Neches River Basin Fish Consumption Advisory
(Including B.A. Steinhagen and Sam Rayburn Reservoirs)
Frequently Asked Questions
Prepared by the Seafood and Aquatic Life Group
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Q: What recommendation has the Texas Department of State Health Services (DSHS) made to protect human health?

A*:* Because the developing nervous system of the human fetus and young children may be especially susceptible to adverse health effects associated with consuming dioxin or mercury contaminated fish, the DSHS recommends more conservative consumption guidance for this sensitive subpopulation. The table below lists DSHS' consumption recommendations for the Neches River and all contiguous waters from the State Highway 7 Bridge west of Lufkin, Texas downstream to the U.S. Highway 96 Bridge near Evadale, Texas including B.A. Steinhagen and Sam Rayburn Reservoirs.

Species Affected	Women of Childbearing Age and Children < 12	Women Past Childbearing Age and Adult Men[1]
Blue catfish > 30 inches	**DO NOT EAT**	2 meals/month
Flathead catfish	**DO NOT EAT**	1 meal/month
Gar (all species)	**DO NOT EAT**	1 meal/month
Largemouth bass > 16 inches	**DO NOT EAT**	2 meals/month
Smallmouth buffalo	**DO NOT EAT**	**DO NOT EAT**
Spotted bass > 16 inches	**DO NOT EAT**	2 meals/month

[1]A meal is eight ounces of fish.

Q: Is it safe to eat other fish from the Neches River Basin?

A: At this time, it is safe to consume other fish not listed in the advisory.

Q: What species of fish did the DSHS test from the Neches River Basin?

A: DSHS tested alligator gar, black crappie, blue catfish, bluegill, channel catfish, flathead catfish, freshwater drum, hybrid striped bass, largemouth bass, longear sunfish, longnose gar, redbreast sunfish, redear sunfish, smallmouth buffalo, spotted bass, spotted gar, warmouth, white bass, and white crappie.

Q: What are the chemical contaminants of concern in the Neches River Basin?

A: Mercury and polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDDs/PCDFs or "dioxins")

Q: What is mercury?

A: Mercury is an element that occurs naturally in the environment in several forms. In the elemental form, mercury is a shiny silver-white liquid. Mercury can combine with other elements such as chlorine, carbon, or oxygen to form mercury compounds. These compounds are called organic mercury if they contain carbon and inorganic mercury if they do not. All forms of mercury are poisonous. The type of mercury found in fish is in the organic form and is called methylmercury.

Q: How does mercury enter the environment?

A: Mercury is found throughout the environment as a result of normal breakdown of the earth's crust by wind and water. Air, water, and soil can contain mercury both from natural sources and from human activity. Inorganic mercury can enter the air from deposits of ore that contain mercury, from the burning of fuels or garbage, and from the emissions of factories that use mercury. Mercury released to the air can be carried for long distances.

Q: How does mercury get into fish?

A: Mercury in water settles to the bottom where it mixes with the sediment. Here it can be changed into an organic form called methylmercury and enter the food chain. Small aquatic plants and animals can absorb the methylmercury in the sediment. Small fish eat these plants and tiny animals and larger fish eat smaller fish. At each step, the concentration of mercury increases. Higher amounts of methylmercury are generally found in older, predatory fish.

Q: How can mercury affect my health?

A: Methylmercury can harm the brain and nervous system of adults and children. Young children are particularly sensitive to mercury because their bodies are still developing. The brain and nervous system in a developing fetus can be permanently damaged if the mother eats food containing high levels of mercury. In young children exposed prenatally to low levels, reported symptoms have included developmental effects such as late walking (>18 months) or late talking (>24 months). Exposure to higher levels may result in abnormalities of the central nervous system, retardation, or seizures. Some children may experience a type of allergic reaction to mercury, with symptoms such as discoloration and itching of hands and feet, insomnia, and sensitiveness to light. Adults exposed to high levels of methylmercury may progressively experience nervous system disorders including tingling of the fingers and toes, irritability, memory loss, depression, insomnia, difficulty in walking or speech, visual changes, or hearing defects.

Q: How can mercury enter and leave my body?

A: Organic mercury in fish or other foods that you might eat enters your bloodstream easily and goes rapidly to other parts of your body, including the brain. Organic mercury that is ingested is eliminated from the body primarily through the feces. The half-life for elimination of mercury is approximately one to two months. Mercury may be found in hair or blood samples. Since there is no placental barrier to mercury, the fetus is at increased risk for methylmercury poisoning.

Q: Can I be tested to see if I have mercury in my body?

A: Blood or hair samples can be taken in your doctor's office and tested in a laboratory. The amount of mercury that is found may be used to predict the potential for adverse health effects. Blood tests are useful during and shortly after mercury poisoning. Once mercury is in the hair, it remains until the hair is cut.

Q: What are dioxins?

A: Dioxins are a group of synthetic organic chemicals that contain 210 structurally related individual polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). In pure form, dioxins are crystals or colorless solids. Dioxins are primarily produced as unintentional byproducts of chlorine bleaching in pulp and paper mills, municipal solid waste and industrial waste incineration, burning household waste, combustion of fossil fuels and wood, waste and drinking water chlorination, and as contaminants in the manufacture of certain organic chemicals. Dioxins are also natural products of forest fires and possibly other natural processes, but these sources are small compared to dioxins produced by human activity.

Q: How do dioxins enter the environment?

A: Currently, the major environmental source of dioxins is incineration. Dioxins are highly persistent in the environment due to their very low water solubility and low volatility. Most are contained in soil and sediments that serve as environmental reservoirs from which dioxins may be released over a long period of time. Particle resuspension from environmental reservoirs is an important contributor to dioxin distribution.

Q: How do dioxins accumulate in fish?

A: Dioxins have been found in soil, ground and surface water, air, sediment, plants, and animals in all regions of the world. Dioxins break down very slowly in the environment and accumulate in fatty tissue, skin, and internal organs of fish and other animals. Levels of dioxins in fish may be hundreds to a million times higher than the concentrations found in water or sediments. The amount of dioxins found in fish varies with species, age, size, fat content, diet, and surface water and sediment concentrations. Generally, larger, older fish will contain higher levels of

dioxins than smaller, younger fish; fatty fish such as smallmouth buffalo and catfish species may contain higher levels of dioxins than lean fish such as crappie and sunfish.

Q: Why do flathead catfish, gar, and smallmouth buffalo accumulate higher levels of dioxins than other Neches River Basin game fish?

A: Generally, dioxin level differences can occur between fish species because of higher lipid "fat" levels, dietary differences, and/or feeding locations in the reservoir or river.

Q: How can dioxins affect my health?

A: Eating fish that contain dioxins may cause skin conditions such as acne and rashes. Dioxins may also affect the immune system, reproductive system, liver, delay physical and neurological development, and may increase the risk of cancer. Additional information about the health effects of dioxins may be obtained from the Agency for Toxic Substances and Disease Registry. See http://www.atsdr.cdc.gov/phs/phs.asp?id=361&tid=63.

Q: Can I be tested to see if I have dioxins in my body?

A: Tests are available to measure dioxins in the blood, body fat, and breast milk, but these tests are not routinely available.

Q: What is the source of dioxins and mercury in the Neches River Basin?

A: DSHS does not attempt to determine contaminant sources in its risk assessments nor do these assessments produce the types of data or information to make these determinations. Questions related to contaminant sources should be directed to the Texas Commission on Environmental Quality (TCEQ).

Q: I have been eating these fish all my life. Will I have adverse health effects?

A: The recommended consumption limits made by the DSHS have allowed a margin of safety below those levels that could result in adverse health effects; however, eating more than the recommended amount of fish from the Neches River Basin does not necessarily mean that a person will have adverse health effects.

Q: Should I stop eating fish?

A: No. Fish are an important source of protein in the diet. The DSHS only recommends that people do not eat or limit consumption of those species listed in the advisory. The DSHS recommends that you follow general consumption guidelines and/or fish consumption advisories or bans issued by the department for Texas waters. Specific advisory information may be obtained by contacting the DSHS Seafood and Aquatic Life Group (512)-834-6757 or by accessing the DSHS Seafood and Aquatic Life Group Web site at

http://www.dshs.state.tx.us/seafood. Fish consumption advisory information is also published in the *Texas Parks and Wildlife Outdoor Annual Hunting and Fishing Regulations* booklet. This booklet is provided to all licensed anglers in Texas.

Q: How can I reduce the amount of mercury that I get from Neches River fish?

A: In general, when you have a choice you should eat smaller fish that have had less time to build up mercury in their tissues and eat fish other than those listed in the advisory.

Q: Will cooking or cleaning fish a certain way reduce the dioxin level?

A: Yes. Dioxins readily accumulate in the fatty tissues of fish. To reduce exposure to dioxins, the skin, dark (reddish-color) muscle tissue, and fatty portions (i.e. belly fat, side fat, and fat along the top of the back) of the fish should be removed before cooking. The DSHS 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.

Q: Will cooking or cleaning fish a certain way reduce the mercury level and make the fish safe to eat?

A: No. Mercury levels are not affected by cooking, and since the mercury is in the muscle tissue, which is the portion of the fish we eat, cleaning or filleting will not make the fish safe.

Q: Should I stop fishing?

A: No. Recreational fishing does not need to stop. Consuming fish in amounts recommended by the DSHS or choosing species of fish not listed in the advisory poses no significant health risks and catch-and-release fishing eliminates potential health risks.

Q: Should I be concerned about dioxins or mercury while conducting contact recreation activities like fishing, boating, or swimming?

A: There is not a concern for dioxin or mercury poisoning while swimming or participating in other contact recreational activities. Levels in the water are low. The concern is for consumption of fish that concentrate the dioxins or mercury in their tissue.

Sources of Information

United States Environmental Protection Agency (EPA) Chemical–specific Fact Sheets
http://water.epa.gov/scitech/swguidance/fishshellfish/techguidance/chemfacts.cfm

Agency for Toxic Substances and Disease Registry (ATSDR) ToxFAQs
http://www.atsdr.cdc.gov/toxfaqs/index.asp

Agency for Toxic Substances and Disease Registry (ATSDR) Public Health Statements
http://www.atsdr.cdc.gov/PHS/Index.asp