FISH CONSUMPTION GUIDELINES FOR LAKE NATOMA (Including Nearby Creeks and Ponds) AND THE LOWER AMERICAN RIVER (SACRAMENTO COUNTY)

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EXECUTIVE SUMMARY

The United States Geological Survey (USGS) and the University of California at Davis (UCD) conducted a reconnaissance survey of mercury contamination in edible fish tissue from Lake Natoma, an area possibly affected by historic gold mining. Samples of 11 sport fish species were collected from the lake and analyzed for mercury content. These data were evaluated by the Office of Environmental Health Hazard Assessment (OEHHA), together with fish samples previously collected from the lower American River by the Toxic Substances Monitoring Program (TSMP) and the Sacramento River Watershed Program (SRWP), in an effort to determine whether there may be potential adverse health effects associated with consuming sport fish from these water bodies.

More than 95 percent of the mercury found in fish occurs as methylmercury, which is a highly toxic form of the element. Consumption of fish is the major route of exposure to methylmercury in the United States. The critical target of methylmercury toxicity is the nervous system, particularly in developing organisms such as the fetus and young children. Significant methylmercury toxicity can occur to the fetus during pregnancy even in the absence of symptoms in the mother. In 1985, the United States Environmental Protection Agency (U.S. EPA) set a reference dose (RfD, that is the daily exposure likely to be without significant risk of deleterious effects during a lifetime) for methylmercury of $3x10^{-4}$ mg/kg-day, based on central nervous system effects (ataxia and paresthesia) in adults. In 1995, and confirmed in 2001, this RfD was lowered to $1x10^{-4}$mg/kg-day, based on developmental neurologic abnormalities in infants exposed *in utero*, using the Iraqi and Faroe Island data, respectively. Because OEHHA finds convincing evidence that the fetus is more sensitive than adults to the neurotoxic effects of mercury, but also recognizes that fish can play an important role in a healthy diet, OEHHA chooses to use both the current and previous U.S. EPA reference doses for two distinct population groups. In this advisory, the current RfD based on effects in infants will be used for women of childbearing age and children aged 17 and younger. The previous RfD, based on effects in adults, will be used for women beyond their childbearing years and men.

In order to determine whether the issuance of fish consumption advice for a site is justified, mean mercury concentrations in fish from that site are compared to OEHHA guidance tissue levels for methylmercury, which are designed so that individuals consuming no more than a preset number of meals should not exceed the RfD for this chemical. Although Lake Natoma and the lower American River are separate water bodies, fish species and fish mercury levels in the two water bodies were sufficiently similar to justify combining data from the two sites so that any advice could be unified in order to facilitate public communication. Thus, after combining fish mercury data from Lake Natoma and the lower American River (downstream from Lake Natoma to Discovery Park), a statistically representative sample size was available to assess the need for consumption guidelines for channel catfish, white catfish, largemouth bass, pikeminnow, sucker, redear sunfish, and bluegill. Supporting data (such as contamination data for a closely related species at a similar trophic level) were used to develop additional consumption guidelines for other sport fish, as necessary.

Evaluation of data and comparison with guidance tissue levels for methylmercury indicated that development of fish consumption advisories was appropriate for Lake Natoma (including nearby creeks and ponds) and the lower American River. Consumers should be informed of the potential hazards from eating fish from these water bodies, particularly those hazards relating to the developing fetus and children. All individuals, especially women of childbearing age and children aged 17 and younger, are advised to limit their fish consumption to reduce methylmercury ingestion to a level as close to the reference dose as possible. To help sport fish consumers achieve this goal, OEHHA has developed advisories for all black bass species (largemouth, smallmouth and spotted bass), channel catfish, white catfish, pikeminnow, sucker, bluegill, and sunfish species. For fish species not included in this evaluation, but potentially found in these water bodies (e.g., trout and crappie), OEHHA advises that women of childbearing age and children aged 17 and younger follow the recent U.S. EPA and U.S. Food and Drug Administration (U.S. FDA) Joint Federal Advisory for Mercury in Fish. This advisory recommends that women who are pregnant or may become pregnant, nursing mothers and young children consume no more than one meal per week of locally caught fish, when no other advice is available, and eat no other fish that week. OEHHA recommends that children through age 17 also follow this advice because of continued nervous system development through adolescence. Additionally, OEHHA recommends that women beyond their childbearing years and men consume no more than 12 meals per month of sport fish, if guidelines are not already in place for the water body where you fish. These advisories and additional guidelines are provided in this report. Meal sizes should be adjusted to body weight as described in the advisory table.

For general advice on how to limit your exposure to chemical contaminants in sport fish (e.g., eating smaller fish of legal size), as well as a fact sheet on methylmercury in sport fish, see the California Sport Fish Consumption Advisories (http://www.oehha.ca.gov/fish.html) and Appendix 1. Site specific advice for other California water bodies can be found online at: http://www.oehha.ca.gov/fish/so_cal/index.html. It should be noted that, unlike the case for many organic contaminants, various cooking and cleaning techniques will not reduce the methylmercury content of fish.

HEALTH ADVISORY

Fish are nutritious, providing a good source of protein and other nutrients, and are recommended as part of a healthy, balanced diet. As with many other kinds of food, however, it is prudent to consume fish in moderation and to make informed choices about which fish are safe to eat. OEHHA provides this consumption advice to the public so that people can continue to eat fish without putting their health at risk.

LAKE NATOMA
(including nearby creeks and ponds)
AND THE LOWER AMERICAN RIVER*
FISH CONSUMPTION GUIDELINES

WOMEN OF CHILDBEARING AGE AND CHILDREN AGED 17 YEARS AND YOUNGER EAT NO MORE THAN:	
DO NOT EAT	**CHANNEL CATFISH**
ONCE A MONTH	**White catfish; all bass; pikeminnow*; or* sucker *OR***
ONCE A WEEK	**Bluegill; sunfish; or other sport fish species**
WOMEN BEYOND CHILDBEARING AGE AND MEN EAT NO MORE THAN:	
ONCE A MONTH	**Channel Catfish or all bass *OR***
ONCE A WEEK	**White catfish; pikeminnow; or sucker *OR***
3 TIMES A WEEK	**Bluegill; sunfish; or other sport fish species**

***MANY OTHER WATER BODIES ARE KNOWN OR SUSPECTED TO HAVE ELEVATED MERCURY LEVELS.** If guidelines are not already in place for the water body where you fish, women of childbearing age and children aged 17 and younger should eat no more than one sport fish meal per week and women beyond childbearing age and men should eat no more than three sport fish meals per week **from any location**.

EAT SMALLER FISH OF LEGAL SIZE. Fish accumulate mercury as they grow.

DO NOT COMBINE FISH CONSUMPTION ADVICE. If you eat multiple species or catch fish from other water bodies, the recommended guidelines for different species and locations should not be combined. For example, if you eat a meal of fish from the one meal per month category, you should not eat another fish species containing mercury for at least one month.

SERVE SMALLER MEALS TO CHILDREN. MEAL SIZE IS ASSUMED TO BE EIGHT OUNCES FOR A 160-POUND ADULT. If you weigh more or less than 160 pounds, add or subtract 1 oz to your meal size, respectively, for each 20 pound difference in body weight.

CONSIDER YOUR TOTAL FISH CONSUMPTION. Fish from many sources (including stores and restaurants) can contain elevated levels of mercury and other contaminants. If you eat fish with lower contaminant levels (including commercial fish) you can safely eat more fish. The American Heart Association recommends that healthy adults eat at least two servings of fish per week. Shrimp, king crab, scallops, farmed catfish, wild salmon, oysters, tilapia, flounder, and sole generally contain some of the lowest mercury levels.

Lake Natoma and the Lower American River Sport Fish
Note: Images are not to scale

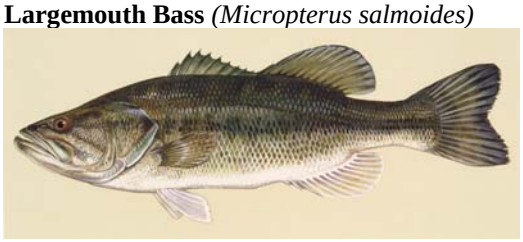
Channel Catfish *(Ictalurus punctalus)*

Duane Raver, USFWS

White catfish *(Amereiurus catus)*

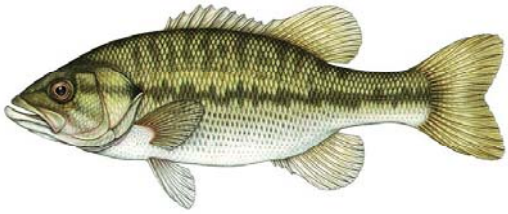
Duane Raver, USFWS

Largemouth Bass *(Micropterus salmoides)*



Duane Raver, USFWS

Spotted Bass *(Micropterus punctulatus)*



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Striped Bass (*Morone saxatilis)*

Duane Raver, USFWS

Sacramento Pikeminnow *(Ptychocheilus grandis)*

Rene' Reyes, USBR

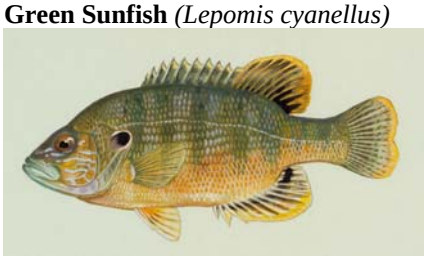
Sacramento Sucker *(Catostomus occidentalis)*

Rene' Reyes, USBR

Bluegill *(Lepomis macrochirus)*

Duane Raver, USFWS

Green Sunfish *(Lepomis cyanellus)*



Duane Raver, USFWS

Redear Sunfish (*Lepomis microlophus)*

Duane Raver, USFWS