however for some species and/or contaminants, tissue from multiple fish were analyzed together.

For two representative species (kelp bass and white croaker) multiple body parts were also analyzed, because anglers often eat more than just the fillet (e.g. whole fish in stew or soup). These body parts included the skin-off fillet from one side, skin-on fillet from the other side, viscera, and the remaining tissue and skeleton together.

The relationships between contaminant concentrations in the different body components allowed us to estimate the total contaminant levels in a whole, ungutted fish, as well as determine how different fish preparations affect contaminant levels.

*Biologists collected over 2,500 samples in areas across the coast of Southern California. Additional samples taken near Ventura to the north and Point Dume to the south are not pictured.*





*Kelp (or calico) bass is an important predator in rocky reef habitats, and a prized target for many anglers.*



*California scorpionfish (or "sculpin") is another commonly caught species.*



*White croaker (or "tomcod") was generally the most highly contaminated species near the Palos Verdes Shelf.*

### *What are the results?*

A full discussion of the differences in contaminant concentrations between species and locations is provided in the 2002-2004 *Southern California Coastal Marine Fish Contaminants Survey*, available online at [www.montroserestoration.gov](http://www.montroserestoration.gov) and [www.epa.gov/region09/features/pvshelf](http://www.epa.gov/region09/features/pvshelf).

#### *Organochlorines (PCBs, DDTs, chlordane, dieldrin)*

Concentrations of PCBs, DDTs, and chlordane varied broadly among species and locations. Maximum concentrations of PCBs were lower than those of DDTs, and maximum values of chlordane were lower than PCBs. Almost all dieldrin concentrations were below the detection limit. This variability was largely consistent with previous surveys.

The variation in contaminant concentrations seemed to be driven both by differences between locations and by species. DDT concentrations were generally higher than PCB concentrations, particularly close to the Palos Verdes shelf. This is consistent with reported sediment concentrations, which have about a 10 to 1 ratio of DDTs to PCBs. One exception was opaleye. Further study and analysis is needed to understand DDT/PCB ratios in opaleye.

For organochlorines, white croaker was generally the most highly

contaminated species near the Palos Verdes shelf (i.e., southern Santa Monica Bay, Palos Verdes Shelf, and San Pedro Bay). White croaker samples collected from segments in Orange County and parts of Long Beach Harbor had levels of contamination that were similar to white croaker collected from the more northerly segments (Point Dume and Ventura).

#### *Mercury*

Variation in mercury was generally driven by differences between species and by fish size, with larger, higher trophic level species (kelp bass, barred sand bass) generally higher in mercury concentrations than smaller, lower trophic level species. One important finding for mercury was that while species belonging to the tuna/mackerel family are often associated with higher mercury content, Pacific mackerel in this study had some of the lowest mercury concentrations of all the species analyzed in this study.

#### *Whole fish analysis*

Based on contaminant analyses of the skin-off fillet, skin-on fillet, viscera, and "remainder" of fish, we estimated the concentrations of contaminants in whole, ungutted fish. Our results suggest that whole fish have concentrations of PCBs and DDTs that are generally 8 to 10 times higher than only the fillets.



### *Find it Online!*

A complete copy of the 2002-2004 Southern California Coastal Marine Fish Contaminants Survey

## How will the results be used?

To help protect the public from consuming contaminated fish, the results will be used to update fish consumption advisories and the commercial fishing ban for white croaker, which will in turn be used to conduct outreach and education about 1) fish contamination; 2) ways to reduce contaminant intake; and 3) which fish provide healthier alternatives.

The results will also help EPA conduct risk assessments and guide potential cleanup options for the contaminated sediment, as well as help the Montrose Settlements Restoration Program (MSRP) efforts to restore the public's ability to fish for less contaminated fish. For example, results will guide the placement of artificial reefs near fishing piers to increase the availability of less-contaminated species for anglers.

### *Updating fishing advisories and commercial fishing bans*

The results of this survey will be used for risk assessments and fish consumption advisory analysis. The California Office of Environmental Health Hazard Assessment (OEHHA) will use this and other data to update existing sport fish consumption advisories and to review the current commercial no-take ("catch ban") zone for white croaker near the Palos Verdes shelf.

EPA and the MSRP encourage the public to play an active role in this

*Updated fish advisory and white croaker catch ban information will be integrated into ongoing public outreach and education programs and materials.*



process, and will work with OEHHA to ensure that the data and advisories are provided and explained to the public

### *Public outreach and education*

Updated fish advisory and white croaker commercial catch ban information will be integrated into ongoing public outreach and education program efforts via the Fish Contamination Education Collaborative, or FCEC.

Members of the FCEC conduct a variety of programs to educate the public about fish contamination (including targeted outreach to people who are most highly exposed to fish contamination), recommend measures to reduce contaminant intake, and provide anglers with information on which fish are better alternatives. Further information about the FCEC may be obtained from [www.pvsfish.org](http://www.pvsfish.org).

### *Cleanup of the contaminated sediments*

The vast majority of the DDTs and PCBs causing the fish contamination are in a large deposit of sediments lying on the Palos Verdes Shelf. EPA is studying the contamination and looking at ways to reduce the risk to human health and the environment from exposure to these contaminants. The data from this survey will assist EPA in developing a cleanup plan, which should be available for public review in 2008.

### *Restoration of lost fishing opportunities*

Because the public's use of marine fishing resources have been negatively impacted by the contaminants, MSRP is investigating ways to increase the availability of less contaminated fish along the coast of Southern California. For example, changing fish habitat around fishing sites could attract different, less contaminated fish.

### For more information, contact:

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## Background

From the 1940s to the 1970s, millions of pounds of DDTs and PCBs were discharged from industrial sources through wastewater outfalls into the ocean at White Point, near Los Angeles. The discharge of these chemicals ceased more than 30 years ago, but their impacts persist today.

The primary source of DDTs was industrial waste from the Montrose Chemical Corporation, which manufactured the pesticide DDT at its facility in Torrance, CA from 1947 to 1982. The contaminants dispersed throughout Southern California's marine environment. The highest sediment and fish concentrations occur offshore of Los Angeles on the Palos Verdes Shelf (PV Shelf), where the outfalls discharge.

Today, large amounts of DDTs and PCBs remain in ocean water and sediments, and certain fish, birds, and other wildlife

continue to accumulate DDTs and PCBs in harmful amounts. The state and federal governments investigated and in 1990 filed an action against several responsible parties. In March 2001, the court approved the last of a series of settlements providing funds to the EPA to respond to the ecological and human risks posed by the DDTs and PCBs, and to six federal and state natural resource trustee agencies (Trustees) to restore injured natural resources and compensate for the loss of the services they provide.

In 1991, the State of California issued fish consumption advisories for locations between Malibu and Newport Beach, largely based on data collected before 1985. It has been more than fifteen years since a large-scale survey of contaminants in fish in this area has been conducted.

## What can I do?

### *Join the FCEC efforts!*

Help educate your community about fish contamination. Visit [www.pvsfish.org](http://www.pvsfish.org) for an event calendar, or contact [info@pvsfish.org](mailto:info@pvsfish.org) for more information on volunteer and paid opportunities.

### *Give us your feedback!*

The processes of updating fish consumption advisories, re-evaluating the existing white croaker commercial catch ban area regulations, making decisions regarding sediment cleanup, and planning artificial reefs will all involve meetings to gather public feedback. For information on how to get involved, contact the people listed above.

