

Spotted Seatrout and Catfish Consumption Advisory in Galveston Bay

FREQUENTLY ASKED QUESTIONS

July 2008

What are PCBs and Dioxins?

PCBs (polychlorinated biphenyls) are a family of organic compounds that have been widely used since 1929 as coolants and lubricants in electrical equipment (transformers, capacitors, etc.) because they don't burn easily and are good insulators. There are no known natural sources of PCBs. Over 1,200,000 tons of PCBs were manufactured in the United States. Of this, about 65% is still in use, 31% is an environmental burden, and 4% has degraded or been incinerated. PCBs are stable compounds, are long-lived in the environment, and can be found everywhere. Concern over toxicity and persistence in the environment led Congress in 1979 to prohibit the manufacture, processing and distribution of PCBs.

Dioxin is a general term describing a family of organic chemicals that last for a long time in the environment. They are formed as unintentional by-products of many industrial processes involving chlorine such as waste incineration, chemical and pesticide manufacturing and pulp and paper bleaching. Dioxins are toxic at very low concentrations. Relative to the 1970's, sources of dioxin have been greatly reduced, but some sources of dioxin still exist in combustion of fossil fuels and wood, incineration of solid waste, and certain chemical manufacturing processes.

How do PCBs and Dioxin affect people?

PCBs and dioxins have been found in soil, ground and surface water, air, sediment, plants, and animals in all regions of the world. PCBs and dioxins break down very slowly in the environment and accumulate in fatty tissue, skin, and internal organs of fish and other animals. The amount of PCBs/dioxins found in fish varies with species, age, size, fat content, diet, and surface water concentrations. Larger, older fish will generally contain higher levels of PCBs/dioxins than lean fish. Eating fish that contain PCBs may cause infants of women who have eaten many contaminated fish to have lower birth weights, delayed physical development, and learning difficulties. PCBs may affect the immune system, reproductive organs, skin, stomach, thyroid, kidney, and liver and may increase the risk of cancer. The types of PCBs that tend to concentrate in fish and bind to sediments happen to be the most carcinogenic components of PCB mixtures. Exposure to dioxins has been linked to suppression of the immune system, a variety of reproductive effects from reduced fertility to birth defects, skin disease, and cancer.

Why would Spotted Seatrout and Catfish show high levels of PCBs and Dioxins?

Once PCBs and dioxins have entered into an animal's body they get stored in fat tissue. This makes it hard for the organism to eliminate them from its body. As you move up the food chain the PCBs/dioxins compounds begin adding up (biomagnification). While animals do eliminate them slowly from their bodies, their physiological systems may not be able to keep pace with the concentration in the environment. Thus some individuals begin accumulating concentrations that pose a risk to humans (or other predators). Predators that are at the top of the food web are going to accumulate the greatest concentrations. It is important to note that not all animals are the same at accumulating PCBs and dioxins. Factors such as growth rate, dietary preferences, migration habits, etc. play a role in determining the concentration that accumulates in the body.

What is the source of the PCBs and Dioxins in Spotted Seatrout and Catfish?

At this time a specific source of PCBs in Galveston Bay is unknown. Because PCBs were once commonly used there are many potential sources. They take a long time to degrade or breakdown and they exist in the environment typically at very low concentrations. PCBs can be found in the sediments, rainfall runoff, in leaching water from buried equipment or landfills, inflow from contaminated tributaries, and atmospheric deposition.

Dioxins are formed as unintentional byproducts of some industrial and chemical production processes, incineration of industrial and municipal solid waste and to a lesser extent as natural byproducts of combustion of fossil fuels and wood. The Texas Commission on Environmental Quality (TCEQ) is looking for sources of dioxins and PCBs in the Houston Ship Channel as part of their Total Maximum Daily Load program. See <http://www.tceq.state.tx.us/implementation/water/tmdl/26-hscdioxin.html> and <http://www.tceq.state.tx.us/implementation/water/tmdl/78-hsc-pcbs.html>. TPWD, TCEQ and EPA recently worked together and found a significant legacy dioxin source in the San Jacinto River, which has become a Superfund site. See <http://epa.gov/superfund/sites/npl/nar1773.htm>.

PCBs and dioxins persist for many years in the environment. Thus pollution sources from decades ago may still be present and having effects now.

How much of Galveston Bay is affected by the Advisory?

The Texas Department of State Health Services (DSHS) has issued an advisory recommending limited consumption of spotted seatrout (speckled trout) and all catfish species in Galveston Bay. This advisory includes the following minor bays associated with the Galveston Bay system: Trinity Bay, Upper and Lower Galveston Bay, East Bay, West Bay, Chocolate Bay and contiguous waters. Maps of the advisory area can be found at <http://www.dshs.state.tx.us/seafood/>.

What about Spotted Seatrout and Catfish caught outside the Advisory area?

Since spotted seatrout and catfish readily move within a bay system, one potential source of public concern is how extensive the PCB/dioxin problem is within areas adjacent to the advisory area of Galveston Bay. The DSHS study did not include samples beyond Galveston Bay, Trinity Bay, East Bay and West Bay. TPWD is supportive of Texas Department of State Health Services in their attempts to locate additional funding to expand their monitoring efforts in waters adjacent to Galveston Bay and in other bay systems.

Are other game fish species affected?

Sampling conducted by the Texas Department of State Health Services in 2004 and 2006-2007 included samples from other species, including red drum, black drum, southern flounder and blue crab. However, only spotted seatrout and catfish showed elevated levels of PCBs/dioxins that would be cause for concern. This is most likely due to different rates of metabolism between species, age, size, fat content, diet and seasonal behavioral patterns.

What should people do?

Anglers can play an important role in helping to spread the word about fish consumption advisories within the fishing community. Catch and release fishing is already a preferred practice of many anglers, and it is a way to minimize risk since no fish is consumed. Since PCBs/dioxins readily accumulate in the fatty tissues of fish, anglers can reduce exposure to these chemicals by removing the skin, dark (reddish-color) muscle tissue, and fatty portions (i.e. belly fat, side fat, and fat along the top of the back) before cooking. The Texas Department of State Health Services recommends baking or broiling skinned, trimmed fish on a rack or grill to allow fat to drip away from the fillet. If fish are fried, the frying oil should not be reused. These cooking methods will reduce exposure to many of the

most common organic chemical contaminants in fish, including PCBs/dioxins. Additional information about preparing fish for consumption can be found at <http://www.dshs.state.tx.us/seafood/eatrisk.shtm> and <http://www.atsdr.cdc.gov/HAC/PHA/oakridge013107-TN/appc3.pdf>.

What is the likely effect of the Advisory on fishing?

This advisory may have some effect on fishing in Galveston Bay and on some associated businesses. Spotted seatrout is one of the most popular sport fish in Texas and continues to increase in popularity. However, many anglers practice catch-and-release with this species, and for those who wish to take fish home, following the handling recommendations from DSHS will reduce an angler's exposure to PCBs/dioxins that might be present in fatty tissues. Additionally, there are many other species available to fishermen including red drum, flounder, and black drum to name a few.

Catfish, both freshwater and saltwater species, are often sought by fishermen. Freshwater species (primarily channel catfish and blue catfish) can be found in the upper reaches of Galveston Bay near the mouths of rivers and bayous while saltwater species (gafftopsail and hardhead catfish) can be found throughout the bay system. All catfish species within the above defined areas of Galveston Bay are covered by this advisory. Following the handling recommendations from DSHS should reduce an angler's exposure to PCBs/dioxins that may be present in fatty tissues.

For more information about how PCBs affect fish and fisheries, contact:

Lance Robinson, Coastal Fisheries Division, Texas Parks and Wildlife Department, Dickinson Marine Laboratory, (281) 534-0101; lance.robinson@tpwd.state.tx.us.

Bill Balboa, Coastal Fisheries Division, Texas Parks and Wildlife Department, Dickinson Marine Laboratory, (281) 534-0110; bill.balboa@tpwd.state.tx.us.