# CONTAMINANTS IN FISH FROM CALIFORNIA LAKES AND RESERVOIRS, 2007-2008: SUMMARY REPORT ON A TWO-YEAR SCREENING SURVEY

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# E EXECUTIVE SUMMARY

This summary report presents results from a two-year screening survey of contaminants in sport fish in California lakes and reservoirs. This survey was performed as part of the State Water Resources Control Board's Surface Water Ambient Monitoring Program (SWAMP). This effort marks the beginning of a new, long-term, statewide, comprehensive bioaccumulation monitoring program for California surface waters. This screening study was the first step in an effort to identify and quantify contaminants in California's lakes to evaluate exposure and risk in humans and wildlife.

This report provides a concise technical summary of the findings of the survey. This report is intended for agency scientists that are charged with managing water quality problems related to bioaccumulation of contaminants in California lakes and reservoirs. Another version of the report is also available (Davis et al. 2010) that provides a more detailed presentation of the methods and findings from the survey.

The Lakes Survey represents a major step forward in understanding the extent of chemical contamination in sport fish in California lakes and reservoirs, and the impact of this contamination on the fishing beneficial use. The study has shown that mercury accumulation in fish is a significant problem throughout much of the state. However, comparison to USEPA's national survey indicate that the degree of mercury contamination in California is not unusual compared to the rest of the country, in spite of the intensive mercury and gold mining that has occurred here. For other contaminants, concentrations were much lower relative to thresholds for human health concern. It should also be noted that this survey focused on the species that accumulate the highest contaminant concentrations. Concentrations in some of the other species can be expected to be substantially lower than observed for the predators and bottom-feeders evaluated in this study.

The Lakes Survey was a preliminary screening of contamination in sport fish. The species selected for sampling (primarily rainbow trout, largemouth bass, and common carp) are known to accumulate high concentrations of contaminants and are therefore good indicators of contamination problems. This screening study did not provide enough information for consumption guidelines – this would require monitoring a broader array of species, larger numbers of fish, and a much higher level of funding.

Fish tissue concentrations were evaluated using thresholds developed by the California Office of Environmental Health Hazard Assessment (OEHHA) for methylmercury, PCBs, dieldrin, DDTs, chlordanes, and selenium, and a State Water Resources Control Board threshold for mercury in tissue that is being used for identification of impaired water bodies.

In 2007 and 2008 the study team collected 4,905 fish representing 23 species from 272 lakes and reservoirs. The survey identified problems in certain areas of the state, with methylmercury and polychlorinated biphenyls (PCBs) being the contaminants of greatest concern.

Methylmercury poses the most widespread potential health risk to persons who consume fish caught in California lakes. Twenty-one percent of the lakes surveyed had at least one fish species with an average methylmercury level high enough (> 0.44 ppm) that OEHHA would consider recommending no consumption of the contaminated species for women between 18 and 45 years of age and children from 1 to 17 years of age. In northern California, the study commonly found low concentrations in high-elevation lakes (above two thousand feet) in the Sierra Nevada and Trinity Alps. Trout were the most frequently caught species in these lakes, and tend to accumulate relatively low methylmercury concentrations. In contrast, methylmercury concentrations in bass were higher than OEHHA's 0.44 ppm threshold in 48% of the lower elevation lakes (below two thousand feet) surveyed in northern California. Southern California had moderate methylmercury contamination, with 15% of the sampled lakes above 0.44 ppm.

Mercury contamination of California water bodies is largely a legacy of historic mercury and gold mining, but can also reach lakes from local and global emissions to the atmosphere. In spite of the extensive mining activity in California, however, the degree of mercury contamination in the state's lakes is not that unusual and comparable to the average condition observed across the U.S. in a recent national lakes survey.

PCBs were second to methylmercury as a potential health concern to consumers of fish caught from California lakes. However, only 1% of the lakes sampled had a species with an average concentration that exceeded OEHHA's threshold for considering a recommendation of no consumption (120 ppb). PCBs are persistent chemicals that are now banned, but were commonly used in electrical, industrial and other applications. Concentrations of other pollutants (dieldrin, DDT, chlordane, and selenium) were generally low, and infrequently exceeded OEHHA thresholds.

This screening survey has raised many questions, and left other questions unanswered. Several areas where additional information would be of great value in addressing management issues are listed below.

1) Data for additional species at lakes with high contaminant concentrations to support development of consumption guidelines.

High priority waters in this regard with elevated concentrations were discussed in the mercury and PCB sections. Development of consumption guidelines requires data from a broader spectrum of species, so anglers can be directed to cleaner species if they are present (as is often the case). Significant funding would be needed to perform this follow-up work at the many lakes with concentrations above thresholds.

2) Focused evaluations of selected lakes to identify sources, controlling factors, and likely outcomes

Distinguishing the relative importance of legacy contamination from mining, atmospheric deposition, and other sources is critical to effective management of methylmercury contamination. More detailed, site-specific field work could be performed to assess the contributions from different sources. Identifying and sampling lakes without mining influence could yield valuable insights. Other controlling factors that can be important in determining accumulation in the food web, such as food web structure and limnology, also need to be understood as a basis for management.

3) Assessment of risks to wildlife from bioaccumulative contaminants

Although this study did not focus on risks to wildlife due to funding limitations, they are likely to be a significant concern. Exposures and risks to wildlife, including fish and fish-eating birds (Sandheinrich and Wiener 2009), are likely to be substantially higher than for humans in some instances. The best approach would be to conduct monitoring targeted at addressing this question.

4) Emerging contaminants

Again due to funding limitations, this study did not evaluate emerging contaminants. Two of these contaminants, polybrominated diphenyl ethers (PBDEs) and perfluorinated compounds (PFCs), are known to accumulate in fish. Human health thresholds for these chemicals in fish are anticipated (PBDEs) or available (PFC screening values have been developed by the state of Minnesota). These and other emerging contaminants accumulate in fish and should be tracked to provide information that managers need in order to act before they become the legacy contaminants of tomorrow.

5) Trends

Lake and reservoir food webs are contaminated with mixtures of contaminants, some with declining concentrations, some rising, and some not changing appreciably. Tracking these trends is essential to effective management of water quality in these ecosystems. Large-scale processes such as climate change can influence trends. Contaminant trends in lakes are affected by a host of sources and processes operating at global (e.g., atmospheric deposition) and local scales. An effective program to monitor trends is needed.

# SECTION 1
# INTRODUCTION

This summary report presents results from a two-year screening survey of contaminants in sport fish in California lakes and reservoirs. This survey was performed as part of the State Water Resources Control Board's Surface Water Ambient Monitoring Program (SWAMP). This effort marks the beginning of a new long-term, statewide, comprehensive bioaccumulation monitoring program for California surface waters.

This report provides a concise technical summary of the findings of the survey. This report is intended for agency scientists that are charged with managing water quality problems related to bioaccumulation of contaminants in California lakes and reservoirs. Another version of the report (Davis et al. 2010) has also been prepared that provides more technical detail on the survey and was the basis for scientific peer review of the work.

Oversight for this project is being provided by the SWAMP Roundtable. The Roundtable is composed of State and Regional Board staff and representatives from other agencies and organizations including US Environmental Protection Agency (USEPA), the California Department of Fish and Game, and the California Office of Environmental Health Hazard Assessment (OEHHA). Interested parties, including members of other agencies, consultants, or other stakeholders also participate.

The Roundtable has formed a subcommittee, the Bioaccumulation Oversight Group (BOG) that specifically guides SWAMP bioaccumulation monitoring. The BOG is composed of State and Regional Board staff and representatives from other agencies and organizations including USEPA, the Department of Fish and Game, OEHHA, and the San Francisco Estuary Institute. The members of the BOG possess extensive experience with bioaccumulation monitoring.

The BOG has also convened a Bioaccumulation Peer Review Panel that is providing evaluation and review of the bioaccumulation program. The members of the Panel are internationally-recognized authorities on bioaccumulation monitoring.

The BOG has developed and begun implementing a plan to evaluate bioaccumulation impacts on the fishing beneficial use in all California water bodies. Sampling of sport fish in lakes and reservoirs was conducted in the first two years of monitoring (2007 and 2008). In 2009 and 2010, sport fish from the California coast, including bays and estuaries are being sampled. Sport fish from rivers and streams will be sampled in 2011. In 2012 the plan is to again begin a two year effort on lakes and begin another five-year cycle of sampling these water body types.

# THE LAKES SURVEY

## Management Questions for This Survey

Three management questions were articulated to guide the design of the Lakes Survey. These management questions are specific to this initial monitoring effort; different sets of management questions will be established to guide later efforts.

### Management Question 1
### What is the condition of California lakes with respect to bioaccumulation in sport fish?

Answering this question has been the goal of assessments related to Section 305(b) of the federal Clean Water Act (CWA). In the past, 305(b) reports have provided water quality information to the general public and served as the basis for USEPA's National Water Quality Inventory Report to Congress. The report provided a statewide, comprehensive assessment of the status of California water bodies with respect to support of designated beneficial uses (e.g., SWRCB [2003]). Beginning in 2010, an Integrated Report provides the recommendations of the staff of the State Water Board for changes to the Clean Water Act Section 303(d) List of impaired water bodies and the Clean Water Act Section 305(b) report on the quality of waters in California (CWA Section 303(d) is discussed further below). Answering this question also provides the state and the public with information that helps describe the magnitude, spatial dimensions, and significance of the bioaccumulation problem relative to other environmental and societal problems.

The information needed to answer this question is the representative, average concentration of contaminants in sport fish indicator species in each lake for an adequately large sampling of lakes.

### Management Question 2
### Should a specific lake be considered for inclusion on the 303(d) List due to bioaccumulation of contaminants in sport fish?

Answering this question is critical to determining the need for 303(d) listing and cleanup actions to reduce contaminant exposure in specific water bodies. Total Maximum Daily Load evaluations (TMDLs) are required for water bodies placed on the 303(d) list. This is the principal regulatory mechanism being used by the State Water Board, the Regional Water Boards, and USEPA to establish priorities for management actions.

The State Board has established a Listing Policy for placing water bodies on the CWA Section 303(d) list. The Listing Policy establishes a standardized approach and includes California listing and de-listing factors. The fish tissue information needed to make a listing determination depends on the type of data and the pollutant. The more representative the samples are of the water body, the better. The goal in addressing Management Question 2 in this survey was to assist the Regional Boards and State Board by providing the data needed for listing decisions. Actual 303(d) listing determinations will be made by the Regional Boards using the data generated in the Lakes Survey.

### Management Question 3
### Should additional sampling of bioaccumulation in sport fish at a lake be conducted for the purpose of developing consumption guidelines?

Answering this question is essential as a first step in developing consumption guidelines. Consumption guidelines provide a mechanism for reducing human exposure to problematic contaminants in the near-term. The information requirements for consumption guidelines are more extensive than for 303(d) listing. OEHHA, the agency responsible for issuing consumption guidelines in California, needs samples representing at least nine or more fish from a variety of species abundant in a water body in order to issue guidance. It is useful to have information not only on the species with high concentrations, but also the species with low concentrations so anglers and other consumers of wild fish can be encouraged to target the low species.

## Overall Approach

The overall approach taken to answer these three questions was to perform a statewide screening study of bioaccumulation in sport fish. The highest priority for SWAMP in the short term is to answer Management Questions 1 and 2. Answering these questions will provide a basis for decision-makers to understand the scope of the bioaccumulation problem and will provide regulators with information needed to establish priorities for cleanup actions. In the longer term, developing consumption guidelines that inform the public on ways to reduce their exposure is also a high priority. This initial monitoring effort was a cost effective way to establish a foundation for developing consumption guidelines by identifying lakes that are candidates for additional sampling

This screening study is already leading to more detailed follow-up investigations of many water bodies that are candidates for the 303(d) List or where consumption guidelines are needed.

# SECTION 2
# METHODS

## SAMPLING DESIGN

The sampling plan was developed to address the three management questions for the project. In 2007 and 2008, sampling was conducted at 272 fishing lakes and reservoirs across California (Figures 1a-d, Tables 1a,b). Fish were collected from lakes across the state from June through November in 2007 and 2008 (Figures 1a-d, Tables 1a,b). Cruise reports with detailed information on locations are available at: http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/lakes_study/bog_07lakes_monplan.pdf.

Targeted sampling of "popular" lakes comprised the bulk of the effort (222 of 272 lakes), with a random sampling of 50 lakes. In addition to the statewide targeted sampling of popular lakes, this report also includes data obtained from a coordinated targeted sampling of lakes in Region 4 (Figures 1a,c,d). The Region 4 Water Board augmented the statewide effort with funds to provide for sampling of 22 additional lakes, including a more thorough analysis of replicate samples than was feasible in the statewide effort.

The second major emphasis of the survey was to provide an evaluation of statewide lake condition. A randomized sampling of 50 lakes from the entire population of California lakes was conducted to provide an unbiased statewide assessment, and a valuable frame of reference for interpreting bias in the targeted sampling. The Sampling Plan (Davis et al. 2007a) provides more details on the design.

## TARGET SPECIES

The overall goal of this screening study was to determine whether sport fish in California lakes have concentrations of contaminants that are above thresholds for protection of human health. Therefore, the study focused on sampling of indicator species that tend to accumulate the highest concentrations of the contaminants of concern. Primary target species were selected that are popular for human consumption (e.g., rainbow trout [Oncorhynchus mykiss]), and/or are effective at documenting spatial trends in methylmercury (e.g., largemouth bass [Micropterus salmoides]) or organics (e.g., common carp [Cyprinus carpio]).

Methylmercury biomagnifies primarily through its accumulation in muscle tissue, so top predators such as largemouth bass tend to have the highest methylmercury concentrations. In contrast, organic contaminants are biomagnified through accumulation in lipid. Bottom-feeding species such as common carp and channel catfish (Ictalurus punctatus) tend to have the highest lipid concentrations in their muscle tissue, and therefore usually have the highest concentrations of organics.

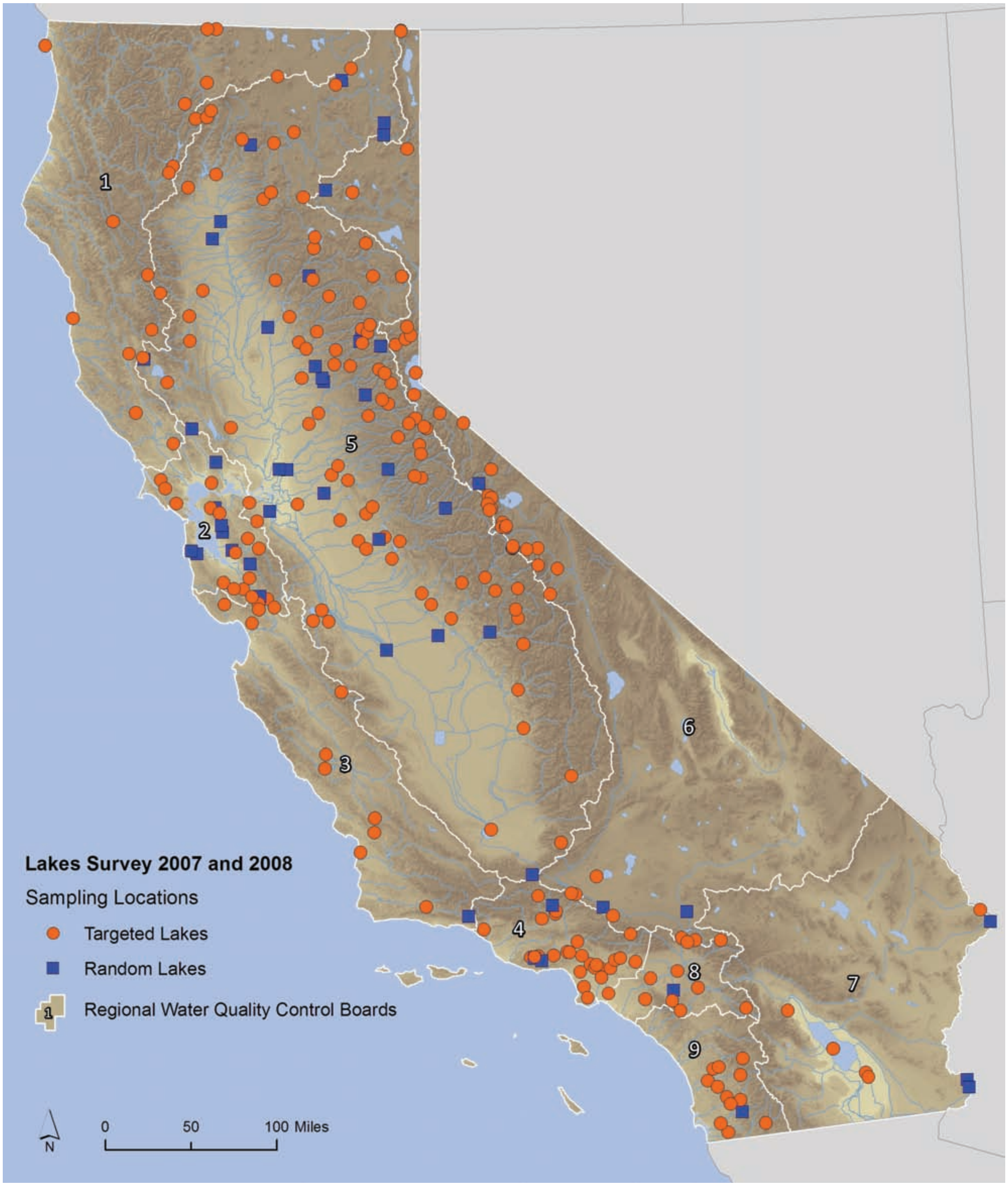


**Figure 1a. Lakes sampled in the Lakes Survey.** Circles represent 222 lakes that were targeted and squares represent 50 lakes sampled randomly. Lakes are sparse in large areas of Regions 1, 6, and 7.

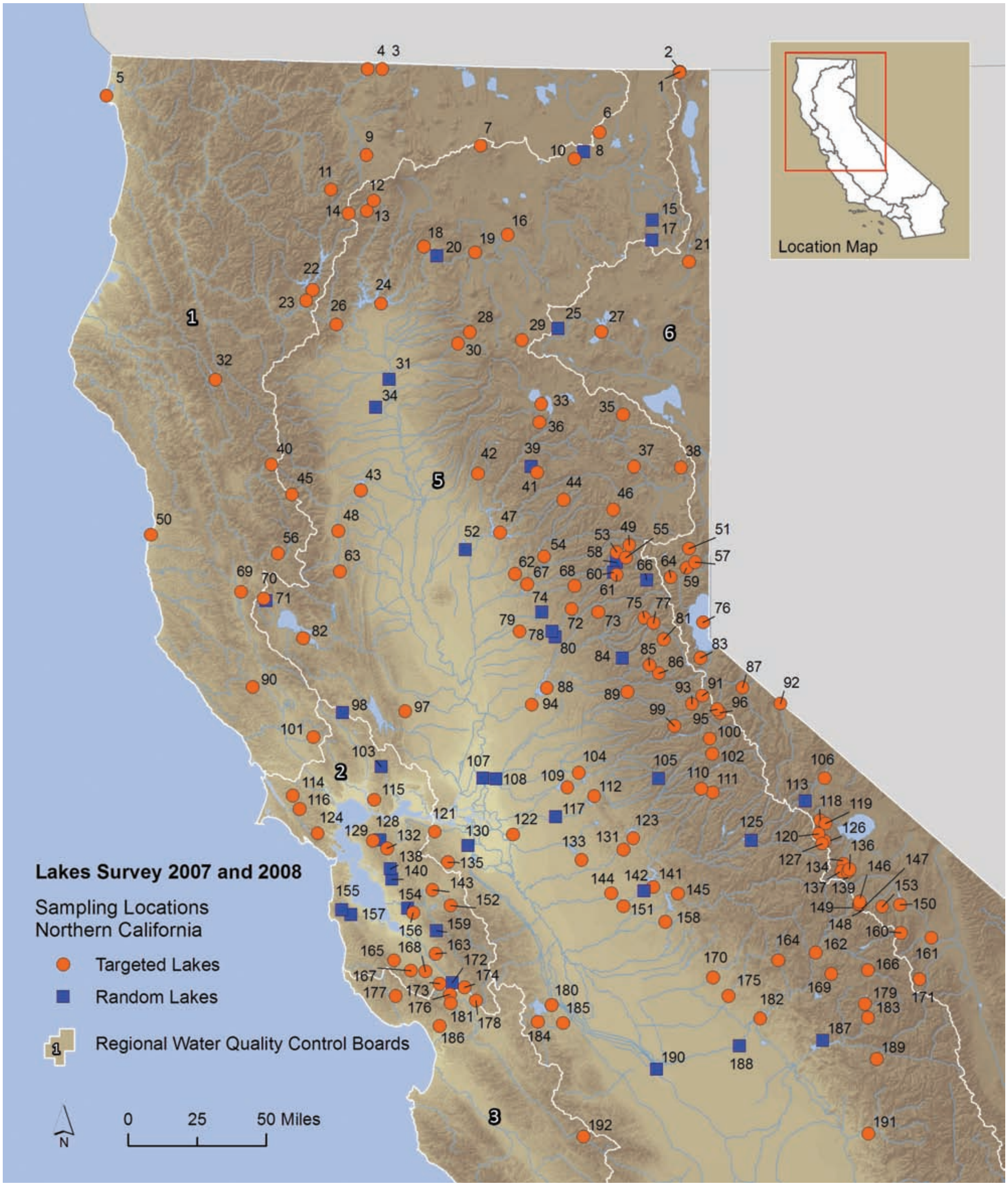


**Figure 1b. Northern California lakes sampled in the Lakes Survey.** Circles represent lakes that were targeted and squares represent those sampled randomly. Numbers on map relate to lake names given in Table 1. Lakes are sparse in much of Region 1.

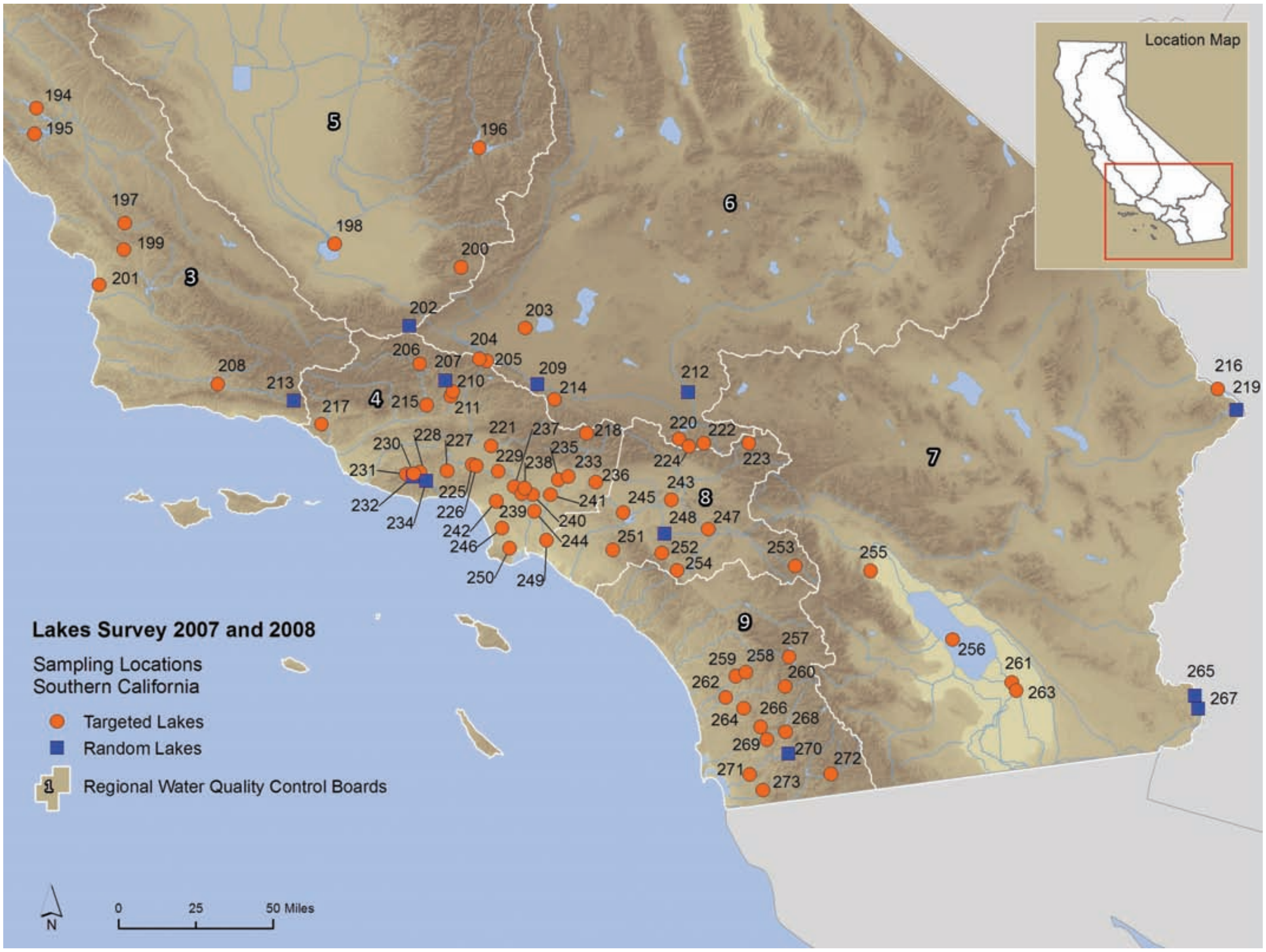


**Figure 1c. Southern California lakes sampled in the Lakes Survey.** Circles represent lakes that were targeted and squares represent those sampled randomly. Numbers on map relate to lake names given in Table 1. Lakes are sparse in large areas of Regions 6 and 7.

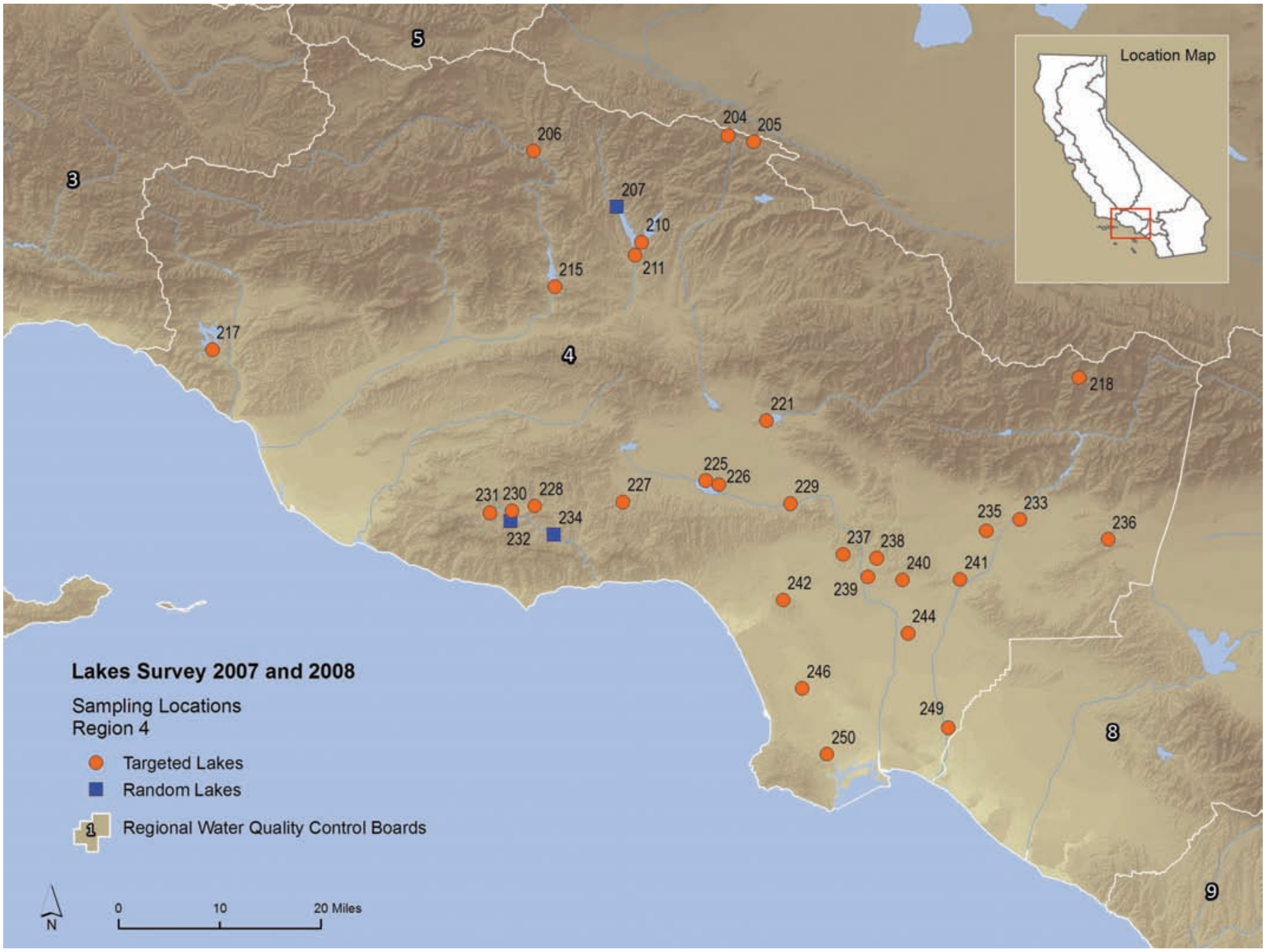


**Figure 1d. Region 4 lakes sampled in the Lakes Survey.** The Region 4 Water Board augmented the Survey with additional funding to sample a larger number of lakes in their Region. Circles represent lakes that were targeted and squares represent those sampled randomly. Numbers on map relate to lake names given in Table 1.

**Table 1a**
**Lakes sampled, ordered by station number.**
Note: These station numbers were assigned only for the purpose of identification on these maps. These are not related to the official station identification numbers in the database.

| | | | Lake Size | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 1 | Cave Lake | 5 | X | | | | | X |
| 2 | Lily Lake | 5 | X | | | | | X |
| 3 | Copco Lake | 1 | X | | | | | X |
| 4 | Iron Gate Reservoir | 1 | X | | | | | X |
| 5 | Dead Lake | 1 | X | | | | | X |
| 6 | Reservoir C | 5 | X | | | | | X |
| 7 | Medicine Lake | 5 | X | | | | | X |
| 8 | Reservoir F | 1 | X | | | | X | |
| 9 | Lake Shastina | 1 | X | | | | | X |
| 10 | Duncan Reservoir | 5 | X | | | | | X |
| 11 | Kangaroo Lake | 1 | X | | | | | X |
| 12 | Siskiyou Lake | 5 | X | | | | | X |
| 13 | Castle Lake | 5 | X | | | | | X |
| 14 | Gumboot Lake | 5 | X | | | | | X |
| 15 | West Valley Reservoir | 5 | X | | | | X | |
| 16 | Big Lake | 5 | X | | | | | X |
| 17 | Moon Lake | 5 | | | X | | X | |
| 18 | Iron Canyon Reservoir | 5 | X | | | | | X |
| 19 | Lake Britton | 5 | X | | | | | X |
| 20 | Tunnel Reservoir | 5 | X | | | | X | |
| 21 | Dodge Reservoir | 6 | X | | | | | X |
| 22 | Trinity Lake | 1 | | | | X | | X |
| 23 | Lewiston Lake | 1 | X | | | | | X |
| 24 | Shasta Lake | 5 | | | | X | | X |
| 25 | Crater Lake | 6 | X | | | | X | |
| 26 | Whiskeytown Lake | 5 | | | X | | | X |
| 27 | Eagle Lake | 6 | | | | X | | X |

| | | Lake Size | | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 28 | North Battle Creek Reservoir | 5 | X | | | | | X |
| 29 | Butte Lake | 5 | X | | | | | X |
| 30 | McCumber Reservoir | 5 | X | | | | | X |
| 31 | Lake California | 5 | X | | | | X | |
| 32 | Ruth Lake | 1 | X | | | | | X |
| 33 | Lake Almanor | 5 | | | | X | | X |
| 34 | Finger Lake | 5 | X | | | | X | |
| 35 | Antelope Lake | 5 | X | | | | | X |
| 36 | Butt Valley Reservoir | 5 | | X | | | | X |
| 37 | Lake Davis | 5 | | | X | | | X |
| 38 | Frenchman Lake | 5 | | X | | | | X |
| 39 | Lower Bucks Lake | 5 | X | | | | X | |
| 40 | Howard Lake | 1 | X | | | | | X |
| 41 | Bucks Lake | 5 | | X | | | | X |
| 42 | Paradise Lake | 5 | X | | | | | X |
| 43 | Black Butte Lake | 5 | | | X | | | X |
| 44 | Little Grass Valley Reservoir | 5 | | X | | | | X |
| 45 | Plaskett Lake | 1 | X | | | | | X |
| 46 | Gold Lake | 5 | X | | | | | X |
| 47 | Lake Oroville | 5 | | | | X | | X |
| 48 | Stony Gorge Reservoir | 5 | | X | | | | X |
| 49 | Jackson Meadow Reservoir | 5 | X | | | | | X |
| 50 | Cleone Lake | 1 | X | | | | | X |
| 51 | Stampede Reservoir | 6 | | | X | | | X |
| 52 | Thermalito Afterbay | 5 | | X | | | X | |
| 53 | Bowman Lake | 5 | X | | | | | X |
| 54 | New Bullards Bar Reservoir | 5 | | | X | | | X |
| 55 | Faucherie Lake | 5 | X | | | | | X |
| 56 | Lake Pillsbury | 1 | | X | | | | X |
| 57 | Boca Reservoir | 6 | X | | | | | X |
| 58 | Feeley Lake | 5 | X | | | | X | |
| 59 | Prosser Creek Reservoir | 6 | X | | | | | X |

| | | Lake Size | | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 60 | Fuller Lake | 5 | X | | | | X | |
| 61 | Lake Spaulding | 5 | X | | | | | X |
| 62 | Collins Lake | 5 | X | | | | | X |
| 63 | East Park Reservoir | 5 | | X | | | | X |
| 64 | Donner Lake | 6 | X | | | | | X |
| 66 | Kidd Lake | 5 | X | | | | X | |
| 67 | Harry L Englebright Lak | 5 | X | | | | | X |
| 68 | Scotts Flat Reservoir | 5 | X | | | | | X |
| 69 | Lake Mendocino | 1 | | X | | | | X |
| 70 | Blue Lakes | 5 | X | | | | | X |
| 71 | Lower Blue Lake | 5 | X | | | | X | |
| 72 | Rollins Reservoir | 5 | X | | | | | X |
| 73 | Big Reservoir | 5 | X | | | | | X |
| 74 | Zayak/Swan Lake | 5 | X | | | | X | |
| 75 | French Meadows Reservoir | 5 | | X | | | | X |
| 76 | Lake Tahoe | 6 | | | | X | | X |
| 77 | Hell Hole Reservoir | 5 | | X | | | | X |
| 78 | Lake of the Pines | 5 | X | | | | X | |
| 79 | Camp Far West Reservoir | 5 | | X | | | | X |
| 80 | Lake Combie | 5 | X | | | | X | |
| 81 | Loon Lake | 5 | X | | | | | X |
| 82 | Clear Lake | 5 | | | | X | | X |
| 83 | Fallen Leaf Lake | 6 | | X | | | | X |
| 84 | Stump Meadow Lake | 5 | X | | | | X | |
| 85 | Union Valley Reservoir | 5 | | X | | | | X |
| 86 | Ice House Reservoir | 5 | X | | | | | X |
| 87 | Indian Creek Reservoir | 6 | X | | | | | X |
| 88 | Folsom Lake | 5 | | | X | | | X |
| 89 | Jenkinson Lake | 5 | X | | | | | X |
| 90 | Lake Sonoma | 1 | | X | | | | X |
| 91 | Caples Lake | 5 | X | | | | | X |
| 92 | Topaz Lake | 6 | X | | | | | X |

| Station Number | Station Name | Regional Board | Lake Size: Small | Lake Size: Medium | Lake Size: Large | Lake Size: Extra-large | Lake Selection: Random | Lake Selection: Targeted |
|---|---|---|---|---|---|---|---|---|
| 93 | Silver Lake | 5 | X | | | | | X |
| 94 | Lake Natomas | 5 | X | | | | | X |
| 95 | Upper Blue Lake | 5 | X | | | | | X |
| 96 | Lower Blue Lake (Alpine County) | 5 | X | | | | | X |
| 97 | Lake Berryessa | 5 | | | | X | | X |
| 98 | Lake Henne | 2 | X | | | | X | |
| 99 | Lower Bear River Reservoir | 5 | X | | | | | X |
| 100 | Lake Alpine | 5 | X | | | | | X |
| 101 | Spring Lake | 1 | X | | | | | X |
| 102 | Spicer Meadow Reservoir | 5 | X | | | | | X |
| 103 | Lake Madigan | 2 | X | | | | X | |
| 104 | Lake Amador | 5 | X | | | | | X |
| 105 | White Pines Lake | 5 | X | | | | X | |
| 106 | Bridgeport Reservoir | 6 | | X | | | | X |
| 107 | Meadows Slough | 5 | X | | | | X | |
| 108 | Cosumnes River | 5 | X | | | | X | |
| 109 | Camanche Reservoir | 5 | | | X | | | X |
| 110 | Beardsley | 5 | X | | | | | X |
| 111 | Pinecrest | 5 | X | | | | | X |
| 112 | New Hogan Lake | 5 | | | X | | | X |
| 113 | Upper Twin Lake | 6 | X | | | | X | |
| 114 | Soulejoule Lake | 2 | X | | | | | X |
| 115 | Lake Chabot (Vallejo) | 2 | X | | | | | X |
| 116 | Nicasio Lake | 2 | X | | | | | X |
| 117 | Unnamed Lake 2 | 5 | X | | | | X | |
| 118 | Virginia Lakes | 6 | X | | | | | X |
| 119 | Lundy Lake | 6 | X | | | | | X |
| 120 | Saddlebag Lake | 6 | X | | | | | X |
| 121 | Contra Loma Reservoir | 5 | X | | | | | X |
| 122 | Yosemite Lake | 5 | X | | | | | X |
| 123 | New Melones Lake | 5 | | X | | | | X |
| 124 | Bon Tempe Lake | 2 | X | | | | | X |

| | | Lake Size | | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 125 | Hetch Hetchy Reservoir | 5 | | X | | | X | |
| 126 | Ellery Lake | 6 | X | | | | | X |
| 127 | Tioga Lake | 6 | X | | | | | X |
| 128 | Briones Reservoir | 2 | X | | | | X | |
| 129 | San Pablo Reservoir | 2 | X | | | | | X |
| 130 | Discovery Bay | 5 | X | | | | X | |
| 131 | Tulloch Reservoir | 5 | X | | | | | X |
| 132 | Lafayette Reservoir | 2 | X | | | | | X |
| 133 | Woodward Reservoir | 5 | | X | | | | X |
| 134 | Grant Lake | 6 | X | | | | | X |
| 135 | Los Vaqueros Reservoir | 5 | | X | | | | X |
| 136 | June Lake | 6 | X | | | | | X |
| 137 | Silver Lake (Region 6) | 6 | X | | | | | X |
| 138 | Upper San Leandro Reservoir | 2 | X | | | | X | |
| 139 | Gull Lake | 6 | X | | | | | X |
| 140 | Lake Chabot (San Leandro) | 2 | X | | | | X | |
| 141 | Don Pedro Reservoir | 5 | | | X | | | X |
| 142 | La Grange Reservoir | 5 | X | | | | X | |
| 143 | Shadow Cliffs Reservoir | 2 | X | | | | | X |
| 144 | Modesto Reservoir | 5 | | X | | | | X |
| 145 | Lake McClure | 5 | | | X | | | X |
| 146 | Twin Lakes | 6 | X | | | | | X |
| 147 | Lake Mamie | 6 | X | | | | | X |
| 148 | Lake Mary | 6 | X | | | | | X |
| 149 | Lake George | 6 | X | | | | | X |
| 150 | Lake Crowley | 6 | | | X | | | X |
| 151 | Turlock Lake | 5 | | | X | | | X |
| 152 | Lake del Valle | 2 | X | | | | | X |
| 153 | Convict Lake | 6 | X | | | | | X |
| 154 | Lago Los Osos | 2 | X | | | | X | |
| 155 | Pilarcitos Lake | 2 | X | | | | X | |
| 156 | Lake Elizabeth | 2 | X | | | | | X |

| Station Number | Station Name | Regional Board | Lake Size: Small | Medium | Large | Extra-large | Lake Selection: Random | Targeted |
|---|---|---|---|---|---|---|---|---|
| 157 | Lower Crystal Springs Reserv | 2 | X | | | | X | |
| 158 | Lake McSwain | 5 | X | | | | | X |
| 159 | Calaveras Reservoir | 2 | | X | | | X | |
| 160 | Rock Creek Lake | 6 | X | | | | | X |
| 161 | Pleasant Valley Reservoir | 6 | X | | | | | X |
| 162 | Mammoth Pool Reservoir | 5 | X | | | | | X |
| 163 | Lake Cunningham | 2 | X | | | | | X |
| 164 | Bass Lake | 5 | X | | | | | X |
| 165 | Stevens Creek Reservoir | 2 | X | | | | | X |
| 166 | Florence Lake | 5 | X | | | | | X |
| 167 | Lake Vasona | 2 | X | | | | | X |
| 168 | Almaden Lake | 2 | X | | | | | X |
| 169 | Huntington Lake | 5 | | X | | | | X |
| 170 | Eastman Lake | 5 | | X | | | | X |
| 171 | Lake Sabrina | 6 | X | | | | | X |
| 172 | Oiger Quarry Ponds | 2 | X | | | | X | |
| 173 | Calero Reservoir | 2 | X | | | | | X |
| 174 | Anderson Lake | 2 | X | | | | | X |
| 175 | Hensley Lake | 5 | | X | | | | X |
| 176 | Chesbro Reservoir | 3 | X | | | | | X |
| 177 | Loch Lomond Reservoir | 3 | X | | | | | X |
| 178 | Coyote Lake | 2 | X | | | | | X |
| 179 | Courtright Reservoir | 5 | | X | | | | X |
| 180 | O'Neill Forebay | 5 | | X | | | | X |
| 181 | Uvas Reservoir | 3 | X | | | | | X |
| 182 | Millerton Lake | 5 | | | X | | | X |
| 183 | Wishon Reservoir | 5 | X | | | | | X |
| 184 | San Luis Reservoir | 5 | | | | X | | X |
| 185 | Los Banos Reservoir | 5 | X | | | | | X |
| 186 | Pinto Lake | 3 | X | | | | | X |
| 187 | Pine Flat Lake | 5 | | | X | | X | |
| 188 | Unnamed Lake 1 | 5 | X | | | | X | |

| | | | Lake Size | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 189 | Hume Lake | 5 | X | | | | | X |
| 190 | Marsh in Fresno Slough | 5 | X | | | | X | |
| 191 | Lake Kaweah | 5 | | X | | | | X |
| 192 | Hernandez Reservoir | 3 | X | | | | | X |
| 193 | Success Lake | 5 | | | X | | | X |
| 194 | Lake San Antonio | 3 | | | X | | | X |
| 195 | Lake Nacimiento | 3 | | | X | | | X |
| 196 | Isabella Lake | 5 | | | X | | | X |
| 197 | Santo Margarita Lake | 3 | X | | | | | X |
| 198 | Lake Webb | 5 | X | | | | | X |
| 199 | Lopez Lake | 3 | X | | | | | X |
| 200 | Brite Valley Lake | 5 | X | | | | | X |
| 201 | Little Oso Flaco Lake | 3 | X | | | | | X |
| 202 | Castac Lake | 5 | X | | | | X | |
| 203 | Apollo Lake | 6 | X | | | | | X |
| 204 | Lake Hughes | 4 | X | | | | | X |
| 205 | Elizabeth Lake | 4 | X | | | | | X |
| 206 | Pyramid Lake | 4 | | X | | | | X |
| 207 | Elderberry Forebay | 4 | X | | | | X | |
| 208 | Lake Cachuma | 3 | | | X | | | X |
| 209 | Palmdale Lake | 6 | X | | | | X | |
| 210 | Castaic Lake | 4 | | X | | | | X |
| 211 | Castaic Lagoon | 4 | X | | | | | X |
| 212 | Spring Valley Lake | 6 | X | | | | X | |
| 213 | Jameson Lake | 3 | X | | | | X | |
| 214 | Little Rock Reservoir | 6 | X | | | | | X |
| 215 | Lake Piru | 4 | X | | | | | X |
| 216 | Lake Havasu | 7 | | | | X | | X |
| 217 | Lake Casitas | 4 | | X | | | | X |
| 218 | Crystal Lake | 4 | X | | | | | X |
| 219 | Gene Wash Reservoir | 7 | X | | | | X | |
| 220 | Silverwood Lake | 6 | X | | | | | X |

| | | | Lake Size | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| **Station Number** | **Station Name** | **Regional Board** | **Small** | **Medium** | **Large** | **Extra-large** | **Random** | **Targeted** |
| 221 | Hansen Lake | 4 | X | | | | | X |
| 222 | Lake Arrowhead | 6 | X | | | | | X |
| 223 | Big Bear Lake | 8 | | | X | | | X |
| 224 | Lake Gregory | 6 | X | | | | | X |
| 225 | Balboa Lake | 4 | X | | | | | X |
| 226 | Sepulveda Lake | 4 | X | | | | | X |
| 227 | Lake Calabasas | 4 | X | | | | | X |
| 228 | Lake Lindero | 4 | X | | | | | X |
| 229 | Toluca Lake | 4 | X | | | | | X |
| 230 | Westlake Lake | 4 | X | | | | | X |
| 231 | Lake Sherwood | 4 | X | | | | | X |
| 232 | Las Virgenes Reservoir | 4 | X | | | | X | |
| 233 | Santa Fe Reservoir | 4 | X | | | | | X |
| 234 | Malibou Lake | 4 | X | | | | X | |
| 235 | Peck Road Water Conservation Park | 4 | X | | | | | X |
| 236 | Puddingstone Reservoir | 4 | X | | | | | X |
| 237 | Echo Lake (Reg 4) | 4 | X | | | | | X |
| 238 | Lincoln Park Lake | 4 | X | | | | | X |
| 239 | Hollenbeck Park Lake | 4 | X | | | | | X |
| 240 | Belvedere Park Lake | 4 | X | | | | | X |
| 241 | Legg Lake | 4 | X | | | | | X |
| 242 | Ken Hahn Park Lake | 4 | X | | | | | X |
| 243 | Lake Evans | 8 | X | | | | | X |
| 244 | John Ford Park Lake | 4 | X | | | | | X |
| 245 | Prado Lake | 8 | X | | | | | X |
| 246 | Alondra Park Lake | 4 | X | | | | | X |
| 247 | Perris Reservoir | 8 | | X | | | | X |
| 248 | Lake Mathews | 8 | | | X | | X | |
| 249 | El Dorado Lakes | 4 | X | | | | | X |
| 250 | Harbor Lake (Lake Machado) | 4 | X | | | | | X |
| 251 | Irvine Lake | 8 | X | | | | | X |

| | | | Lake Size | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 252 | Lee Lake/Corona Lake | 8 | X | | | | | X |
| 253 | Lake Hemet | 8 | X | | | | | X |
| 254 | Lake Elsinore | 8 | | X | | | | X |
| 255 | Lake Cahuilla | 7 | X | | | | | X |
| 256 | Salton Sea | 7 | | | | X | | X |
| 257 | Lake Henshaw | 9 | | X | | | | X |
| 258 | Lake Wohlford | 9 | X | | | | | X |
| 259 | Dixon Lake | 9 | X | | | | | X |
| 260 | Lake Sutherland | 9 | X | | | | | X |
| 261 | Ramer Lake | 7 | X | | | | | X |
| 262 | Lake Hodges | 9 | X | | | | | X |
| 263 | Wiest Lake | 7 | X | | | | | X |
| 264 | Lake Poway | 9 | X | | | | | X |
| 265 | Ferguson Lake | 7 | X | | | | X | |
| 266 | San Vicente Reservoir | 9 | X | | | | | X |
| 267 | Senator Wash Reservoir | 7 | X | | | | X | |
| 268 | El Capitan Lake | 9 | | X | | | | X |
| 269 | Lake Jennings | 9 | X | | | | | X |
| 270 | Loveland Reservoir | 9 | X | | | | X | |
| 271 | Sweetwater Reservoir | 9 | X | | | | | X |
| 272 | Morena Reservoir | 9 | X | | | | | X |
| 273 | Lower Otay Reservoir | 9 | X | | | | | X |

**Table 1b**
**Lakes sampled, ordered by name.**
Note: These station numbers were assigned only for the purpose of identification on these maps. These are not related to the official station identification numbers in the database.

| | | | Lake Size | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 168 | Almaden Lake | 2 | X | | | | | X |
| 246 | Alondra Park Lake | 4 | X | | | | | X |
| 174 | Anderson Lake | 2 | X | | | | | X |
| 35 | Antelope Lake | 5 | X | | | | | X |
| 203 | Apollo Lake | 6 | X | | | | | X |
| 225 | Balboa Lake | 4 | X | | | | | X |
| 164 | Bass Lake | 5 | X | | | | | X |
| 110 | Beardsley | 5 | X | | | | | X |
| 240 | Belvedere Park Lake | 4 | X | | | | | X |
| 223 | Big Bear Lake | 8 | | | X | | | X |
| 16 | Big Lake | 5 | X | | | | | X |
| 73 | Big Reservoir | 5 | X | | | | | X |
| 43 | Black Butte Lake | 5 | | | X | | | X |
| 70 | Blue Lakes | 5 | X | | | | | X |
| 57 | Boca Reservoir | 6 | X | | | | | X |
| 124 | Bon Tempe Lake | 2 | X | | | | | X |
| 53 | Bowman Lake | 5 | X | | | | | X |
| 106 | Bridgeport Reservoir | 6 | | X | | | | X |
| 128 | Briones Reservoir | 2 | X | | | | X | |
| 200 | Brite Valley Lake | 5 | X | | | | | X |
| 41 | Bucks Lake | 5 | | X | | | | X |
| 36 | Butt Valley Reservoir | 5 | | X | | | | X |
| 29 | Butte Lake | 5 | X | | | | | X |
| 159 | Calaveras Reservoir | 2 | | X | | | X | |
| 173 | Calero Reservoir | 2 | X | | | | | X |
| 109 | Camanche Reservoir | 5 | | | X | | | X |
| 79 | Camp Far West Reservoir | 5 | | X | | | | X |

| | | | Lake Size | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 91 | Caples Lake | 5 | X | | | | | X |
| 202 | Castac Lake | 5 | X | | | | X | |
| 211 | Castaic Lagoon | 4 | X | | | | | X |
| 210 | Castaic Lake | 4 | | X | | | | X |
| 13 | Castle Lake | 5 | X | | | | | X |
| 1 | Cave Lake | 5 | X | | | | | X |
| 176 | Chesbro Reservoir | 3 | X | | | | | X |
| 82 | Clear Lake | 5 | | | | X | | X |
| 50 | Cleone Lake | 1 | X | | | | | X |
| 62 | Collins Lake | 5 | X | | | | | X |
| 121 | Contra Loma Reservoir | 5 | X | | | | | X |
| 153 | Convict Lake | 6 | X | | | | | X |
| 3 | Copco Lake | 1 | X | | | | | X |
| 108 | Cosumnes River | 5 | X | | | | X | |
| 179 | Courtright Reservoir | 5 | | X | | | | X |
| 178 | Coyote Lake | 2 | X | | | | | X |
| 25 | Crater Lake | 6 | X | | | | X | |
| 218 | Crystal Lake | 4 | X | | | | | X |
| 5 | Dead Lake | 1 | X | | | | | X |
| 130 | Discovery Bay | 5 | X | | | | X | |
| 259 | Dixon Lake | 9 | X | | | | | X |
| 21 | Dodge Reservoir | 6 | X | | | | | X |
| 141 | Don Pedro Reservoir | 5 | | | X | | | X |
| 64 | Donner Lake | 6 | X | | | | | X |
| 10 | Duncan Reservoir | 5 | X | | | | | X |
| 27 | Eagle Lake | 6 | | | | X | | X |
| 63 | East Park Reservoir | 5 | | X | | | | X |
| 170 | Eastman Lake | 5 | | X | | | | X |
| 237 | Echo Lake (Reg 4) | 4 | X | | | | | X |
| 268 | El Capitan Lake | 9 | | X | | | | X |
| 249 | El Dorado Lakes | 4 | X | | | | | X |
| 207 | Elderberry Forebay | 4 | X | | | | X | |

| | | | Lake Size | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 205 | Elizabeth Lake | 4 | X | | | | | X |
| 126 | Ellery Lake | 6 | X | | | | | X |
| 83 | Fallen Leaf Lake | 6 | | X | | | | X |
| 55 | Faucherie Lake | 5 | X | | | | | X |
| 58 | Feeley Lake | 5 | X | | | | X | |
| 265 | Ferguson Lake | 7 | X | | | | X | |
| 34 | Finger Lake | 5 | X | | | | X | |
| 166 | Florence Lake | 5 | X | | | | | X |
| 88 | Folsom Lake | 5 | | | X | | | X |
| 75 | French Meadows Reservoir | 5 | | X | | | | X |
| 38 | Frenchman Lake | 5 | | X | | | | X |
| 60 | Fuller Lake | 5 | X | | | | X | |
| 219 | Gene Wash Reservoir | 7 | X | | | | X | |
| 46 | Gold Lake | 5 | X | | | | | X |
| 134 | Grant Lake | 6 | X | | | | | X |
| 139 | Gull Lake | 6 | X | | | | | X |
| 14 | Gumboot Lake | 5 | X | | | | | X |
| 221 | Hansen Lake | 4 | X | | | | | X |
| 250 | Harbor Lake (Lake Machado) | 4 | X | | | | | X |
| 67 | Harry L Englebright Lak | 5 | X | | | | | X |
| 77 | Hell Hole Reservoir | 5 | | X | | | | X |
| 175 | Hensley Lake | 5 | | X | | | | X |
| 192 | Hernandez Reservoir | 3 | X | | | | | X |
| 125 | Hetch Hetchy Reservoir | 5 | | X | | | X | |
| 239 | Hollenbeck Park Lake | 4 | X | | | | | X |
| 40 | Howard Lake | 1 | X | | | | | X |
| 189 | Hume Lake | 5 | X | | | | | X |
| 169 | Huntington Lake | 5 | | X | | | | X |
| 86 | Ice House Reservoir | 5 | X | | | | | X |
| 87 | Indian Creek Reservoir | 6 | X | | | | | X |
| 18 | Iron Canyon Reservoir | 5 | X | | | | | X |
| 4 | Iron Gate Reservoir | 1 | X | | | | | X |

| | | Lake Size | | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 251 | Irvine Lake | 8 | X | | | | | X |
| 196 | Isabella Lake | 5 | | | X | | | X |
| 49 | Jackson Meadow Reservoir | 5 | X | | | | | X |
| 213 | Jameson Lake | 3 | X | | | | X | |
| 89 | Jenkinson Lake | 5 | X | | | | | X |
| 244 | John Ford Park Lake | 4 | X | | | | | X |
| 136 | June Lake | 6 | X | | | | | X |
| 11 | Kangaroo Lake | 1 | X | | | | | X |
| 242 | Ken Hahn Park Lake | 4 | X | | | | | X |
| 66 | Kidd Lake | 5 | X | | | | X | |
| 142 | La Grange Reservoir | 5 | X | | | | X | |
| 132 | Lafayette Reservoir | 2 | X | | | | | X |
| 154 | Lago Los Osos | 2 | X | | | | X | |
| 33 | Lake Almanor | 5 | | | | X | | X |
| 100 | Lake Alpine | 5 | X | | | | | X |
| 104 | Lake Amador | 5 | X | | | | | X |
| 222 | Lake Arrowhead | 6 | X | | | | | X |
| 97 | Lake Berryessa | 5 | | | | X | | X |
| 19 | Lake Britton | 5 | X | | | | | X |
| 208 | Lake Cachuma | 3 | | | X | | | X |
| 255 | Lake Cahuilla | 7 | X | | | | | X |
| 227 | Lake Calabasas | 4 | X | | | | | X |
| 31 | Lake California | 5 | X | | | | X | |
| 217 | Lake Casitas | 4 | | X | | | | X |
| 140 | Lake Chabot (San Leandro) | 2 | X | | | | X | |
| 115 | Lake Chabot (Vallejo) | 2 | X | | | | | X |
| 80 | Lake Combie | 5 | X | | | | X | |
| 150 | Lake Crowley | 6 | | | X | | | X |
| 163 | Lake Cunningham | 2 | X | | | | | X |
| 37 | Lake Davis | 5 | | | X | | | X |
| 152 | Lake del Valle | 2 | X | | | | | X |
| 156 | Lake Elizabeth | 2 | X | | | | | X |

| | | Lake Size | | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| **Station Number** | **Station Name** | **Regional Board** | **Small** | **Medium** | **Large** | **Extra-large** | **Random** | **Targeted** |
| 254 | Lake Elsinore | 8 | | X | | | | X |
| 243 | Lake Evans | 8 | X | | | | | X |
| 149 | Lake George | 6 | X | | | | | X |
| 224 | Lake Gregory | 6 | X | | | | | X |
| 216 | Lake Havasu | 7 | | | | X | | X |
| 253 | Lake Hemet | 8 | X | | | | | X |
| 98 | Lake Henne | 2 | X | | | | X | |
| 257 | Lake Henshaw | 9 | | X | | | | X |
| 262 | Lake Hodges | 9 | X | | | | | X |
| 204 | Lake Hughes | 4 | X | | | | | X |
| 269 | Lake Jennings | 9 | X | | | | | X |
| 191 | Lake Kaweah | 5 | | X | | | | X |
| 228 | Lake Lindero | 4 | X | | | | | X |
| 103 | Lake Madigan | 2 | X | | | | X | |
| 147 | Lake Mamie | 6 | X | | | | | X |
| 148 | Lake Mary | 6 | X | | | | | X |
| 248 | Lake Mathews | 8 | | | X | | X | |
| 145 | Lake McClure | 5 | | | X | | | X |
| 158 | Lake McSwain | 5 | X | | | | | X |
| 69 | Lake Mendocino | 1 | | X | | | | X |
| 195 | Lake Nacimiento | 3 | | | X | | | X |
| 94 | Lake Natomas | 5 | X | | | | | X |
| 78 | Lake of the Pines | 5 | X | | | | X | |
| 47 | Lake Oroville | 5 | | | | X | | X |
| 56 | Lake Pillsbury | 1 | | X | | | | X |
| 215 | Lake Piru | 4 | X | | | | | X |
| 264 | Lake Poway | 9 | X | | | | | X |
| 171 | Lake Sabrina | 6 | X | | | | | X |
| 194 | Lake San Antonio | 3 | | | X | | | X |
| 9 | Lake Shastina | 1 | X | | | | | X |
| 231 | Lake Sherwood | 4 | X | | | | | X |
| 90 | Lake Sonoma | 1 | | X | | | | X |

| Station Number | Station Name | Regional Board | Lake Size: Small | Lake Size: Medium | Lake Size: Large | Lake Size: Extra-large | Lake Selection: Random | Lake Selection: Targeted |
|---|---|---|---|---|---|---|---|---|
| 61 | Lake Spaulding | 5 | X | | | | | X |
| 260 | Lake Sutherland | 9 | X | | | | | X |
| 76 | Lake Tahoe | 6 | | | | X | | X |
| 167 | Lake Vasona | 2 | X | | | | | X |
| 198 | Lake Webb | 5 | X | | | | | X |
| 258 | Lake Wohlford | 9 | X | | | | | X |
| 232 | Las Virgenes Reservoir | 4 | X | | | | X | |
| 252 | Lee Lake/Corona Lake | 8 | X | | | | | X |
| 241 | Legg Lake | 4 | X | | | | | X |
| 23 | Lewiston Lake | 1 | X | | | | | X |
| 2 | Lily Lake | 5 | X | | | | | X |
| 238 | Lincoln Park Lake | 4 | X | | | | | X |
| 44 | Little Grass Valley Reservoir | 5 | | X | | | | X |
| 201 | Little Oso Flaco Lake | 3 | X | | | | | X |
| 214 | Little Rock Reservoir | 6 | X | | | | | X |
| 177 | Loch Lomond Reservoir | 3 | X | | | | | X |
| 81 | Loon Lake | 5 | X | | | | | X |
| 199 | Lopez Lake | 3 | X | | | | | X |
| 185 | Los Banos Reservoir | 5 | X | | | | | X |
| 135 | Los Vaqueros Reservoir | 5 | | X | | | | X |
| 270 | Loveland Reservoir | 9 | X | | | | X | |
| 99 | Lower Bear River Reservoir | 5 | X | | | | | X |
| 71 | Lower Blue Lake | 5 | X | | | | X | |
| 96 | Lower Blue Lake (Alpine County) | 5 | X | | | | | X |
| 39 | Lower Bucks Lake | 5 | X | | | | X | |
| 157 | Lower Crystal Springs Reserv | 2 | X | | | | X | |
| 273 | Lower Otay Reservoir | 9 | X | | | | | X |
| 119 | Lundy Lake | 6 | X | | | | | X |
| 234 | Malibou Lake | 4 | X | | | | X | |
| 162 | Mammoth Pool Reservoir | 5 | X | | | | | X |
| 190 | Marsh in Fresno Slough | 5 | X | | | | X | |
| 30 | McCumber Reservoir | 5 | X | | | | | X |

| | | | Lake Size | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 107 | Meadows Slough | 5 | X | | | | X | |
| 7 | Medicine Lake | 5 | X | | | | | X |
| 182 | Millerton Lake | 5 | | | X | | | X |
| 144 | Modesto Reservoir | 5 | | X | | | | X |
| 17 | Moon Lake | 5 | | | X | | X | |
| 272 | Morena Reservoir | 9 | X | | | | | X |
| 54 | New Bullards Bar Reservoir | 5 | | | X | | | X |
| 112 | New Hogan Lake | 5 | | | X | | | X |
| 123 | New Melones Lake | 5 | | X | | | | X |
| 116 | Nicasio Lake | 2 | X | | | | | X |
| 28 | North Battle Creek Reservoir | 5 | X | | | | | X |
| 172 | Oiger Quarry Ponds | 2 | X | | | | X | |
| 180 | O'Neill Forebay | 5 | | X | | | | X |
| 209 | Palmdale Lake | 6 | X | | | | X | |
| 42 | Paradise Lake | 5 | X | | | | | X |
| 235 | Peck Road Water Conservation Park | 4 | X | | | | | X |
| 247 | Perris Reservoir | 8 | | X | | | | X |
| 155 | Pilarcitos Lake | 2 | X | | | | X | |
| 187 | Pine Flat Lake | 5 | | | X | | X | |
| 111 | Pinecrest | 5 | X | | | | | X |
| 186 | Pinto Lake | 3 | X | | | | | X |
| 45 | Plaskett Lake | 1 | X | | | | | X |
| 161 | Pleasant Valley Reservoir | 6 | X | | | | | X |
| 245 | Prado Lake | 8 | X | | | | | X |
| 59 | Prosser Creek Reservoir | 6 | X | | | | | X |
| 236 | Puddingstone Reservoir | 4 | X | | | | | X |
| 206 | Pyramid Lake | 4 | | X | | | | X |
| 261 | Ramer Lake | 7 | X | | | | | X |
| 6 | Reservoir C | 5 | X | | | | | X |
| 8 | Reservoir F | 1 | X | | | | X | |
| 160 | Rock Creek Lake | 6 | X | | | | | X |
| 72 | Rollins Reservoir | 5 | X | | | | | X |

| | | | Lake Size | | | | Lake Selection | |
|---|---|---|---|---|---|---|---|---|
| Station Number | Station Name | Regional Board | Small | Medium | Large | Extra-large | Random | Targeted |
| 32 | Ruth Lake | 1 | X | | | | | X |
| 120 | Saddlebag Lake | 6 | X | | | | | X |
| 256 | Salton Sea | 7 | | | | X | | X |
| 184 | San Luis Reservoir | 5 | | | | X | | X |
| 129 | San Pablo Reservoir | 2 | X | | | | | X |
| 266 | San Vicente Reservoir | 9 | X | | | | | X |
| 233 | Santa Fe Reservoir | 4 | X | | | | | X |
| 197 | Santo Margarita Lake | 3 | X | | | | | X |
| 68 | Scotts Flat Reservoir | 5 | X | | | | | X |
| 267 | Senator Wash Reservoir | 7 | X | | | | X | |
| 226 | Sepulveda Lake | 4 | X | | | | | X |
| 143 | Shadow Cliffs Reservoir | 2 | X | | | | | X |
| 24 | Shasta Lake | 5 | | | | X | | X |
| 93 | Silver Lake | 5 | X | | | | | X |
| 137 | Silver Lake (Region 6) | 6 | X | | | | | X |
| 220 | Silverwood Lake | 6 | X | | | | | X |
| 12 | Siskiyou Lake | 5 | X | | | | | X |
| 114 | Soulejoule Lake | 2 | X | | | | | X |
| 102 | Spicer Meadow Reservoir | 5 | X | | | | | X |
| 101 | Spring Lake | 1 | X | | | | | X |
| 212 | Spring Valley Lake | 6 | X | | | | X | |
| 51 | Stampede Reservoir | 6 | | | X | | | X |
| 165 | Stevens Creek Reservoir | 2 | X | | | | | X |
| 48 | Stony Gorge Reservoir | 5 | | X | | | | X |
| 84 | Stump Meadow Lake | 5 | X | | | | X | |
| 193 | Success Lake | 5 | | | X | | | X |
| 271 | Sweetwater Reservoir | 9 | X | | | | | X |
| 52 | Thermalito Afterbay | 5 | | X | | | X | |
| 127 | Tioga Lake | 6 | X | | | | | X |
| 229 | Toluca Lake | 4 | X | | | | | X |
| 92 | Topaz Lake | 6 | X | | | | | X |
| 22 | Trinity Lake | 1 | | | | X | | X |

| Station Number | Station Name | Regional Board | Lake Size: Small | Medium | Large | Extra-large | Lake Selection: Random | Targeted |
|---|---|---|---|---|---|---|---|---|
| 131 | Tulloch Reservoir | 5 | X | | | | | X |
| 20 | Tunnel Reservoir | 5 | X | | | | X | |
| 151 | Turlock Lake | 5 | | | X | | | X |
| 146 | Twin Lakes | 6 | X | | | | | X |
| 85 | Union Valley Reservoir | 5 | | X | | | | X |
| 188 | Unnamed Lake 1 | 5 | X | | | | X | |
| 117 | Unnamed Lake 2 | 5 | X | | | | X | |
| 95 | Upper Blue Lake | 5 | X | | | | | X |
| 138 | Upper San Leandro Reservoir | 2 | X | | | | X | |
| 113 | Upper Twin Lake | 6 | X | | | | X | |
| 181 | Uvas Reservoir | 3 | X | | | | | X |
| 118 | Virginia Lakes | 6 | X | | | | | X |
| 15 | West Valley Reservoir | 5 | X | | | | X | |
| 230 | Westlake Lake | 4 | X | | | | | X |
| 26 | Whiskeytown Lake | 5 | | | X | | | X |
| 105 | White Pines Lake | 5 | X | | | | X | |
| 263 | Wiest Lake | 7 | X | | | | | X |
| 183 | Wishon Reservoir | 5 | X | | | | | X |
| 133 | Woodward Reservoir | 5 | | X | | | | X |
| 122 | Yosemite Lake | 5 | X | | | | | X |
| 74 | Zayak/Swan Lake | 5 | X | | | | X | |

Consequently, this study targeted two indicator species in each lake – a top predator (e.g., black bass) as a methylmercury indicator and a high lipid, bottom-feeding species (e.g., common carp or channel catfish) as an organics and selenium indicator. This approach is recommended by USEPA (2000). Some high elevation lakes only had one abundant high trophic level species (i.e., a trout species). In these cases, the one species still represented a worst-case indicator for methylmercury and organics and was sampled and analyzed for all of the pollutants on the analyte list. The species sampled most frequently were the primary target species: largemouth bass, common carp, and rainbow trout (Table 2). Other species were collected where the primary targets could not be obtained.

Black bass (including largemouth, smallmouth [*Micropterus dolomieui*], and spotted bass [*Micropterus punctulatus*]) and Sacramento pikeminnow (*Ptychocheilus grandis*) were the key methylmercury indicators. These species have a high trophic position and a strong size:methylmercury relationship. For these species, fish were sampled across a wide range of lengths and analyzed as individuals to facilitate estimation of size-standardized methylmercury concentrations. For other species methylmercury was analyzed in composites of 5 individuals.

Channel catfish and common carp were the primary targets for high lipid bottom-feeders. These species were analyzed for organics, selenium, and methylmercury. Organics and selenium were expected to be highest in these species (Davis et al. 2007b, SFEI 2008).

## LOCATIONS TARGETED

Lakes and reservoirs in California vary tremendously in size, from hundreds of small ponds less than 10 ha to Lake Tahoe at 50,000 ha. For larger lakes it is necessary to sample more than one location to obtain a representative characterization of the water body. For small lakes less than 500 ha in size, one sampling location covered a significant fraction of the surface area of the lake and was considered adequate to characterize the lake. However, for larger lakes, sampling of additional locations was performed. For lakes of medium size (500 – 1000 ha), two locations were generally sampled. For lakes in the large category (1000 – 5000 ha) and extra large category (>5000 ha), two to four locations were sampled.

## ARCHIVING STRATEGY

Due to the large number of water bodies to be sampled, the relatively high cost of organics analysis, and an expectation that some of these would be below thresholds for concern, an archiving strategy was developed for composite samples of the bottom-feeder species. The strategy varied somewhat by the size of lake. The basic approach was to begin by analyzing one representative sample from each lake, and then proceed to other samples if the first sample exceeded a threshold. The threshold for this follow-up analysis was designated as 75% of the threshold for concern (Tables 3 and 4). This approach avoided expenditure of funds on organics analysis where it was not needed.

**Table 2**
**Scientific and common names of fish species collected,** the number of lakes in which they were sampled, their minimum, median, and maximum total lengths (mm), and whether they were analyzed as composites or individuals.

| Species Name | Common Name | Number of Lakes Sampled | Minimum Length (mm) | Median Length (mm) | Maximum Length (mm) | Analyzed as Composites | Analyzed as Individuals |
|---|---|---|---|---|---|---|---|
| *Pomoxis nigromaculatus* | Black Crappie | 3 | 225 | 289.5 | 335 | x | |
| *Lepomis macrochirus* | Bluegill | 2 | 117 | 134.5 | 165 | x | |
| *Salvelinus fontinalis* | Brook Trout | 2 | 200 | 263.5 | 308 | x | |
| *Ameiurus nebulosus* | Brown Bullhead | 13 | 149 | 292 | 417 | x | |
| *Salmo trutta* | Brown Trout | 12 | 203 | 347 | 485 | x | x |
| *Ictalurus punctatus* | Channel Catfish | 12 | 386 | 509 | 766 | x | |
| *Cyprinus carpio* | Common Carp | 78 | 290 | 551 | 886 | x | x |
| *Oncorhynchus mykiss aquilarum* | Eagle Lake Trout | 1 | 448 | 503.5 | 547 | x | |
| *Carassius auratus* | Goldfish | 1 | 309 | 332.5 | 350 | x | |
| *Mylopharodon conocephalus* | Hardhead | 1 | 140 | 147.5 | 161 | x | |
| *Lavinia exilicauda* | Hitch | 1 | 204 | 239.5 | 292 | x | |
| *Oncorhynchus nerka* | Kokanee | 2 | 326 | 343 | 359 | | x |
| *Salvelinus namaycush* | Lake Trout | 2 | 356 | 408 | 460 | x | x |
| *Micropterus salmoides* | Largemouth Bass | 143 | 157 | 350 | 623 | x | x |
| *Lepomis gibbosus* | Pumpkinseed | 1 | 120 | 135 | 150 | x | |
| *Oncorhynchus mykiss* | Rainbow Trout | 79 | 140 | 301 | 598 | x | x |
| *Lepomis microlophus* | Redear Sunfish | 1 | 206 | 220 | 242 | x | |
| *Ptychocheilus grandis* | Sacramento Pikeminnow | 2 | 354 | 406.5 | 493 | x | x |
| *Catostomus occidentalis* | Sacramento Sucker | 15 | 211 | 431 | 564 | x | |
| *Micropterus dolomieu* | Smallmouth Bass | 10 | 151 | 309 | 529 | x | x |
| *Micropterus punctulatus* | Spotted Bass | 2 | 126 | 248 | 480 | | x |
| *Morone saxatilis* | Striped Bass | 1 | 486 | 534 | 582 | x | x |
| *Tilapia leucosticta* | Tilapia | 1 | 253 | 276 | 299 | x | |

**Table 3**
**Thresholds selected for triggering follow-up analysis of archived composite samples.** Triggers were 75% of a threshold for concern (see Davis et al. 2007a). All samples were analyzed for mercury, so a threshold for follow-up analysis was not needed.

| Pollutant | Threshold for Follow-up Analysis (ppb wet weight) |
|---|---|
| PCBs | 22 |
| DDTs | 622 |
| Dieldrin | 18 |
| Chlordanes | 225 |
| Selenium | 2,947 |

Aliquots from all composites were archived whether they were analyzed or not, in case of any analytical problems or other circumstances calling for analysis or re-analysis at a later time. In addition, aliquots of some samples were selected for long-term archiving. This will provide an integrative, representative sample for each lake that can be reanalyzed in later years to confirm earlier analyses, look for new chemicals of concern, provide material for application of new analytical methods, provide material for other ecological research, and other purposes. In addition, each Regional Board identified lakes they were interested in sampling more often and establishing a baseline for trend analysis. A list of trend lakes can be found in Appendix 2. For trend lakes individual archives were retained for all species and all locations, and where sufficient tissue was present, location and lakewide archives were also retained.

**Table 4**
**Thresholds for concern based on an assessment of human health risk from these pollutants by OEHHA** (Klasing and Brodberg, 2008). All values given in ng/g (ppb). The lowest available threshold for each pollutant is in bold font. One serving is defined as 8 ounces (227 g) prior to cooking. The FCG and ATLs for mercury are for the most sensitive population (i.e., women aged 18 to 45 years and children aged 1 to 17 years).

| Pollutant | Fish Contaminant Goal | Advisory Tissue Level (3 servings/week) | Advisory Tissue Level (2 servings/week) | Advisory Tissue Level (No Consumption) |
|---|---|---|---|---|
| Chlordanes | **5.6** | 190 | 280 | 560 |
| DDTs | **21** | 520 | 1000 | 2100 |
| Dieldrin | **0.46** | 15 | 23 | 46 |
| Mercury | 220 | **70** | 150 | 440 |
| PCBs | **3.6** | 21 | 42 | 120 |
| Selenium | 7400 | **2500** | 4900 | 15000 |

## SAMPLE PROCESSING

Dissection and compositing of muscle tissue samples were performed following USEPA guidance (USEPA 2000). All fish were dissected skin-off, and only the fillet muscle tissue was used for analysis.

## CHEMICAL ANALYSIS

Nearly all (>95%) of the mercury present in fish is methylmercury (Wiener et al. 2007). Consequently, monitoring programs usually analyze total mercury as a proxy for methylmercury, as was done in this study. USEPA (2000) recommends this approach, and the conservative assumption be made that all mercury is present as methylmercury to be most protective of human health. Total mercury and selenium in muscle tissue were measured by Moss Landing Marine Laboratory (Moss Landing, CA). Detection limits for total mercury and all of the other analytes are presented in Table 5.

Trace organics in muscle tissue were measured by the California Department of Fish and Game Water Pollution Control Laboratory (Rancho Cordova, CA). PCBs are reported as the sum of 55 congeners (Table 5). Concentrations in many lakes were near or below limits of detection (Table 5). The most abundant congeners were detected in 65-69% of the 364 samples analyzed for PCBs. Frequencies of detection and reporting were lower for the less abundant PCB congeners.

## QUALITY ASSURANCE

The samples were analyzed in multiple batches. QAQC analyses for SWAMP Data Quality Objectives (DQOs) (precision, accuracy, recovery, completeness, and sensitivity) were performed for each batch as required by the SWAMP BOG QAPP (Bonnema 2007). The Technical Report for this study (Davis et al. 2009) contains a complete description of the QA results.

There were 55,598 sample results for individual constituents including tissue composites, composite blind duplicates, and laboratory QA/QC samples. Overall, all data with the exception of 865 results were considered usable for the intended purpose. A 98% completeness level was attained which met the 90% project completeness goal specified in the Lakes QAPP.

## ASSESSMENT THRESHOLDS

This report compared fish tissue concentrations to two types of thresholds for concern for pollutants in sport fish that were developed by OEHHA (Klasing and Brodberg 2008): Fish Contaminant Goals (FCGs) and Advisory Tissue Levels (ATLs) (Table 4).

**Table 5**
**Analytes included in the study, detection limits, and frequencies of detection and reporting.**
Frequency of detection includes all results above detection limits. Frequency of reporting includes all results that were reportable (above the detection limit and passing all QA review).

| Class | Analyte | MDL | Number of Observations | Frequency of Detection (%) | Frequency of Reporting (%) |
|---|---|---|---|---|---|
| Metals/Metalloids | Mercury | 0.01 | 3158 | 99% | 99% |
| | Selenium | 0.12 | 209 | 86% | 86% |
| Cyclodienes | Dieldrin | 0.42 | 360 | 29% | 29% |
| Chlordanes | Nonachlor, cis- | 0.30 | 360 | 36% | 36% |
| | Chlordane, cis- | 0.39 | 360 | 44% | 33% |
| | Nonachlor, trans- | 0.19 | 360 | 68% | 59% |
| | Chlordane, trans- | 0.44 | 360 | 41% | 28% |
| | Oxychlordane | 0.46 | 360 | 6% | 6% |
| DDTs | DDE(o,p') | 0.17 | 360 | 8% | 8% |
| | DDE(p,p') | 0.47 | 360 | 93% | 92% |
| | DDT(o,p') | 0.21 | 360 | 4% | 4% |
| | DDT(p,p') | 0.15 | 360 | 19% | 19% |
| | DDD(o,p') | 0.09 | 360 | 30% | 30% |
| | DDD(p,p') | 0.12 | 360 | 71% | 71% |
| PCB Congeners | PCB 008 | 0.14 | 364 | 3% | 3% |
| | PCB 018 | 0.13 | 364 | 15% | 15% |
| | PCB 027 | 0.11 | 364 | 5% | 5% |
| | PCB 028 | 0.16 | 364 | 27% | 27% |
| | PCB 029 | 0.11 | 364 | 0% | 0% |
| | PCB 031 | 0.15 | 364 | 23% | 23% |
| | PCB 033 | 0.15 | 364 | 12% | 12% |
| | PCB 044 | 0.15 | 364 | 32% | 32% |
| | PCB 049 | 0.11 | 364 | 40% | 40% |
| | PCB 052 | 0.17 | 364 | 40% | 38% |
| | PCB 056 | 0.10 | 364 | 38% | 23% |
| | PCB 060 | 0.11 | 364 | 29% | 27% |
| | PCB 064 | 0.10 | 364 | 25% | 24% |
| | PCB 066 | 0.13 | 364 | 48% | 41% |
| | PCB 070 | 0.19 | 364 | 45% | 35% |
| | PCB 074 | 0.12 | 364 | 38% | 36% |
| | PCB 077 | 0.11 | 364 | 15% | 15% |
| | PCB 087 | 0.15 | 364 | 51% | 39% |

| Class | Analyte | MDL | Number of Observations | Frequency of Detection (%) | Frequency of Reporting (%) |
|---|---|---|---|---|---|
| PCB Congeners | PCB 095 | 0.18 | 364 | 54% | 41% |
| | PCB 097 | 0.11 | 364 | 45% | 38% |
| | PCB 099 | 0.12 | 364 | 58% | 55% |
| | PCB 101 | 0.18 | 364 | 66% | 54% |
| | PCB 105 | 0.15 | 364 | 40% | 39% |
| | PCB 110 | 0.21 | 364 | 59% | 43% |
| | PCB 114 | 0.10 | 364 | 10% | 7% |
| | PCB 118 | 0.24 | 364 | 54% | 49% |
| | PCB 126 | 0.11 | 364 | 2% | 2% |
| | PCB 128 | 0.11 | 364 | 44% | 43% |
| | PCB 137 | 0.10 | 364 | 23% | 23% |
| | PCB 138 | 0.19 | 364 | 64% | 63% |
| | PCB 141 | 0.11 | 364 | 36% | 36% |
| | PCB 146 | 0.10 | 364 | 35% | 35% |
| | PCB 149 | 0.12 | 364 | 60% | 57% |
| | PCB 151 | 0.09 | 364 | 45% | 45% |
| | PCB 153 | 0.18 | 364 | 69% | 68% |
| | PCB 156 | 0.11 | 364 | 30% | 29% |
| | PCB 157 | 0.10 | 364 | 10% | 10% |
| | PCB 158 | 0.10 | 364 | 38% | 37% |
| | PCB 169 | 0.10 | 364 | 6% | 3% |
| | PCB 170 | 0.12 | 364 | 32% | 32% |
| | PCB 174 | 0.11 | 364 | 32% | 32% |
| | PCB 177 | 0.09 | 364 | 32% | 32% |
| | PCB 180 | 0.10 | 364 | 65% | 64% |
| | PCB 183 | 0.10 | 364 | 38% | 38% |
| | PCB 187 | 0.11 | 364 | 55% | 55% |
| | PCB 189 | 0.10 | 364 | 4% | 4% |
| | PCB 194 | 0.10 | 364 | 30% | 30% |
| | PCB 195 | 0.11 | 364 | 12% | 12% |
| | PCB 198/199 | 0.09 | 364 | 14% | 2% |
| | PCB 200 | 0.10 | 364 | 9% | 9% |
| | PCB 201 | 0.11 | 364 | 37% | 37% |
| | PCB 203 | 0.09 | 364 | 38% | 38% |
| | PCB 206 | 0.11 | 364 | 26% | 23% |
| | PCB 209 | 0.09 | 364 | 15% | 15% |

FCGs, as described by Klasing and Brodberg (2008), are “estimates of contaminant levels in fish that pose no significant health risk to humans consuming sport fish at a standard consumption rate of one serving per week (or eight ounces [before cooking] per week, or 32 g/day), prior to cooking, over a lifetime and can provide a starting point for OEHHA to assist other agencies that wish to develop fish tissue-based criteria with a goal toward pollution mitigation or elimination. FCGs prevent consumers from being exposed to more than the daily reference dose for non-carcinogens or to a risk level greater than $1x10^{-6}$ for carcinogens (not more than one additional cancer case in a population of 1,000,000 people consuming fish at the given consumption rate over a lifetime). FCGs are based solely on public health considerations without regard to economic considerations, technical feasibility, or the counterbalancing benefits of fish consumption.” For organic pollutants, FCGs are lower than ATLs.

ATLs, as described by Klasing and Brodberg (2008), “while still conferring no significant health risk to individuals consuming sport fish in the quantities shown over a lifetime, were developed with the recognition that there are unique health benefits associated with fish consumption and that the advisory process should be expanded beyond a simple risk paradigm in order to best promote the overall health of the fish consumer. ATLs provide numbers of recommended fish servings that correspond to the range of contaminant concentrations found in fish and are used to provide consumption advice to prevent consumers from being exposed to more than the average daily reference dose for non-carcinogens or to a risk level greater than $1x10^{-4}$ for carcinogens (not more than one additional cancer case in a population of 10,000 people consuming fish at the given consumption rate over a lifetime). ATLs are designed to encourage consumption of fish that can be eaten in quantities likely to provide significant health benefits, while discouraging consumption of fish that, because of contaminant concentrations, should not be eaten or cannot be eaten in amounts recommended for improving overall health (eight ounces total, prior to cooking, per week). ATLs are but one component of a complex process of data evaluation and interpretation used by OEHHA in the assessment and communication of fish consumption risks. The nature of the contaminant data or omega-3 fatty acid concentrations in a given species in a water body, as well as risk communication needs, may alter strict application of ATLs when developing site-specific advisories. For example, OEHHA may recommend that consumers eat fish containing low levels of omega-3 fatty acids less often than the ATL table would suggest based solely on contaminant concentrations. OEHHA uses ATLs as a framework, along with best professional judgment, to provide fish consumption guidance on an ad hoc basis that best combines the needs for health protection and ease of communication for each site.” For methylmercury and selenium, the 3 serving and 2 serving ATLs are lower than the FCGs.

Consistent with the description of ATLs above, the assessments presented in this report are not intended to represent consumption advice.

For methylmercury, results were also compared to a 0.3 ppm threshold that is being used by the State and Regional Water Boards in the current round of 303(d) listing.

## DATA ANALYSIS

For individual largemouth bass, regression equations were used to estimate methylmercury concentrations (mean and 95% confidence interval) in a 350 mm (total length) largemouth bass for each lake. The 350 mm value was selected to represent the middle of the typical size distribution above the legal limit of 305 mm (12 in) for largemouth bass in California.

### Candidates for 303(d) Listing

One of the objectives of this survey was to provide information that could be used in evaluating whether a given lake should be included on the 303(d) List for each pollutant. The sampling design was developed specifically to address this objective. To meet listing requirements in a cost-effective manner, all available samples were analyzed for lakes where an initial analysis of a lakewide composite sample showed that concentrations approached a threshold. This report does not, however, present an assessment for the purposes of 303(d) listing determinations. These determinations were left to the discretion of the Regional Boards.

# SECTION 3 RESULTS AND DISCUSSION

In this screening study, 4,905 fish representing 23 species were collected from 272 lakes and reservoirs in California (Figure 1a-c, Tables 1a,b). A concise summary of the data for each lake is provided in Appendix 1. Excel files containing these tables are available from SFEI (contact Jay Davis, jay@sfei.org). All data collected for this study are maintained in the SWAMP database which is managed by the data management team at Moss Landing Marine Laboratories (http://swamp.mpsl.mlml.calstate.edu). The complete dataset, which will be used for 303(d) listing determinations, includes QA data (quality control samples and blind duplicates) and additional ancillary information (specific location information, fish sex, weights, etc). It is anticipated that by the fall of 2010, the complete dataset from this study will also be available on the web at http://www.ceden.org. Finally, data from this study are available on the web through the California Water Quality Monitoring Council's "My Water Quality" portal (www.CaWaterQuality.net). This site is designed to present data from the Lakes Survey and other studies in a nontechnical manner to the public, and allows mapping and viewing of summary data from each lake.

## METHYLMERCURY

### Comparison to Thresholds

Methylmercury is the pollutant that poses the most widespread potential health risks to consumers of fish caught from California lakes. Methylmercury was the only pollutant that frequently reached concentrations high enough that OEHHA would consider recommending no consumption of the contaminated species (0.44 ppm wet weight). This degree of contamination was quite prevalent across the state. Overall, 56 of the 272 lakes surveyed (21%) had a species with an average concentration exceeding 0.44 ppm (Table 6, Figure 2). For the random lakes, 23% had a species above 0.44 ppm (Figure 3a). The 95% confidence interval for this estimate was ±11%. Expressed on an areal basis, an estimated 18% of California lake area had fish with concentrations above 0.44 ppm (Figure 3a). For the targeted lakes, 20% had concentrations above the 0.44 ppm threshold (Figure 3b). The occurrence of these high mercury lakes showed distinct regional variation. Only 2% of the northern California trout lakes were above 0.44 ppm (Table 6). In contrast, 48% of the lower elevation lakes in northern California were above 0.44 ppm. In southern California, the overall degree of contamination was less severe than in the low elevation lakes of northern California, but the fraction of lakes above 0.44 ppm was still substantial (16%).

**Table 6**
**Percentages of lakes in methylmercury concentration categories by region.**
Concentrations in ppm. Note: Some lakes did not fall into these three regional categories.

| Region | Number of Lakes | Percentage of Lakes in Each Concentration Category | | | | | |
|---|---|---|---|---|---|---|---|
| | | < 0.07 | 0.07-0.15 | 0.15-0.22 | 0.22 – 0.3 | 0.3 -0.44 | >0.44 |
| California (All Data) | 272 | 32 | 13 | 13 | 7 | 14 | 21 |
| Northern California Trout Lakes | 87 | 71 | 16 | 6 | 2 | 2 | 1 |
| Northern California Lower Elevation (<2000 ft) | 82 | 2 | 5 | 11 | 12 | 22 | 48 |
| Southern California | 83 | 27 | 12 | 20 | 7 | 18 | 16 |

The State and Regional Boards are applying a methylmercury threshold of 0.3 ppm in fish tissue in the current round of 303(d) listing of impaired water bodies. Many lakes across the state had fish tissue concentrations above this threshold. Overall, 95 of the 272 lakes surveyed (35%) had a species with an average methylmercury concentration exceeding 0.30 ppm (Table 6, Figure 2). The occurrence of lakes with concentrations above this threshold showed distinct regional variation. Only 3% of the northern California trout lakes were above 0.30 ppm (Table 6). In contrast, 70% of the lower elevation lakes in northern California were above 0.30 ppm. In southern California, 34% of lakes were above 0.30 ppm.

Most of the lakes surveyed had some degree of methylmercury contamination. Methylmercury concentrations measured in this study were frequently higher than the lowest OEHHA threshold for methylmercury – 0.07 ppm – a concentration at which OEHHA would consider recommending consumption of less than three servings of fish per week. Overall, 68% of the 272 lakes sampled had a fish species with methylmercury concentrations above the lowest threshold for methylmercury (the 0.07 ppm three serving ATL) (Table 6, Figure 2). Most (71%) of the northern California trout lakes were below 0.07 ppm (Table 6). This was in sharp contrast to lower elevation lakes (below 2000 ft) in northern California, which had only 2% below 0.07 ppm. Concentrations in Southern California lakes were intermediate, with 27% below 0.07 ppm.

## Variation Within and Among Species

As expected, relatively high methylmercury concentrations were observed in species that are high trophic position predators, including largemouth, smallmouth, and spotted bass and Sacramento pikeminnow (Table 7). For some of these species, however, the averages are based on small sample sizes and therefore are imprecise estimates. Statewide average concentrations in smallmouth and largemouth bass (0.42 and 0.41 ppm, respectively) approached OEHHA's no consumption ATL of 0.44 ppm. Other warmwater species such as common carp, channel catfish, black crappie, and bluegill had moderate methylmercury contamination.

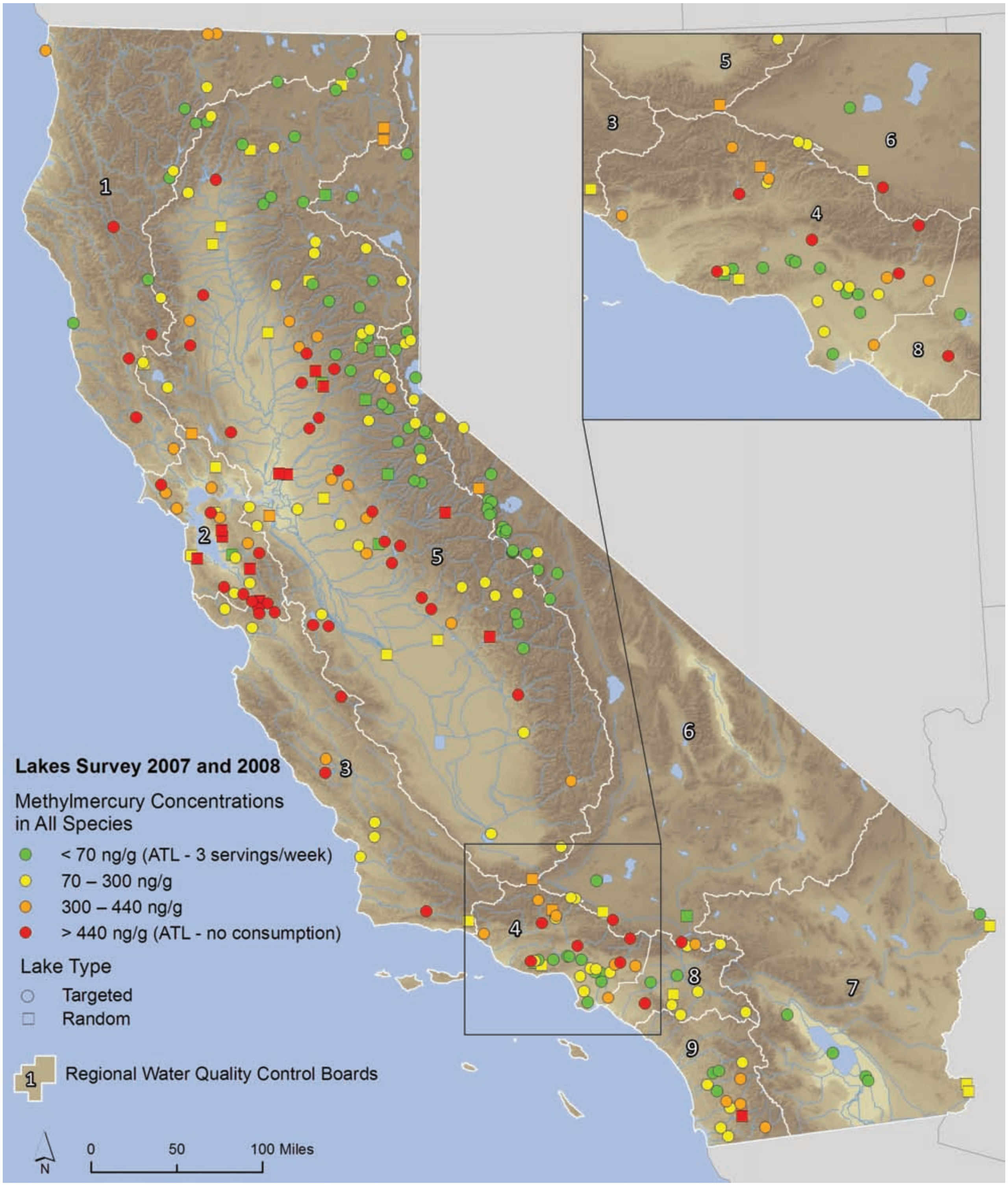


**Figure 2. Spatial patterns in methylmercury concentrations** (ng/g wet weight) in lakes sampled in the Lakes Survey, 2007-2008. Each point represents the highest average methylmercury concentration among the species sampled in each lake. Concentrations based on location composites and individual fish, from both targeted (circles) and random (squares) lakes.

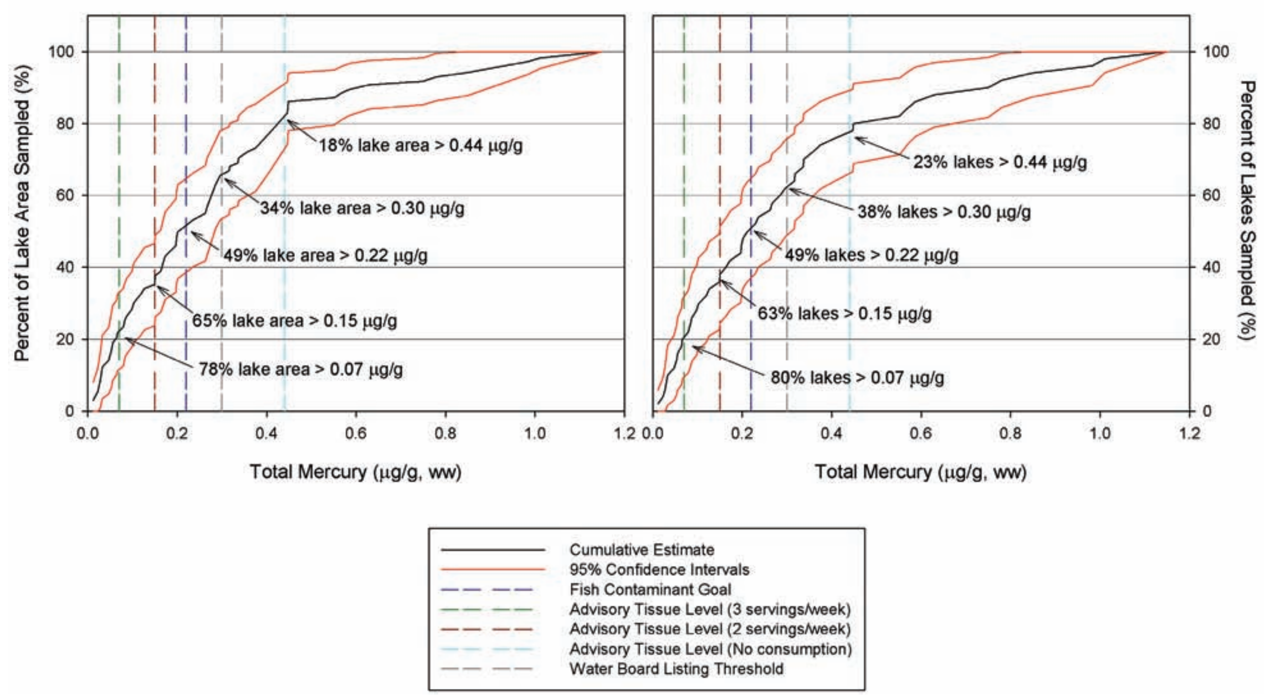


**Figure 3a. Cumulative distribution function (CDF) plot for mercury in random lakes,** shown as percent of lake area (left) and percent of lakes (right). Concentrations are the highest species average (ug/g wet weight) for each lake, based on location composites and individual fish at randomly sampled lakes in the Lakes Survey. Vertical lines are threshold values. Data in µg/g, or ppm.

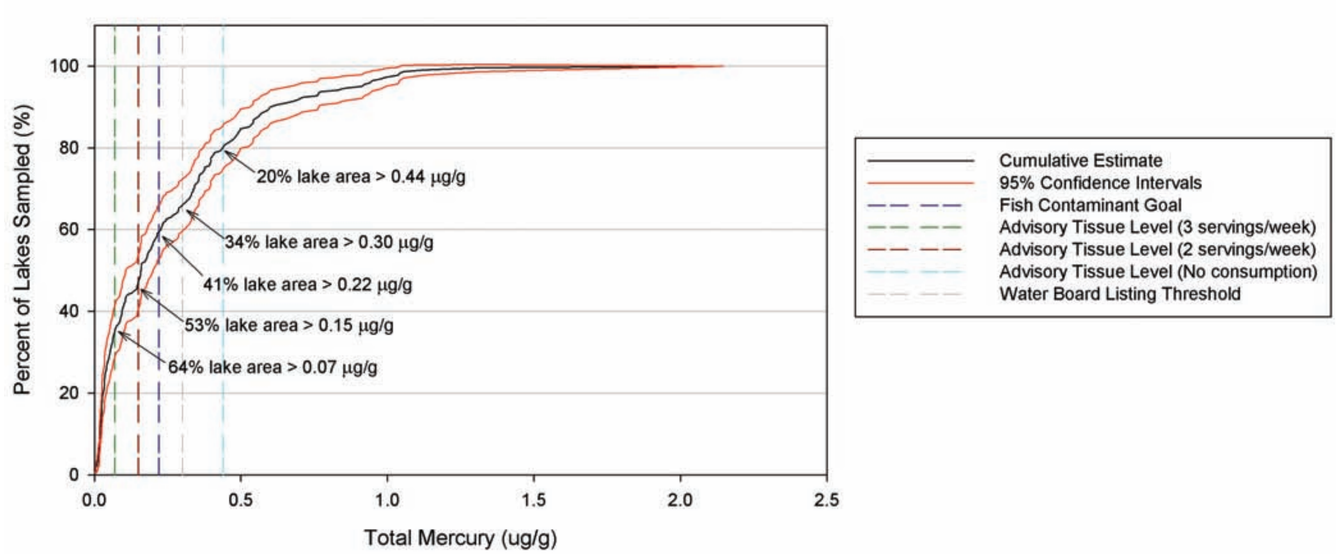


**Figure 3b. Cumulative distribution function (CDF) plot for mercury at targeted lakes,** shown as percent of lakes sampled. Concentrations are the highest species average (ug/g wet weight) for each lake, based on location composites and individual fish at targeted lakes in the Lakes Survey. Vertical lines are threshold values. Data in µg/g, or ppm.

## Table 7

**Average concentrations of mercury (ppm wet weight) in each species sampled in this survey.** Averages are based on the total number of composites or estimated averages for all locations (i.e., all of the data points shown in Appendix 1). Concentrations in ppm. Averages by species are shown for the entire statewide dataset, and for each region. Almaden Lake in Region 2 had high concentrations and a large influence on the Region 2 averages for largemouth and common carp. Without the data from Almaden Lake, the average was 0.23 ppm for common carp, 0.58 ppm for largemouth bass, and 0.36 ppm for Region 2 as a whole. N=number of samples; S.E.=standard error of the mean.

| Species | California | | | Region 1 | | | Region 2 | | | Region 3 | | | Region 4 | | | Region 5 | | | Region 6 | | | Region 7 | | | Region 8 | | | Region 9 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | Concentration | S.E. | N | Concentration | S.E. | N | Concentration | S.E. | N | Concentration | S.E. | N | Concentration | S.E. | N | Concentration | S.E. | N | Concentration | S.E. | N | Concentration | S.E. | N | Concentration | S.E. | N | Concentration | S.E. |
| Black Crappie | 4 | 0.04 | 0.02 | | | | | | | | | | | | | 1 | 0.08 | | | | | 3 | 0.03 | 0.01 | | | | | | |
| Bluegill | 3 | 0.08 | 0.02 | | | | 2 | 0.10 | 0.01 | | | | 1 | 0.04 | | | | | | | | | | | | | | | | |
| Brook Trout | 4 | 0.13 | 0.04 | | | | | | | | | | | | | 4 | 0.13 | 0.04 | | | | | | | | | | | | |
| Brown Bullhead | 24 | 0.08 | 0.01 | 1 | 0.13 | | | | | | | | 8 | 0.14 | 0.03 | 15 | 0.05 | 0 | | | | | | | | | | | | |
| Brown Trout | 19 | 0.20 | 0.05 | | | | | | | | | | | | | 17 | 0.21 | 0.06 | 2 | 0.05 | 0 | | | | | | | | | |
| Channel Catfish | 20 | 0.17 | 0.04 | | | | 7 | 0.12 | 0.04 | | | | 3 | 0.10 | 0.03 | 6 | 0.36 | 0.10 | 2 | 0.06 | 0 | 1 | 0.01 | | | | | 1 | 0.05 | |
| Common Carp | 172 | 0.18 | 0.01 | 2 | 0.08 | 0.01 | 20 | 0.31 | 0.07 | 13 | 0.32 | 0.04 | 31 | 0.05 | 0.01 | 61 | 0.22 | 0.01 | 4 | 0.21 | 0.11 | 14 | 0.03 | 0.01 | 13 | 0.11 | 0.02 | 14 | 0.14 | 0.03 |
| Eagle Lake Trout | 4 | 0.06 | 0.01 | | | | | | | | | | | | | | | | 4 | 0.06 | 0.01 | | | | | | | | | |
| Goldfish | 2 | 0.07 | 0 | | | | | | | 2 | 0.07 | 0 | | | | | | | | | | | | | | | | | | |
| Hardhead | 2 | 0.11 | 0.01 | 2 | 0.11 | 0.01 | | | | | | | | | | | | | | | | | | | | | | | | |
| Hitch | 2 | 0.03 | 0 | | | | | | | 2 | 0.03 | 0 | | | | | | | | | | | | | | | | | | |
| Kokanee | 3 | 0.08 | 0.01 | | | | | | | | | | | | | 1 | 0.10 | | 2 | 0.08 | 0 | | | | | | | | | |
| Lake Trout | 2 | 0.16 | 0.01 | | | | | | | | | | | | | | | | 2 | 0.16 | 0.01 | | | | | | | | | |
| Largemouth Bass | 199 | 0.41 | 0.02 | 13 | 0.58 | 0.10 | 22 | 0.65 | 0.09 | 14 | 0.43 | 0.08 | 26 | 0.31 | 0.04 | 93 | 0.42 | 0.03 | 5 | 0.41 | 0.14 | 3 | 0.11 | 0.02 | 8 | 0.15 | 0.05 | 15 | 0.25 | 0.04 |
| Pumpkinseed | 1 | 0.19 | 0 | | | | | | | | | | 1 | 0.19 | | | | | | | | | | | | | | | | |
| Rainbow Trout | 152 | 0.05 | 0 | 12 | 0.04 | 0.01 | 2 | 0.26 | 0.01 | 2 | 0.23 | 0.04 | 1 | 0.03 | | 76 | 0.04 | 0 | 58 | 0.04 | 0 | | | | 1 | 0.03 | | | | |
| Redear Sunfish | 2 | 0.02 | 0 | | | | | | | | | | 2 | 0.02 | 0 | | | | | | | | | | | | | | | |
| Sac. Pikeminnow | 2 | 0.27 | 0.07 | | | | | | | | | | | | | 2 | 0.27 | 0.07 | | | | | | | | | | | | |
| Sacramento Sucker | 28 | 0.27 | 0.04 | | | | 2 | 0.29 | 0.02 | 2 | 0.09 | 0 | | | | 18 | 0.31 | 0.05 | 6 | 0.20 | 0.05 | | | | | | | | | |
| Smallmouth Bass | 22 | 0.42 | 0.06 | | | | | | | 3 | 1.00 | 0.03 | | | | 19 | 0.33 | 0.05 | | | | | | | | | | | | |
| Spotted Bass | 6 | 0.32 | 0.11 | | | | | | | | | | | | | 6 | 0.32 | 0.11 | | | | | | | | | | | | |
| Striped Bass | 3 | 0.21 | 0.02 | | | | | | | | | | | | | | | | | | | | | | 3 | 0.21 | 0.02 | | | |
| Tilapia1 | 4 | 0.01 | 0 | | | | | | | | | | | | | | | | | | | 4 | 0.01 | 0 | | | | | | |
| Overall | 680 | 0.15 | 0.02 | 30 | 0.19 | 0.03 | 55 | 0.29 | 0.04 | 38 | 0.31 | 0.03 | 73 | 0.11 | 0.02 | 319 | 0.22 | 0.05 | 85 | 0.14 | 0.04 | 25 | 0.04 | 0.01 | 25 | 0.12 | 0.03 | 30 | 0.15 | 0.03 |

Rainbow trout generally had low concentrations of methylmercury, with a statewide average (0.05 ppm) below the lowest OEHHA threshold (the 0.07 ppm three serving ATL).

Trout generally occupy a lower trophic position and accumulate lower concentrations of methylmercury and other pollutants, though exceptions to this pattern occur and were observed in this study (discussed further below). Another factor that probably contributes to lower observed concentrations in trout is that, in many lakes, recently planted hatchery fish are part of the catch. A previous study found that hatchery trout consistently had very low concentrations of methylmercury (rainbow trout from four hatcheries all had less than 0.023 ppm – Grenier et al. 2007).

It is important to note that resident, self-sustaining trout populations in these lakes are likely to have higher concentrations than the hatchery fish that are most readily collected. The results from Hetch Hetchy Reservoir, which has a self-sustaining population of brown trout, illustrate this point. Hetch Hetchy Reservoir was anomalous among the trout lakes with methylmercury concentrations of 0.96 and 0.54 ppm in composites of brown trout from two distinct locations (Figure 4). One other lake (Loon Lake, which also has a self-sustaining population of brown trout) also had relatively high concentrations in two composites of brown trout (0.50 and 0.30 ppm). Brown trout from the other nine lakes where they were collected generally had low concentrations (all around 0.10 ppm or less, except for one composite from Hell Hole Reservoir at 0.28 ppm).

Larger size fish from self-sustaining trout populations are particularly likely to accumulate high concentrations of methylmercury. A second factor that could contribute to the high concentrations in brown trout from Hetchy Hetchy Reservoir and Loon Lake is that brown trout are known to switch to from a diet of invertebrates to a diet of fish as they get older (Moyle 2002). The brown trout samples with high methylmercury were all above 400 mm in average length, while the samples with lower methylmercury were all below 400 mm (Figure 4).

Rainbow trout showed less variation in methylmercury concentrations than brown trout. The highest concentrations of methylmercury in rainbow trout were observed in two composites from Pilarcitos Lake in Region 2 (0.26 and 0.27 ppm). Other lakes with relatively high concentrations in rainbow trout were Jameson Lake in Region 3 (0.19 and 0.27 ppm in two composites) and Mammoth Pool Reservoir in Region 5 (0.10 and 0.22 in two composites).

Very few California lakes contain predatory fish, such as largemouth bass, with low concentrations of methylmercury (Figure 5). Only 8 of the 143 lakes where largemouth bass were sampled (6%) had average largemouth concentrations of 0.07 ppm or lower. The average (size-adjusted) concentrations observed in lakes with largemouth bass that were below the lowest OEHHA threshold were 0.07 ppm in Lake of the Pines (Region 5), 0.03 ppm in Lake Calabassas and 0.01 ppm in Toluca Lake (Region 4), 0.07 ppm in Prado Lake and 0.03 ppm in Lake Evans (Region 8), and 0.05 ppm in each of three Region 9 lakes (Dixon Lake, Lake Poway, and Lake Wohlford). These lakes stand out as having exceptionally low methylmercury contamination. These low concentrations may be due to variation in ecosystem factors such as water

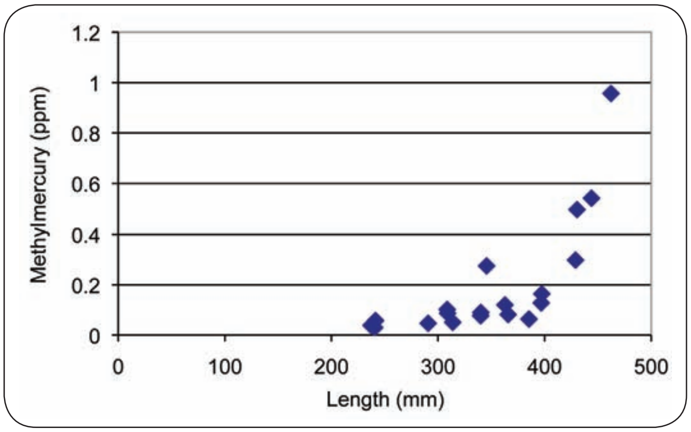


**Figure 4. Methylmercury concentration (ug/g wet weight) versus average length (total) for brown trout composites.** Data from 11 lakes in the Sierra Nevada.

chemistry, productivity, trophic dynamics, wetland presence, or others; or due to variation in sources, such as an absence of mining influence. The influence of these factors was explored in further detail in a companion paper (Negrey et al. 2010). The low concentrations observed at these lakes indicate that it is indeed possible for lakes in the California landscape, even those with self-sustaining populations of predators, to not have excessive bioaccumulation of methylmercury, and that a realistic management goal for at least some lakes may be to attain concentrations of this magnitude.

A much higher percentage of the low elevation lakes where predators (black bass, Sacramento pikeminnow, striped bass) were not collected had methylmercury concentrations below the 0.07 ppm threshold: 16 of 23 (70%). The species sampled at these lakes (e.g., common carp, channel catfish, black crappie, and bluegill) tend to accumulate lower concentrations of methylmercury.

Limited evaluation of correlations among species could be evaluated with this dataset (Figure 6). The largest sample size was available for largemouth bass and common carp. A fairly strong correlation was observed between these species (R2 = 0.59), with bass averaging 1.6 times higher concentrations than carp. Considerable variation around the regression line was observed, especially toward the higher end of the distribution of concentrations. Although sample sizes were small, concentrations in largemouth bass also appeared to have consistent relationships with Sacramento sucker, brown bullhead, and channel catfish.

## Spatial Patterns

Methylmercury concentrations across the state varied at a regional scale (Table 6, Figure 2). In northern California, low concentrations were commonly observed in fish from high elevation lakes in the Sierra Nevada and Trinity Alps. The highest species averages observed in most of these lakes were below the three-serving ATL (0.07 ppm). Trout (mostly rainbow trout, but a few lakes had brown trout, brook trout, lake trout, or Eagle Lake trout) were the most commonly caught species in these lakes, and, as discussed above, tend to accumulate lower methylmercury concentrations than largemouth bass. For the 87 northern California trout lakes sampled, 71% had a maximum species average below 0.07 ppm, another 16% were between 0.07 and 0.15 ppm, and only one of these lakes (1%) had a species average above 0.44 ppm – Hetch Hetchy Reservoir with brown trout at 0.75 ppm (Table 8). Photodemethylation in the very clear water column of high-elevation lakes may be a mechanistic process that contributes to the low methylmercury concentrations in these areas.

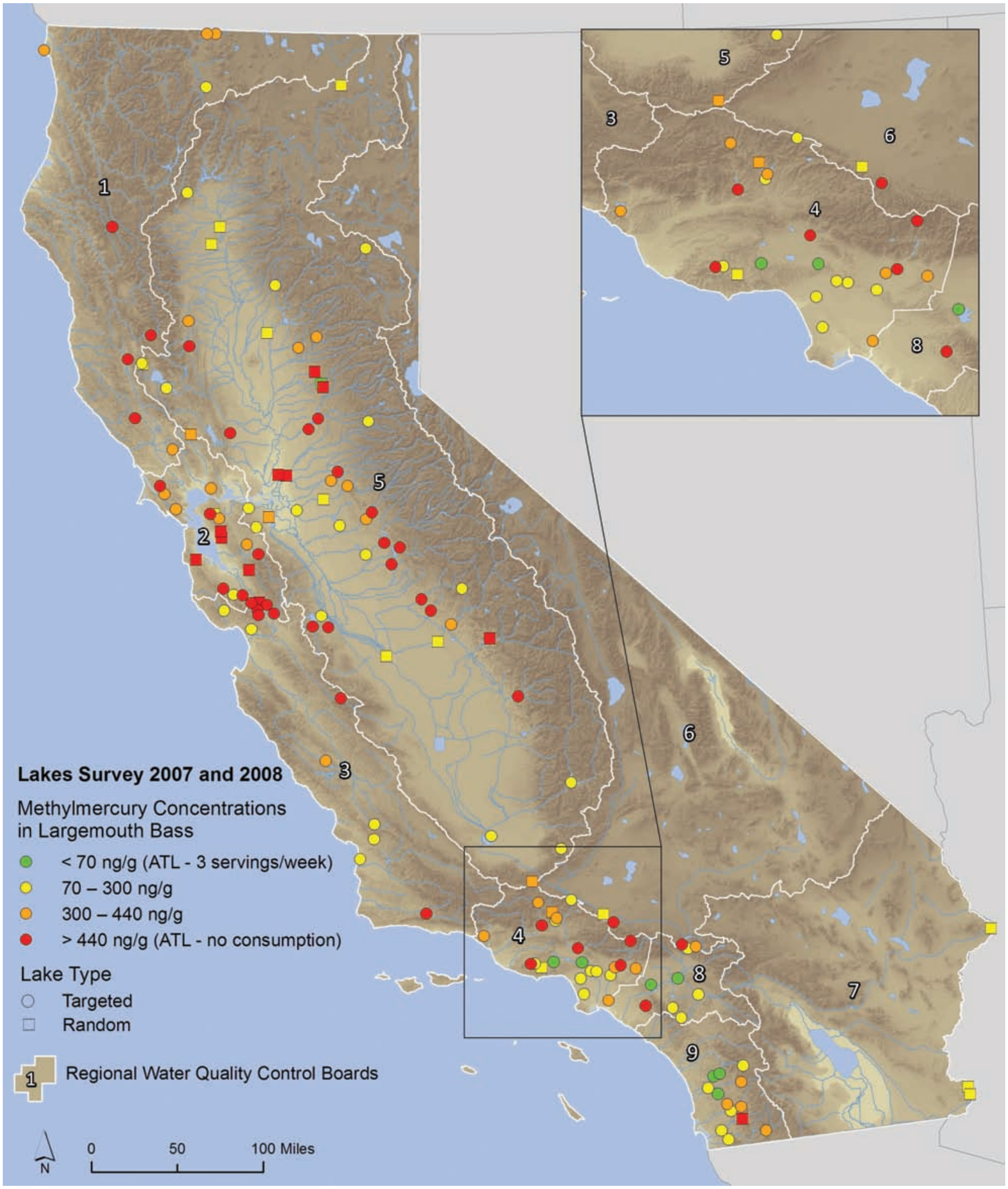


**Figure 5. Spatial patterns in methylmercury concentrations (ug/g wet weight) in standard-sized (350 mm) largemouth bass** at lakes sampled in the Lakes Survey, from both targeted (circles) and random (squares) lakes.

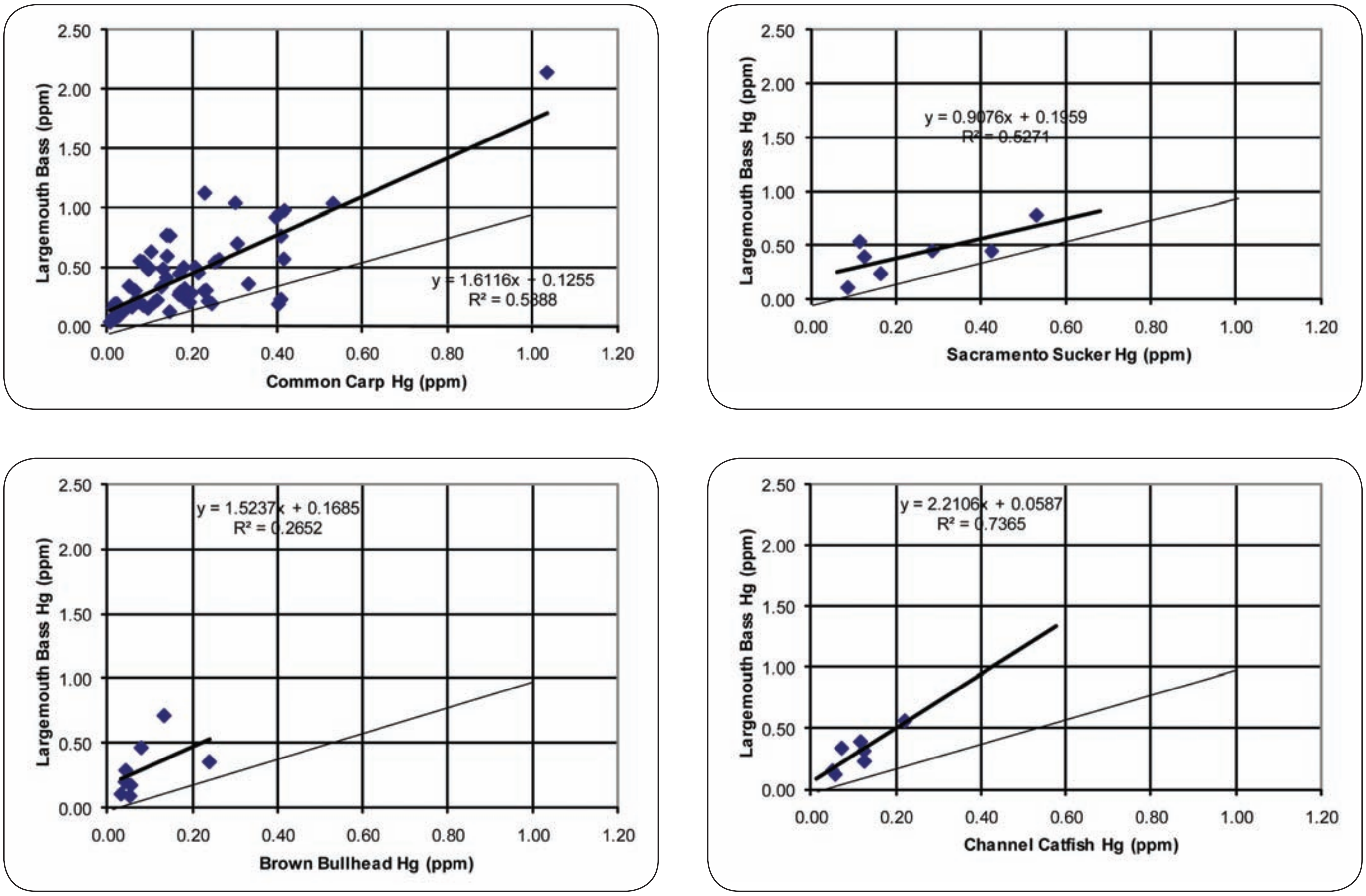


**Figure 6. Correlations of methylmercury concentrations (ug/g wet weight) in largemouth bass with concentrations in other species.**

In contrast to the northern California trout lakes, methylmercury concentrations in fish from lower elevation (below 2000 ft) lakes in northern California (Table 6, Figure 2) were almost always higher than the three-serving per week ATL (0.07 ppm), and frequently higher than the no consumption ATL (0.44 ppm). Of the 82 lower elevation lakes sampled in northern California, 48% had a maximum species average above 0.44 ppm, another 34% were between 0.22 and 0.44 ppm, and only two (2%) lakes in this region had a species average below 0.07 ppm. The two lakes that had a methylmercury concentration at or below 0.07 ppm were Lago Los Osos in Region 2 and Lake of the Pines in Region 5. Largemouth bass were not caught at Lago Los Osos – only channel catfish were collected. Lake of the Pines was the only lake in northern California where largemouth bass were collected that had an average concentration at a standard size of 350 mm of 0.07 ppm or lower. Interestingly, the average concentration measured at this lake was in sharp contrast to concentrations in 350 mm largemouth at two adjacent lakes: Lake Combie immediately to the south at 0.78 ppm, and Zayak/Swan Lake to the north at 0.98 ppm.

**Table 8**
**Lakes with methylmercury above 0.44 ppm (wet weight) OEHHA threshold in average concentrations or composite samples.** Data are sorted by region. Data for samples of individual fish are not included in this table.

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppm) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Lake Pillsbury | Year1 | medium | targeted | Largemouth Bass | 350 | 1.34 | L1 | NA | 11 | 350 mm Standard Size |
| 1 | Lake Pillsbury | Year1 | medium | targeted | Largemouth Bass | 350 | 1.29 | L2 | NA | 11 | 350 mm Standard Size |
| 1 | Lake Sonoma | Year1 | medium | targeted | Largemouth Bass | 350 | 0.71 | L2 | NA | 11 | 350 mm Standard Size |
| 1 | Lake Sonoma | Year1 | medium | targeted | Largemouth Bass | 350 | 0.64 | L1 | NA | 11 | 350 mm Standard Size |
| 1 | Ruth Lake | Year2 | small | targeted | Largemouth Bass | 350 | 0.71 | L1 | NA | 11 | 350 mm Standard Size |
| 1 | Ruth Lake | Year2 | small | targeted | Brown Bullhead | 323.8 | 0.13 | L1 | 1 | 5 | Location Composite |
| 1 | Lake Mendocino | Year1 | medium | targeted | Largemouth Bass | 350 | 0.55 | L1 | NA | 11 | 350 mm Standard Size |
| 1 | Lake Mendocino | Year1 | medium | targeted | Largemouth Bass | 350 | 0.54 | L2 | NA | 11 | 350 mm Standard Size |
| 1 | Lake Mendocino | Year1 | medium | targeted | Common Carp | 491.6 | 0.10 | L2 | 1 | 5 | Location Composite |
| 1 | Lake Mendocino | Year1 | medium | targeted | Common Carp | 479 | 0.07 | L1 | 1 | 5 | Location Composite |
| 2 | Almaden Lake | Year2 | small | targeted | Largemouth Bass | 350 | 2.15 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Almaden Lake | Year2 | small | targeted | Common Carp | 669.4 | 1.05 | L1 | 1 | 5 | Location Composite |
| 2 | Almaden Lake | Year2 | small | targeted | Common Carp | 668.4 | 1.02 | L1 | 2 | 5 | Location Composite |
| 2 | Calero Reservoir | Year2 | small | targeted | Largemouth Bass | 350 | 1.05 | L1 | NA | 16 | 350 mm Standard Size |
| 2 | Upper San Leandro Reservoir | Year1 | small | random | Largemouth Bass | 350 | 1.01 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Anderson Lake | Year1 | small | targeted | Largemouth Bass | 350 | 0.98 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Anderson Lake | Year1 | small | targeted | Common Carp | 501.2 | 0.52 | L1 | 2 | 5 | Location Composite |
| 2 | Anderson Lake | Year1 | small | targeted | Common Carp | 502.6 | 0.32 | L1 | 1 | 5 | Location Composite |

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppm) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Soulejoule Lake | Year1 | small | targeted | Largemouth Bass | 350 | 0.94 | L1 | NA | 16 | 350 mm Standard Size |
| 2 | Calaveras Reservoir | Year1 | medium | random | Largemouth Bass | 350 | 0.86 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Calaveras Reservoir | Year1 | medium | random | Largemouth Bass | 350 | 0.31 | L2 | NA | 11 | 350 mm Standard Size |
| 2 | Lower Crystal Springs Reservoir | Year1 | small | random | Largemouth Bass | 350 | 0.85 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Coyote Lake | Year2 | small | targeted | Largemouth Bass | 350 | 0.76 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Coyote Lake | Year2 | small | targeted | Common Carp | 636.6 | 0.47 | L1 | 1 | 5 | Location Composite |
| 2 | Coyote Lake | Year2 | small | targeted | Common Carp | 633.4 | 0.35 | L1 | 2 | 5 | Location Composite |
| 2 | Stevens Creek Reservoir | Year1 | small | targeted | Largemouth Bass | 350 | 0.70 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Stevens Creek Reservoir | Year1 | small | targeted | Common Carp | 601.4 | 0.32 | L1 | 2 | 5 | Location Composite |
| 2 | Stevens Creek Reservoir | Year1 | small | targeted | Common Carp | 606.4 | 0.29 | L1 | 1 | 5 | Location Composite |
| 2 | Lake Chabot (San Leandro) | Year1 | small | random | Largemouth Bass | 350 | 0.57 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Lake Chabot (San Leandro) | Year1 | small | targeted | Common Carp | 520.8 | 0.54 | L1 | 1 | 5 | Location Composite |
| 2 | Lake Chabot (San Leandro) | Year1 | small | targeted | Common Carp | 520.6 | 0.29 | L1 | 2 | 5 | Location Composite |
| 2 | Lake del Valle | Year2 | small | targeted | Largemouth Bass | 350 | 0.56 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Lake del Valle | Year2 | small | targeted | Channel Catfish | 506.8 | 0.32 | L1 | 2 | 5 | Location Composite |
| 2 | Lake del Valle | Year2 | small | targeted | Channel Catfish | 506.6 | 0.13 | L1 | 1 | 5 | Location Composite |
| 2 | San Pablo Reservoir | Year1 | small | targeted | Largemouth Bass | 350 | 0.48 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | San Pablo Reservoir | Year1 | small | targeted | Common Carp | 500 | 0.17 | L1 | 2 | 4 | Location Composite |
| 2 | San Pablo Reservoir | Year1 | small | targeted | Common Carp | 506.4 | 0.09 | L1 | 1 | 5 | Location Composite |

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppm) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Oiger Quarry Ponds | Year1 | small | random | Largemouth Bass | 350 | 0.45 | L1 | NA | 11 | 350 mm Standard Size |
| 2 | Oiger Quarry Ponds | Year1 | small | targeted | Sacramento Sucker | 438.4 | 0.31 | L1 | 1 | 5 | Location Composite |
| 2 | Oiger Quarry Ponds | Year1 | small | targeted | Sacramento Sucker | 436.4 | 0.26 | L1 | 2 | 5 | Location Composite |
| 3 | Chesbro Reservoir | Year1 | small | targeted | Largemouth Bass | 350 | 1.04 | L1 | NA | 11 | 350 mm Standard Size |
| 3 | Chesbro Reservoir | Year1 | small | targeted | Common Carp | 524 | 0.55 | L1 | 1 | 5 | Location Composite |
| 3 | Chesbro Reservoir | Year1 | small | targeted | Common Carp | 522.6 | 0.51 | L1 | 2 | 5 | Location Composite |
| 3 | Uvas Reservoir | Year1 | small | targeted | Largemouth Bass | 350 | 0.91 | L1 | NA | 11 | 350 mm Standard Size |
| 3 | Hernandez Reservoir | Year2 | small | targeted | Largemouth Bass | 350 | 0.83 | L1 | NA | 16 | 350 mm Standard Size |
| 3 | Lake Cachuma | Year2 | large | targeted | Largemouth Bass | 350 | 0.61 | L1 | NA | 6 | 350 mm Standard Size |
| 3 | Lake Cachuma | Year2 | large | targeted | Largemouth Bass | 350 | 0.48 | L2 | NA | 11 | 350 mm Standard Size |
| 3 | Lake Cachuma | Year2 | large | targeted | Largemouth Bass | 350 | 0.40 | L3 | NA | 11 | 350 mm Standard Size |
| 3 | Lake Cachuma | Year2 | large | targeted | Common Carp | 535.8 | 0.20 | L3 | 1 | 5 | Location Composite |
| 3 | Lake Cachuma | Year2 | large | targeted | Common Carp | 528.6 | 0.18 | L1 | 1 | 5 | Location Composite |
| 3 | Lake Cachuma | Year2 | large | targeted | Common Carp | 536.6 | 0.16 | L2 | 1 | 5 | Location Composite |
| 3 | Lake Nacimiento | Year1 | large | targeted | Common Carp | 502.6 | 0.56 | L2 | 1 | 5 | Location Composite |
| 3 | Lake Nacimiento | Year1 | large | targeted | Common Carp | 510 | 0.50 | L3 | 1 | 5 | Location Composite |
| 3 | Lake Nacimiento | Year1 | large | targeted | Common Carp | 421.2 | 0.37 | L1 | 1 | 5 | Location Composite |
| 4 | Crystal Lake | Year1 | small | targeted | Largemouth Bass | 350 | 0.95 | L1 | NA | 5 | 350 mm Standard Size |
| 4 | Crystal Lake | Year1 | small | targeted | Pumpkinseed | 135 | 0.19 | L1 | 1 | 5 | Location Composite |
| 4 | Santa Fe Reservoir | Year1 | small | targeted | Largemouth Bass | 350 | 0.59 | L1 | NA | 16 | 350 mm Standard Size |
| 4 | Santa Fe Reservoir | Year1 | small | targeted | Common Carp | 531.8 | 0.16 | L1 | 1 | 5 | Location Composite |
| 4 | Santa Fe Reservoir | Year1 | small | targeted | Common Carp | 531.4 | 0.12 | L1 | 2 | 5 | Location Composite |

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppm) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Lake Sherwood | Year1 | small | targeted | Largemouth Bass | 350 | 0.54 | L1 | NA | 16 | 350 mm Standard Size |
| 4 | Hansen Lake | Year1 | small | targeted | Largemouth Bass | 350 | 0.49 | L1 | NA | 16 | 350 mm Standard Size |
| 4 | Hansen Lake | Year1 | small | targeted | Common Carp | 547.4 | 0.12 | L1 | 2 | 5 | Location Composite |
| 4 | Hansen Lake | Year1 | small | targeted | Common Carp | 547.8 | 0.08 | L1 | 1 | 5 | Location Composite |
| 4 | Lake Piru | Year1 | small | targeted | Largemouth Bass | 350 | 0.46 | L1 | NA | 16 | 350 mm Standard Size |
| 4 | Lake Piru | Year1 | small | targeted | Brown Bullhead | 295.6 | 0.10 | L1 | 2 | 5 | Location Composite |
| 4 | Lake Piru | Year1 | small | targeted | Brown Bullhead | 296.6 | 0.06 | L1 | 1 | 5 | Location Composite |
| 5 | New Melones Lake | Year2 | medium | targeted | Largemouth Bass | 350 | 1.22 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | New Melones Lake | Year2 | medium | targeted | Largemouth Bass | 350 | 1.03 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | New Melones Lake | Year2 | medium | targeted | Common Carp | 587.4 | 0.26 | L1 | 1 | 5 | Location Composite |
| 5 | New Melones Lake | Year2 | medium | targeted | Common Carp | 544 | 0.20 | L2 | 1 | 5 | Location Composite |
| 5 | Cosumnes River | Year1 | small | random | Largemouth Bass | 350 | 1.15 | L1 | NA | 16 | 350 mm Standard Size |
| 5 | New Hogan Lake | Year2 | large | targeted | Largemouth Bass | 350 | 0.51 | L3 | NA | 11 | 350 mm Standard Size |
| 5 | New Hogan Lake | Year2 | large | targeted | Largemouth Bass | 350 | 0.41 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | New Hogan Lake | Year2 | large | targeted | Largemouth Bass | 350 | 0.37 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Eastman Lake | Year2 | medium | targeted | Largemouth Bass | 350 | 1.05 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Eastman Lake | Year2 | medium | targeted | Largemouth Bass | 350 | 1.03 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Eastman Lake | Year2 | medium | targeted | Common Carp | 671.4 | 0.33 | L1 | 1 | 5 | Location Composite |
| 5 | Eastman Lake | Year2 | medium | targeted | Common Carp | 652.8 | 0.27 | L2 | 1 | 5 | Location Composite |
| 5 | Zayak/Swan Lake | Year1 | small | random | Largemouth Bass | 350 | 0.98 | L1 | NA | 16 | 350 mm Standard Size |

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppm) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Hetch Hetchy Reservoir | Year1 | medium | targeted | Brown Trout | 462.3 | 0.96 | L2 | 1 | 3 | Location Composite |
| 5 | Hetch Hetchy Reservoir | Year1 | medium | targeted | Brown Trout | 444 | 0.54 | L1 | 1 | 5 | Location Composite |
| 5 | Hensley Lake | Year1 | medium | targeted | Largemouth Bass | 350 | 0.80 | L2 | NA | 12 | 350 mm Standard Size |
| 5 | Hensley Lake | Year1 | medium | targeted | Largemouth Bass | 350 | 0.72 | L1 | NA | 10 | 350 mm Standard Size |
| 5 | Hensley Lake | Year1 | medium | targeted | Common Carp | 469.4 | 0.16 | L1 | 1 | 5 | Location Composite |
| 5 | Hensley Lake | Year1 | medium | targeted | Common Carp | 480.4 | 0.13 | L2 | 1 | 5 | Location Composite |
| 5 | Shasta Lake | Year1 | ex-large | targeted | Channel Catfish | 592.6 | 0.80 | L2 | 1 | 5 | Location Composite |
| 5 | Shasta Lake | Year1 | ex-large | targeted | Channel Catfish | 681.5 | 0.36 | L1 | 1 | 4 | Location Composite |
| 5 | Lake McClure | Year1 | large | targeted | Largemouth Bass | 350 | 0.79 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Lake McClure | Year1 | large | targeted | Largemouth Bass | 350 | 0.77 | L3 | NA | 11 | 350 mm Standard Size |
| 5 | Lake McClure | Year1 | large | targeted | Largemouth Bass | 350 | 0.75 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Lake McClure | Year1 | large | targeted | Common Carp | 444.8 | 0.17 | L2 | 1 | 5 | Location Composite |
| 5 | Lake McClure | Year1 | large | targeted | Common Carp | 425 | 0.13 | L3 | 1 | 5 | Location Composite |
| 5 | Lake McClure | Year1 | large | targeted | Common Carp | 413.6 | 0.12 | L1 | 1 | 5 | Location Composite |
| 5 | Lake Combie | Year1 | small | random | Largemouth Bass | 350 | 0.78 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Lake Combie | Year1 | small | targeted | Sacramento Sucker | 443.6 | 0.60 | L1 | 1 | 5 | Location Composite |
| 5 | Lake Combie | Year1 | small | targeted | Sacramento Sucker | 443.2 | 0.46 | L1 | 2 | 5 | Location Composite |
| 5 | Lake Berryessa | Year2 | ex-large | targeted | Largemouth Bass | 350 | 0.77 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Lake Berryessa | Year2 | ex-large | targeted | Largemouth Bass | 350 | 0.60 | L4 | NA | 11 | 350 mm Standard Size |
| 5 | Lake Berryessa | Year2 | ex-large | targeted | Largemouth Bass | 350 | 0.53 | L3 | NA | 11 | 350 mm Standard Size |
| 5 | Lake Berryessa | Year2 | ex-large | targeted | Largemouth Bass | 350 | 0.51 | L2 | NA | 11 | 350 mm Standard Size |

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppm) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Rollins Reservoir | Year2 | small | targeted | Sacramento Sucker | 448.6 | 0.68 | L1 | 1 | 5 | Location Composite |
| 5 | Harry L Englebright Lake | Year2 | small | targeted | Sacramento Sucker | 481.4 | 0.66 | L1 | 1 | 5 | Location Composite |
| 5 | Harry L Englebright Lake | Year2 | small | targeted | Sacramento Sucker | 479.8 | 0.59 | L1 | 2 | 5 | Location Composite |
| 5 | Harry L Englebright Lake | Year2 | small | targeted | Rainbow Trout | 305.8 | 0.08 | L1 | 1 | 5 | Location Composite |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Largemouth Bass | 350 | 0.62 | L4 | NA | 11 | 350 mm Standard Size |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Largemouth Bass | 350 | 0.57 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Largemouth Bass | 350 | 0.57 | L3 | NA | 11 | 350 mm Standard Size |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Largemouth Bass | 350 | 0.51 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Common Carp | 767.75 | 0.35 | L2 | 1 | 4 | Location Composite |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Common Carp | 728.2 | 0.25 | L1 | 1 | 5 | Location Composite |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Common Carp | 801.4 | 0.19 | L3 | 1 | 5 | Location Composite |
| 5 | Lake Amador | Year2 | small | targeted | Largemouth Bass | 350 | 0.60 | L1 | NA | 16 | 350 mm Standard Size |
| 5 | Folsom Lake | Year2 | large | targeted | Largemouth Bass | 350 | 0.59 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Folsom Lake | Year2 | large | targeted | Largemouth Bass | 350 | 0.48 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Folsom Lake | Year2 | large | targeted | Largemouth Bass | 350 | 0.34 | L3 | NA | 11 | 350 mm Standard Size |
| 5 | Pine Flat Lake | Year1 | large | random | Largemouth Bass | 350 | 0.58 | L3 | NA | 11 | 350 mm Standard Size |
| 5 | Pine Flat Lake | Year1 | large | random | Largemouth Bass | 350 | 0.55 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Pine Flat Lake | Year1 | large | random | Largemouth Bass | 350 | 0.53 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Pine Flat Lake | Year1 | large | targeted | Common Carp | 585 | 0.09 | L1 | 1 | 5 | Location Composite |
| 5 | Pine Flat Lake | Year1 | large | targeted | Common Carp | 590 | 0.07 | L2 | 1 | 5 | Location Composite |
| 5 | Los Banos Reservoir | Year1 | small | targeted | Largemouth Bass | 350 | 0.55 | L1 | NA | 11 | 350 mm Standard Size |

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppm) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Lake Natomas | Year1 | small | targeted | Largemouth Bass | 350 | 0.54 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Lake Natomas | Year1 | small | targeted | Common Carp | 579 | 0.26 | L1 | 1 | 5 | Location Composite |
| 5 | Lake Natomas | Year1 | small | targeted | Common Carp | 568.4 | 0.25 | L1 | 2 | 5 | Location Composite |
| 5 | New Bullards Bar Reservoir | Year2 | large | targeted | Largemouth Bass | 350 | 0.54 | L3 | NA | 11 | 350 mm Standard Size |
| 5 | New Bullards Bar Reservoir | Year2 | large | targeted | Largemouth Bass | 350 | 0.38 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | New Bullards Bar Reservoir | Year2 | large | targeted | Largemouth Bass | 350 | 0.27 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Lake Kaweah | Year2 | medium | targeted | Largemouth Bass | 350 | 0.54 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Lake Kaweah | Year2 | medium | targeted | Largemouth Bass | 350 | 0.46 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Lake Kaweah | Year2 | medium | targeted | Common Carp | 653.4 | 0.25 | L1 | 1 | 5 | Location Composite |
| 5 | Lake Kaweah | Year2 | medium | targeted | Common Carp | 684.8 | 0.17 | L2 | 1 | 5 | Location Composite |
| 5 | Lake McSwain | Year1 | small | targeted | Largemouth Bass | 350 | 0.54 | L1 | NA | 9 | 350 mm Standard Size |
| 5 | Lake McSwain | Year1 | small | targeted | Sacramento Sucker | 406.8 | 0.15 | L1 | 2 | 5 | Location Composite |
| 5 | Lake McSwain | Year1 | small | targeted | Sacramento Sucker | 410.6 | 0.08 | L1 | 1 | 5 | Location Composite |
| 5 | Turlock Lake | Year1 | large | targeted | Common Carp | 495.4 | 0.52 | L2 | 1 | 5 | Location Composite |
| 5 | Turlock Lake | Year1 | large | targeted | Common Carp | 527.4 | 0.42 | L3 | 1 | 5 | Location Composite |
| 5 | Turlock Lake | Year1 | large | targeted | Common Carp | 489 | 0.28 | L1 | 1 | 5 | Location Composite |
| 5 | Turlock Lake | Year1 | large | targeted | Largemouth Bass | 350 | 0.24 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Turlock Lake | Year1 | large | targeted | Largemouth Bass | 350 | 0.23 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Turlock Lake | Year1 | large | targeted | Largemouth Bass | 350 | 0.21 | L3 | NA | 10 | 350 mm Standard Size |
| 5 | East Park Reservoir | Year1 | medium | targeted | Largemouth Bass | 350 | 0.52 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | East Park Reservoir | Year1 | medium | targeted | Largemouth Bass | 350 | 0.39 | L1 | NA | 11 | 350 mm Standard Size |

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppm) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | East Park Reservoir | Year1 | medium | targeted | Common Carp | 451 | 0.25 | L2 | 1 | 5 | Location Composite |
| 5 | East Park Reservoir | Year1 | medium | targeted | Common Carp | 452.8 | 0.18 | L1 | 1 | 5 | Location Composite |
| 5 | Loon Lake | Year1 | small | targeted | Brown Trout | 430.4 | 0.50 | L1 | 1 | 5 | Location Composite |
| 5 | Loon Lake | Year1 | small | targeted | Brown Trout | 429 | 0.30 | L1 | 2 | 5 | Location Composite |
| 5 | Meadows Slough | Year1 | small | targeted | Sacramento Sucker | 519 | 0.47 | L1 | 2 | 5 | Location Composite |
| 5 | Meadows Slough | Year1 | small | random | Largemouth Bass | 350 | 0.45 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Meadows Slough | Year1 | small | targeted | Sacramento Sucker | 519 | 0.38 | L1 | 1 | 5 | Location Composite |
| 5 | Don Pedro Reservoir | Year1 | large | targeted | Largemouth Bass | 350 | 0.46 | L3 | NA | 11 | 350 mm Standard Size |
| 5 | Don Pedro Reservoir | Year1 | large | targeted | Largemouth Bass | 350 | 0.46 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Don Pedro Reservoir | Year1 | large | targeted | Largemouth Bass | 350 | 0.40 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Don Pedro Reservoir | Year1 | large | targeted | Common Carp | 563 | 0.20 | L2 | 1 | 5 | Location Composite |
| 5 | Don Pedro Reservoir | Year1 | large | targeted | Common Carp | 516.2 | 0.16 | L3 | 1 | 5 | Location Composite |
| 5 | Don Pedro Reservoir | Year1 | large | targeted | Common Carp | 555.8 | 0.15 | L1 | 1 | 5 | Location Composite |
| 5 | Stony Gorge Reservoir | Year1 | medium | targeted | Largemouth Bass | 350 | 0.45 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Stony Gorge Reservoir | Year1 | medium | targeted | Largemouth Bass | 350 | 0.34 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Stony Gorge Reservoir | Year1 | medium | targeted | Sacramento Sucker | 322.4 | 0.14 | L2 | 1 | 5 | Location Composite |
| 5 | Stony Gorge Reservoir | Year1 | medium | targeted | Sacramento Sucker | 313.4 | 0.11 | L1 | 1 | 5 | Location Composite |
| 5 | Camp Far West Reservoir | Year1 | medium | targeted | Channel Catfish | 418 | 0.44 | L2 | 1 | 5 | Location Composite |
| 5 | Camp Far West Reservoir | Year1 | medium | targeted | Channel Catfish | 458.6 | 0.32 | L1 | 1 | 5 | Location Composite |
| 5 | Isabella Lake | Year2 | large | targeted | Common Carp | 497.6 | 0.44 | L2 | 1 | 5 | Location Composite |
| 5 | Isabella Lake | Year2 | large | targeted | Common Carp | 494.6 | 0.41 | L1 | 1 | 5 | Location Composite |

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppm) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Isabella Lake | Year2 | large | targeted | Common Carp | 529.4 | 0.35 | L3 | 1 | 5 | Location Composite |
| 5 | Isabella Lake | Year2 | large | targeted | Largemouth Bass | 350 | 0.21 | L2 | NA | 11 | 350 mm Standard Size |
| 5 | Isabella Lake | Year2 | large | targeted | Largemouth Bass | 350 | 0.19 | L1 | NA | 11 | 350 mm Standard Size |
| 5 | Isabella Lake | Year2 | large | targeted | Largemouth Bass | 350 | 0.16 | L3 | NA | 11 | 350 mm Standard Size |
| 6 | Little Rock Reservoir | Year2 | small | targeted | Largemouth Bass | 350 | 0.92 | L1 | NA | 11 | 350 mm Standard Size |
| 6 | Little Rock Reservoir | Year2 | small | targeted | Common Carp | 497.4 | 0.43 | L1 | 1 | 5 | Location Composite |
| 6 | Little Rock Reservoir | Year2 | small | targeted | Common Carp | 497 | 0.37 | L1 | 2 | 5 | Location Composite |
| 6 | Silverwood Lake | Year1 | small | targeted | Largemouth Bass | 350 | 0.49 | L1 | NA | 16 | 350 mm Standard Size |
| 8 | Irvine Lake | Year1 | small | targeted | Largemouth Bass | 350 | 0.48 | L1 | NA | 11 | 350 mm Standard Size |
| 8 | Irvine Lake | Year1 | small | targeted | Common Carp | 596 | 0.11 | L1 | 2 | 5 | Location Composite |
| 8 | Irvine Lake | Year1 | small | targeted | Common Carp | 597 | 0.09 | L1 | 1 | 5 | Location Composite |
| 9 | Loveland Reservoir | Year1 | small | random | Largemouth Bass | 350 | 0.63 | L1 | NA | 11 | 350 mm Standard Size |
| 9 | Loveland Reservoir | Year1 | small | targeted | Common Carp | 456.4 | 0.11 | L1 | 2 | 5 | Location Composite |
| 9 | Loveland Reservoir | Year1 | small | targeted | Common Carp | 455.6 | 0.09 | L1 | 1 | 5 | Location Composite |

Although methylmercury concentrations were generally not as high in southern California, the methylmercury problem is not confined to northern California and its well-known mining regions. Most of the 83 lakes in southern California were between 0.07 and 0.44 ppm (57%), but 16% had a maximum species average above 0.44 ppm (Table 6). Average concentrations above 0.90 ppm were observed in two lakes in close proximity to each other: Crystal Lake (0.95 ppm in largemouth) and Little Rock Reservoir (0.92 ppm in largemouth). The remaining lakes (27%) in this region had a species average below 0.07 ppm (Table 6, Figure 2). Largemouth bass were collected at only seven of the 22 lakes that were below 0.07 ppm in southern California.

## Implications Regarding Sources

Although identifying sources of contamination was not a primary goal of the study, this is one of the broader goals of the SWAMP. With an extensive statewide dataset, an attempt was made to determine whether the results from this study could shed some light on the relative importance of sources contributing to bioaccumulation of methylmercury uptake such as historic mining activity and atmospheric deposition. Understanding the relative importance of these and other sources has significant implications for management of the methylmercury problem in California.

Two approaches were taken to attempt to discern the importance of different sources. The first approach was quantitative – the development of a statistical model to evaluate the relative importance of many potentially important factors influencing methylmercury bioaccumulation (Negrey et al. 2010). This assessment examined watershed attributes relating to contaminant sources (mercury and gold mining, soil mercury, point sources) and other factors (e.g., watershed area, forested area, wetland area), as well as detailed information on lake attributes, making use of information generated in companion study to develop bioaccumulation factors for lakes. This quantitative assessment focused on the 17 lakes where detailed information was available.

The second approach, presented in Davis et al. (2010), was a qualitative evaluation of the fish methylmercury data in comparison to broad scale datasets on mining and geology. This qualitative effort focused on assessing the potential influence of atmospheric deposition of mercury. Considerable uncertainty surrounds this topic.

It seems certain that atmospheric deposition contributes to food web uptake to some degree. Global atmospheric transport brings a significant quantity of mercury across the Pacific Ocean. Local terrestrial sources of atmospheric mercury then add to this global background. Mercury deposited to surface waters from the atmosphere is considered to have relatively high bioavailability (Hintelmann et al. 2002).

However, the extent of the atmospheric deposition contribution to food web mercury in California's lakes and reservoirs is unclear. At one end of the spectrum is the hypothesis that atmospheric deposition alone could be sufficient to cause the degree of methylmercury bioaccumulation that is observed across California. One major body of evidence in support of this hypothesis is extensive data from other regions in North America where atmospheric deposition is clearly the driver of bioaccumulation (Wiener et al. 2006, Harris et al. 2007). In spite of the extensive mining legacy in California, the degree of food web contamination in this state does not differ greatly from that seen across the rest of the continent (discussed further below). An alternative hypothesis is that atmospheric deposition constitutes a lower level background that contributes to, but does not dominate, food web contamination, and that mining legacy or geologic mercury is the primary source of methylmercury in the food web in California's lakes and reservoirs.

The approach taken by Davis et al. (2010) to evaluate these hypotheses was to compare patterns in some of the key watershed attributes identified by Negrey et al. (2010) to fish methylmercury at a selected subset of the 272 lake dataset. The subset of lakes selected for this analysis all had largemouth bass, and included the 14 lakes with the highest bass methylmercury concentrations, the 14 lakes with the lowest concentrations, and the 17 lakes included in the quantitative analysis. It was hoped that any obvious patterns would readily emerge from a comparison of lakes with low and high methylmercury concentrations in fish.

Overall, this analysis suggested that in the active and complex geology of California it is not possible to conclusively determine whether specific watersheds are free from the possible influence of historic mining activity or mercury-enriched geology based solely on available GIS layers. In order to resolve the question of the influence of atmospheric deposition it would be necessary to perform more detailed, site-specific field work to assess the contributions of mining sediment or geology. The simplest approach would be to measure the amount of total mercury in lake sediments and see how this correlates with mercury in the food web. This approach appears promising based on Negrey et al. (2010). To reduce potential variability related to food web structure, a more definitive study would ideally examine accumulation in young-of-the-year fish (Wiener et al. 2007). Another possible approach would be to assess mercury sources through the use of mercury isotopes, which have shown some promise in identifying sources of food web mercury in San Francisco Bay (unpublished data).

Available data appear to support a general conceptual model that includes a combination of atmospheric deposition, legacy contamination from mining, and geological sources as the drivers of methylmercury bioaccumulation in California lakes and reservoirs. Methylmercury concentrations in largemouth bass of approximately 0.2 ppm in two coastal lakes situated relatively far from geologic sources of mercury but very close to the coast may be a reasonable indication of the degree of contamination attributable to long-range atmospheric transport and deposition from sources across the Pacific Ocean. Atmospheric deposition can probably lead to significantly higher or lower concentrations in aquatic food webs depending on site-specific biogeochemistry or limnology (e.g., lake productivity). Emissions from urban areas, historic mining districts, and geological sources lead to increased atmospheric deposition in inland areas adding to the background oceanic input. Mining-contaminated sediments, mercury-rich soils, and other terrestrial sources are transported into aquatic ecosystems and can also contribute to severe food web contamination, with the Guadalupe Reservoir (Tetra Tech 2005; also described in the next section) being the most extreme example. Lake biogeochemistry can also greatly dampen or increase the impact of the combined mix of sources. The end result of the interplay of these and other factors is the spatially heterogeneous patchwork of aquatic food web contamination observed in this survey.

## Comparison to the National Lakes Survey

USEPA recently published results from a national probabilistic survey of contaminants in fish based on sampling conducted in 2000-2003 (Stahl et al. 2009). The results from this survey provide a national frame of reference for the present study. Unfortunately, the data from the two surveys are not directly comparable for two major reasons. First, the USEPA survey used a similar approach with a predator and a bottom-dweller targeted at each lake. However, USEPA analyzed fillets in the predator, but whole bodies in the bottom-dweller. USEPA consequently presented results for predators and bottom-dwellers separately. Second, USEPA did not make as great an effort to control for the size of fish analyzed. The sizes of fish collected were more variable and they did not estimate concentrations at a standard size.

The national survey found that fillets of predators in 49% of the sampled population of lakes had methylmercury concentrations that exceeded the USEPA 0.3 ppm fish tissue criterion for mercury. The median methylmercury concentration in predator fillets in the national survey was 0.28 ppm (Table 9). In comparison, the median for predator fillets in this survey was much lower: 0.16 ppm. However, due to the large surface area of mountains in California, the state survey included a much higher percentage of trout lakes (44%) than the national survey (12%). The largemouth bass data from this study provide another frame of reference for comparing California to the US as a whole. The median methylmercury concentration in largemouth bass in this study was 0.34 ppm, slightly higher than the national median (0.28 ppm). Overall, although it is difficult to make a direct comparison, both the California data for predators and for largemouth bass indicate that methylmercury concentrations in California sport fish are at or below the national median.

The USEPA survey sampled 18 California lakes. Nine out of 18 (50%) of these lakes had a sample above the USEPA threshold of 0.3 ppm, similar to the national dataset as a whole. In general these data fell within the range of results from the present survey. One exception was Guadalupe Reservoir, which was sampled by USEPA but was not in the California survey. The largemouth bass composite sample from Guadalupe Reservoir had a methylmercury concentration of 6.60 ppm, the highest concentration measured in the entire country. The carp composite from Guadalupe Reservoir measured 0.52 ppm, close to the national maximum for bottom dwellers of 0.60 ppm. Exceptionally high methylmercury contamination in Guadalupe Reservoir, downstream of the historic New Almaden mercury mining district, has previously been documented (e.g., Tetra Tech 2005).

## Priorities for Further Assessment

Lakes with average methylmercury concentrations of one or more species above 0.44 ppm should clearly be considered high priorities for further assessment to determine the need for consumption guidelines and management actions. Many lakes had concentrations well above the 0.44 ppm threshold (Table 8). Almaden Lake in Santa Clara County (also downstream of New Almaden) had the highest species average methylmercury concentration in this survey: 2.15 ppm in largemouth bass. Other lakes with a species average concentrations above 1 ppm included (all are in 350 mm largemouth bass unless otherwise noted): Lake Pillsbury in Region 1 (1.31 ppm); Upper San Leandro Reservoir (1.01 ppm) and Calero Reservoir (1.05 ppm) in Region 2; Cosumnes River (1.15 ppm), Lower Mokelumne River 7 (1.21 ppm in Sacramento pikeminnow), New Melones Lake (1.12 ppm), and Eastman Lake (1.04 ppm) in Region 5; and Chesbro Reservoir (1.04 ppm) and Lake Nacimiento (1.00 ppm in smallmouth bass [not size-adjusted]) in Region

3. All of these lakes above 1 ppm were in the mercury and gold mining regions in the northern part of the state. Table 8 shows the data for samples at the 61 lakes that had a species average above 0.44 ppm based on either individual or composite samples. Consumption guidelines have already been issued for 20 (33%) of these lakes, but 41 (67%) do not have guidelines.

Other priorities for further assessment to understand the sources and patterns of methylmercury contamination in California lakes are discussed in the last section of this report: Recommendations for Future Monitoring.

**Table 9**
**Comparison of data from this study to data from the national study of contaminants in fish from lakes (Stahl et al. 2009).** Data from this study for largemouth bass and predators (including all bass and trout species, as well as Sacramento pikeminnow) are compared to predator data from the national survey. All data are for muscle fillets.

| | | Mercury (ppm wet) | DDTs (ppb wet) | PCBs (ppb wet) |
|---|---|---|---|---|
| **This study:** largemouth bass | # of samples | 199 | 101 | 101 |
| | MEDIAN | 0.34 | 1.9 | 1.1 |
| **This study:** predators (181 trout, 44%) | # of samples | 414 | 191 | 191 |
| | MEDIAN | 0.16 | 1.96 | 0.46 |
| **USEPA:** predators (59 trout, 12%) | # of samples | 486 | 486 | 486 |
| | MEDIAN | 0.28 | 1.5 | 2.2 |

## PCBS

### Comparison to Thresholds

PCBs (measured as the sum of 55 congeners) were second to methylmercury in reaching fish tissue concentrations posing potential health risks to consumers of fish caught from California lakes. However, far fewer lakes had PCB concentrations exceeding OEHHA's higher risk thresholds (Tables 4 and 10, Figure 7). Overall, only three of the 272 lakes assessed (1.1%) had a species with an average concentration high enough that OEHHA would consider recommending no consumption of the contaminated species (120 ppb). The vast majority of lakes in the survey (92%) were below the three serving ATL for PCBs (21 ppb).

The lowest threshold for PCBs was the FCG (3.6 ppb). For PCBs, 33% of the 272 lakes were above this threshold: 20% of the random lakes and 35% of the targeted lakes (Figures 8a,b). Southern California had a higher percentage of lakes with at least one sample above 3.6 ppb (60%) than lower elevation lakes in northern California (40%) and northern California trout lakes (8%) (Table 10).

The frequency distributions were different for random and targeted lakes (Figures 8a,b). This was due to the relatively extensive sampling of Region 4, the Region with the highest PCB concentrations. For the random lakes, the percentages expressed on an areal basis were very similar to those expressed on a per lake basis.

## Spatial Patterns

PCB concentrations across the state varied at a regional scale (Table 10, Figure 7). Similar to the regional pattern seen for methylmercury, in northern California low concentrations were commonly observed in high elevation lakes in the Sierra Nevada and Trinity Alps. The vast majority of species averages observed in these lakes were below the FCG (3.6 ppb). For the 87 northern California lakes where trout were collected, 92% had a maximum species average below 3.6 ppb, 7% were between 3.6 and 21 ppb (the 3 serving ATL), one lake (1%) was between 21 and 42 ppb (the 2 serving ATL), and none were above 42 ppb. The highest species average measured in this region was 28 ppb in a brown trout sample from Silver Lake in Region 6.

PCB concentrations in low elevation (below 2000 ft) lakes in northern California were greater than those in the trout lakes (Table 10, Figure 7). Of the 82 low elevation lakes sampled in northern California, 60% had a maximum species average below 3.6 ppb, 29% were between 3.6 and 21 ppb, 2% were between 21 and 42 ppb, 7% were between 42 and 120 ppb, and one was above 120 ppb. The one lake with a species average above 120 ppb was Lake Vasona in Region 2, where two common carp composites had an average of 147 ppb (Table 11). The two composites measured 204 and 89 ppb. Average concentrations at two other low elevation lakes from northern California were among the highest concentrations measured in the state (Table 11): Lake Chabot in San Leandro in Region 2 (98 ppb) and San Luis Reservoir in Region 5 (85 ppb).

**Table 10**
**Percentages of lakes in PCB concentration categories by region.**
Concentrations in ppb. Note: Some lakes did not fall into the three regional categories.

| Region | Number of Lakes | Percentage of Lakes in Each PCB Concentration Category | | | | |
|---|---|---|---|---|---|---|
| | | <3.6 | 3.6-21 | 21-42 | 42-120 | >120 |
| California | 272 | 67 | 25 | 3 | 4 | 1 |
| Northern California Trout Lakes | 87 | 92 | 7 | 1 | 0 | 0 |
| Northern California Lower Elevation (<2000 ft) | 82 | 60 | 29 | 2 | 7 | 1 |
| Southern California | 83 | 40 | 46 | 5 | 7 | 2 |

Southern California was the region with the highest PCB concentrations. Of the 83 lakes in southern California sampled, 40% had a maximum species average below 3.6 ppb, 46% were between 3.6 and 21 ppb, 5% were between 21 and 42 ppb, 7% were between 42 and 120 ppb, and two lakes (2%) were above 120 ppb (Table 10). Average concentrations at four lakes from southern California were among the highest concentrations measured in the state (Table 11): Pyramid Lake (238 ppb in brown bullhead), Elderberry Forebay (131 ppb in channel catfish), and Echo Lake (101 ppb in common carp) in Region 4; and Silverwood Lake (93 ppb in largemouth bass) in Region 6. Pyramid Lake and Elderberry Forebay were the two lakes in southern California exceeding the 120 ppb no consumption ATL. The PCB concentrations observed in largemouth bass in Silverwood Lake are exceptionally high for this species, and much higher than those measured in largemouth bass from Pyramid Lake where the higher lipid, bottom-feeding species (brown bullhead) reached the maximum concentrations observed in the entire dataset.

## Implications Regarding Sources

The geographic distribution of PCBs measured in California sport fish provides an indication of the location and nature of the principal sources of these chemicals. A review of historic bioaccumulation monitoring of PCBs in California (Davis et al. 2007) found that high concentrations of PCBs tended to occur in areas of historic use or maintenance of electrical equipment. These areas tend to be concentrated in urban centers with high amounts of industrial activity, but also occur in scattered areas across the landscape where electrical equipment or other PCB-containing equipment was used. The many hydroelectric facilities in the state are potential sites of past or present PCB contamination.

Similar to methylmercury, significant variation exists among species in their tendency to accumulate PCBs, with high-lipid bottom-feeders like common carp, channel catfish, and brown bullhead usually accumulating the highest concentrations. Trophic position is also an important influence on biomagnification of organic contaminants, though factors leading to high concentrations in bottom-feeding species in California freshwater systems seem to predominate. Because of this interspecific variation, a map of concentrations in common carp and channel catfish provides a clearer picture of spatial variation (Figure 9).

The patchy distribution of PCBs across the state, with lakes with low concentrations observed in most areas and scattered lakes with much higher concentrations, is consistent with contamination by local sources. The Los Angeles and San Francisco Bay regions appear to be exceptions to this general pattern, with a very high prevalence of lakes above the FCG (Figure 9) that may suggest an elevated signal of regional atmospheric deposition. Other urban sources, such as urban runoff and landfill leachates may also contribute to this regional pattern.

## Comparison to the National Lakes Survey

USEPA's national lakes survey did not analyze bottom-feeder fillets. Whole body and fillet samples typically exhibit very different concentrations of organics, so it is not possible to directly compare the bottom-feeder

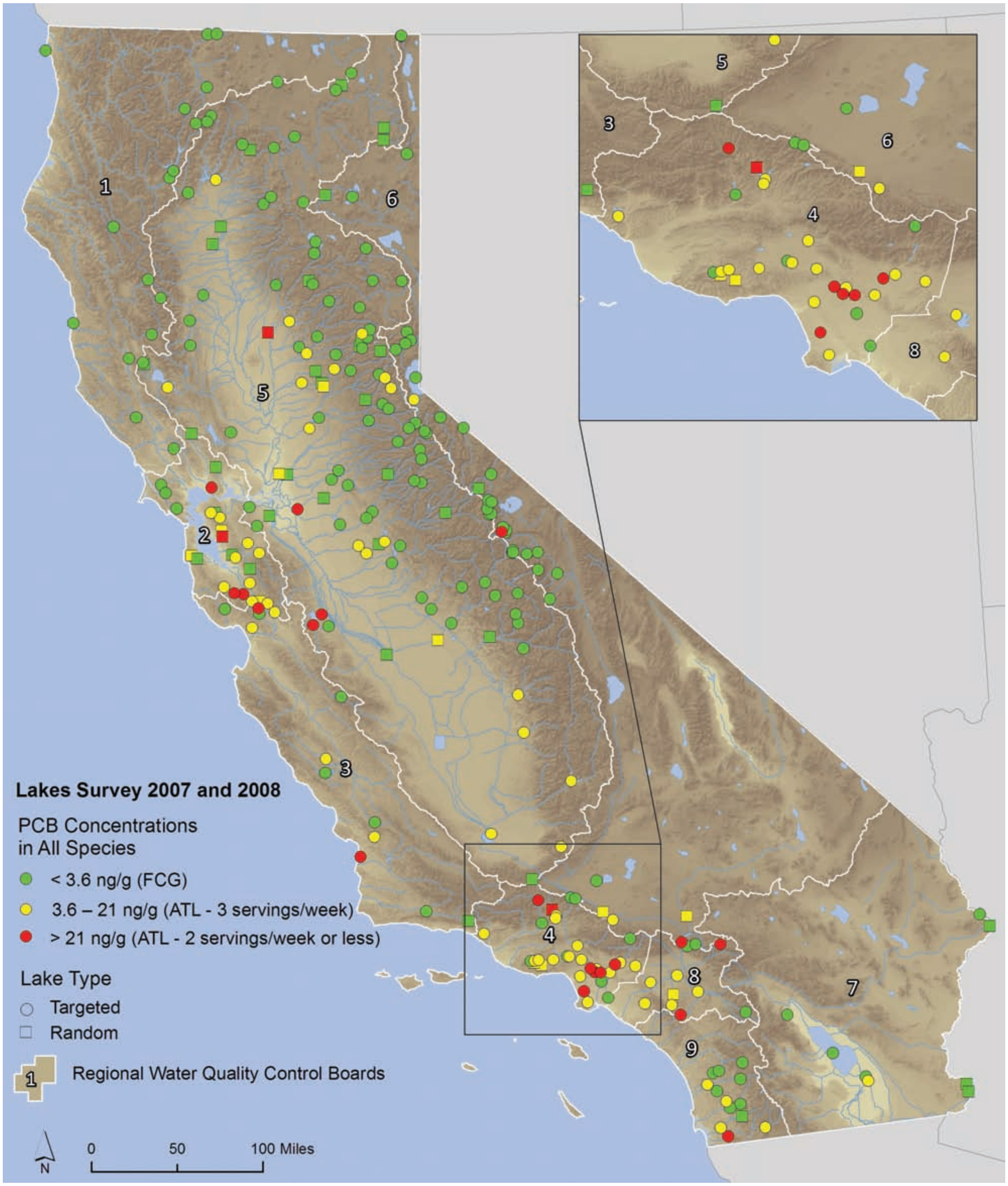


**Figure 7. Spatial patterns in PCB concentrations** (ng/g wet weight) at lakes sampled in the Lakes Survey. Each point represents the highest average concentration among the species sampled in each lake. Concentrations based on lake-wide and location composites, from both targeted (circles) and random (squares) lakes. Note different scale from the methylmercury maps, with the two serving ATL as the highest threshold.

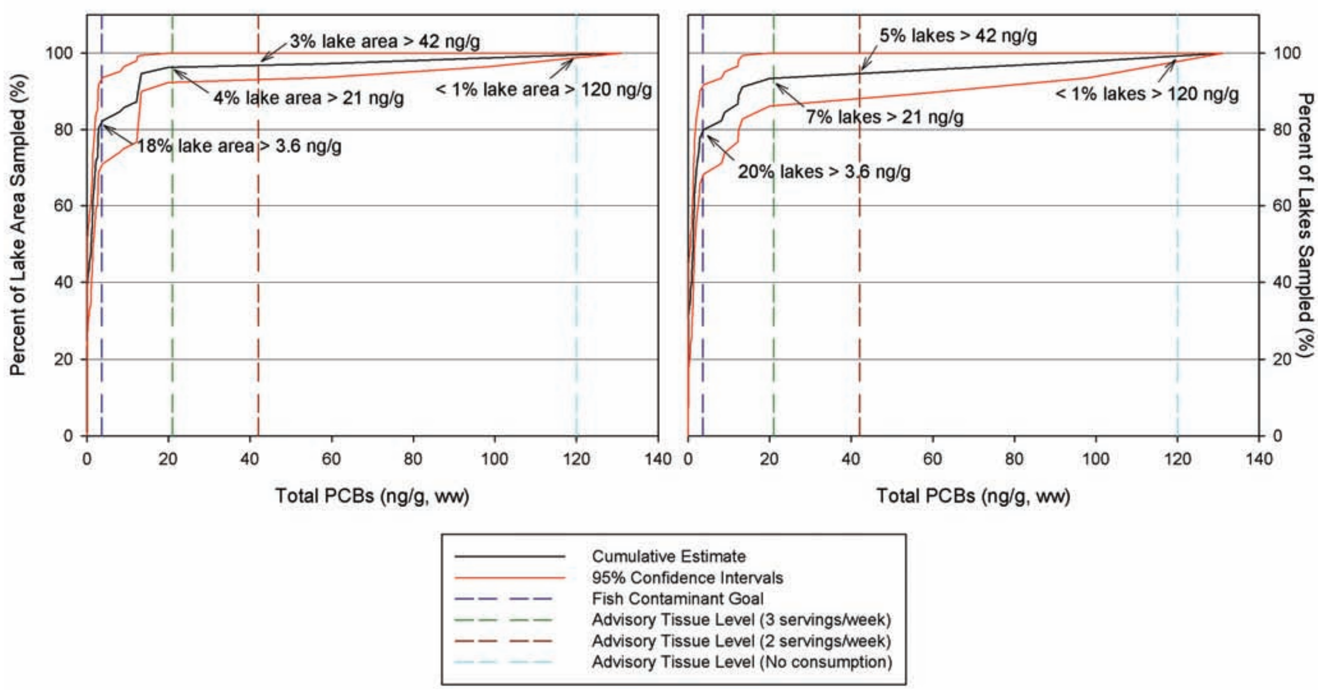


**Figure 8a. Cumulative distribution function (CDF) plot for PCBs at random lakes,** shown as percent of lake area (left) and percent of lakes (right). Concentrations (ng/g wet weight) are the highest species average for each lake, based on lake-wide composites at randomly sampled lakes in the Lakes Survey. Vertical lines are threshold values. Text on figure describes the percent of lake area or lakes that exceed each threshold value.

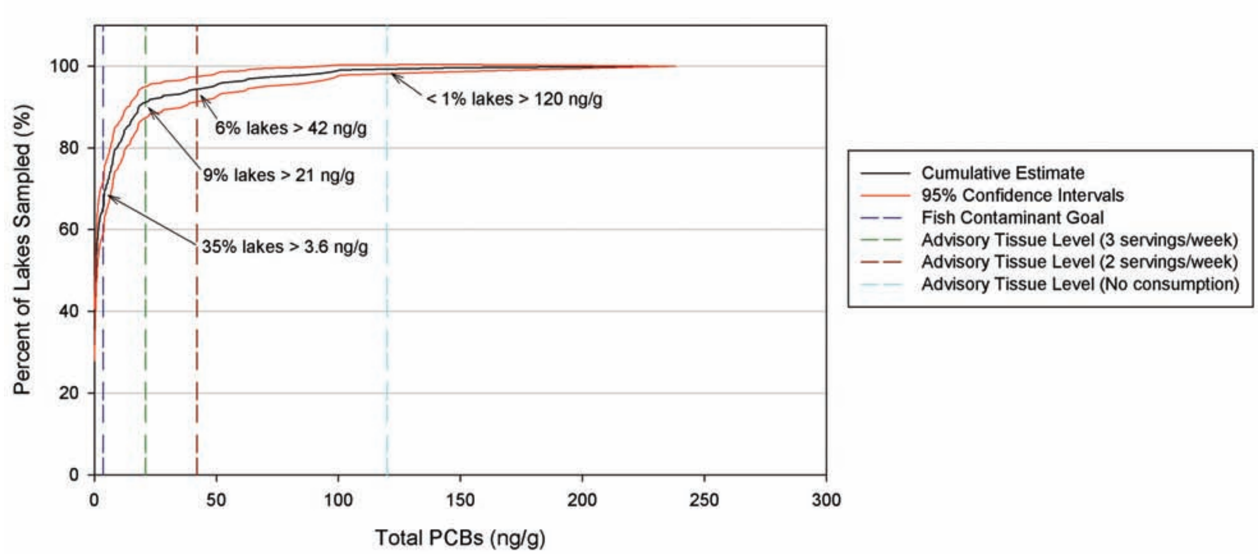


**Figure 8b. Cumulative Distribution Function (CDF) plot for PCBs at targeted lakes,** shown as percent of lakes sampled. Concentrations (ng/g wet weight) are the highest species average for each lake, based on lake-wide composites at targeted lakes in the Lakes Survey. Vertical lines are threshold values.

**Table 11**
**Lakes with the highest PCB concentrations (ppb).**
Data for samples of individual fish are not included in this table.

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppb) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Lake Vasona | Year2 | small | targeted | Common Carp | 591 | 204 | L1 | 1 | 5 | Location Composite |
| 2 | Lake Vasona | Year2 | small | targeted | Common Carp | 590 | 89 | L1 | 2 | 5 | Location Composite |
| 2 | Lake Chabot (San Leandro) | Year1 | small | targeted | Common Carp | 521 | 148 | L1 | 1 | 5 | Location Composite |
| 2 | Lake Chabot (San Leandro) | Year1 | small | targeted | Common Carp | 521 | 48 | L1 | 2 | 5 | Location Composite |
| 4 | Pyramid Lake | Year1 | medium | targeted | Brown Bullhead | 319 | 416 | L1 | 1 | 5 | Location Composite |
| 4 | Pyramid Lake | Year1 | medium | targeted | Brown Bullhead | 353 | 195 | L1; L2 | NA | 10 | Lake-wide Composite |
| 4 | Pyramid Lake | Year1 | medium | targeted | Largemouth Bass | 359 | 66 | L1; L2 | NA | 10 | Lake-wide Composite |
| 4 | Pyramid Lake | Year1 | medium | targeted | Largemouth Bass | 361 | 66 | L1 | 1 | 5 | Location Composite |
| 4 | Pyramid Lake | Year1 | medium | targeted | Brown Bullhead | 387 | 60 | L2 | 1 | 5 | Location Composite |
| 4 | Pyramid Lake | Year1 | medium | targeted | Largemouth Bass | 357 | 35 | L2 | 1 | 5 | Location Composite |
| 4 | Elderberry Forebay | Year1 | small | targeted | Channel Catfish | 587 | 146 | L1 | 2 | 5 | Location Composite |
| 4 | Elderberry Forebay | Year1 | small | targeted | Channel Catfish | 594 | 116 | L1 | 1 | 5 | Location Composite |
| 4 | Elderberry Forebay | Year1 | small | targeted | Largemouth Bass | 350 | 32 | L1 | 1 | 5 | Location Composite |
| 4 | Elderberry Forebay | Year1 | small | targeted | Largemouth Bass | 347 | 20 | L1 | 2 | 5 | Location Composite |
| 4 | Echo Lake - Reg 4 | Year1 | small | targeted | Common Carp | 501 | 119 | L1 | 1 | 5 | Location Composite |
| 4 | Echo Lake - Reg 4 | Year1 | small | targeted | Common Carp | 498 | 83 | L1 | 2 | 5 | Location Composite |
| 4 | Echo Lake - Reg 4 | Year1 | small | targeted | Largemouth Bass | 380 | 65 | L1 | 1 | 5 | Location Composite |
| 4 | Echo Lake - Reg 4 | Year1 | small | targeted | Largemouth Bass | 380 | 31 | L1 | 2 | 5 | Location Composite |

| Regional Board | Station Name | Study Year | Lake Size | Lake Type | Common Name | Total Length Average (mm) | Result (ppb) | Location Code | Composite Number | Number Fish In Sample | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Common Carp | 801 | 133 | L3 | 1 | 5 | Location Composite |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Common Carp | 766 | 100 | L1; L2; L3 | NA | 14 | Lake-wide Composite |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Common Carp | 728 | 81 | L1 | 1 | 5 | Location Composite |
| 5 | San Luis Reservoir | Year1 | ex-large | targeted | Common Carp | 768 | 42 | L2 | 1 | 4 | Location Composite |
| 6 | Silverwood Lake | Year1 | small | targeted | Largemouth Bass | 368 | 131 | L1 | 1 | 5 | Location Composite |
| 6 | Silverwood Lake | Year1 | small | targeted | Largemouth Bass | 367 | 55 | L1 | 2 | 5 | Location Composite |

data in the national and California datasets. Although organics concentrations were generally lower in predator tissues, the predator fillets provide the best basis for comparing the two datasets. USEPA found that predator fillets in 16.8% of the sampled population of lakes had total PCB tissue concentrations that exceeded a 12 ppb human health risk-based threshold (Stahl et al. 2009). The median PCB concentration in predator fillets in the national survey was 2.2 ppb (Table 9). In comparison, the median for predator fillets in this survey was much lower: 0.46 ppb. However, due to the large surface area of mountains in California, the state survey included a much higher percentage of trout lakes (44%) than the national survey (12%), and trout tend to accumulate lower concentrations of PCBs than bottom-feeding warmwater species such as carp and catfish. The largemouth bass data from this study provide another frame of reference for comparing California to the US as a whole. The median PCB concentration for largemouth bass in this study was 1.1 ppb, also well below the national median of 2.2 ppb (Table 9). Both the California data for predators and for largemouth bass indicate that PCB concentrations in California sport fish are below the national median. Overall, the degree of PCB contamination of California lakes documented in this survey is relatively low compared to the rest of the country.

The USEPA survey sampled bottom dwellers in 11 California lakes. Seven out of 11 (64%) of these lakes had a sample above 12 ppb. In general these samples had higher PCB concentrations than observed in the present study. Particularly high concentrations were measured in Lake Oroville (252 ppb in common carp), Guadalupe Reservoir (103 ppb in common carp), and San Luis Reservoir (102 ppb in Sacramento sucker). This result for San Luis Reservoir was similar to results from the present study (average of 85 ppb in common carp fillets - Table 11).

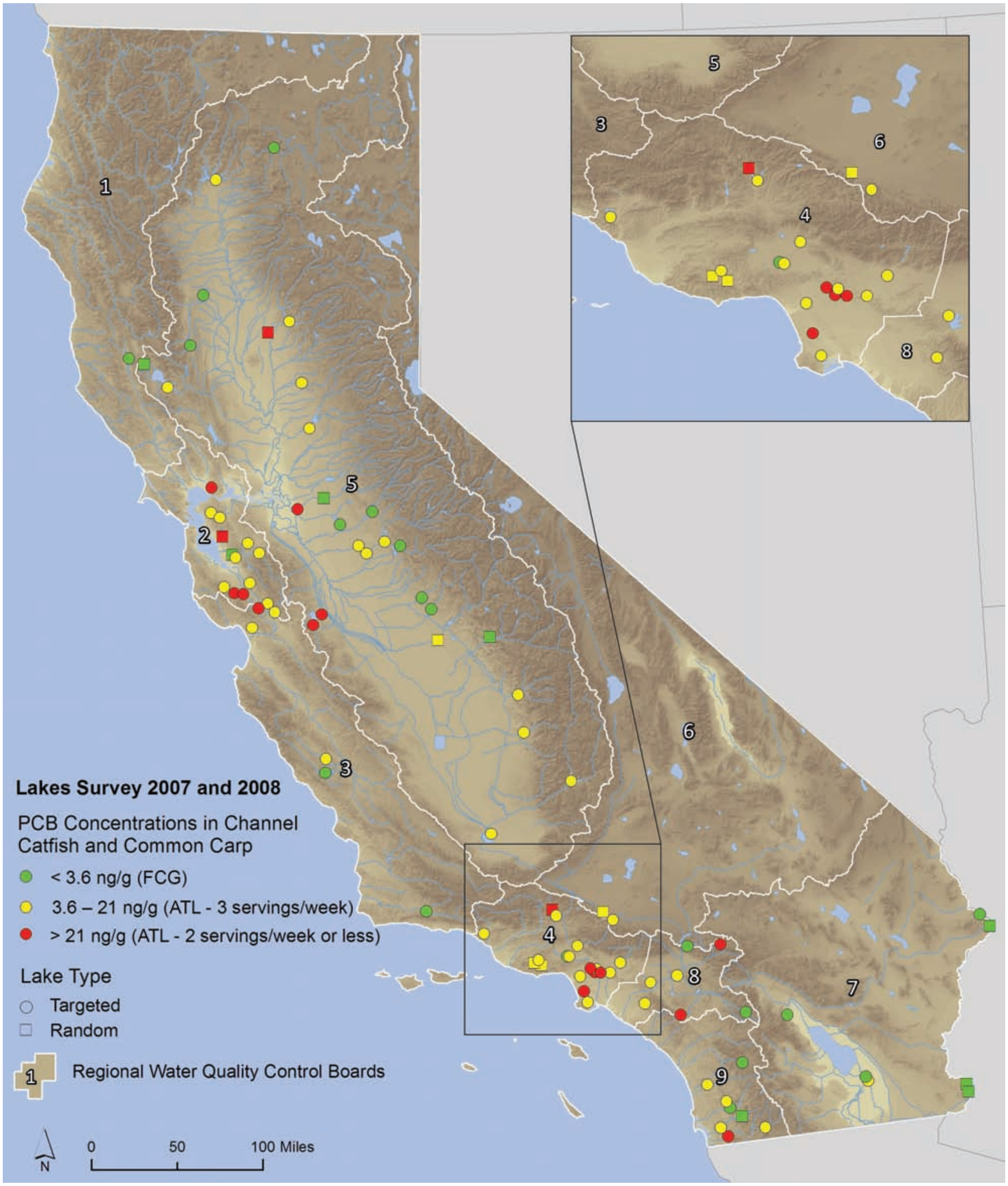


**Figure 9. Spatial patterns in PCB concentrations (ng/g wet weight) in common carp and channel catfish** at lakes sampled in the Lakes Survey, from both targeted (circles) and random (squares) lakes. Note that the two serving ATL is the highest threshold shown on this map.

### Priorities for Further Assessment

Using the same criterion that was employed for methylmercury (i.e., exceedance of the no consumption ATL - 120 ppb for PCBs) only three lakes (in contrast to 61 for methylmercury) stand out as high priorities for further assessment to determine the need for consumption guidelines and management actions. Pyramid Lake in Region 4 had the highest species average by far for PCBs in the state (224 ppb in brown bullhead), and the highest concentration in a sample (416 ppb in a composite sample) (Table 11). Elderberry Forebay, a lake just 10 miles away from Pyramid Lake, was another lake with an average concentration exceeding 120 ppb (131 ppb in channel catfish) (Table 11). The third lake with an average above 120 ppb was Lake Vasona in Region 2 (146 ppb in common carp) (Table 11).

Other lakes with relatively high PCB concentrations included Echo Lake (average of 101 ppb in common carp), Lake Chabot (San Leandro) (average of 98 ppb in common carp), Silverwood Lake (average of 93 ppb in largemouth bass), and San Luis Reservoir (average of 85 ppb in common carp). The high concentrations in largemouth bass at Silverwood Lake suggest that this water body may warrant further investigation. Consumption guidelines have been issued for only one of these lakes: Lake Chabot (San Leandro), which has guidelines resulting from PCB contamination.

## OTHER POLLUTANTS WITH THRESHOLDS

OEHHA (Klasing and Brodberg 2008) developed thresholds for four other pollutants that were analyzed in this survey: dieldrin, DDT, chlordane, and selenium. Concentrations of these pollutants infrequently exceeded any threshold, and only one highly unusual lake exceeded any no consumption ATLs (Tables 12-15). Results for these pollutants are briefly summarized below.

**Table 12**
**Percentages of lakes in dieldrin concentration categories by region.** Concentrations in ppb.
Note: Some lakes did not fall into the three regional categories.

| Region | Number of Lakes | Percentage of Lakes in Each Dieldrin Concentration Category | | | | |
|---|---|---|---|---|---|---|
| | | < .46 | .46-15 | 15-23 | 23-46 | >46 |
| California | 272 | 80 | 20 | 0 | 0 | 0 |
| Northern California Trout Lakes | 87 | 89 | 11 | 0 | 0 | 0 |
| Northern California Lower Elevation (<2000 ft) | 82 | 72 | 28 | 0 | 0 | 0 |
| Southern California | 83 | 73 | 25 | 0 | 0 | 1 |

**Table 13**
**Percentages of lakes in DDT concentration categories by region.** Concentrations in ppb.
Note: Some lakes did not fall into the three regional categories.

| Region | Number of Lakes | Percentage of Lakes in Each DDT Concentration Category | | | | |
|---|---|---|---|---|---|---|
| | | <21 | 21-520 | 520-1000 | 1000-2100 | >2100 |
| California | 272 | 87 | 13 | 0 | 0 | 0 |
| Northern California Trout Lakes | 87 | 99 | 1 | 0 | 0 | 0 |
| Northern California Lower Elevation (<2000 ft) | 82 | 76 | 24 | 0 | 0 | 0 |
| Southern California | 83 | 82 | 17 | 0 | 0 | 1 |

**Table 14**
**Percentages of lakes in chlordane concentration categories by region.**
Concentrations in ppb. Note: Some lakes did not fall into the three regional categories.

| Region | Number of Lakes | Percentage of Lakes in Each Chlordane Concentration Category | | | | |
|---|---|---|---|---|---|---|
| | | <5.6 | 5.6-190 | 190-280 | 280-560 | >560 |
| California | 272 | 91 | 9 | 0 | 0 | 0 |
| Northern California Trout Lakes | 87 | 99 | 1 | 0 | 0 | 0 |
| Northern California Lower Elevation (<2000 ft) | 82 | 87 | 13 | 0 | 0 | 0 |
| Southern California | 83 | 86 | 14 | 0 | 0 | 0 |

**Table 15**
**Percentages of lakes in selenium concentration categories by region.**
Concentrations in ppb. Note: Some lakes did not fall into the three regional categories.

| Region | Number of Lakes | Percentage of Lakes in Each Selenium Concentration Category | | | | |
|---|---|---|---|---|---|---|
| | | <2500 | 2500-4900 | 4900-7400 | 7400-15000 | 15000 |
| California | 189 | 98 | 2 | 0 | 0 | 0 |
| Northern California Trout Lakes | 8 | 100 | 0 | 0 | 0 | 0 |
| Northern California Lower Elevation (<2000 ft) | 81 | 99 | 1 | 0 | 0 | 0 |
| Southern California | 80 | 96 | 4 | 0 | 0 | 0 |

## Dieldrin

The maximum species averages for dieldrin were below the lowest threshold (the 0.46 ppb FCG) in 80% of all the lakes sampled, including 89% of the northern California trout lakes, 72% of the northern California low elevation lakes, and 73% of the southern California lakes (Table 12, Figure 10). Only one lake out of the 272 lakes sampled exceeded an ATL threshold – Little Oso Flaco Lake, which had an exceptionally high average concentration of 276 ppb based on two goldfish composites. The next highest species average measured was 6.6 ppb in common carp from San Luis Reservoir. Only Little Oso Flaco Lake appears to be a high priority for further assessment or action based on dieldrin concentrations.

Little Oso Flaco Lake is a small lake in the midst of agricultural fields and dunes 1.5 miles from the coast in San Luis Obispo County. Probably due to its proximity to agricultural fields, this lake is noteworthy for its extremely high concentrations of dieldrin, DDTs, and chlordanes. Little Oso Flaco Lake had the highest concentrations in the state for dieldrin and DDT, and one of the highest concentrations of chlordanes.

## DDTs

The maximum species averages for DDTs were below the lowest threshold (the 21 ppb FCG) in 87% of all the lakes sampled, including 99% of the northern California trout lakes, 76% of the northern California lower elevation lakes, and 82% of the southern California lakes (Table 13, Figure 11). As for dieldrin, Little Oso Flaco Lake stood out as the only one of 272 lakes exceeding the no consumption ATL of 2100 ppb. DDTs in the two goldfish composites from Little Oso Flaco averaged 7490 ppb. Only one other lake had a sample exceeding the 3 serving ATL threshold for DDTs (520 ppb): Pinto Lake in Region 3, which had a concentration of 557 ppb in a common carp composite (and 290 ppb in a second carp composite). Only Little Oso Flaco Lake appears to be a high priority for further assessment of human health risks due to DDT contamination.

USEPA's national lakes survey found that predator fillets in 1.7% of the sampled population of lakes had concentrations that exceeded the 69 ppb human health risk-basedthreshold for DDT (Stahl et al. 2009). The median DDT concentration in predator fillets in the national survey was 1.5 ppb (Table 9). In comparison, the median for predator fillets in this survey was much higher: 2.0 ppb. Another factor suggesting relatively high DDT concentrations in California is that, due to the large surface area of mountains in California, the state survey included a much higher percentage of trout lakes (44%) than the national survey (12%), and trout tend to accumulate lower concentrations of DDTs than bottom-feeding warmwater species such as carp and catfish. The largemouth bass data from this study provide another frame of reference for comparing California to the US as a whole. The median DDT concentration for largemouth bass in this study was 1.9 ppb, also above the national median. Both the California data for predators and for largemouth bass indicate that DDT concentrations in California sport fish are slightly above the national median.

The maximum DDT concentration observed in the national survey was 1,761 ppb (whole body). The average concentration observed for Little Oso Flaco Lake in this study (7490 ppb in muscle) greatly exceeded all of the concentrations measured by USEPA. Overall, the degree of DDT contamination of California lakes documented in this survey is slightly elevated compared to the rest of the country.

The USEPA survey sampled bottom dwellers in 11 California lakes. Four out of 11 (36%) of these lakes had a DDT sample above 69 ppb. In general these whole body samples had higher DDT concentrations than observed in fillets in the present study. Particularly high DDT concentrations were measured in Clear Lake (154 ppb in goldfish and 106 ppb in largemouth bass), San Luis Reservoir (97 ppb in Sacramento sucker), and Guadalupe Reservoir (85 ppb in common carp). The result for San Luis Reservoir was lower than the result from the present study (average of 196 ppb in common carp), but the present study found high variance among three composites at this reservoir (324, 175, and 90 ppb). The USEPA bottom dweller result for Clear Lake was very similar to the concentration observed in common carp at Clear Lake in the present study (134 ppb).

Risks to wildlife from DDT contamination in some lakes are likely to be significant. Based on the degree of contamination observed in this survey, DDT would be expected to exceed thresholds for effects on raptor reproduction in some lakes. In addition to Little Oso Flaco Lake, Pinto Lake, San Luis Reservoir, and Clear Lake, other lakes with relatively high DDT concentrations included Sepulveda Lake (275 ppb in common carp), Perris Reservoir (193 ppb in largemouth bass), Lake del Valle (104 ppb in channel catfish), and Almaden Lake (99 ppb in common carp).

## Chlordanes

The maximum species averages for chlordanes were below the lowest threshold (the 5.6 ppb FCG) in 91% of all the lakes sampled, including 99% of the northern California trout lakes, 87% of the northern California lower elevation lakes, and 86% of the southern California lakes (Table 14, Figure 12). None of the ATL thresholds were exceeded in any part of the state. The highest species average measured was 68 ppb in common carp from Almaden Lake in Region 2. The highest concentration measured in any sample was 78 ppb in a common carp composite from Lake Lindero (a second sample in Lake Lindero measured 43 ppb). Other lakes with relatively high concentrations were Lake Chabot (San Leandro) (42 ppb) and Little Oso Flaco Lake (36 ppb).

USEPA compared their predator results to a threshold of 67 ppb for chlordanes. Predator fillets in 0.3% of the national sampled population of lakes had concentrations that exceeded this threshold. Bottom-dweller concentrations (whole body) in the national survey had a median concentration of 1.65 ppb. Only one lake in the present study had a concentration (fillet) above 67 ppb (Almaden Lake). None of the lakes sampled appear to be a high priority for further assessment or action based on chlordane concentrations.

## Selenium

The maximum species averages for selenium were below the lowest selenium threshold (the 3 serving ATL of 2,500 ppb) in 98% of all lakes sampled, including 100% of the northern California trout lakes, 99% of the northern California lower elevation lakes, and 96% of the southern California lakes (Table 15, Figure 13). Only Lake Cunningham (3,780 ppb) in Region 2, Ramer Lake (3,020 ppb) and Salton Sea (2,580 ppb) in Region 7, and Lake Lindero (2,790 ppb) in Region 4 exceeded the 2,500 ppb threshold. The highest concentration measured in any sample was 4,040 ppb in a common carp composite from Lake Cunningham. Only one sample (the carp composite from Lake Cunningham) exceeded a no effect threshold of 4 ppm (SFEI 2008) for effects on fish. None of the lakes sampled appear to be a high priority for further assessment or action based on selenium concentrations.

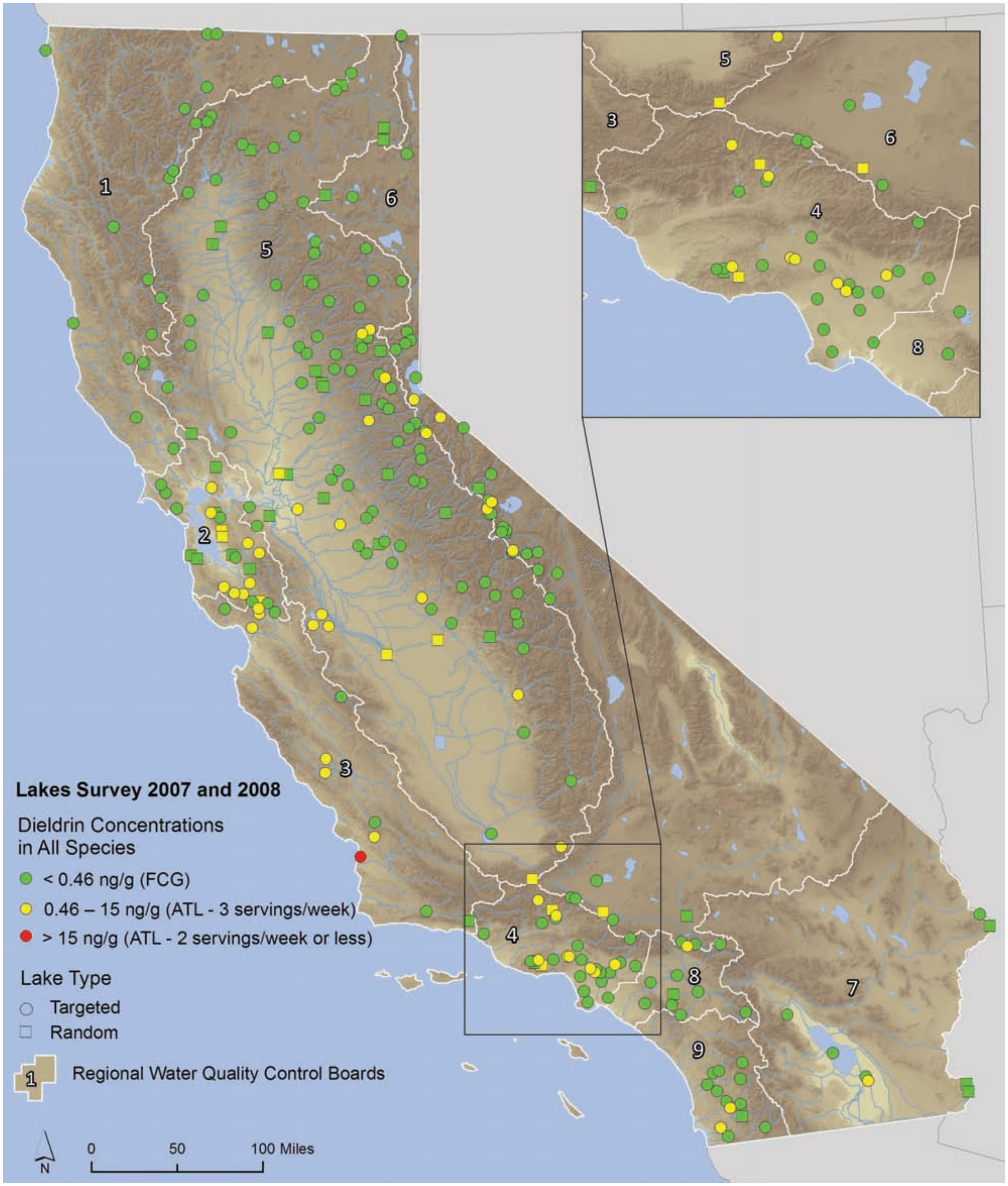


**Figure 10. Spatial patterns in dieldrin concentrations** (ng/g wet weight) at lakes sampled in the Lakes Survey. Each point represents the highest average concentration among the species sampled in each lake. Concentrations based on lake-wide and location composites, from both targeted (circles) and random (squares) lakes. Colors represent dieldrin concentration categories. Note that the two serving ATL is the highest threshold shown on this map.

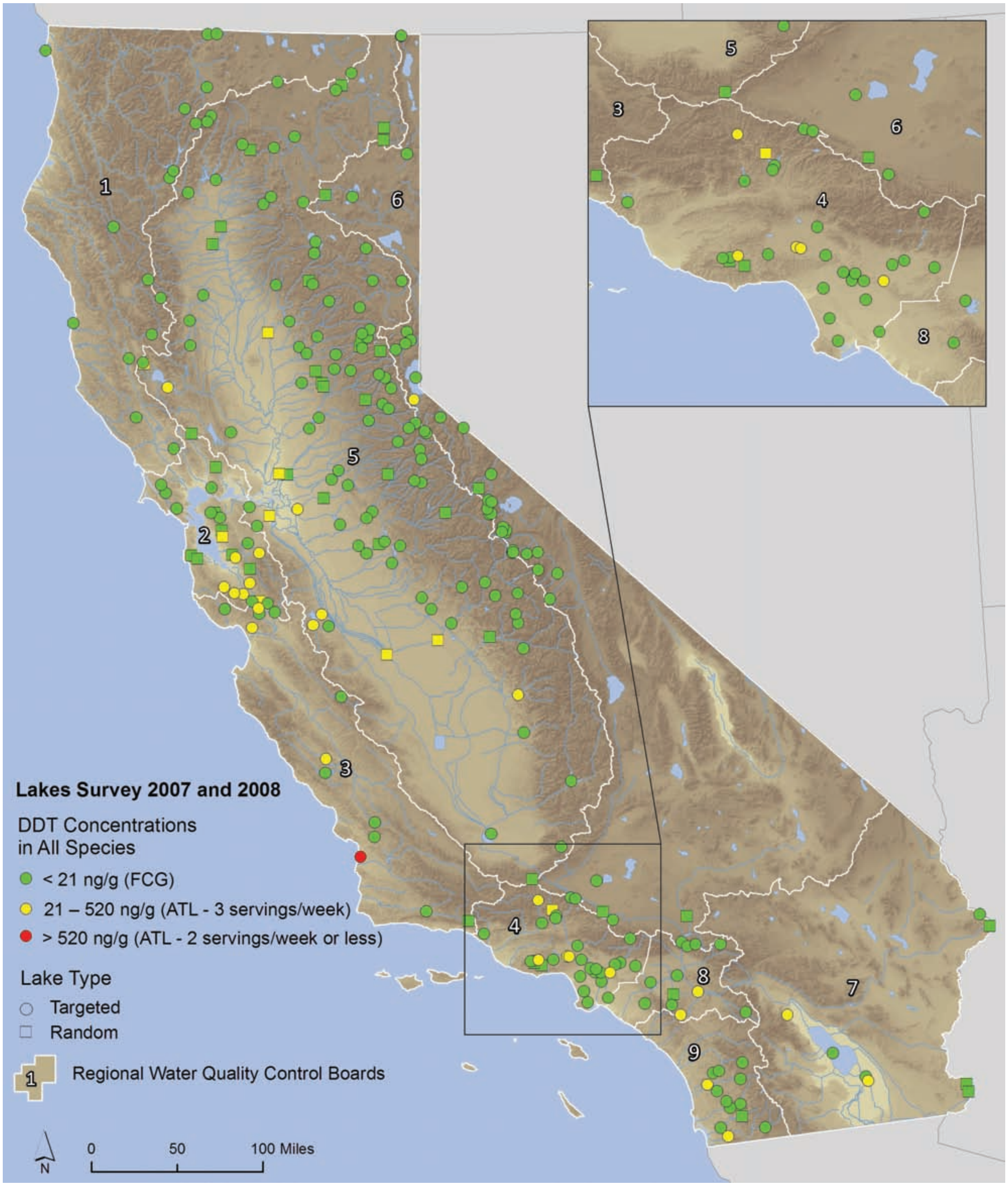


**Figure 11. Spatial patterns in DDT concentrations** (ng/g wet weight) at lakes sampled in the Lakes Survey. Each point represents the highest average concentration among the species sampled in each lake. Concentrations based on lake-wide and location composites, from both targeted (circles) and random (squares) lakes. Note that the two serving ATL is the highest threshold shown on this map.

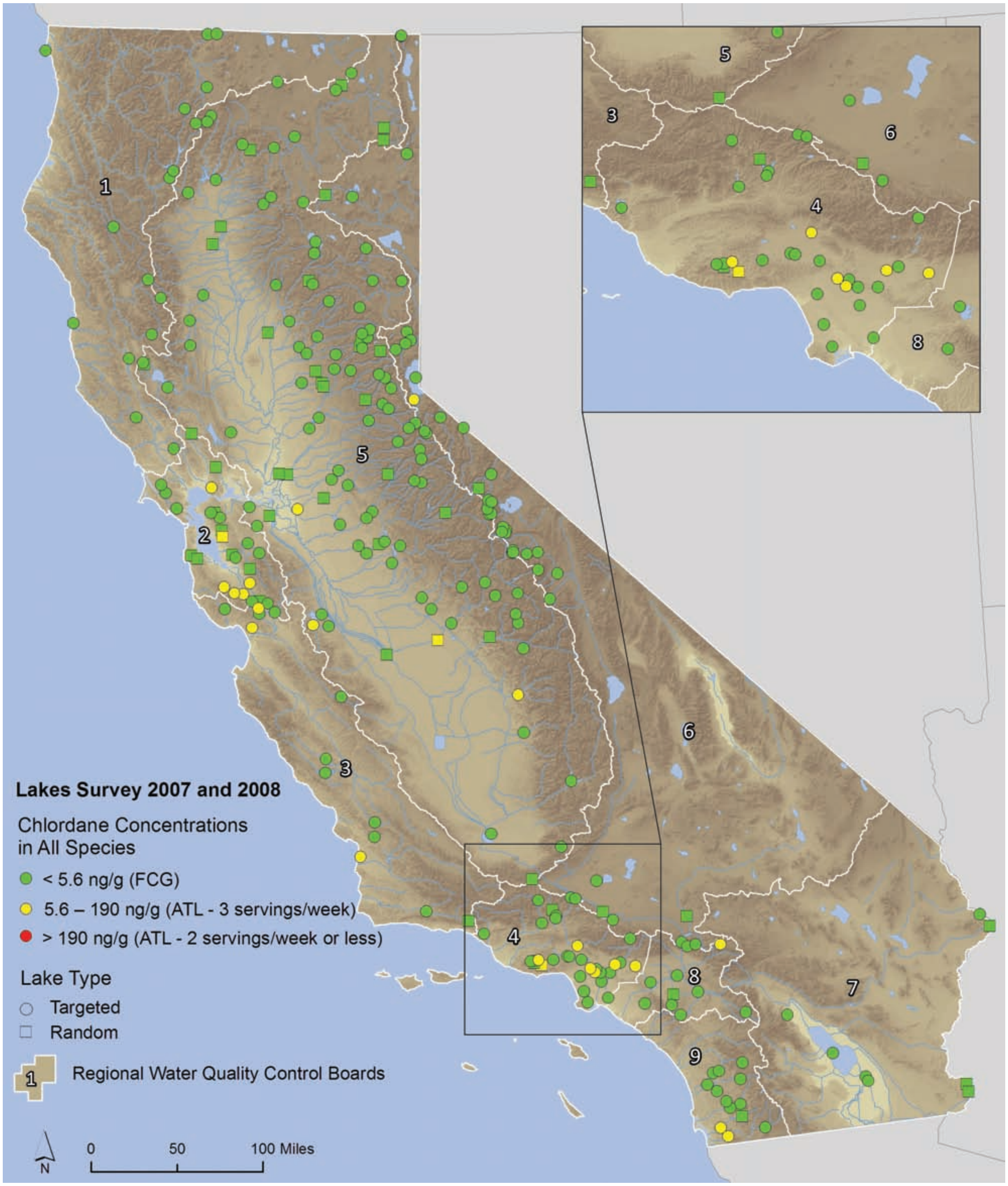


**Figure 12. Spatial patterns in chlordane concentrations** (ng/g wet weight) at lakes sampled in the Lakes Survey. Each point represents the highest average concentration among the species sampled in each lake. Concentrations based on lake-wide and location composites, from both targeted (circles) and random (squares) lakes. Note that the two serving ATL is the highest threshold shown on this map.

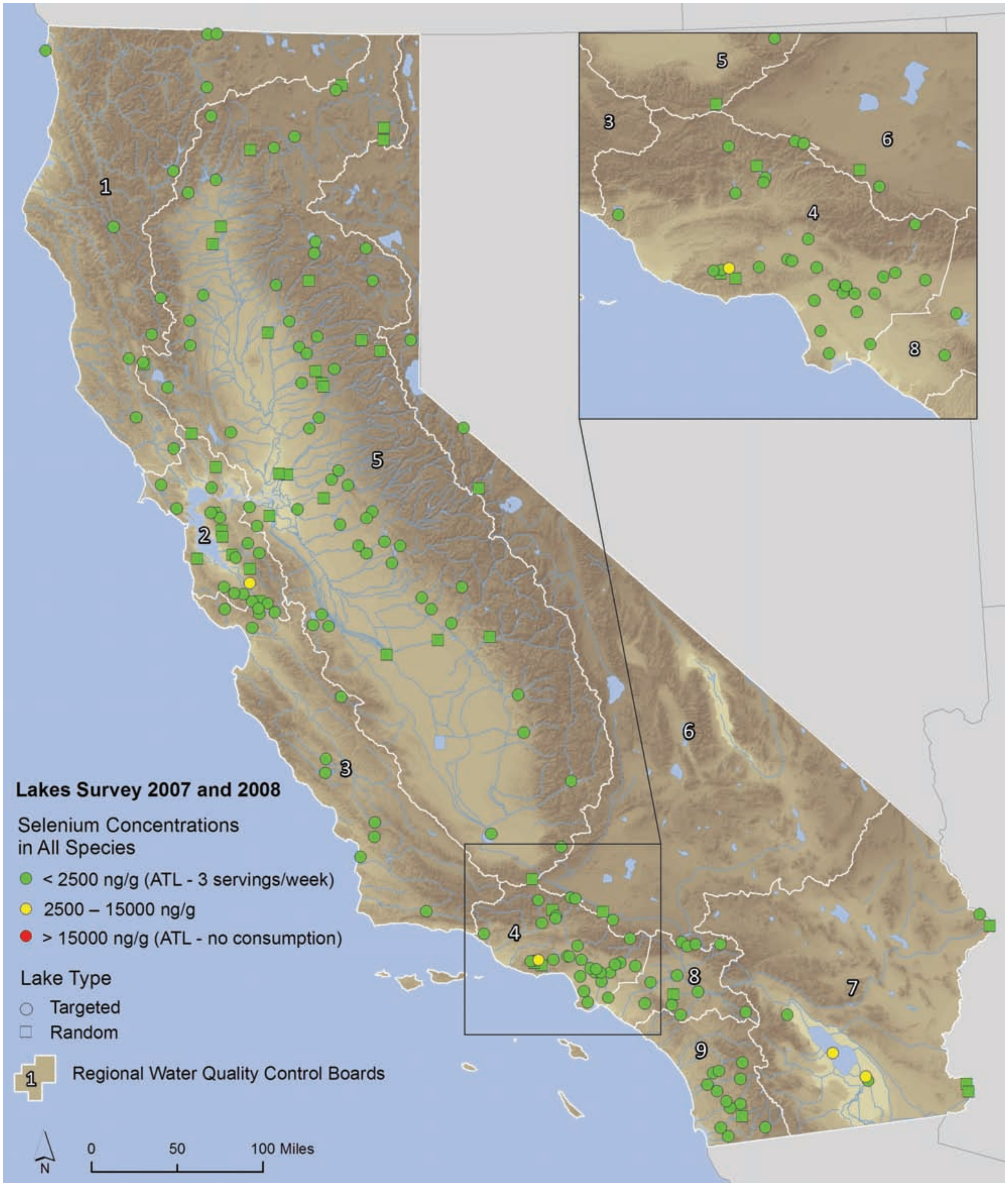


**Figure 13. Spatial patterns in selenium concentrations** (ng/g wet weight) at lakes sampled in the Lakes Survey. Each point represents the highest average concentration among the species sampled in each lake. Concentrations based on lake-wide and location composites, from both targeted (circles) and random (squares) lakes. Note that the two serving ATL is the highest threshold shown on this map.

# SECTION 4
# RECOMMENDATIONS FOR FUTURE MONITORING

The work presented in this report represents a major step forward in understanding the extent of chemical contamination in sport fish in California lakes and reservoirs, and the impact of this contamination on the fishing beneficial use. The study has shown that mercury accumulation in fish is a significant problem throughout much of the state. However, comparison to USEPA's national survey indicate that the degree of mercury contamination in California is not unusual compared to the rest of the country, in spite of the intensive mercury and gold mining that has occurred here. For other contaminants, concentrations were much lower relative to thresholds for human health concern. It should also be noted that this survey focused on the species that accumulate the highest contaminant concentrations. Concentrations in some of the other species can be expected to be substantially lower than observed for the predators and bottom-feeders evaluated in this study.

This survey has also raised many questions, and left other questions unanswered. Several areas where further study would be of great value in addressing management issues are described below. The needed studies are described below in general terms, as details should be developed through a deliberate and thoughtful group process.

## 1) FOLLOW-UP SAMPLING TO DEVELOP CONSUMPTION GUIDELINES AT LAKES WITH HIGHLY CONTAMINATED FISH

High priority water bodies in this regard with elevated concentrations were discussed in the mercury and PCB sections. Development of consumption guidelines requires data from a broader spectrum of species, so anglers can be directed to cleaner species if they are present (as is often the case). Obtaining the needed data typically costs approximately $20,000 per lake. Costs are greater for larger lakes. Some of this work is already underway in Regions 2 and 4, but significant additional resources would be needed to perform this follow-up work at the many lakes with concentrations above thresholds.

## 2) FOCUSED EVALUATIONS OF SELECTED LAKES TO IDENTIFY CONTAMINANT SOURCES

Distinguishing the relative importance of legacy contamination from mining, atmospheric deposition, and other sources is critical to effective management of methylmercury contamination. The efforts in this report and in Negrey et al. (2010) to identify sources and controlling factors for methylmercury have provided a foundation for progress on this front, and information that can help in pursuing more refined approaches in the future. More detailed, site-specific field work could be performed to assess the contributions of different sources. Identifying and sampling lakes without mining influence could yield valuable insights. Studies that include assessment of key parameters in sediment, the food web (including lower trophic levels and trophic position), lake water, and the watersheds would have the best chance of answering source questions. Emerging tools such as mercury isotopes may be valuable in this context.

## 3) ASSESSMENT OF RISKS TO WILDLIFE FROM BIOACCUMULATIVE CONTAMINANTS

Although this study did not focus on risks to wildlife due to funding limitations, they are likely to be a significant concern. Exposures and risks to wildlife, including fish and fish-eating birds (Sandheinrich and Wiener 2009), are likely to be substantially higher than for humans in some instances. These risks could be assessed in a preliminary manner by estimating likely exposures based on extrapolation from the sport fish data to other species. The best approach would be to conduct monitoring targeted at addressing this question. A sampling design focusing on wildlife prey or directly on piscivorous species would be needed for an accurate assessment of exposure and risks in wildlife.

## 4) EMERGING CONTAMINANTS

Again due to funding limitations, this study did not evaluate emerging contaminants. Two of these contaminants, polybrominated diphenyl ethers (PBDEs) and perfluorinated compounds (PFCs), are known to accumulate in fish. Human health thresholds for these chemicals in fish are anticipated (PBDEs) or available (PFC screening values have been developed by the state of Minnesota). These and other emerging contaminants accumulate in fish and should be tracked to provide information that managers need in order to act before they become the legacy contaminants of tomorrow. In the short-term, samples archived from this study could be analyzed for these chemicals. In the longer-term, rising concerns such as these should be included in future surveys. A decreased emphasis on legacy contaminants that are on the decline in future surveys could free up funding to evaluate emerging contaminants.

## 5) TREND MONITORING

Lake and reservoir food webs are contaminated with mixtures of contaminants, some with declining concentrations, some rising, and some not changing appreciably. Tracking these trends is essential to effective management of water quality in these ecosystems. Large-scale processes such as climate change can influence trends. A recent study indicates that lakes in California are warming twice as fast as surface air temperatures (Schneider et al. 2009). The likely effect of this on mercury cycling is not known, but some effect on trends seems plausible. Contaminant trends in lakes are affected by a host of sources and processes operating at global (e.g., atmospheric deposition) and local scales. An effective program to monitor trends is needed. This could include establishing long-term time series at selected locations. More thorough sampling of ancillary parameters (e.g., trophic position) would greatly enhance interpretation of these time series. It will also be valuable to repeat a broad lakes survey, but the optimal interval for this has not yet been determined.

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SWAMP
Surface Water
Ambient Monitoring
Program

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# APPENDIX 1 A

**Summary results of the SWAMP Lakes Survey**
Data are for composites or averages at each location. Sample Type codes: C1=composite from location 1; C2=composite from location 2; LC=Lakewide Composite; 350AVE1=ANCOVA-based average for 350 mm fish at location 1; 350AVE2=ANCOVA-based average for 350 mm fish at location 2.

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Cleone Lake | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 2.5 | 0.2 |
| 1 | Cleone Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 1 | Copco Lake | 2 | Largemouth Bass | 350AVE1 | 0.31 | | | | | |
| 1 | Copco Lake | 2 | Largemouth Bass | C1 | | 0.0 | 0.08 | 0.0 | 0.0 | 0.0 |
| 1 | Dead Lake | 2 | Largemouth Bass | 350AVE1 | 0.37 | | | | | |
| 1 | Dead Lake | 2 | Largemouth Bass | C1 | | 0.0 | 0.08 | 0.0 | 0.8 | 0.0 |
| 1 | Howard Lake | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 2.8 | 0.0 |
| 1 | Howard Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 1 | Iron Gate Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.33 | | | | | |
| 1 | Iron Gate Reservoir | 2 | Largemouth Bass | C1 | | 0.0 | 0.08 | 0.0 | 0.0 | 1.3 |
| 1 | Kangaroo Lake | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 1.0 | 0.0 |
| 1 | Kangaroo Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 1 | Lake Mendocino | 1 | Common Carp | C1 | 0.07 | | | | | |
| 1 | Lake Mendocino | 1 | Common Carp | C2 | 0.10 | | | | | |
| 1 | Lake Mendocino | 1 | Common Carp | LC | | 0.0 | 0.20 | 0.0 | 4.8 | 0.0 |
| 1 | Lake Mendocino | 1 | Largemouth Bass | 350AVE1 | 0.55 | | | | | |
| 1 | Lake Mendocino | 1 | Largemouth Bass | 350AVE2 | 0.54 | | | | | |
| 1 | Lake Pillsbury | 1 | Largemouth Bass | 350AVE1 | 1.34 | | | | | |
| 1 | Lake Pillsbury | 1 | Largemouth Bass | 350AVE2 | 1.29 | | | | | |
| 1 | Lake Pillsbury | 1 | Largemouth Bass | LC | | 0.0 | 0.33 | 0.4 | 0.0 | 0.0 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Lake Shastina | 2 | Largemouth Bass | 350AVE1 | 0.23 | | | | | |
| 1 | Lake Shastina | 2 | Largemouth Bass | C1 | | 0.0 | 0.08 | 0.0 | 1.0 | 0.4 |
| 1 | Lake Sonoma | 1 | Largemouth Bass | 350AVE1 | 0.64 | | | | | |
| 1 | Lake Sonoma | 1 | Largemouth Bass | 350AVE2 | 0.71 | | | | | |
| 1 | Lake Sonoma | 1 | Largemouth Bass | LC | | 0.0 | 0.31 | 0.7 | 0.7 | 0.0 |
| 1 | Lewiston Lake | 2 | Rainbow Trout | C1 | 0.04 | 0.0 | | 0.0 | 2.5 | 0.3 |
| 1 | Lewiston Lake | 2 | Rainbow Trout | C2 | 0.03 | | | | | |
| 1 | Plaskett Lake | 2 | Hardhead | C1 | 0.12 | 0.0 | 0.08 | 0.0 | 0.0 | 0.0 |
| 1 | Plaskett Lake | 2 | Hardhead | C2 | 0.10 | | | | | |
| 1 | Reservoir F | 1 | Largemouth Bass | 350AVE1 | 0.15 | | | | | |
| 1 | Reservoir F | 1 | Largemouth Bass | C1 | | 0.0 | 0.05 | 0.0 | 0.0 | 0.0 |
| 1 | Ruth Lake | 2 | Brown Bullhead | C1 | 0.13 | 0.0 | 0.19 | 0.0 | 0.7 | 0.0 |
| 1 | Ruth Lake | 2 | Largemouth Bass | 350AVE1 | 0.71 | | | | | |
| 1 | Spring Lake | 1 | Largemouth Bass | 350AVE1 | 0.38 | | | | | |
| 1 | Spring Lake | 1 | Largemouth Bass | C1 | | 0.0 | 0.14 | 0.4 | 0.8 | 0.0 |
| 1 | Trinity Lake | 1 | Rainbow Trout | C1 | 0.11 | | | | | |
| 1 | Trinity Lake | 1 | Rainbow Trout | C2 | 0.11 | | | | | |
| 1 | Trinity Lake | 1 | Rainbow Trout | C3 | 0.08 | | | | | |
| 1 | Trinity Lake | 1 | Rainbow Trout | C4 | 0.05 | | | | | |
| 1 | Trinity Lake | 1 | Rainbow Trout | LC | | 0.0 | 0.32 | 0.0 | 0.8 | 0.2 |
| 2 | Almaden Lake | 2 | Common Carp | C1 | 1.05 | 0.9 | 0.35 | 62.2 | 79.0 | 37.3 |
| 2 | Almaden Lake | 2 | Common Carp | C2 | 1.02 | 1.6 | | 73.7 | 118.7 | 60.6 |
| 2 | Almaden Lake | 2 | Largemouth Bass | 350AVE1 | 2.15 | | | | | |
| 2 | Anderson Lake | 1 | Common Carp | C1 | 0.32 | 0.0 | 0.41 | 5.3 | 11.4 | 10.2 |
| 2 | Anderson Lake | 1 | Common Carp | C2 | 0.52 | | | | | |
| 2 | Anderson Lake | 1 | Largemouth Bass | 350AVE1 | 0.98 | | | | | |
| 2 | Bon Tempe Lake | 1 | Largemouth Bass | 350AVE1 | 0.33 | | | | | |
| 2 | Bon Tempe Lake | 1 | Largemouth Bass | C1 | | 0.0 | 0.23 | 0.9 | 0.0 | 0.1 |
| 2 | Briones Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.16 | | | | | |
| 2 | Briones Reservoir | 1 | Largemouth Bass | C1 | | 0.0 | 0.34 | 0.2 | 1.0 | 0.9 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Calaveras Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.86 | | | | | |
| 2 | Calaveras Reservoir | 1 | Largemouth Bass | 350AVE2 | 0.31 | | | | | |
| 2 | Calaveras Reservoir | 1 | Largemouth Bass | LC | | 0.0 | 0.48 | 0.3 | 1.4 | 0.6 |
| 2 | Calero Reservoir | 2 | Largemouth Bass | 350AVE1 | 1.05 | | | | | |
| 2 | Calero Reservoir | 2 | Largemouth Bass | C1 | | 0.0 | 0.62 | 2.0 | 9.5 | 8.1 |
| 2 | Coyote Lake | 2 | Common Carp | C1 | 0.47 | 0.0 | 0.65 | 1.2 | 9.0 | 6.0 |
| 2 | Coyote Lake | 2 | Common Carp | C2 | 0.35 | | | | | |
| 2 | Coyote Lake | 2 | Largemouth Bass | 350AVE1 | 0.76 | | | | | |
| 2 | Lafayette Reservoir | 2 | Channel Catfish | C1 | 0.10 | 0.0 | 0.08 | 1.5 | 10.7 | 10.9 |
| 2 | Lafayette Reservoir | 2 | Channel Catfish | C2 | 0.05 | | | | | |
| 2 | Lafayette Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.34 | | | | | |
| 2 | Lago Los Osos | 1 | Channel Catfish | C1 | 0.01 | 0.0 | 0.05 | 0.0 | 2.1 | 2.2 |
| 2 | Lake Chabot (San Leandro) | 1 | Common Carp | C1 | 0.54 | 6.5 | 0.35 | 61.9 | 73.8 | 147.7 |
| 2 | Lake Chabot (San Leandro) | 1 | Common Carp | C2 | 0.29 | 2.4 | | 22.8 | 25.5 | 48.0 |
| 2 | Lake Chabot (San Leandro) | 1 | Largemouth Bass | 350AVE1 | 0.57 | | | | | |
| 2 | Lake Chabot (Vallejo) | 1 | Common Carp | C1 | 0.14 | 1.1 | 2.34 | 27.9 | 16.9 | 30.9 |
| 2 | Lake Chabot (Vallejo) | 1 | Common Carp | C2 | 0.14 | 1.2 | 0.52 | 19.5 | 10.6 | 25.0 |
| 2 | Lake Chabot (Vallejo) | 1 | Largemouth Bass | 350AVE1 | 0.41 | | | | | |
| 2 | Lake Cunningham | 2 | Common Carp | C1 | 0.03 | 1.2 | 4.04 | 6.7 | 37.8 | 9.5 |
| 2 | Lake Cunningham | 2 | Common Carp | C2 | 0.16 | | 3.53 | | | |
| 2 | Lake del Valle | 2 | Channel Catfish | C1 | 0.13 | 0.5 | 0.21 | 2.3 | 103.6 | 3.7 |
| 2 | Lake del Valle | 2 | Channel Catfish | C2 | 0.32 | | | | | |
| 2 | Lake del Valle | 2 | Largemouth Bass | 350AVE1 | 0.56 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Lake Elizabeth | 2 | Common Carp | C1 | 0.04 | 0.4 | 0.59 | 3.7 | 58.6 | 17.2 |
| 2 | Lake Elizabeth | 2 | Common Carp | C2 | 0.26 | | | | | |
| 2 | Lake Henne | 1 | Largemouth Bass | 350AVE1 | 0.41 | | | | | |
| 2 | Lake Henne | 1 | Largemouth Bass | C1 | | 0.0 | 0.20 | 0.6 | 0.5 | 0.1 |
| 2 | Lake Madigan | 1 | Bluegill | C1 | 0.09 | 0.0 | 0.35 | 0.0 | 0.0 | 0.0 |
| 2 | Lake Madigan | 1 | Bluegill | C2 | 0.12 | | | | | |
| 2 | Lake Vasona | 2 | Common Carp | C1 | 0.07 | 0.8 | 0.40 | 30.5 | 35.9 | 203.9 |
| 2 | Lake Vasona | 2 | Common Carp | C2 | 0.04 | 0.7 | | 12.5 | 17.7 | 89.4 |
| 2 | Lake Vasona | 2 | Largemouth Bass | 350AVE1 | 0.16 | | | | | |
| 2 | Lower Crystal Springs Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.85 | | | | | |
| 2 | Lower Crystal Springs Reservoir | 1 | Largemouth Bass | C1 | | 0.4 | 0.41 | 0.3 | 0.7 | 1.2 |
| 2 | Nicasio Lake | 2 | Largemouth Bass | 350AVE1 | 0.40 | | | | | |
| 2 | Nicasio Lake | 2 | Largemouth Bass | C1 | | 0.0 | | 0.0 | 0.5 | 0.0 |
| 2 | Oiger Quarry Ponds | 1 | Largemouth Bass | 350AVE1 | 0.45 | | | | | |
| 2 | Oiger Quarry Ponds | 1 | Sacramento Sucker | C1 | 0.31 | 0.5 | 0.29 | 1.7 | 81.7 | 7.6 |
| 2 | Oiger Quarry Ponds | 1 | Sacramento Sucker | C2 | 0.26 | | | | | |
| 2 | Pilarcitos Lake | 1 | Rainbow Trout | C1 | 0.27 | 0.0 | | 0.0 | 0.0 | 3.8 |
| 2 | Pilarcitos Lake | 1 | Rainbow Trout | C2 | 0.26 | | | | | |
| 2 | San Pablo Reservoir | 1 | Common Carp | C1 | 0.09 | 1.2 | 0.33 | 5.1 | 5.6 | 7.6 |
| 2 | San Pablo Reservoir | 1 | Common Carp | C2 | 0.17 | | | | | |
| 2 | San Pablo Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.48 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Shadow Cliffs Reservoir | 2 | Channel Catfish | C1 | 0.13 | 0.5 | 0.45 | 0.5 | 14.0 | 12.0 |
| 2 | Shadow Cliffs Reservoir | 2 | Channel Catfish | C2 | 0.11 | | | | | |
| 2 | Shadow Cliffs Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.39 | | | | | |
| 2 | Soulejoule Lake | 1 | Largemouth Bass | 350AVE1 | 0.94 | | | | | |
| 2 | Soulejoule Lake | 1 | Largemouth Bass | C1 | | 0.0 | 0.23 | 0.0 | 0.0 | 0.0 |
| 2 | Stevens Creek Reservoir | 1 | Common Carp | C1 | 0.29 | 0.6 | 1.04 | 24.0 | 31.0 | 22.5 |
| 2 | Stevens Creek Reservoir | 1 | Common Carp | C2 | 0.32 | 0.8 | | 14.1 | 19.8 | 15.6 |
| 2 | Stevens Creek Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.70 | | | | | |
| 2 | Upper San Leandro Reservoir | 1 | Largemouth Bass | 350AVE1 | 1.01 | | | | | |
| 2 | Upper San Leandro Reservoir | 1 | Largemouth Bass | C1 | | 1.4 | 0.37 | 4.5 | 6.9 | 4.4 |
| 3 | Chesbro Reservoir | 1 | Common Carp | C1 | 0.55 | 0.5 | 0.28 | 20.2 | 46.3 | 93.0 |
| 3 | Chesbro Reservoir | 1 | Common Carp | C2 | 0.51 | 0.6 | | 12.6 | 33.4 | 47.0 |
| 3 | Chesbro Reservoir | 1 | Largemouth Bass | 350AVE1 | 1.04 | | | | | |
| 3 | Hernandez Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.83 | | | | | |
| 3 | Hernandez Reservoir | 2 | Largemouth Bass | C1 | | 0.0 | 0.82 | 0.0 | 0.8 | 0.0 |
| 3 | Jameson Lake | 1 | Rainbow Trout | C1 | 0.19 | 0.0 | | 0.0 | 0.0 | 0.0 |
| 3 | Jameson Lake | 1 | Rainbow Trout | C2 | 0.27 | | | | | |
| 3 | Lake Cachuma | 2 | Common Carp | C1 | 0.18 | | | | | |
| 3 | Lake Cachuma | 2 | Common Carp | C2 | 0.16 | | | | | |
| 3 | Lake Cachuma | 2 | Common Carp | C3 | 0.20 | | | | | |
| 3 | Lake Cachuma | 2 | Common Carp | LC | | 0.0 | 1.34 | 0.0 | 1.2 | 0.0 |
| 3 | Lake Cachuma | 2 | Largemouth Bass | 350AVE1 | 0.61 | | | | | |
| 3 | Lake Cachuma | 2 | Largemouth Bass | 350AVE2 | 0.48 | | | | | |
| 3 | Lake Cachuma | 2 | Largemouth Bass | 350AVE3 | 0.40 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | Lake Nacimiento | 1 | Common Carp | C1 | 0.37 | | | | | |
| 3 | Lake Nacimiento | 1 | Common Carp | C2 | 0.56 | | | | | |
| 3 | Lake Nacimiento | 1 | Common Carp | C3 | 0.50 | | | | | |
| 3 | Lake Nacimiento | 1 | Common Carp | LC | | 0.5 | 0.88 | 0.4 | 7.0 | 0.7 |
| 3 | Lake Nacimiento | 1 | Smallmouth Bass | AVE1 | 1.01 | | | | | |
| 3 | Lake Nacimiento | 1 | Smallmouth Bass | AVE2 | 0.94 | | | | | |
| 3 | Lake Nacimiento | 1 | Smallmouth Bass | AVE3 | 1.03 | | | | | |
| 3 | Lake San Antonio | 1 | Common Carp | C1 | 0.17 | | | | | |
| 3 | Lake San Antonio | 1 | Common Carp | C2 | 0.30 | | | | | |
| 3 | Lake San Antonio | 1 | Common Carp | C3 | 0.23 | | | | | |
| 3 | Lake San Antonio | 1 | Common Carp | LC | | 1.3 | 1.06 | 1.3 | 23.3 | 3.9 |
| 3 | Lake San Antonio | 1 | Largemouth Bass | 350AVE1 | 0.30 | | | | | |
| 3 | Lake San Antonio | 1 | Largemouth Bass | 350AVE2 | 0.28 | | | | | |
| 3 | Lake San Antonio | 1 | Largemouth Bass | 350AVE3 | 0.32 | | | | | |
| 3 | Little Oso Flaco Lake | 2 | Goldfish | C1 | 0.07 | 276.0 | 0.42 | 30.8 | 7022.4 | 54.0 |
| 3 | Little Oso Flaco Lake | 2 | Goldfish | C2 | 0.07 | 277.0 | | 41.5 | 7957.7 | 69.3 |
| 3 | Little Oso Flaco Lake | 2 | Hitch | C1 | 0.03 | 5.6 | 0.47 | 0.0 | 157.6 | 0.4 |
| 3 | Little Oso Flaco Lake | 2 | Hitch | C2 | 0.03 | | | | | |
| 3 | Little Oso Flaco Lake | 2 | Largemouth Bass | 350AVE1 | 0.16 | | | | | |
| 3 | Loch Lomond Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.11 | | | | | |
| 3 | Loch Lomond Reservoir | 2 | Largemouth Bass | C1 | | 0.0 | 0.69 | 0.2 | 0.6 | 0.0 |
| 3 | Lopez Lake | 2 | Largemouth Bass | 350AVE1 | 0.10 | | | | | |
| 3 | Lopez Lake | 2 | Sacramento Sucker | C1 | 0.09 | 0.7 | 0.97 | 1.8 | 11.6 | 5.6 |
| 3 | Lopez Lake | 2 | Sacramento Sucker | C2 | 0.09 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | Pinto Lake | 1 | Common Carp | C1 | 0.27 | 6.4 | 0.27 | 19.3 | 556.8 | 9.7 |
| 3 | Pinto Lake | 1 | Common Carp | C2 | 0.22 | 2.4 | | 7.9 | 289.6 | 5.5 |
| 3 | Pinto Lake | 1 | Largemouth Bass | 350AVE1 | 0.19 | | | | | |
| 3 | Santo Margarita Lake | 2 | Largemouth Bass | 350AVE1 | 0.21 | | | | | |
| 3 | Santo Margarita Lake | 2 | Largemouth Bass | C1 | | 0.0 | 0.70 | 0.0 | 1.0 | 0.0 |
| 3 | Uvas Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.91 | | | | | |
| 3 | Uvas Reservoir | 1 | Largemouth Bass | C1 | | 0.5 | 0.50 | 1.8 | 7.1 | 1.9 |
| 4 | Alondra Park Lake | 1 | Common Carp | C1 | 0.05 | 0.0 | 0.35 | 3.4 | 13.2 | 45.4 |
| 4 | Alondra Park Lake | 1 | Common Carp | C2 | 0.07 | 0.0 | | 3.0 | 14.6 | 58.8 |
| 4 | Alondra Park Lake | 1 | Largemouth Bass | 350AVE1 | 0.20 | | | | | |
| 4 | Alondra Park Lake | 1 | Largemouth Bass | C1 | | 0.0 | | 0.2 | 4.5 | 19.9 |
| 4 | Alondra Park Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 0.9 | 4.8 | 3.3 |
| 4 | Balboa Lake | 1 | Common Carp | C1 | 0.01 | 0.9 | 1.17 | 0.0 | 34.0 | 1.0 |
| 4 | Balboa Lake | 1 | Common Carp | C2 | 0.01 | 0.5 | | 0.0 | 17.7 | 0.0 |
| 4 | Belvedere Park Lake | 1 | Common Carp | C1 | 0.04 | 0.0 | 0.39 | 3.8 | 5.7 | 22.3 |
| 4 | Castaic Lagoon | 1 | Largemouth Bass | 350AVE1 | 0.18 | | | | | |
| 4 | Castaic Lagoon | 1 | Largemouth Bass | C1 | | 0.0 | 0.38 | 0.5 | 5.1 | 9.3 |
| 4 | Castaic Lagoon | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 4.4 | 5.0 |
| 4 | Castaic Lagoon | 1 | Rainbow Trout | C1 | 0.03 | 0.0 | 0.29 | 0.0 | 1.8 | 3.2 |
| 4 | Castaic Lagoon | 1 | Redear Sunfish | C1 | 0.02 | 0.0 | 0.48 | 0.0 | 1.0 | 1.4 |
| 4 | Castaic Lagoon | 1 | Redear Sunfish | C2 | 0.03 | 0.0 | | 0.0 | 0.8 | 0.9 |
| 4 | Castaic Lake | 1 | Common Carp | C1 | 0.25 | 0.6 | | 2.1 | 15.5 | 18.8 |
| 4 | Castaic Lake | 1 | Common Carp | C2 | 0.11 | 0.5 | | 1.4 | 7.5 | 16.9 |
| 4 | Castaic Lake | 1 | Common Carp | LC | | 0.7 | 0.57 | 2.1 | 10.9 | 16.0 |
| 4 | Castaic Lake | 1 | Largemouth Bass | 350AVE1 | 0.39 | | | | | |
| 4 | Castaic Lake | 1 | Largemouth Bass | 350AVE2 | 0.24 | | | | | |
| 4 | Castaic Lake | 1 | Largemouth Bass | C1 | | 0.0 | | 0.0 | 8.9 | 7.8 |
| 4 | Castaic Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 7.6 | 12.8 |
| 4 | Castaic Lake | 1 | Largemouth Bass | LC | | 0.6 | | 1.5 | 11.3 | 16.8 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Crystal Lake | 1 | Largemouth Bass | 350AVE1 | 0.95 | | | | | |
| 4 | Crystal Lake | 1 | Largemouth Bass | C1 | | 0.0 | 0.13 | 0.2 | 0.8 | 1.4 |
| 4 | Crystal Lake | 1 | Pumpkinseed | C1 | 0.19 | 0.0 | 0.19 | 0.4 | 0.7 | 0.9 |
| 4 | Echo Lake (Reg 4) | 1 | Common Carp | C1 | 0.02 | 1.1 | 0.34 | 18.4 | 23.5 | 119.0 |
| 4 | Echo Lake (Reg 4) | 1 | Common Carp | C2 | 0.02 | 0.8 | | 12.9 | 14.9 | 82.6 |
| 4 | Echo Lake (Reg 4) | 1 | Largemouth Bass | 350AVE1 | 0.08 | | | | | |
| 4 | Echo Lake (Reg 4) | 1 | Largemouth Bass | C1 | | 0.8 | | 8.5 | 13.0 | 64.7 |
| 4 | Echo Lake (Reg 4) | 1 | Largemouth Bass | C2 | | 0.6 | | 3.0 | 6.4 | 31.5 |
| 4 | El Dorado Lakes | 1 | Largemouth Bass | 350AVE1 | 0.36 | | | | | |
| 4 | El Dorado Lakes | 1 | Largemouth Bass | C1 | | 0.0 | 0.05 | 0.3 | 2.7 | 3.3 |
| 4 | El Dorado Lakes | 1 | Largemouth Bass | C2 | | 0.0 | | 1.5 | 1.0 | 0.3 |
| 4 | Elderberry Forebay | 1 | Channel Catfish | C1 | 0.13 | 1.9 | 0.34 | 3.7 | 33.5 | 116.3 |
| 4 | Elderberry Forebay | 1 | Channel Catfish | C2 | 0.13 | 1.8 | | 4.3 | 44.6 | 146.2 |
| 4 | Elderberry Forebay | 1 | Largemouth Bass | 350AVE1 | 0.32 | | | | | |
| 4 | Elderberry Forebay | 1 | Largemouth Bass | C1 | | 0.8 | | 1.0 | 10.7 | 32.2 |
| 4 | Elderberry Forebay | 1 | Largemouth Bass | C2 | | 0.5 | | 0.0 | 7.2 | 19.6 |
| 4 | Elizabeth Lake | 1 | Brown Bullhead | C1 | 0.24 | 0.0 | 0.14 | 0.4 | 2.0 | 0.4 |
| 4 | Elizabeth Lake | 1 | Brown Bullhead | C2 | 0.19 | 0.0 | | 0.0 | 3.4 | 1.2 |
| 4 | Hansen Lake | 1 | Common Carp | C1 | 0.08 | 0.0 | 0.49 | 6.6 | 8.9 | 6.2 |
| 4 | Hansen Lake | 1 | Common Carp | C2 | 0.12 | 0.0 | | 6.1 | 8.0 | 5.1 |
| 4 | Hansen Lake | 1 | Largemouth Bass | 350AVE1 | 0.49 | | | | | |
| 4 | Hansen Lake | 1 | Largemouth Bass | C1 | | 0.0 | | 2.4 | 5.0 | 4.4 |
| 4 | Hansen Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 3.4 | 6.8 | 3.5 |
| 4 | Harbor Lake (Lake Machado) | 1 | Common Carp | C1 | 0.01 | 0.0 | 0.44 | 2.3 | 4.7 | 5.0 |
| 4 | Harbor Lake (Lake Machado) | 1 | Common Carp | C2 | 0.01 | 0.0 | | 4.8 | 4.7 | 2.8 |
| 4 | Hollenbeck Park Lake | 1 | Common Carp | C1 | 0.01 | 0.6 | 0.78 | 8.4 | 12.6 | 45.2 |
| 4 | Hollenbeck Park Lake | 1 | Common Carp | C2 | 0.02 | 0.8 | | 12.5 | 17.6 | 55.4 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | John Ford Park Lake | 1 | Bluegill | C1 | 0.04 | 0.0 | 0.23 | 0.0 | 0.6 | 0.0 |
| 4 | Ken Hahn Park Lake | 1 | Common Carp | C1 | 0.03 | 0.0 | 0.78 | 2.5 | 7.2 | 6.7 |
| 4 | Ken Hahn Park Lake | 1 | Common Carp | C2 | 0.10 | 0.8 | 0.30 | 7.6 | 11.2 | 19.8 |
| 4 | Ken Hahn Park Lake | 1 | Largemouth Bass | 350AVE1 | 0.30 | | | | | |
| 4 | Ken Hahn Park Lake | 1 | Largemouth Bass | C1 | | 0.0 | | 0.2 | 0.9 | 0.8 |
| 4 | Ken Hahn Park Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 0.7 | 0.6 |
| 4 | Lake Calabasas | 1 | Largemouth Bass | 350AVE1 | 0.03 | | | | | |
| 4 | Lake Calabasas | 1 | Largemouth Bass | C1 | | 0.0 | 0.14 | 0.3 | 5.8 | 25.7 |
| 4 | Lake Calabasas | 1 | Largemouth Bass | C2 | | 0.0 | | 0.7 | 6.3 | 4.9 |
| 4 | Lake Casitas | 1 | Common Carp | C1 | 0.13 | 0.0 | | 2.2 | 15.0 | 5.1 |
| 4 | Lake Casitas | 1 | Common Carp | C2 | 0.12 | 0.0 | | 1.3 | 10.6 | 2.7 |
| 4 | Lake Casitas | 1 | Common Carp | LC | | 0.0 | 1.12 | 1.5 | 10.5 | |
| 4 | Lake Casitas | 1 | Largemouth Bass | 350AVE1 | 0.38 | | | | | |
| 4 | Lake Casitas | 1 | Largemouth Bass | 350AVE2 | 0.29 | | | | | |
| 4 | Lake Casitas | 1 | Largemouth Bass | C1 | | 0.0 | | 0.0 | 1.5 | 0.1 |
| 4 | Lake Casitas | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 1.8 | 0.1 |
| 4 | Lake Casitas | 1 | Largemouth Bass | LC | | 0.0 | | 0.4 | 2.6 | 0.3 |
| 4 | Lake Hughes | 1 | Brown Bullhead | C1 | 0.04 | 0.0 | 0.05 | 1.0 | 2.2 | 1.5 |
| 4 | Lake Hughes | 1 | Brown Bullhead | C2 | 0.04 | 0.0 | | 2.6 | 3.5 | 1.7 |
| 4 | Lake Hughes | 1 | Largemouth Bass | 350AVE1 | 0.20 | | | | | |
| 4 | Lake Hughes | 1 | Largemouth Bass | C1 | | 0.0 | | 1.3 | 3.1 | 2.3 |
| 4 | Lake Hughes | 1 | Largemouth Bass | C2 | | 0.0 | | 0.5 | 1.7 | 4.5 |
| 4 | Lake Lindero | 1 | Common Carp | C1 | 0.01 | 1.8 | 3.24 | 77.6 | 86.2 | 16.2 |
| 4 | Lake Lindero | 1 | Common Carp | C2 | 0.01 | 0.9 | 2.34 | 42.8 | 55.8 | 13.2 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Lake Piru | 1 | Brown Bullhead | C1 | 0.06 | 0.0 | 0.46 | 1.3 | 4.1 | 1.1 |
| 4 | Lake Piru | 1 | Brown Bullhead | C2 | 0.10 | 0.0 | | 1.3 | 3.3 | 0.4 |
| 4 | Lake Piru | 1 | Largemouth Bass | 350AVE1 | 0.46 | | | | | |
| 4 | Lake Piru | 1 | Largemouth Bass | C1 | | 0.0 | | 0.5 | 4.2 | 1.3 |
| 4 | Lake Piru | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 1.1 | 0.1 |
| 4 | Lake Sherwood | 1 | Largemouth Bass | 350AVE1 | 0.54 | | | | | |
| 4 | Lake Sherwood | 1 | Largemouth Bass | C1 | | 0.5 | 0.17 | 0.3 | 1.8 | 0.0 |
| 4 | Lake Sherwood | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 1.5 | 0.0 |
| 4 | Las Virgenes Reservoir | 1 | Channel Catfish | C1 | 0.05 | 0.0 | 0.16 | 0.9 | 7.8 | 6.7 |
| 4 | Legg Lake | 1 | Common Carp | C1 | 0.01 | 0.0 | 0.38 | 0.3 | 63.7 | 20.2 |
| 4 | Legg Lake | 1 | Common Carp | C2 | 0.02 | 0.0 | | 0.0 | 42.3 | 12.0 |
| 4 | Legg Lake | 1 | Largemouth Bass | 350AVE1 | 0.18 | | | | | |
| 4 | Legg Lake | 1 | Largemouth Bass | C1 | | 0.0 | | 1.8 | 72.1 | 23.7 |
| 4 | Legg Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 25.2 | 6.3 |
| 4 | Lincoln Park Lake | 1 | Common Carp | C1 | 0.02 | 0.5 | 0.67 | 1.9 | 7.9 | 10.2 |
| 4 | Lincoln Park Lake | 1 | Common Carp | C2 | 0.01 | 0.4 | | 1.7 | 8.2 | 12.6 |
| 4 | Lincoln Park Lake | 1 | Largemouth Bass | 350AVE1 | 0.15 | | | | | |
| 4 | Lincoln Park Lake | 1 | Largemouth Bass | C1 | | 0.0 | | 0.5 | 3.6 | 9.9 |
| 4 | Lincoln Park Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 0.2 | 1.7 | 5.8 |
| 4 | Malibou Lake | 1 | Common Carp | C1 | 0.04 | 0.7 | 1.32 | 15.2 | 18.1 | 18.2 |
| 4 | Malibou Lake | 1 | Common Carp | C2 | 0.03 | 0.7 | | 14.7 | 17.2 | 14.4 |
| 4 | Malibou Lake | 1 | Largemouth Bass | 350AVE1 | 0.12 | | | | | |
| 4 | Malibou Lake | 1 | Largemouth Bass | C1 | | 0.7 | | 2.3 | 3.0 | 1.6 |
| 4 | Malibou Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 2.0 | 1.0 |
| 4 | Peck Road Water Conservation Park | 1 | Largemouth Bass | 350AVE1 | 0.36 | | | | | |
| 4 | Peck Road Water Conservation Park | 1 | Largemouth Bass | C1 | | 1.0 | 0.34 | 19.2 | 24.4 | 55.3 |
| 4 | Peck Road Water Conservation Park | 1 | Largemouth Bass | C2 | | 0.5 | | 8.6 | 9.0 | 22.7 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Puddingstone Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.44 | | | | | |
| 4 | Puddingstone Reservoir | 1 | Largemouth Bass | C1 | | 0.7 | 0.32 | 9.3 | 30.8 | 18.7 |
| 4 | Puddingstone Reservoir | 1 | Largemouth Bass | C2 | | 0.0 | | 5.0 | 10.8 | 5.9 |
| 4 | Pyramid Lake | 1 | Brown Bullhead | C1 | 0.29 | 1.3 | | 6.9 | 135.4 | 416.1 |
| 4 | Pyramid Lake | 1 | Brown Bullhead | C2 | 0.19 | | | 0.4 | 17.7 | 60.3 |
| 4 | Pyramid Lake | 1 | Brown Bullhead | LC | | 0.7 | 0.21 | 2.4 | 86.5 | 194.7 |
| 4 | Pyramid Lake | 1 | Largemouth Bass | 350AVE1 | 0.37 | | | | | |
| 4 | Pyramid Lake | 1 | Largemouth Bass | 350AVE2 | 0.33 | | | | | |
| 4 | Pyramid Lake | 1 | Largemouth Bass | C1 | | 0.5 | | 0.0 | 25.6 | 66.1 |
| 4 | Pyramid Lake | 1 | Largemouth Bass | C2 | | 0.5 | | 0.0 | 13.2 | 34.6 |
| 4 | Pyramid Lake | 1 | Largemouth Bass | LC | | 0.6 | | 0.4 | 23.8 | 66.1 |
| 4 | Santa Fe Reservoir | 1 | Common Carp | C1 | 0.16 | 0.0 | 0.17 | 2.2 | 9.4 | 19.1 |
| 4 | Santa Fe Reservoir | 1 | Common Carp | C2 | 0.12 | 0.4 | | 2.4 | 9.3 | 21.3 |
| 4 | Santa Fe Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.59 | | | | | |
| 4 | Santa Fe Reservoir | 1 | Largemouth Bass | C1 | | 0.0 | | 0.3 | 1.4 | 5.0 |
| 4 | Santa Fe Reservoir | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 1.0 | 1.7 |
| 4 | Sepulveda Lake | 1 | Common Carp | C1 | 0.01 | 0.7 | 1.08 | 2.8 | 387.1 | 4.1 |
| 4 | Sepulveda Lake | 1 | Common Carp | C2 | 0.01 | 0.5 | | 1.2 | 163.8 | 4.1 |
| 4 | Toluca Lake | 1 | Largemouth Bass | 350AVE1 | 0.00 | | | | | |
| 4 | Toluca Lake | 1 | Largemouth Bass | C1 | | 0.9 | 1.86 | 6.4 | 7.5 | 6.6 |
| 4 | Toluca Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 3.8 | 5.5 | 5.9 |
| 4 | Westlake Lake | 1 | Largemouth Bass | 350AVE1 | 0.09 | | | | | |
| 4 | Westlake Lake | 1 | Largemouth Bass | C1 | | 0.7 | 2.12 | 3.7 | 7.3 | 5.7 |
| 4 | Westlake Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 2.2 | 5.3 | 6.9 |
| 5 | Antelope Lake | 2 | Brown Bullhead | C1 | 0.04 | 0.0 | 0.31 | 0.0 | 0.7 | 0.0 |
| 5 | Antelope Lake | 2 | Brown Bullhead | C2 | 0.03 | | | | | |
| 5 | Antelope Lake | 2 | Largemouth Bass | 350AVE1 | 0.11 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Bass Lake | 2 | Brown Bullhead | C1 | 0.05 | 0.0 | 0.08 | 2.5 | 1.8 | 0.0 |
| 5 | Bass Lake | 2 | Largemouth Bass | 350AVE1 | 0.09 | | | | | |
| 5 | Beardsley | 2 | Rainbow Trout | C1 | 0.05 | 0.0 | | 0.0 | 1.0 | 0.6 |
| 5 | Beardsley | 2 | Rainbow Trout | C2 | 0.06 | | | | | |
| 5 | Big Lake | 2 | Rainbow Trout | C1 | 0.02 | | | | | |
| 5 | Big Lake | 2 | Sacramento Sucker | C1 | 0.10 | 0.0 | 0.43 | 0.0 | 1.6 | 0.0 |
| 5 | Big Lake | 2 | Sacramento Sucker | C2 | 0.03 | | | | | |
| 5 | Big Reservoir | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 3.0 | 0.0 |
| 5 | Big Reservoir | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Black Butte Lake | 2 | Common Carp | C1 | 0.39 | | | | | |
| 5 | Black Butte Lake | 2 | Common Carp | C2 | 0.31 | | | | | |
| 5 | Black Butte Lake | 2 | Common Carp | C3 | 0.40 | | | | | |
| 5 | Black Butte Lake | 2 | Common Carp | LC | | 0.0 | 0.42 | 0.2 | 1.6 | 0.0 |
| 5 | Black Butte Lake | 2 | Smallmouth Bass | AVE1 | 0.49 | | | | | |
| 5 | Black Butte Lake | 2 | Smallmouth Bass | AVE2 | 0.64 | | | | | |
| 5 | Black Butte Lake | 2 | Smallmouth Bass | AVE3 | 0.45 | | | | | |
| 5 | Blue Lakes | 2 | Largemouth Bass | 350AVE1 | 0.16 | | | | | |
| 5 | Blue Lakes | 2 | Largemouth Bass | C1 | | 0.0 | 0.49 | 0.6 | 7.1 | 0.2 |
| 5 | Bowman Lake | 2 | Brown Trout | C1 | 0.16 | 0.7 | | 1.4 | 3.5 | 4.0 |
| 5 | Bowman Lake | 2 | Brown Trout | C2 | 0.13 | | | | | |
| 5 | Brite Valley Lake | 2 | Brown Bullhead | C1 | 0.04 | 0.5 | 0.08 | 0.3 | 20.9 | 18.1 |
| 5 | Brite Valley Lake | 2 | Brown Bullhead | C2 | 0.05 | | | | | |
| 5 | Brite Valley Lake | 2 | Largemouth Bass | 350AVE1 | 0.29 | | | | | |
| 5 | Bucks Lake | 2 | Rainbow Trout | C1 | 0.02 | | | | | |
| 5 | Bucks Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Bucks Lake | 2 | Rainbow Trout | LC | | 0.0 | | 0.0 | 3.8 | 0.2 |
| 5 | Butt Valley Reservoir | 2 | Smallmouth Bass | AVE1 | 0.17 | | | | | |
| 5 | Butt Valley Reservoir | 2 | Smallmouth Bass | AVE2 | 0.12 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Butte Lake | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 0.0 | 0.0 |
| 5 | Camanche Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.38 | | | | | |
| 5 | Camanche Reservoir | 2 | Largemouth Bass | 350AVE2 | 0.27 | | | | | |
| 5 | Camanche Reservoir | 2 | Largemouth Bass | 350AVE3 | 0.33 | | | | | |
| 5 | Camanche Reservoir | 2 | Largemouth Bass | LC | | 0.0 | 0.44 | 0.0 | 0.9 | 0.5 |
| 5 | Camp Far West Reservoir | 1 | Channel Catfish | C1 | 0.32 | | | | | |
| 5 | Camp Far West Reservoir | 1 | Channel Catfish | C2 | 0.44 | | | | | |
| 5 | Camp Far West Reservoir | 1 | Channel Catfish | LC | | 0.0 | 0.05 | 1.4 | 5.2 | 4.2 |
| 5 | Camp Far West Reservoir | 1 | Spotted Bass | AVE1 | 0.54 | | | | | |
| 5 | Camp Far West Reservoir | 1 | Spotted Bass | AVE2 | 0.76 | | | | | |
| 5 | Caples Lake | 1 | Brown Trout | C1 | 0.08 | 0.0 | | 0.0 | 2.9 | 0.4 |
| 5 | Caples Lake | 1 | Brown Trout | C2 | 0.12 | | | | | |
| 5 | Castac Lake | 1 | Black Crappie | C1 | 0.08 | 0.6 | 0.20 | 0.3 | 3.7 | 0.1 |
| 5 | Castac Lake | 1 | Largemouth Bass | 350AVE1 | 0.32 | | | | | |
| 5 | Castac Lake | 1 | Largemouth Bass | C1 | | 0.0 | 0.05 | 0.3 | 4.7 | 0.1 |
| 5 | Castle Lake | 2 | Rainbow Trout | C1 | 0.04 | 0.0 | | 0.0 | 1.3 | 0.2 |
| 5 | Castle Lake | 2 | Rainbow Trout | C2 | 0.03 | | | | | |
| 5 | Cave Lake | 2 | Brook Trout | C1 | 0.18 | 0.0 | | 0.0 | 0.0 | 0.0 |
| 5 | Cave Lake | 2 | Brook Trout | C2 | 0.21 | | | | | |
| 5 | Clear Lake | 2 | Common Carp | C1 | 0.18 | | | | | |
| 5 | Clear Lake | 2 | Common Carp | C2 | 0.15 | | | | | |
| 5 | Clear Lake | 2 | Common Carp | C3 | 0.28 | | | | | |
| 5 | Clear Lake | 2 | Common Carp | C4 | 0.07 | | | | | |
| 5 | Clear Lake | 2 | Common Carp | LC | | 0.0 | 0.19 | 4.7 | 133.7 | 13.2 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Clear Lake | 2 | Largemouth Bass | 350AVE1 | 0.21 | | | | | |
| 5 | Clear Lake | 2 | Largemouth Bass | 350AVE2 | 0.30 | | | | | |
| 5 | Clear Lake | 2 | Largemouth Bass | 350AVE3 | 0.31 | | | | | |
| 5 | Clear Lake | 2 | Largemouth Bass | 350AVE4 | 0.23 | | | | | |
| 5 | Collins Lake | 2 | Largemouth Bass | 350AVE1 | 0.38 | | | | | |
| 5 | Collins Lake | 2 | Largemouth Bass | C1 | | 0.0 | 0.35 | 0.0 | 0.6 | 0.0 |
| 5 | Contra Loma Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.20 | | | | | |
| 5 | Contra Loma Reservoir | 1 | Largemouth Bass | C1 | | 0.0 | 0.26 | 0.0 | 1.1 | 0.0 |
| 5 | Cosumnes River | 1 | Largemouth Bass | 350AVE1 | 1.15 | | | | | |
| 5 | Cosumnes River | 1 | Largemouth Bass | C1 | | 0.0 | 0.20 | 0.5 | 4.5 | 1.2 |
| 5 | Courtright Reservoir | 2 | Rainbow Trout | C1 | 0.06 | | | | | |
| 5 | Courtright Reservoir | 2 | Rainbow Trout | C2 | 0.04 | | | | | |
| 5 | Courtright Reservoir | 2 | Rainbow Trout | LC | | 0.0 | | 0.0 | 1.7 | 0.5 |
| 5 | Discovery Bay | 1 | Largemouth Bass | 350AVE1 | 0.36 | | | | | |
| 5 | Discovery Bay | 1 | Largemouth Bass | C1 | | 0.0 | 0.27 | 0.4 | 27.4 | 2.0 |
| 5 | Don Pedro Reservoir | 1 | Common Carp | C1 | 0.15 | | | | | |
| 5 | Don Pedro Reservoir | 1 | Common Carp | C2 | 0.20 | | | | | |
| 5 | Don Pedro Reservoir | 1 | Common Carp | C3 | 0.16 | | | | | |
| 5 | Don Pedro Reservoir | 1 | Common Carp | LC | | 0.0 | 0.50 | 3.1 | 3.2 | 11.3 |
| 5 | Don Pedro Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.46 | | | | | |
| 5 | Don Pedro Reservoir | 1 | Largemouth Bass | 350AVE2 | 0.40 | | | | | |
| 5 | Don Pedro Reservoir | 1 | Largemouth Bass | 350AVE3 | 0.46 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Duncan Reservoir | 2 | Brown Bullhead | C1 | 0.04 | 0.0 | 0.08 | 0.0 | 0.0 | 0.0 |
| 5 | Duncan Reservoir | 2 | Brown Bullhead | C2 | 0.04 | | | | | |
| 5 | Duncan Reservoir | 2 | Rainbow Trout | C1 | 0.04 | | | | | |
| 5 | East Park Reservoir | 1 | Common Carp | C1 | 0.18 | | | | | |
| 5 | East Park Reservoir | 1 | Common Carp | C2 | 0.25 | | | | | |
| 5 | East Park Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.39 | | | | | |
| 5 | East Park Reservoir | 1 | Largemouth Bass | 350AVE2 | 0.52 | | | | | |
| 5 | Eastman Lake | 2 | Common Carp | C1 | 0.33 | | | | | |
| 5 | Eastman Lake | 2 | Common Carp | C2 | 0.27 | | | | | |
| 5 | Eastman Lake | 2 | Common Carp | LC | | 0.5 | 0.08 | 2.6 | 9.0 | 0.7 |
| 5 | Eastman Lake | 2 | Largemouth Bass | 350AVE1 | 1.03 | | | | | |
| 5 | Eastman Lake | 2 | Largemouth Bass | 350AVE2 | 1.05 | | | | | |
| 5 | Faucherie Lake | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 2.7 | 0.0 |
| 5 | Faucherie Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Feeley Lake | 1 | Brown Bullhead | C1 | 0.03 | 0.0 | 0.05 | 0.3 | 3.2 | 0.1 |
| 5 | Finger Lake | 1 | Largemouth Bass | 350AVE1 | 0.29 | | | | | |
| 5 | Finger Lake | 1 | Largemouth Bass | C1 | | 0.0 | 0.22 | 0.0 | 0.0 | 0.0 |
| 5 | Florence Lake | 1 | Brown Trout | C1 | 0.09 | 0.0 | | 0.0 | 1.1 | 1.8 |
| 5 | Florence Lake | 1 | Brown Trout | C2 | 0.10 | | | | | |
| 5 | Folsom Lake | 2 | Largemouth Bass | 350AVE1 | 0.59 | | | | | |
| 5 | Folsom Lake | 2 | Largemouth Bass | 350AVE2 | 0.48 | | | | | |
| 5 | Folsom Lake | 2 | Largemouth Bass | 350AVE3 | 0.34 | | | | | |
| 5 | Folsom Lake | 2 | Largemouth Bass | LC | | 0.0 | 0.39 | 0.2 | 8.8 | 0.5 |
| 5 | French Meadows Reservoir | 1 | Rainbow Trout | C1 | 0.11 | | | | | |
| 5 | French Meadows Reservoir | 1 | Rainbow Trout | C2 | 0.06 | | | | | |
| 5 | French Meadows Reservoir | 1 | Rainbow Trout | LC | | 0.0 | | 0.0 | 2.6 | 0.3 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Frenchman Lake | 1 | Rainbow Trout | C1 | 0.14 | | | | | |
| 5 | Frenchman Lake | 1 | Rainbow Trout | C2 | 0.12 | | | | | |
| 5 | Frenchman Lake | 1 | Rainbow Trout | LC | | 0.0 | | 0.0 | 0.7 | 0.1 |
| 5 | Fuller Lake | 1 | Brown Trout | C1 | 0.09 | 0.0 | | 1.3 | 1.6 | 2.1 |
| 5 | Fuller Lake | 1 | Brown Trout | C2 | 0.08 | | | | | |
| 5 | Gold Lake | 1 | Rainbow Trout | C1 | 0.07 | 0.0 | | 0.0 | 2.8 | 0.5 |
| 5 | Gold Lake | 1 | Rainbow Trout | C2 | 0.06 | | | | | |
| 5 | Gumboot Lake | 1 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 1.1 | 0.8 |
| 5 | Gumboot Lake | 1 | Rainbow Trout | C2 | 0.05 | | | | | |
| 5 | Harry L Englebright Lak | 2 | Rainbow Trout | C1 | 0.08 | | | | | |
| 5 | Harry L Englebright Lak | 2 | Sacramento Sucker | C1 | 0.66 | 0.0 | 0.35 | 0.4 | 3.5 | 17.6 |
| 5 | Harry L Englebright Lak | 2 | Sacramento Sucker | C2 | 0.59 | | | | | |
| 5 | Hell Hole Reservoir | 2 | Brown Trout | C1 | 0.05 | | | | | |
| 5 | Hell Hole Reservoir | 2 | Brown Trout | C2 | 0.28 | | | | | |
| 5 | Hell Hole Reservoir | 2 | Brown Trout | LC | | 0.8 | | 1.2 | 1.3 | 9.7 |
| 5 | Hensley Lake | 1 | Common Carp | C1 | 0.16 | | | | | |
| 5 | Hensley Lake | 1 | Common Carp | C2 | 0.13 | | | | | |
| 5 | Hensley Lake | 1 | Common Carp | LC | | 0.0 | 0.23 | 1.2 | 0.8 | 0.2 |
| 5 | Hensley Lake | 1 | Largemouth Bass | 350AVE1 | 0.72 | | | | | |
| 5 | Hensley Lake | 1 | Largemouth Bass | 350AVE2 | 0.80 | | | | | |
| 5 | Hetch Hetchy Reservoir | 1 | Brown Trout | C1 | 0.54 | | | | | |
| 5 | Hetch Hetchy Reservoir | 1 | Brown Trout | C2 | 0.96 | | | | | |
| 5 | Hetch Hetchy Reservoir | 1 | Brown Trout | LC | | 0.0 | | 0.2 | 7.0 | 2.6 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Hume Lake | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.2 | 2.1 | 0.9 |
| 5 | Hume Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Huntington Lake | 2 | Rainbow Trout | C1 | 0.04 | | | | | |
| 5 | Huntington Lake | 2 | Rainbow Trout | C2 | 0.13 | | | | | |
| 5 | Huntington Lake | 2 | Rainbow Trout | LC | | 0.0 | | 0.3 | 2.4 | 1.4 |
| 5 | Ice House Reservoir | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 3.3 | 0.0 |
| 5 | Ice House Reservoir | 2 | Rainbow Trout | C2 | 0.03 | | | | | |
| 5 | Iron Canyon Reservoir | 2 | Rainbow Trout | C1 | 0.06 | 0.0 | | 0.0 | 0.0 | 0.0 |
| 5 | Isabella Lake | 2 | Common Carp | C1 | 0.41 | | | | | |
| 5 | Isabella Lake | 2 | Common Carp | C2 | 0.44 | | | | | |
| 5 | Isabella Lake | 2 | Common Carp | C3 | 0.35 | | | | | |
| 5 | Isabella Lake | 2 | Common Carp | LC | | 0.5 | 0.27 | 2.0 | 10.3 | 7.7 |
| 5 | Isabella Lake | 2 | Largemouth Bass | 350AVE1 | 0.19 | | | | | |
| 5 | Isabella Lake | 2 | Largemouth Bass | 350AVE2 | 0.21 | | | | | |
| 5 | Isabella Lake | 2 | Largemouth Bass | 350AVE3 | 0.16 | | | | | |
| 5 | Jackson Meadow Reservoir | 2 | Rainbow Trout | C1 | 0.09 | 0.6 | | 0.8 | 1.7 | 1.5 |
| 5 | Jackson Meadow Reservoir | 2 | Rainbow Trout | C2 | 0.06 | | | | | |
| 5 | Jenkinson Lake | 2 | Largemouth Bass | 350AVE1 | 0.16 | | | | | |
| 5 | Jenkinson Lake | 2 | Rainbow Trout | C1 | 0.03 | 0.5 | | 0.2 | 3.5 | 0.0 |
| 5 | Jenkinson Lake | 2 | Rainbow Trout | C2 | 0.03 | | | | | |
| 5 | Jenkinson Lake | 2 | Smallmouth Bass | AVE1 | 0.29 | | | | | |
| 5 | Kidd Lake | 1 | Brown Bullhead | C1 | 0.06 | 0.0 | 0.05 | 0.0 | 3.5 | 0.1 |
| 5 | Kidd Lake | 1 | Brown Bullhead | C2 | 0.05 | | | | | |
| 5 | La Grange Reservoir | 1 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.2 | 0.7 | 2.8 |
| 5 | La Grange Reservoir | 1 | Rainbow Trout | C2 | 0.03 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Lake Almanor | 2 | Smallmouth Bass | AVE1 | 0.21 | | | | | |
| 5 | Lake Almanor | 2 | Smallmouth Bass | AVE2 | 0.10 | | | | | |
| 5 | Lake Almanor | 2 | Smallmouth Bass | AVE3 | 0.15 | | | | | |
| 5 | Lake Almanor | 2 | Smallmouth Bass | AVE4 | 0.11 | | | | | |
| 5 | Lake Almanor | 2 | Smallmouth Bass | LC | | 0.0 | 0.87 | 0.0 | 0.0 | 0.0 |
| 5 | Lake Alpine | 1 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 1.1 | 0.0 |
| 5 | Lake Alpine | 1 | Rainbow Trout | C2 | 0.03 | | | | | |
| 5 | Lake Amador | 2 | Largemouth Bass | 350AVE1 | 0.60 | | | | | |
| 5 | Lake Amador | 2 | Largemouth Bass | C1 | | 0.0 | 0.33 | 0.3 | 1.0 | 0.2 |
| 5 | Lake Berryessa | 2 | Largemouth Bass | 350AVE1 | 0.77 | | | | | |
| 5 | Lake Berryessa | 2 | Largemouth Bass | 350AVE2 | 0.51 | | | | | |
| 5 | Lake Berryessa | 2 | Largemouth Bass | 350AVE3 | 0.53 | | | | | |
| 5 | Lake Berryessa | 2 | Largemouth Bass | 350AVE4 | 0.60 | | | | | |
| 5 | Lake Berryessa | 2 | Largemouth Bass | LC | | 0.0 | 0.34 | 0.0 | 1.9 | 0.0 |
| 5 | Lake Britton | 2 | Common Carp | C1 | 0.04 | 0.0 | 0.29 | 0.0 | 1.4 | 0.0 |
| 5 | Lake Britton | 2 | Common Carp | C2 | 0.06 | | | | | |
| 5 | Lake Britton | 2 | Smallmouth Bass | AVE1 | 0.18 | | | | | |
| 5 | Lake California | 1 | Largemouth Bass | 350AVE1 | 0.27 | | | | | |
| 5 | Lake California | 1 | Largemouth Bass | C1 | | 0.0 | 0.15 | 0.0 | 0.6 | 0.1 |
| 5 | Lake Combie | 1 | Largemouth Bass | 350AVE1 | 0.78 | | | | | |
| 5 | Lake Combie | 1 | Sacramento Sucker | C1 | 0.60 | 0.0 | 0.62 | 0.5 | 8.4 | 12.3 |
| 5 | Lake Combie | 1 | Sacramento Sucker | C2 | 0.46 | | | | | |
| 5 | Lake Davis | 2 | Brown Bullhead | C1 | 0.08 | | | | | |
| 5 | Lake Davis | 2 | Brown Bullhead | C2 | 0.06 | | | | | |
| 5 | Lake Davis | 2 | Brown Bullhead | C3 | 0.06 | | | | | |
| 5 | Lake Davis | 2 | Brown Bullhead | LC | | 0.0 | 0.08 | 0.0 | 1.0 | 0.0 |
| 5 | Lake Davis | 2 | Rainbow Trout | C1 | 0.04 | | | | | |
| 5 | Lake Davis | 2 | Rainbow Trout | C2 | 0.04 | | | | | |
| 5 | Lake Davis | 2 | Rainbow Trout | C3 | 0.03 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Lake Kaweah | 2 | Common Carp | C1 | 0.25 | | | | | |
| 5 | Lake Kaweah | 2 | Common Carp | C2 | 0.17 | | | | | |
| 5 | Lake Kaweah | 2 | Common Carp | LC | | 4.2 | 0.42 | 13.0 | 50.3 | 13.3 |
| 5 | Lake Kaweah | 2 | Largemouth Bass | 350AVE1 | 0.46 | | | | | |
| 5 | Lake Kaweah | 2 | Largemouth Bass | 350AVE2 | 0.54 | | | | | |
| 5 | Lake McClure | 1 | Common Carp | C1 | 0.12 | | | | | |
| 5 | Lake McClure | 1 | Common Carp | C2 | 0.17 | | | | | |
| 5 | Lake McClure | 1 | Common Carp | C3 | 0.13 | | | | | |
| 5 | Lake McClure | 1 | Common Carp | LC | | 0.0 | 0.37 | 0.0 | 0.0 | 0.0 |
| 5 | Lake McClure | 1 | Largemouth Bass | 350AVE1 | 0.75 | | | | | |
| 5 | Lake McClure | 1 | Largemouth Bass | 350AVE2 | 0.79 | | | | | |
| 5 | Lake McClure | 1 | Largemouth Bass | 350AVE3 | 0.77 | | | | | |
| 5 | Lake McSwain | 1 | Largemouth Bass | 350AVE1 | 0.54 | | | | | |
| 5 | Lake McSwain | 1 | Sacramento Sucker | C1 | 0.08 | 0.0 | 0.77 | 2.9 | 2.8 | 2.7 |
| 5 | Lake McSwain | 1 | Sacramento Sucker | C2 | 0.15 | | | | | |
| 5 | Lake Natomas | 1 | Common Carp | C1 | 0.26 | 0.0 | 0.37 | 0.5 | 10.1 | 8.1 |
| 5 | Lake Natomas | 1 | Common Carp | C2 | 0.25 | | | | | |
| 5 | Lake Natomas | 1 | Largemouth Bass | 350AVE1 | 0.54 | | | | | |
| 5 | Lake of the Pines | 1 | Largemouth Bass | 350AVE1 | 0.07 | | | | | |
| 5 | Lake of the Pines | 1 | Largemouth Bass | C1 | | 0.0 | 0.05 | 0.4 | 0.7 | 0.0 |
| 5 | Lake Oroville | 1 | Common Carp | C1 | 0.29 | | | | | |
| 5 | Lake Oroville | 1 | Common Carp | C2 | 0.22 | | | | | |
| 5 | Lake Oroville | 1 | Common Carp | C3 | 0.24 | | | | | |
| 5 | Lake Oroville | 1 | Common Carp | C4 | 0.31 | | | | | |
| 5 | Lake Oroville | 1 | Common Carp | LC | | 0.0 | 0.44 | 0.4 | 5.1 | 6.8 |
| 5 | Lake Oroville | 1 | Smallmouth Bass | AVE1 | 0.50 | | | | | |
| 5 | Lake Oroville | 1 | Smallmouth Bass | AVE2 | 0.45 | | | | | |
| 5 | Lake Oroville | 1 | Smallmouth Bass | AVE3 | 0.42 | | | | | |
| 5 | Lake Oroville | 1 | Smallmouth Bass | AVE4 | 0.39 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Lake Spaulding | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 3.0 | 0.0 |
| 5 | Lake Spaulding | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Lake Webb | 2 | Common Carp | C1 | 0.12 | 0.0 | 0.67 | 0.0 | 8.8 | 3.7 |
| 5 | Lake Webb | 2 | Common Carp | C2 | 0.11 | | | | | |
| 5 | Lake Webb | 2 | Largemouth Bass | 350AVE1 | 0.22 | | | | | |
| 5 | Lily Lake | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 2.0 | 0.0 |
| 5 | Lily Lake | 2 | Rainbow Trout | C2 | 0.05 | | | | | |
| 5 | Little Grass Valley Reservoir | 2 | Rainbow Trout | C1 | 0.02 | | | | | |
| 5 | Little Grass Valley Reservoir | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Little Grass Valley Reservoir | 2 | Rainbow Trout | LC | | 0.0 | | 0.0 | 3.4 | 0.0 |
| 5 | Loon Lake | 1 | Brown Trout | C1 | 0.50 | 0.0 | | 0.2 | 7.4 | 4.0 |
| 5 | Loon Lake | 1 | Brown Trout | C2 | 0.30 | | | | | |
| 5 | Los Banos Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.55 | | | | | |
| 5 | Los Banos Reservoir | 1 | Largemouth Bass | C1 | | 0.5 | 0.44 | 0.2 | 3.3 | 0.2 |
| 5 | Los Vaqueros Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.26 | | | | | |
| 5 | Los Vaqueros Reservoir | 2 | Largemouth Bass | 350AVE2 | 0.21 | | | | | |
| 5 | Los Vaqueros Reservoir | 2 | Sacramento Sucker | C1 | 0.29 | | | | | |
| 5 | Los Vaqueros Reservoir | 2 | Sacramento Sucker | C2 | 0.04 | | | | | |
| 5 | Los Vaqueros Reservoir | 2 | Sacramento Sucker | LC | | 0.4 | 0.42 | 0.5 | 5.8 | 2.3 |
| 5 | Lower Bear River Reservoir | 1 | Rainbow Trout | C1 | 0.04 | 0.0 | | 0.0 | 3.8 | 1.2 |
| 5 | Lower Bear River Reservoir | 1 | Rainbow Trout | C2 | 0.04 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Lower Blue Lake | 1 | Common Carp | C1 | 0.26 | 0.0 | 0.22 | 0.5 | 59.3 | 1.1 |
| 5 | Lower Blue Lake | 1 | Common Carp | C2 | 0.19 | | | | | |
| 5 | Lower Blue Lake | 1 | Largemouth Bass | 350AVE1 | 0.30 | | | | | |
| 5 | Lower Blue Lake (Alpine County) | 2 | Rainbow Trout | C1 | 0.02 | 0.5 | | 0.2 | 3.0 | 0.0 |
| 5 | Lower Blue Lake (Alpine County) | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Lower Bucks Lake | 1 | Kokanee | AVE1 | 0.10 | | | | | |
| 5 | Lower Bucks Lake | 1 | Kokanee | C1 | | 0.0 | 0.05 | 0.6 | 3.7 | 0.1 |
| 5 | Mammoth Pool Reservoir | 1 | Rainbow Trout | C1 | 0.22 | 0.0 | | 1.6 | 1.1 | 0.0 |
| 5 | Mammoth Pool Reservoir | 1 | Rainbow Trout | C2 | 0.10 | | | | | |
| 5 | Marsh in Fresno Slough | 1 | Brown Bullhead | C1 | 0.06 | 0.5 | 0.13 | 0.3 | 22.8 | 2.7 |
| 5 | Marsh in Fresno Slough | 1 | Brown Bullhead | C2 | 0.05 | | | | | |
| 5 | Marsh in Fresno Slough | 1 | Largemouth Bass | 350AVE1 | 0.17 | | | | | |
| 5 | McCumber Reservoir | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 2.9 | 0.0 |
| 5 | McCumber Reservoir | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Meadows Slough | 1 | Largemouth Bass | 350AVE1 | 0.45 | | | | | |
| 5 | Meadows Slough | 1 | Sacramento Sucker | C1 | 0.38 | 2.5 | 0.05 | 4.7 | 68.1 | 13.3 |
| 5 | Meadows Slough | 1 | Sacramento Sucker | C2 | 0.47 | | | | | |
| 5 | Medicine Lake | 2 | Brook Trout | C1 | 0.06 | 0.0 | | 0.0 | 1.6 | 0.0 |
| 5 | Medicine Lake | 2 | Brook Trout | C2 | 0.05 | | | | | |
| 5 | Millerton Lake | 1 | Largemouth Bass | 350AVE1 | 0.31 | | | | | |
| 5 | Millerton Lake | 1 | Largemouth Bass | 350AVE2 | 0.36 | | | | | |
| 5 | Millerton Lake | 1 | Largemouth Bass | 350AVE3 | 0.40 | | | | | |
| 5 | Millerton Lake | 1 | Largemouth Bass | LC | | 0.0 | 0.19 | 0.0 | 0.6 | 0.1 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Modesto Reservoir | 1 | Common Carp | C1 | 0.22 | | | | | |
| 5 | Modesto Reservoir | 1 | Common Carp | C2 | 0.31 | | | | | |
| 5 | Modesto Reservoir | 1 | Common Carp | LC | | 0.0 | 0.27 | 3.3 | 8.8 | 7.9 |
| 5 | Modesto Reservoir | 1 | Smallmouth Bass | AVE1 | 0.20 | | | | | |
| 5 | Modesto Reservoir | 1 | Smallmouth Bass | AVE2 | 0.27 | | | | | |
| 5 | Moon Lake | 1 | Sacramento Pikeminnow | AVE1 | 0.34 | | | | | |
| 5 | Moon Lake | 1 | Sacramento Pikeminnow | C1 | | 0.0 | 0.14 | 0.0 | 1.9 | 1.0 |
| 5 | New Bullards Bar Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.27 | | | | | |
| 5 | New Bullards Bar Reservoir | 2 | Largemouth Bass | 350AVE2 | 0.38 | | | | | |
| 5 | New Bullards Bar Reservoir | 2 | Largemouth Bass | 350AVE3 | 0.54 | | | | | |
| 5 | New Bullards Bar Reservoir | 2 | Largemouth Bass | LC | | 0.0 | 0.55 | 0.0 | 0.0 | 0.0 |
| 5 | New Hogan Lake | 2 | Largemouth Bass | 350AVE1 | 0.41 | | | | | |
| 5 | New Hogan Lake | 2 | Largemouth Bass | 350AVE2 | 0.37 | | | | | |
| 5 | New Hogan Lake | 2 | Largemouth Bass | 350AVE3 | 0.51 | | | | | |
| 5 | New Hogan Lake | 2 | Largemouth Bass | LC | | 0.0 | 0.39 | 0.0 | 0.0 | 0.0 |
| 5 | New Melones Lake | 2 | Common Carp | C1 | 0.26 | | | | | |
| 5 | New Melones Lake | 2 | Common Carp | C2 | 0.20 | | | | | |
| 5 | New Melones Lake | 2 | Common Carp | LC | | 0.0 | 0.46 | 0.4 | 0.0 | 0.4 |
| 5 | New Melones Lake | 2 | Largemouth Bass | 350AVE1 | 1.22 | | | | | |
| 5 | New Melones Lake | 2 | Largemouth Bass | 350AVE2 | 1.03 | | | | | |
| 5 | North Battle Creek Reservoir | 2 | Brown Trout | C1 | 0.03 | 0.0 | | 0.0 | 0.6 | 0.0 |
| 5 | North Battle Creek Reservoir | 2 | Brown Trout | C2 | 0.04 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | O'Neill Forebay | 1 | Channel Catfish | C1 | 0.12 | 0.6 | 0.17 | 3.8 | 26.0 | 57.2 |
| 5 | O'Neill Forebay | 1 | Channel Catfish | C2 | 0.13 | | | | | 67.0 |
| 5 | O'Neill Forebay | 1 | Largemouth Bass | 350AVE1 | 0.26 | | | | | |
| 5 | O'Neill Forebay | 1 | Largemouth Bass | 350AVE2 | 0.21 | | | | | |
| 5 | O'Neill Forebay | 1 | Largemouth Bass | C2 | | 0.0 | | 0.0 | 2.9 | 7.8 |
| 5 | Paradise Lake | 2 | Largemouth Bass | 350AVE1 | 0.16 | | | | | |
| 5 | Paradise Lake | 2 | Largemouth Bass | C1 | | 0.0 | 0.40 | 0.0 | 0.7 | 0.0 |
| 5 | Pine Flat Lake | 1 | Common Carp | AVE3 | 0.07 | | | | | |
| 5 | Pine Flat Lake | 1 | Common Carp | C1 | 0.09 | | | | | |
| 5 | Pine Flat Lake | 1 | Common Carp | C2 | 0.07 | | | | | |
| 5 | Pine Flat Lake | 1 | Common Carp | LC | | 0.0 | 0.21 | 2.5 | 5.2 | 1.6 |
| 5 | Pine Flat Lake | 1 | Largemouth Bass | 350AVE1 | 0.55 | | | | | |
| 5 | Pine Flat Lake | 1 | Largemouth Bass | 350AVE2 | 0.53 | | | | | |
| 5 | Pine Flat Lake | 1 | Largemouth Bass | 350AVE3 | 0.58 | | | | | |
| 5 | Pinecrest | 1 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 0.0 | 0.0 |
| 5 | Pinecrest | 1 | Rainbow Trout | C2 | 0.03 | | | | | |
| 5 | Reservoir C | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 2.2 | 0.0 |
| 5 | Reservoir C | 2 | Rainbow Trout | C2 | 0.01 | | | | | |
| 5 | Rollins Reservoir | 2 | Sacramento Sucker | C1 | 0.68 | 0.0 | 0.43 | 0.4 | 0.1 | 13.5 |
| 5 | Rollins Reservoir | 2 | Smallmouth Bass | AVE1 | 0.85 | | | | | |
| 5 | San Luis Reservoir | 1 | Common Carp | C1 | 0.25 | 6.1 | | 9.9 | 175.1 | 80.8 |
| 5 | San Luis Reservoir | 1 | Common Carp | C2 | 0.35 | 2.5 | | 7.5 | 90.0 | 41.7 |
| 5 | San Luis Reservoir | 1 | Common Carp | C3 | 0.19 | 11.3 | | 19.9 | 323.6 | 133.1 |
| 5 | San Luis Reservoir | 1 | Common Carp | LC | | 6.4 | 0.45 | 16.0 | 219.8 | 99.9 |
| 5 | San Luis Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.51 | | | | | |
| 5 | San Luis Reservoir | 1 | Largemouth Bass | 350AVE2 | 0.57 | | | | | |
| 5 | San Luis Reservoir | 1 | Largemouth Bass | 350AVE3 | 0.57 | | | | | |
| 5 | San Luis Reservoir | 1 | Largemouth Bass | 350AVE4 | 0.62 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Scotts Flat Reservoir | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 3.2 | 1.2 |
| 5 | Scotts Flat Reservoir | 2 | Rainbow Trout | C2 | 0.03 | | | | | |
| 5 | Shasta Lake | 1 | Channel Catfish | C1 | 0.36 | | | | | |
| 5 | Shasta Lake | 1 | Channel Catfish | C2 | 0.80 | | | | | |
| 5 | Shasta Lake | 1 | Channel Catfish | LC | | 0.0 | 0.33 | 2.8 | 8.4 | 18.2 |
| 5 | Shasta Lake | 1 | Spotted Bass | AVE1 | 0.32 | | | | | |
| 5 | Shasta Lake | 1 | Spotted Bass | AVE2 | 0.18 | | | | | |
| 5 | Shasta Lake | 1 | Spotted Bass | AVE3 | 0.11 | | | | | |
| 5 | Shasta Lake | 1 | Spotted Bass | AVE4 | 0.03 | | | | | |
| 5 | Silver Lake | 2 | Rainbow Trout | C1 | 0.05 | 0.0 | | 0.0 | 2.1 | 0.0 |
| 5 | Siskiyou Lake | 2 | Smallmouth Bass | AVE1 | 0.24 | | | | | |
| 5 | Siskiyou Lake | 2 | Smallmouth Bass | C1 | | 0.0 | 0.36 | 0.2 | 1.8 | 0.9 |
| 5 | Spicer Meadow Reservoir | 2 | Rainbow Trout | C1 | 0.15 | 0.0 | | 0.0 | 1.9 | 0.0 |
| 5 | Spicer Meadow Reservoir | 2 | Rainbow Trout | C2 | 0.12 | | | | | |
| 5 | Stony Gorge Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.34 | | | | | |
| 5 | Stony Gorge Reservoir | 1 | Largemouth Bass | 350AVE2 | 0.45 | | | | | |
| 5 | Stony Gorge Reservoir | 1 | Sacramento Sucker | C1 | 0.11 | | | | | |
| 5 | Stony Gorge Reservoir | 1 | Sacramento Sucker | C2 | 0.14 | | | | | |
| 5 | Stony Gorge Reservoir | 1 | Sacramento Sucker | LC | | 0.0 | 0.38 | 0.0 | 0.5 | 0.0 |
| 5 | Stump Meadow Lake | 1 | Brown Trout | C1 | 0.06 | 0.0 | | 0.2 | 5.1 | 1.3 |
| 5 | Success Lake | 2 | Common Carp | C1 | 0.26 | | | | | |
| 5 | Success Lake | 2 | Common Carp | C2 | 0.27 | | | | | |
| 5 | Success Lake | 2 | Common Carp | C3 | 0.16 | | | | | |
| 5 | Success Lake | 2 | Common Carp | LC | | 0.0 | 0.16 | 1.7 | 2.1 | 6.7 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Success Lake | 2 | Rainbow Trout | C1 | 0.03 | | | | | |
| 5 | Success Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Success Lake | 2 | Rainbow Trout | C3 | 0.03 | | | | | |
| 5 | Success Lake | 2 | Rainbow Trout | LC | | 0.0 | | 0.0 | 1.7 | 0.0 |
| 5 | Thermalito Afterbay | 1 | Common Carp | C1 | 0.23 | | | | | 63.1 |
| 5 | Thermalito Afterbay | 1 | Common Carp | C2 | 0.24 | | | | | 51.0 |
| 5 | Thermalito Afterbay | 1 | Common Carp | LC | | 0.0 | 0.15 | 3.2 | 81.5 | 43.8 |
| 5 | Thermalito Afterbay | 1 | Largemouth Bass | 350AVE1 | 0.26 | | | | | |
| 5 | Thermalito Afterbay | 1 | Largemouth Bass | 350AVE2 | 0.17 | | | | | |
| 5 | Tulloch Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.37 | | | | | |
| 5 | Tulloch Reservoir | 1 | Largemouth Bass | C1 | | 0.0 | 0.44 | 2.2 | 1.3 | 1.1 |
| 5 | Tunnel Reservoir | 1 | Sacramento Pikeminnow | AVE1 | 0.20 | | | | | |
| 5 | Tunnel Reservoir | 1 | Sacramento Sucker | C1 | 0.06 | 0.0 | 0.05 | 0.0 | 1.2 | 0.1 |
| 5 | Turlock Lake | 1 | Common Carp | C1 | 0.28 | | | | | |
| 5 | Turlock Lake | 1 | Common Carp | C2 | 0.52 | | | | | |
| 5 | Turlock Lake | 1 | Common Carp | C3 | 0.42 | | | | | |
| 5 | Turlock Lake | 1 | Common Carp | LC | | 0.0 | 0.24 | 3.5 | 13.6 | 7.8 |
| 5 | Turlock Lake | 1 | Largemouth Bass | 350AVE1 | 0.24 | | | | | |
| 5 | Turlock Lake | 1 | Largemouth Bass | 350AVE2 | 0.23 | | | | | |
| 5 | Turlock Lake | 1 | Largemouth Bass | 350AVE3 | 0.21 | | | | | |
| 5 | Union Valley Reservoir | 2 | Rainbow Trout | C1 | 0.03 | | | | | |
| 5 | Union Valley Reservoir | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | Union Valley Reservoir | 2 | Rainbow Trout | LC | | 0.0 | | 0.0 | 2.0 | 0.0 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Unnamed Lake 1 | 1 | Common Carp | C1 | 0.11 | 0.5 | 0.05 | 5.7 | 49.0 | 8.2 |
| 5 | Unnamed Lake 1 | 1 | Largemouth Bass | 350AVE1 | 0.20 | | | | | |
| 5 | Unnamed Lake 2 | 1 | Common Carp | C1 | 0.19 | 0.0 | 0.05 | 0.2 | 6.3 | 0.8 |
| 5 | Unnamed Lake 2 | 1 | Common Carp | C2 | 0.20 | | | | | |
| 5 | Unnamed Lake 2 | 1 | Largemouth Bass | 350AVE1 | 0.20 | | | | | |
| 5 | Upper Blue Lake | 2 | Rainbow Trout | C1 | 0.03 | 0.4 | | 0.0 | 3.1 | 0.0 |
| 5 | Upper Blue Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 5 | West Valley Reservoir | 1 | Sacramento Sucker | C1 | 0.34 | 0.0 | 0.05 | 0.4 | 4.4 | 1.6 |
| 5 | West Valley Reservoir | 1 | Sacramento Sucker | C2 | 0.41 | | | | | |
| 5 | Whiskeytown Lake | 2 | Largemouth Bass | 350AVE1 | 0.22 | | | | | |
| 5 | Whiskeytown Lake | 2 | Largemouth Bass | 350AVE2 | 0.16 | | | | | |
| 5 | Whiskeytown Lake | 2 | Largemouth Bass | 350AVE3 | 0.16 | | | | | |
| 5 | Whiskeytown Lake | 2 | Largemouth Bass | LC | | 0.0 | 0.57 | 0.0 | 0.0 | 0.0 |
| 5 | White Pines Lake | 1 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 0.0 | 0.1 |
| 5 | White Pines Lake | 1 | Rainbow Trout | C2 | 0.03 | | | | | |
| 5 | Wishon Reservoir | 1 | Rainbow Trout | C1 | 0.05 | 0.0 | | 0.0 | 2.4 | 1.5 |
| 5 | Wishon Reservoir | 1 | Rainbow Trout | C2 | 0.04 | | | | | |
| 5 | Woodward Reservoir | 1 | Common Carp | C1 | 0.23 | | | | | |
| 5 | Woodward Reservoir | 1 | Common Carp | C2 | 0.17 | | | | | |
| 5 | Woodward Reservoir | 1 | Common Carp | LC | | 0.5 | 0.32 | 3.3 | 5.2 | 2.0 |
| 5 | Woodward Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.31 | | | | | |
| 5 | Woodward Reservoir | 1 | Largemouth Bass | 350AVE2 | 0.25 | | | | | |
| 5 | Yosemite Lake | 1 | Common Carp | C1 | 0.09 | 1.1 | 0.63 | 5.9 | 50.9 | 38.8 |
| 5 | Yosemite Lake | 1 | Common Carp | C2 | 0.05 | | | | | 36.6 |
| 5 | Yosemite Lake | 1 | Largemouth Bass | 350AVE1 | 0.21 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Zayak/Swan Lake | 1 | Largemouth Bass | 350AVE1 | 0.98 | | | | | |
| 5 | Zayak/Swan Lake | 1 | Largemouth Bass | C1 | | 0.0 | 0.19 | 0.6 | 0.0 | 0.1 |
| 6 | Apollo Lake | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 1.1 | 0.0 |
| 6 | Apollo Lake | 2 | Rainbow Trout | C2 | 0.04 | | | | | |
| 6 | Boca Reservoir | 2 | Rainbow Trout | C1 | 0.03 | | | | | |
| 6 | Boca Reservoir | 2 | Sacramento Sucker | C1 | 0.10 | 0.0 | 0.08 | 0.0 | 1.1 | 0.0 |
| 6 | Boca Reservoir | 2 | Sacramento Sucker | C2 | 0.09 | | | | | |
| 6 | Bridgeport Reservoir | 1 | Rainbow Trout | C1 | 0.02 | | | | | |
| 6 | Bridgeport Reservoir | 1 | Rainbow Trout | C2 | 0.02 | | | | | |
| 6 | Bridgeport Reservoir | 1 | Rainbow Trout | LC | | 0.0 | | 0.0 | 0.6 | 0.0 |
| 6 | Convict Lake | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 1.5 | 0.0 |
| 6 | Convict Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 6 | Crater Lake | 1 | Rainbow Trout | C1 | 0.07 | 0.0 | | 0.2 | 1.3 | 0.3 |
| 6 | Crater Lake | 1 | Rainbow Trout | C2 | 0.04 | | | | | |
| 6 | Dodge Reservoir | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 2.1 | 0.0 |
| 6 | Dodge Reservoir | 2 | Rainbow Trout | C2 | 0.03 | | | | | |
| 6 | Donner Lake | 1 | Rainbow Trout | C1 | 0.04 | 0.0 | | 0.2 | 2.6 | 2.3 |
| 6 | Donner Lake | 1 | Rainbow Trout | C2 | 0.04 | | | | | |
| 6 | Eagle Lake | 1 | Eagle Lake Trout | C1 | 0.07 | | | | | |
| 6 | Eagle Lake | 1 | Eagle Lake Trout | C2 | 0.06 | | | | | |
| 6 | Eagle Lake | 1 | Eagle Lake Trout | C3 | 0.05 | | | | | |
| 6 | Eagle Lake | 1 | Eagle Lake Trout | C4 | 0.05 | | | | | |
| 6 | Eagle Lake | 1 | Eagle Lake Trout | LC | | 0.0 | | 0.7 | 2.0 | 1.9 |
| 6 | Ellery Lake | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 2.2 | 0.0 |
| 6 | Ellery Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Fallen Leaf Lake | 2 | Lake Trout | C1 | 0.16 | | | | | |
| 6 | Fallen Leaf Lake | 2 | Lake Trout | C2 | 0.15 | | | | | |
| 6 | Fallen Leaf Lake | 2 | Lake Trout | LC | | 0.5 | | 11.3 | 36.8 | 8.6 |
| 6 | Grant Lake | 1 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 3.3 | 0.6 |
| 6 | Grant Lake | 1 | Rainbow Trout | C2 | 0.03 | | | | | |
| 6 | Gull Lake | 2 | Rainbow Trout | C1 | 0.02 | 0.0 | | 0.0 | 1.9 | 0.0 |
| 6 | Gull Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 6 | Indian Creek Reservoir | 2 | Rainbow Trout | C1 | 0.08 | 0.6 | | 0.7 | 0.5 | 0.0 |
| 6 | Indian Creek Reservoir | 2 | Rainbow Trout | C2 | 0.07 | | | | | |
| 6 | June Lake | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 1.5 | 0.0 |
| 6 | June Lake | 2 | Rainbow Trout | C2 | 0.04 | | | | | |
| 6 | Lake Arrowhead | 2 | Largemouth Bass | 350AVE1 | 0.34 | | | | | |
| 6 | Lake Arrowhead | 2 | Largemouth Bass | C1 | | 0.0 | 0.21 | 0.5 | 0.9 | 0.5 |
| 6 | Lake Crowley | 1 | Rainbow Trout | C1 | 0.08 | | | | | |
| 6 | Lake Crowley | 1 | Rainbow Trout | C2 | 0.13 | | | | | |
| 6 | Lake Crowley | 1 | Rainbow Trout | LC | | 0.0 | | 0.0 | 0.5 | 0.0 |
| 6 | Lake George | 1 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 1.8 | 0.4 |
| 6 | Lake Gregory | 2 | Common Carp | C1 | 0.02 | 0.5 | 0.08 | 5.0 | 0.7 | 1.2 |
| 6 | Lake Gregory | 2 | Common Carp | C2 | 0.02 | | | | | |
| 6 | Lake Gregory | 2 | Largemouth Bass | 350AVE1 | 0.19 | | | | | |
| 6 | Lake Mamie | 2 | Rainbow Trout | C1 | 0.02 | 0.5 | | 0.2 | 2.7 | 0.0 |
| 6 | Lake Mamie | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 6 | Lake Mary | 1 | Rainbow Trout | C1 | 0.04 | 0.0 | | 0.0 | 3.2 | 2.5 |
| 6 | Lake Mary | 1 | Rainbow Trout | C2 | 0.03 | | | | | |
| 6 | Lake Sabrina | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 1.1 | 0.0 |
| 6 | Lake Sabrina | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 6 | Lake Tahoe | 1 | Rainbow Trout | C1 | 0.06 | | | | | |
| 6 | Lake Tahoe | 1 | Rainbow Trout | C2 | 0.08 | | | | | |
| 6 | Lake Tahoe | 1 | Rainbow Trout | C3 | 0.04 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Lake Tahoe | 1 | Rainbow Trout | C4 | 0.07 | | | | | |
| 6 | Lake Tahoe | 1 | Rainbow Trout | LC | | 0.0 | | 0.4 | 1.3 | 2.3 |
| 6 | Little Rock Reservoir | 2 | Common Carp | C1 | 0.43 | 0.0 | 0.33 | 2.9 | 1.3 | 7.5 |
| 6 | Little Rock Reservoir | 2 | Common Carp | C2 | 0.37 | | | | | |
| 6 | Little Rock Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.92 | | | | | |
| 6 | Lundy Lake | 2 | Rainbow Trout | C1 | 0.06 | 0.9 | | 0.7 | 2.4 | 3.2 |
| 6 | Lundy Lake | 2 | Rainbow Trout | C2 | 0.05 | | | | | |
| 6 | Palmdale Lake | 1 | Channel Catfish | C1 | 0.06 | 0.5 | 0.18 | 1.2 | 10.4 | 20.0 |
| 6 | Palmdale Lake | 1 | Channel Catfish | C2 | 0.06 | | | | | |
| 6 | Palmdale Lake | 1 | Largemouth Bass | 350AVE1 | 0.13 | | | | | |
| 6 | Pleasant Valley Reservoir | 2 | Rainbow Trout | C1 | 0.08 | 0.0 | | 0.0 | 2.9 | 0.2 |
| 6 | Pleasant Valley Reservoir | 2 | Rainbow Trout | C2 | 0.06 | | | | | |
| 6 | Prosser Creek Reservoir | 1 | Rainbow Trout | C1 | 0.10 | 0.0 | | 0.0 | 0.7 | 0.1 |
| 6 | Prosser Creek Reservoir | 1 | Rainbow Trout | C2 | 0.09 | | | | | |
| 6 | Rock Creek Lake | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 2.2 | 0.0 |
| 6 | Rock Creek Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 6 | Saddlebag Lake | 2 | Rainbow Trout | C1 | 0.02 | 0.5 | | 0.7 | 2.8 | 0.8 |
| 6 | Saddlebag Lake | 2 | Rainbow Trout | C2 | 0.03 | | | | | |
| 6 | Silver Lake (Region 6) | 1 | Brown Trout | C1 | 0.05 | 0.0 | | 0.0 | 0.8 | 27.8 |
| 6 | Silverwood Lake | 1 | Largemouth Bass | 350AVE1 | 0.49 | | | | | |
| 6 | Silverwood Lake | 1 | Largemouth Bass | C1 | | 0.0 | 0.35 | 1.4 | 13.8 | 131.4 |
| 6 | Silverwood Lake | 1 | Largemouth Bass | C2 | | 0.0 | | 1.1 | 8.5 | 54.8 |
| 6 | Spring Valley Lake | 1 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 4.7 | 12.2 |
| 6 | Spring Valley Lake | 1 | Rainbow Trout | C2 | 0.04 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Stampede Reservoir | 2 | Rainbow Trout | C1 | 0.03 | | | | | |
| 6 | Stampede Reservoir | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 6 | Stampede Reservoir | 2 | Rainbow Trout | C3 | 0.03 | | | | | |
| 6 | Stampede Reservoir | 2 | Rainbow Trout | LC | | 0.0 | | 0.0 | 1.8 | 0.0 |
| 6 | Tioga Lake | 2 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 2.6 | 0.2 |
| 6 | Tioga Lake | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 6 | Topaz Lake | 2 | Rainbow Trout | C1 | 0.18 | | | | | |
| 6 | Topaz Lake | 2 | Sacramento Sucker | C1 | 0.24 | 0.0 | 0.22 | 0.2 | 0.0 | 1.3 |
| 6 | Topaz Lake | 2 | Sacramento Sucker | C2 | 0.12 | | | | | |
| 6 | Twin Lakes | 2 | Rainbow Trout | C1 | 0.02 | 0.5 | | 0.7 | 2.2 | 1.5 |
| 6 | Twin Lakes | 2 | Rainbow Trout | C2 | 0.02 | | | | | |
| 6 | Upper Twin Lake | 1 | Brown Trout | C1 | 0.06 | | | | | |
| 6 | Upper Twin Lake | 1 | Sacramento Sucker | C1 | 0.30 | 0.0 | 0.37 | 0.2 | 2.2 | 0.5 |
| 6 | Upper Twin Lake | 1 | Sacramento Sucker | C2 | 0.37 | | | | | |
| 6 | Virginia Lakes | 1 | Rainbow Trout | C1 | 0.03 | 0.0 | | 0.0 | 2.3 | 0.9 |
| 6 | Virginia Lakes | 1 | Rainbow Trout | C2 | 0.03 | | | | | |
| 7 | Ferguson Lake | 1 | Common Carp | C1 | 0.03 | 0.0 | 1.87 | 0.7 | 7.7 | 1.8 |
| 7 | Ferguson Lake | 1 | Common Carp | C2 | 0.02 | | | | | |
| 7 | Ferguson Lake | 1 | Largemouth Bass | 350AVE1 | 0.09 | | | | | |
| 7 | Gene Wash Reservoir | 1 | Common Carp | C1 | 0.02 | 0.0 | 2.67 | 0.0 | 1.6 | 1.3 |
| 7 | Gene Wash Reservoir | 1 | Common Carp | C2 | 0.01 | | 1.60 | | | |
| 7 | Gene Wash Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.08 | | | | | |
| 7 | Lake Cahuilla | 1 | Common Carp | C1 | 0.01 | 0.0 | 2.09 | 0.0 | 31.4 | 0.6 |
| 7 | Lake Cahuilla | 1 | Common Carp | C2 | 0.01 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 7 | Lake Havasu | 1 | Common Carp | C1 | 0.02 | | 1.70 | | | |
| 7 | Lake Havasu | 1 | Common Carp | C2 | 0.02 | | 1.81 | | | |
| 7 | Lake Havasu | 1 | Common Carp | C3 | 0.06 | | 1.17 | | | |
| 7 | Lake Havasu | 1 | Common Carp | C4 | 0.05 | | 1.40 | | | |
| 7 | Lake Havasu | 1 | Common Carp | LC | | 0.0 | 2.32 | 0.2 | 3.8 | 1.2 |
| 7 | Ramer Lake | 1 | Black Crappie | C1 | 0.03 | | | | | |
| 7 | Ramer Lake | 1 | Black Crappie | C2 | 0.04 | | | | | |
| 7 | Ramer Lake | 1 | Common Carp | C1 | 0.01 | 0.0 | 3.85 | 0.0 | 13.5 | 0.0 |
| 7 | Ramer Lake | 1 | Common Carp | C2 | 0.01 | | 2.19 | | | |
| 7 | Salton Sea | 1 | Tilapia1 | C1 | 0.01 | | 2.24 | | | |
| 7 | Salton Sea | 1 | Tilapia1 | C2 | 0.01 | | 2.70 | | | |
| 7 | Salton Sea | 1 | Tilapia1 | C3 | 0.01 | | 2.57 | | | |
| 7 | Salton Sea | 1 | Tilapia1 | C4 | 0.01 | | 2.82 | | | |
| 7 | Salton Sea | 1 | Tilapia1 | LC | | 0.0 | 3.52 | 0.0 | 3.0 | 0.0 |
| 7 | Senator Wash Reservoir | 1 | Common Carp | C1 | 0.10 | 0.0 | 2.49 | 0.0 | 5.3 | 1.4 |
| 7 | Senator Wash Reservoir | 1 | Common Carp | C2 | 0.09 | | 1.91 | | | |
| 7 | Senator Wash Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.15 | | | | | |
| 7 | Wiest Lake | 1 | Black Crappie | C1 | 0.01 | | | | | |
| 7 | Wiest Lake | 1 | Channel Catfish | C1 | 0.01 | 0.5 | 0.84 | 0.3 | 48.6 | 4.2 |
| 8 | Big Bear Lake | 1 | Common Carp | C1 | 0.19 | 0.5 | | 6.5 | 14.7 | 36.8 |
| 8 | Big Bear Lake | 1 | Common Carp | C2 | 0.25 | 0.0 | | 7.6 | 19.3 | 37.9 |
| 8 | Big Bear Lake | 1 | Common Carp | C3 | 0.21 | 0.0 | | 7.9 | 25.5 | 57.9 |
| 8 | Big Bear Lake | 1 | Common Carp | LC | | 0.0 | 0.05 | 6.1 | 18.8 | 51.7 |
| 8 | Irvine Lake | 1 | Common Carp | C1 | 0.09 | 0.0 | 1.99 | 4.0 | 7.9 | 4.6 |
| 8 | Irvine Lake | 1 | Common Carp | C2 | 0.11 | | | | | |
| 8 | Irvine Lake | 1 | Largemouth Bass | 350AVE1 | 0.48 | | | | | |
| 8 | Lake Elsinore | 1 | Common Carp | C1 | 0.14 | 0.0 | | 3.3 | 16.1 | 17.5 |
| 8 | Lake Elsinore | 1 | Common Carp | C2 | 0.16 | 0.0 | | 6.0 | 31.4 | 53.1 |
| 8 | Lake Elsinore | 1 | Common Carp | LC | | 0.5 | 0.23 | 3.6 | 17.7 | 34.2 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Lake Elsinore | 1 | Largemouth Bass | 350AVE1 | 0.12 | | | | | |
| 8 | Lake Elsinore | 1 | Largemouth Bass | 350AVE2 | 0.12 | | | | | |
| 8 | Lake Evans | 2 | Common Carp | C1 | 0.01 | 0.0 | 0.76 | 0.3 | 12.2 | 4.9 |
| 8 | Lake Evans | 2 | Common Carp | C2 | 0.01 | | | | | |
| 8 | Lake Evans | 2 | Largemouth Bass | 350AVE1 | 0.03 | | | | | |
| 8 | Lake Hemet | 2 | Common Carp | C1 | 0.10 | 0.0 | 0.08 | 1.0 | 3.9 | 0.5 |
| 8 | Lake Hemet | 2 | Common Carp | C2 | 0.12 | | | | | |
| 8 | Lake Hemet | 2 | Rainbow Trout | C1 | 0.03 | | | | | |
| 8 | Lake Mathews | 1 | Striped Bass | AVE1 | 0.25 | | | | | |
| 8 | Lake Mathews | 1 | Striped Bass | AVE2 | 0.20 | | | | | |
| 8 | Lake Mathews | 1 | Striped Bass | AVE3 | 0.19 | | | | | |
| 8 | Lake Mathews | 1 | Striped Bass | LC | | 0.0 | 1.52 | 0.3 | 7.6 | 8.9 |
| 8 | Lee Lake/ Corona Lake | 2 | Largemouth Bass | 350AVE1 | 0.16 | | | | | |
| 8 | Lee Lake/ Corona Lake | 2 | Largemouth Bass | C1 | | 0.0 | 0.61 | 1.7 | 4.7 | 16.4 |
| 8 | Perris Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.10 | | | | | |
| 8 | Perris Reservoir | 2 | Largemouth Bass | 350AVE2 | 0.10 | | | | | |
| 8 | Perris Reservoir | 2 | Largemouth Bass | LC | | 0.0 | 0.56 | 1.3 | 193.1 | 11.8 |
| 8 | Prado Lake | 1 | Common Carp | C1 | 0.02 | 0.0 | 0.31 | 0.3 | 6.6 | 7.1 |
| 8 | Prado Lake | 1 | Common Carp | C2 | 0.02 | | | | | |
| 8 | Prado Lake | 1 | Largemouth Bass | 350AVE1 | 0.07 | | | | | |
| 9 | Dixon Lake | 2 | Largemouth Bass | 350AVE1 | 0.06 | | | | | |
| 9 | Dixon Lake | 2 | Largemouth Bass | C1 | | 0.0 | 1.01 | 0.0 | 1.1 | 0.8 |
| 9 | El Capitan Lake | 2 | Largemouth Bass | 350AVE1 | 0.36 | | | | | |
| 9 | El Capitan Lake | 2 | Largemouth Bass | 350AVE2 | 0.33 | | | | | |
| 9 | El Capitan Lake | 2 | Largemouth Bass | LC | | 0.0 | 1.00 | 0.7 | 1.2 | 0.4 |
| 9 | Lake Henshaw | 2 | Common Carp | C1 | 0.10 | | | | | |
| 9 | Lake Henshaw | 2 | Common Carp | C2 | 0.07 | | | | | |
| 9 | Lake Henshaw | 2 | Common Carp | LC | | 0.0 | 1.42 | 0.0 | 1.4 | 0.0 |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Lake Henshaw | 2 | Largemouth Bass | 350AVE1 | 0.19 | | | | | |
| 9 | Lake Henshaw | 2 | Largemouth Bass | 350AVE2 | 0.16 | | | | | |
| 9 | Lake Hodges | 1 | Common Carp | C1 | 0.17 | 0.0 | 0.22 | 3.8 | 25.9 | 4.9 |
| 9 | Lake Hodges | 1 | Common Carp | C2 | 0.17 | | | | | |
| 9 | Lake Hodges | 1 | Largemouth Bass | 350AVE1 | 0.29 | | | | | |
| 9 | Lake Jennings | 2 | Channel Catfish | C1 | 0.05 | 1.3 | 0.19 | 0.3 | 8.6 | 0.8 |
| 9 | Lake Jennings | 2 | Largemouth Bass | 350AVE1 | 0.16 | | | | | |
| 9 | Lake Poway | 2 | Largemouth Bass | 350AVE1 | 0.05 | | | | | |
| 9 | Lake Poway | 2 | Largemouth Bass | C1 | | 0.0 | 1.42 | 0.4 | 1.0 | 0.5 |
| 9 | Lake Sutherland | 2 | Largemouth Bass | 350AVE1 | 0.34 | | | | | |
| 9 | Lake Sutherland | 2 | Largemouth Bass | C1 | | 0.0 | 1.22 | 0.3 | 0.5 | 0.0 |
| 9 | Lake Wohlford | 2 | Largemouth Bass | 350AVE1 | 0.05 | | | | | |
| 9 | Lake Wohlford | 2 | Largemouth Bass | C1 | | 0.0 | 0.91 | 0.7 | 2.2 | 0.6 |
| 9 | Loveland Reservoir | 1 | Common Carp | C1 | 0.09 | 0.0 | 0.62 | 1.8 | 1.5 | 1.7 |
| 9 | Loveland Reservoir | 1 | Common Carp | C2 | 0.11 | | | | | |
| 9 | Loveland Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.63 | | | | | |
| 9 | Lower Otay Reservoir | 1 | Common Carp | C1 | 0.05 | 0.6 | 0.49 | 13.1 | 77.0 | 29.2 |
| 9 | Lower Otay Reservoir | 1 | Common Carp | C2 | 0.10 | 0.0 | | 6.5 | 51.0 | 15.8 |
| 9 | Lower Otay Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.20 | | | | | |
| 9 | Morena Reservoir | 2 | Common Carp | C1 | 0.35 | 0.0 | 0.64 | 2.3 | 5.3 | 5.2 |
| 9 | Morena Reservoir | 2 | Common Carp | C2 | 0.31 | | | | | |
| 9 | Morena Reservoir | 2 | Largemouth Bass | 350AVE1 | 0.36 | | | | | |
| 9 | San Vicente Reservoir | 1 | Common Carp | C1 | 0.05 | 0.0 | 1.40 | 4.0 | 4.5 | 6.1 |
| 9 | San Vicente Reservoir | 1 | Common Carp | C2 | 0.05 | | | | | |
| 9 | San Vicente Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.34 | | | | | |

| Regional Board | Station Name | Study Year | Common Name | Sample Type | Mercury (µg/g ww) | Dieldrin (ng/g ww) | Selenium (µg/g ww) | Sums of Chlordanes (ng/g ww) | Sums of DDTs (ng/g ww) | Sum of PCBs (ng/g ww) |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Sweetwater Reservoir | 1 | Common Carp | C1 | 0.20 | 1.0 | 0.53 | 7.2 | 16.0 | 12.3 |
| 9 | Sweetwater Reservoir | 1 | Common Carp | C2 | 0.16 | | | | | |
| 9 | Sweetwater Reservoir | 1 | Largemouth Bass | 350AVE1 | 0.23 | | | | | |

# APPENDIX 2 A

**List of lakes identified for trend analysis.**
From Davis et al. (2007a).

| Sampling Sequence | NAME | Region | County | Area (ha) | Elevation (ft) |
|---|---|---|---|---|---|
| 166 | Barrett | 9 | SAN DIEGO | 50.7 | 1593 |
| 131 | Big Bear Lake | 8 | SAN BERNARDINO | 1102.4 | 6760 |
| 199 | Bridgeport Reservoir | 6 | MONO | 1058.1 | 6456 |
| 95 | Castaic Lake | 4 | LOS ANGELES | 923.4 | 1518 |
| 28 | Donner Lake | 6 | NEVADA | 331.5 | 5936 |
| 213 | Eagle Lake | 6 | LASSEN | 8118 | 5110 |
| 58 | Elsinore, Lake | 8 | RIVERSIDE | 983.6 | 1242 |
| Other | Ferguson Lake | 7 | IMPERIAL | 197.2 | 191 |
| 115 | Lake Cahuilla | 7 | RIVERSIDE | 48.1 | 22 |
| 55 | Lake Casitas | 4 | VENTURA | 699. | 6519 |
| 217 | Lake Chabot (San Leandro) | 2 | ALAMEDA | 126 | 522 |
| 27 | Lake Crowley | 6 | MONO | 1966.9 | 6768 |
| 216 | Lake Havasu | 7 | MOHAVE | 7985.7 | 451 |
| 70 | Lake Hodges | 9 | SAN DIEGO | 165.6 | 277 |
| 149 | Lake Mendocino | 1 | MENDOCINO | 689.5 | 741 |
| 60 | Lake Nacimiento | 3 | SAN LUIS OBISPO | 2330.8 | 806 |
| 133 | Lake Natoma | 5 | SACRAMENTO | 196.3 | 129 |
| 137 | Lake Pillsbury | 1 | LAKE | 798.7 | 1820 |
| 179 | Lake Piru | 4 | VENTURA | 493.9 | 1078 |
| 164 | Lake San Antonio | 3 | MONTEREY | 2194.1 | 780 |
| Other | Lake Shastina | 1 | SISKIYOU | 363 | 2808 |
| 121 | Lake Sonoma | 1 | SONOMA | 962.1 | 452 |
| 209 | Lake Trinity | 1 | TRINITY | 6497 | 2374 |

| Sampling Sequence | NAME | Region | County | Area (ha) | Elevation (ft) |
|---|---|---|---|---|---|
| 80 | Loon Lake | 5 | EL DORADO | 399.2 | 6381 |
| 182 | Lower Otay | 9 | SAN DIEGO | 425.1 | 494 |
| 158 | Oso Flaco Lake | 3 | SAN LUIS OBISPO | 9.4 | 21 |
| 88 | Pinto Lake | 3 | SANTA CRUZ | 46.7 | 114 |
| 187 | Prado Park Lake | 8 | RIVERSIDE | 8.8 | 487 |
| 51 | Puddingstone Reservoir | 4 | LOS ANGELES | 98.4 | 941 |
| 75 | Ramer Lake | 7 | IMPERIAL | 62.8 | 174 |
| 171 | Salton Sea | 7 | RIVERSIDE | 94403.1 | 231 |
| 200 | San Luis Reservoir | 5 | MERCED | 5208.2 | 555 |
| 205 | San Pablo Reservoir | 2 | CONTRA COSTA | 317.3 | 318 |
| 210 | Santiago Reservoir/Irvine Lake | 8 | ORANGE | 234.6 | 794 |
| 18 | Shasta Lake | 5 | SHASTA | 11036.9 | 1077 |
| 35 | Silverwood Lake | 6 | BERNARDINO | 364.4 | 3375 |
| 93 | Soulejule | 2 | MARIN | 19.7 | 258 |
| 48 | Stevens Creek Reservoir | 2 | SANTA CLARA | 36.8 | NA |
| 46 | Sweetwater Reservoir | 9 | SAN DIEGO | 372.4 | 242 |
| 40 | Tahoe, Lake | 6 | PLACER | 49692.2 | 6231 |
| 19 | Wiest Lake | 7 | IMPERIAL | 16.8 | 162 |

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