

### Summary Concentrations of Trace Elements in Bay/Delta Estuary Biota

Trace Element	Concentration (ppm wet weight)					Concentrations Exceeding Alert Levels in Delta <sup>a</sup>	Comments
	Mussel	Clam	Fish	Bird	Seal		
Cadmium	0.11 - 4.91	--	0.03 - 0.48	4.17	<0.06 - 0.33	No, but elevated levels in Bay shellfish	Highly persistent in mammals once accumulated; Highly bioavailable
Copper	0.314 - 4.385	10 - 100	1.3 - 3.0	7.14 - 13.86	3.0 - 8.7	Yes. Levels in some Suisun Bay and Delta fish exceed MIS.	Elevated levels acutely toxic to striped bass;
Mercury	0.01 - 0.46	--	0.13 - 0.94	0.16 - 0.6	0.40 - 3.65	Yes. Levels in some Delta fish exceed MIS.	May interact with selenium in biota; Health advisories for consumption of striped bass; Bioaccumulates; Elevated levels in Endangered Clapper Rail may be causing reproductive effects; Reproductive effects in Willets.
Selenium	0.19 - 0.66	0.3 - 1.30	0.28 - 22.0	24 - 58	2.07 - 6.49	No, but elevated levels in Bay shellfish, fish, and ducks	Elevated levels detected in striped bass tissues; Causes bird deformities and reproductive problems; Health advisories for consumption of fish from Kesterson area; Bivalve accumulation in Bay/Delta
Zinc	11.0 - 45.8	--	16.0 - 43.0	21.6	--	No alert levels established for tissue.	Elevated levels detected in striped bass tissues;

<sup>a</sup> Alert Levels refer to maximum tissue residue levels that are protective of human health. They include:

- 1) the median international standard (MIS), which is a general guideline of what other nations consider to be elevated contaminant levels in fish and shellfish tissue;
- 2) the U.S. Food and Drug Administration (FDA) action levels, which represent maximum allowable concentrations for some toxic substances in human foods;
- 3) the State Department of Health Service's maximum allowable residue levels (MARL), established to ensure that a consumer of specified fish or wildlife species does not exceed the permissible intake level for particular contaminants.

Source: Monroe, Michael W., Judy Kelly, and Nina Lisowski. 1992. State of the Estuary. San Francisco Estuary Project. 270 pp.

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