



CORPORATE HEADQUARTERS

November 17, 2014

SENT VIA EMAIL TO: paula.wilson@deq.idaho.gov

Ms. Paula Wilson
Idaho Department of Environmental Quality
1410 North Hilton
Boise, ID 83706

Dear Ms. Wilson

During the October 2, 2014 water quality rulemaking meeting, the topic of “heritage” and “suppression” related to fish consumption rates were discussed. In regards to “suppression”, the question asked and discussed during the meeting was whether the concentrations of chemicals in game fish in Idaho “suppress” fish consumption rates.

As described in the attached Arcadis memo, there is one state-wide advisory for bass consumption and 22 water body-specific advisories for consumption of various other species.¹ All these advisories are based on mercury, with the exception of Lake Coeur d’Alene, which has advisories based on arsenic and lead in addition to mercury.

A fish consumption advisory is based on concentrations of a chemical exceeding risk thresholds based on consuming 8.5 meals (4 ounces uncooked per meal) of fish per month. This equates to a fish consumption rate of 32 grams per day. The risk threshold is adjusted for sensitive populations (children and pregnant women); this may reduce the fish consumption. It should be noted, that as shown in Table 1 of the attachment, for the general population more than 8.5 meals per month of fish can be eaten for most of the waters that have fish advisories. Further, as noted above, such advisories are present on a very small proportion of Idaho waters. Thus, it is unlikely that concentrations of chemicals in fish have any measureable “suppression” effect on the consumption rates of Idaho game fish.

¹ From the perspective of “suppression” of “heritage” rates, the state-wide advisory for bass is not especially relevant given that bass are not native to Idaho having been introduced in the late 1800’s and, thus, would not have been a component of a “heritage” diet of Native Americans. Additionally none of the advisories include anadromous species that are cited as being important components of a “heritage” diet.

Please let me know if you have any questions about the enclosed memo.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Alan L. Prouty', with a stylized flourish extending to the right.

Alan L. Prouty
Vice President, Sustainability & Regulatory Affairs

Attachment – Arcadis Memo



ARCADIS U.S., Inc.
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MEMO

To:
Alan Prouty

Copies:
Joe Meyer

From:
Paul Anderson
Ben Latham
Michele Buonanduci

Date:
November 17, 2014

ARCADIS Project No.:
ME000168.0001

Subject:
Idaho Fish Consumption Advisories and Determinations

This memorandum provides an overview and summary of the Idaho Fish Consumption Advisory Program (IFCAP) fish consumption advisories and listing methodology. This memorandum focuses on fish tissue data that have been collected by IFCAP specifically for use in development of fish consumption advisories for protection of human health and includes a summary of the fish consumption advisory determination process.

The tables that accompany this memorandum summarize the state fish consumption advisories. **Table 1** summarizes the fish consumption limits by water body. **Table 2** summarizes the IFCAP risk assessment assumptions. **Table 3** summarizes the chemical concentrations used to derive the Idaho fish consumption advisories. For some water bodies the specific data used for the setting of the consumption advisories were not available for review (approximately 20 percent of the consumption advisory listings). For those water bodies, available data obtained from other sources were included in **Table 3**. These data are potentially the same data used for the fish consumption limit determination, but the data may be incomplete or may not have been used by IFCAP. There is a potential delay in when fish consumption limits are set and when the data used for the calculation is released (IDHW 2014b), or in some instances the data may not have been released or could not be located in the references obtained for use in the preparation of this memorandum. Additionally, data may have been collected and assessed that did not lead to a fish consumption limit that may not have been released.

1. Existing Fish Consumption Advisories

The Idaho water bodies that currently have fish consumption advisories are summarized on the Idaho Department of Health and Welfare (IDHW) website (<http://healthandwelfare.idaho.gov/Portals/0/Health/EnvironmentalHealth/FishGuide.pdf> - IDHW 2014a) and **Table 1** of this memorandum. There is currently one State-wide advisory for bass consumption and

22 water body-specific advisories for consumption of various other species. All existing advisories are based on mercury, with the exception of Lake Coeur d'Alene, which has advisories based on arsenic and lead in addition to mercury.

Until recently, there was a temporary advisory based on selenium in fish tissue for East Mill Creek, a tributary to Blackfoot River in southeast Idaho. However, these data are not included in this memorandum because this advisory was removed in August 2013 following additional review of the data (IDHW 2013a). Screening values (SVs) were calculated for selenium in fish tissue of the streams of the upper Blackfoot River watershed by the Bureau of Environmental Health and Safety (BEHS), Division of Health, and IDHW for the protection of human health. These SVs were 6.2 mg/kg dry weight (dw) for the general population, 5.4 mg/kg dw for pregnant women, and 3.1 mg/kg dw for children under 7 years old. These values assume a reference dose of 0.005 mg/kg/day (BEHS 2003). Use of these screening values has not been continued by the state of Idaho.

2. Listing Methodology

Fish consumption advisories in Idaho are issued by the IFCAP, an interagency group supported primarily by the IDHW. Additional contributing agencies include the Idaho Department of Environmental Quality (IDEQ), Idaho Department of Fish and Game (IDFG), Idaho Department of Agriculture (IDA), US Geological Survey (USGS), and US Environmental Protection Agency (USEPA). The IFCAP guidance follows the fish advisory guidelines issued by the USEPA (i.e., USEPA 1994, 1995, 1996, 1999), with some Idaho-specific modifications intended to accommodate the specific needs of the State and the limited funding resources of the agencies contributing to the IFCAP program (IDHW 2013b). IFCAP targets water bodies and fish species of interest, conducts tissue sampling, and uses a risk assessment approach to issue consumption advisories based on the sampling results.

a. Sampling Guidelines

IFCAP aims to assess one to five water bodies per year, with prioritization based on the potential contaminants present; frequency of fishing activities; availability of fish for consumption; and public interest in the water body. IFCAP targets popular game species for each water body assessed, with consideration of the size and abundance of the species as well as their potential to bioaccumulate contaminants. Tissue sampling is primarily conducted by the IDFG through the Water Quality Division and USGS. IDHW assesses the data collected and performs the risk assessment for potential exposures associated with fish consumption.

For most species, samples are prepared as fillets and analyzed for various selected metals, pesticides, polychlorinated biphenyls, and polybrominated diphenyl ethers depending on the water body and data needs. For fish known to be canned and eaten whole, fish to be analyzed are gutted and prepared as

whole body carcasses. To achieve a target level of statistical confidence, IFCAP aims to collect and analyze 10 fish per target species per sampling location.

b. Fish Advisory Consideration

When there are insufficient samples to achieve statistical confidence (i.e., less than 10), a warning message or temporary advisory is considered and resampling is recommended when either (a) the maximum fish tissue concentration is three times greater than the action level or (b) the average fish tissue concentration is higher than the action level. When there are sufficient samples to achieve statistical confidence (i.e., 10 or more), an advisory will be issued when either (a) or (b) occurs and reevaluation will only occur when additional environmental information supports the need.

c. Risk Assessment Procedure

The IFCAP guidance states that a consumption advisory will be issued when it is not possible to follow the American Heart Association’s recommendation to eat at least two fish meals a week or roughly 8.5 meals per month without consuming a dose exceeding a health-based screening level [e.g., reference dose (RfD)]. IFCAP (IDHW 2013b) uses the risk assessment assumptions summarized in **Table 2** and the following equations (USEPA 1994) to calculate the recommended meals per month. Consumption advisories in Idaho are risk-based and exist primarily for mercury with some limited advisories for lead and arsenic. Mercury and lead consumption limits are calculated by IDHW based on the non-carcinogenic endpoint, and arsenic limits are calculated on the carcinogenic endpoint.

- Calculation for non-carcinogens:

$$\frac{\text{Meals}}{\text{Month}} = \frac{\frac{\text{RfD} \times \text{BW}}{\text{Conc}} \times 30.44 \text{ days/month}}{\text{MS}}$$

- Calculation for carcinogens:

$$\frac{\text{Meals}}{\text{Month}} = \frac{\frac{\text{TR} \times \text{BW}}{\text{CSF} \times \text{Conc}} \times 70 \text{ years} \times 30.44 \text{ days/month}}{\text{ED} \times \text{MS}}$$

- Where:

RfD = Reference Dose (mg/kg-day)
 CSF = Cancer Slope Factor [(mg/kg-day)⁻¹]
 TR = Target Risk (unitless)
 BW = Body Weight (kg)
 ED = Exposure Duration (30 years)
 Conc = Fish Tissue Concentration (mg/kg)
 MS = Meal Size (kg)

For many waters the recommended consumption limits shown in **Table 1** cannot be replicated using the above equations and the exposure assumption inputs shown in **Table 2**. This is due in part to some additional risk management decisions the State makes once the limits based on those equations have been derived.

For example, based solely on the above equations and the exposure assumptions shown in **Table 2** (i.e., all other assumptions and risk management decisions being equal), consumption limits for the general population should be least restrictive. The mercury consumption limits for pregnant and nursing women should be about 10 percent more restrictive than the limits for the general population, and the consumption limits for children should be about two or six times more stringent than the consumption limits for the general population depending on the RfD that is used for children versus adults (see text that follows regarding the use of variable RfDs). However, review of **Table 1** indicates that for all waters (with the exception of Lake Coeur d'Alene), consumption limits based on mercury are the same for children and pregnant and nursing women and that the consumption limits for both of these receptor groups are about three to four times lower than the consumption limits for the general population rather than the two or six times lower as indicated by the equations cited.

The relative differences in consumption limits among the three receptor groups for Lake Coeur d'Alene differ depending upon lake, species, and tissue type. In some cases (arsenic in whole body Kokanee, **Table 1**) the relative differences between pregnant and nursing women, children, and the general population parallel the differences expected based on the relative intake differences from the assumptions shown in **Table 2** when using the same RfD – as is more generally practiced. In other cases, as with most other waters, the differences in some of the Lake Coeur d'Alene waters cannot be explained by the different assumptions shown in **Table 2** alone.

Based on correspondence with IDHW, when issuing final consumption limits for mercury, the State conservatively reduces the pregnant and nursing women meal consumption limits to equal the consumption limits derived for children (IDHW 2014b). This approach is taken for simplicity with the underlying assumption that the more sensitive population (i.e. children) should dictate meal choices for another sensitive subpopulation. Additionally, the State also employs an RfD for children that is lower (more conservative) than the RfD used for adults for mercury. The mercury RfD for children of 0.0001 milligrams of mercury per kilogram of body weight per day (mg/kg-day) is based on published USEPA data (USEPA 2014). The RfD used for an adult in the general population is a less conservative 0.0003 (mg/kg /day) based on Agency for Toxic Substances and Disease Registry data (ATSDR 2014). The practice of using different RfDs for different populations is a deviation from general practices because reference doses are determined with consideration for all affected populations and as such are generally intended to be applied consistently across populations. The use of differing reference doses is not included in the Idaho Fish Consumption Advisory Protocol (IDHW 2013b). Based on the risk management decision to use different RfDs depending on population and have the consumption limits for pregnant and nursing women be identical to those derived for children, the consumption limits for pregnant and nursing

women and children are inconsistently calculated and deviate from the assumptions included in **Table 2**. In addition, IDHW rounding results for the mercury limits may also be contributing to variability of the limit results (IDHW 2014b). Note that the arsenic and lead consumption advisory limits for Lake Coeur d'Alene were not calculated with these considerations.

3. Chemical Concentrations

The chemical concentrations in tissue collected by IFCAP that are used in development of the fish consumption advisories are summarized in **Table 3**. Specific sampling data could not be located for some of the water bodies where consumption limits are being applied. In some other instances the data used to support the consumption limits could not be located or may be only partially available; however, tissue data that were available from other sources for those water bodies are presented in the summary table for illustrative purposes. Such data are presumably available given the existence of a consumption advisory for such water bodies. IDHW (2014b) indicated that there may be a lag in when data are collected and when the data are published and available to the public via online resources.

4. References

ARCADIS. 2014. Memorandum RE Idaho Fish Tissue Sampling Data. November 5.

ATSDR. 2014. Toxic Substances Portal. Available at:

<http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=24#12> [Accessed October 30, 2014]

Bureau of Environmental Health and Safety (BEHS). 2003. Selenium in Fish Streams of the Upper Blackfoot River Watershed, Southeast Idaho Selenium Project, Soda Springs, Caribou County, Idaho. Idaho Department of Health and Welfare, Division of Health. Available at:

<http://www.atsdr.cdc.gov/HAC/pha/pha.asp?docid=1052&pg=1>

Idaho Department of Health and Welfare (IDHW). 2013a. Health Consultation: Selenium in Fish Tissue, Blackfoot, Salt and Bear River Watersheds, Southeast Idaho. August 28.

IDHW. 2013b. Idaho Fish Consumption Advisory Project Protocol.

IDHW. 2014a. Eat Fish, Be Smart, Choose Wisely: A guide to safe fish consumption for fish caught in Idaho waters. Available at:

<http://healthandwelfare.idaho.gov/Portals/0/Health/EnvironmentalHealth/FishGuide.pdf> [Accessed October 20, 2014]

IDHW. 2014b. Correspondence with Jim Vannoy. Program Manager, Environmental Health Program, Idaho Division of Public Health. October 28 and 30.

US Environmental Protection Agency (USEPA). 1994. Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. Volume II: Risk Assessment and Fish Consumption Limits. Office of Water. EPA823-B-94-004.

USEPA. 1996. Guidance for Assessing Chemical Contamination Data for Use in Fish Advisories. Volume III: Risk Management. Office of Water. EPA823-R-95-00x.

USEPA. 1995. Guidance for Assessing Chemical Contamination Data for Use in Fish Advisories. Volume IV: Risk Communication. Office of Water. EPA823-R-95-001.

USEPA. 1999. Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. Volume I: Fish Sampling and Analysis. 3rd edition – Draft. Office of Water. EPA823-R-99-007.

USEPA. 2014. Integrated Risk Information System (IRIS). Available at: <http://www.epa.gov/iris/> [Accessed October 29, 2014].



Tables

Table 1. Idaho Fish Consumption Advisories

Water Body	Species	Contaminant	Advisory Limit (Meals/Month) [a]			
			Women who are pregnant, planning to become pregnant, or nursing	Children under age 15	General population	
Statewide	Bass	Mercury	2	2	8	
American Falls Reservoir [e]	Utah Sucker	Mercury	2	2	8	
Bear River [f]	Carp	Mercury	4	4	14	
Boise River [e]	Catfish	Mercury	3	3	11	
Brownlee Reservoir	Carp, Catfish, Perch	Mercury	2	2	8	
	Crappie	Mercury	3	3	10	
Chesterfield Reservoir [f]	Rainbow Trout	Mercury	4	4	14	
CJ Strike Reservoir	Bass	Mercury	2	2	8	
Glendale Reservoir [e]	Crappie, Perch	Mercury	3	3	10	
	Bluegill	Mercury	4	4	14	
Grasmere Reservoir [f]	Lahontan Cutthroat Trout	Mercury	3	3	10	
Hells Canyon Reservoir [f]	Carp, Catfish	Mercury	2	2	8	
Jordan Creek [f]	Redband Trout	Mercury	2	2	8	
Lake Coeur d'Alene	All Lakes	Kokanee, Whole Body [b]	Arsenic	10	6	12
		Kokanee, Fillet [b]	Arsenic, Mercury	10	6	20
	Northern Lake	Bullhead, Whole Body [c,d]	Lead	4	3	20
		Bullhead, Fillet [c]	Arsenic, Mercury	24	14	69
	Central Lake	Bullhead, Whole Body [c,d]	Lead	2	0	8
		Bullhead, Fillet [c]	Arsenic	13	7	14
	Southern Lake	Bullhead, Whole Body [c,d]	Lead	13	8	33
Bullhead, Fillet [c]		Arsenic, Mercury	15	9	61	
Lake Lowell	Sucker	Mercury	3	3	10	
	Carp	Mercury	4	4	14	
Lake Pend Oreille	Lake Trout	Mercury	1	1	5	
	Whitefish	Mercury	4	4	14	
Oakley Reservoir [e]	Yellow Perch	Mercury	4	4	14	
	Walleye	Mercury	2	2	8	
Payette Lake [f]	Lake Trout	Mercury	2	2	7	
Payette River [f]	Sucker	Mercury	4	4	14	
Portneuf River [f]	Cutthroat, Rainbow, and Brown Trout	Mercury	3	3	10	
Priest Lake [f]	Lake Trout	Mercury	4	4	14	
Salmon Falls Creek Reservoir	Perch	Mercury	2	2	10	
	Walleye (<16")	Mercury	2	2	10	
	Walleye (16-20")	Mercury	0	0	6	
	Walleye (>20")	Mercury	0	0	2	
	Bass	Mercury	0	0	6	
	Rainbow Trout	Mercury	6	6	22	
Shoofly Reservoir [f]	Lahontan Cutthroat Trout	Mercury	2	2	8	
South Fork Snake River [f]	Brown Trout	Mercury	4	4	14	
Weston Reservoir [f]	Yellow Perch	Mercury	3	3	10	

Notes:

- [a] The amount of fish you can safely eat in a meal depends on your body weight. If you weigh 150 pounds, you can safely eat up to 8 ounces (precooked weight) of fish in a meal. To adjust the meal size for lighter or heavier weight, subtract or add 1 ounce of fish for every 20 pound difference in body weight.
- [b] Kokanee are similar to many fish in the lake that were not tested. It is possible that these fish have high levels of arsenic and mercury, and the guidelines for Kokanee should be followed for these fish: Bluegill, Crappie and Perch less than 8 inches, Pumpkinseed, Rainbow Trout, Brook Trout, Cutthroat Trout & Tench.
- [c] Bullhead are similar to many fish in the lake that were not tested. It is possible that these fish have high levels of lead, arsenic and mercury, and the guidelines for Bullhead should be followed for these fish: Channel Catfish and Suckers.
- [d] People with increased blood lead levels or living in an area with high concentrations of lead in their yard soil or house dust should eat less whole Bullhead than suggested in this advisory. This is especially true for children and pregnant women.
- [e] Data related to these consumption restrictions could not be located.
- [f] Partial data sets for these water bodies was available for review as shown in Table 3; however, the consumption limits may be based on additional or different data that was not available.

Table 2. IFCAP Risk Assessment Assumptions

Parameter	General Population	Pregnant Women [a]	Children [b]
Body Weight (kg)	80	70	20
Meal Size, Uncooked (oz)	4	4	2.25
Arsenic Cancer Slope Factor (mg/kg-day) ⁻¹	1.5 [c]	1.5 [c]	1.5 [c]
Lead Diet Slope Factor (ug/dL per ug Pb ingested per day)	0.027 [d]	0.034 [d]	0.24 [d]
Mercury Reference Dose (mg/kg-day)	0.0003 [e]	0.0003 [e]	0.0001 [f]

Notes:

- [a] Pregnant women, women planning to be pregnant, and nursing mothers
- [b] Children 6 years old or younger
- [c] Cancer slope factor from Agency for Toxic Substances and Disease Registry (ATSDR)
- [d] Slope factor from ATSDR
- [e] Reference dose for adults from ATSDR
- [f] Reference dose for children from EPA Integrated Risk Information

Table 3. Chemical Concentrations Driving Idaho Fish Consumption Advisories

Water Body	Species	Contaminant	Number Sampled	Concentration Range (ppm)	Mean Concentration (ppm)	Notes	Source		
Bear River	Carp	Mercury	10	NA - 0.252	0.252 [a]	[k]	Essig [g]		
Brownlee Reservoir	Carp, Catfish, Perch	Mercury	76	0.17 - 0.67	0.35 [a]	7.87 - 32.19 inches	USEPA [f]		
	Crappie	Mercury	58	0.08 - 0.95	0.36 [a]	6.11 - 12.63 inches	USEPA [f]		
Chesterfield Reservoir	Rainbow Trout	Mercury	8	NA - 0.227	0.227 [a]	[k]	Essig and Kosterman [h]		
CJ Strike Reservoir	Bass	Mercury	10	0.1 - 0.24	0.138 [a]	10.23 - 13.38 inches	USEPA [f]		
Grasmere Reservoir	Lahontan Cutthroat Trout	Mercury	10	NA - 0.319	0.319 [a]	[k]	Essig and Kosterman [h]		
Hells Canyon Reservoir	Carp, Catfish	Mercury	20	0.556 - 0.561	0.5585 [a]	[k]	Essig and Kosterman [h]		
Jordan Creek	Redband Trout	Mercury	9	NA - 0.551	0.551 [a]	Rainbow Trout [k]	Dai and Ingham [i]		
Lake Coeur d'Alene	Kokanee, Whole Body	Arsenic	11	NA - 0.194	0.145 [a]	Entire Lake	ATSDR 2003 [c]		
		Mercury	11	NA - 0.0853	0.0752 [a]	Entire Lake	ATSDR 2003 [c]		
	Kokanee, Fillet	Arsenic	10	NA - 0.117	0.0831 [a]	Entire Lake	ATSDR 2003 [c]		
		Mercury	10	NA - 0.104	0.0917 [a]	Entire Lake	ATSDR 2003 [c]		
	Bullhead, Whole Body	Arsenic		10	NA - 0.117	0.0831 [a]	Entire Lake	ATSDR 2003 [c]	
				10	NA - 0.104	0.0917 [a]	Entire Lake	ATSDR 2003 [c]	
				10	NA - 0.511	0.218 [a]	Center Lake	ATSDR 2003 [c]	
				10	NA - 0.11	0.0503 [a]	South Lake	ATSDR 2003 [c]	
				30	NA - 14.12	1.92 [a]	Entire Lake	ATSDR 2003 [c]	
				10	NA - 3.696	1.42 [a]	North Lake	ATSDR 2003 [c]	
		Lead		10	NA - 14.12	3.85 [a]	Center Lake	ATSDR 2003 [c]	
				10	NA - 1.353	0.479 [a]	South Lake	ATSDR 2003 [c]	
			Mercury		30	NA - 0.0752	0.0417 [a]	Entire Lake	ATSDR 2003 [c]
					10	NA - 0.0512	0.0283 [a]	North Lake	ATSDR 2003 [c]
					10	NA - 0.0752	0.0451 [a]	Center Lake	ATSDR 2003 [c]
					10	NA - 0.0708	0.0518 [a]	South Lake	ATSDR 2003 [c]
	Arsenic			30	NA - 0.328	0.056 [a]	Entire Lake	ATSDR 2003 [c]	
				10	ND	ND [a]	North Lake	ATSDR 2003 [c]	
	Bullhead, Fillet	Arsenic		10	NA - 0.328	0.116 [a]	Center Lake	ATSDR 2003 [c]	
				10	NA - 0.052	0.0276 [a]	South Lake	ATSDR 2003 [c]	
				30	NA - 1.494	0.0955 [a]	Entire Lake	ATSDR 2003 [c]	
				10	NA - 0.076	0.0288 [a]	North Lake	ATSDR 2003 [c]	
				10	NA - 1.494	0.232 [a]	Center Lake	ATSDR 2003 [c]	
				10	NA - 0.08	0.026 [a]	South Lake	ATSDR 2003 [c]	
		Mercury		30	NA - 0.138	0.0554 [a]	Entire Lake	ATSDR 2003 [c]	
				10	NA - 0.052	0.0385 [a]	North Lake	ATSDR 2003 [c]	
				10	NA - 0.138	0.0646 [a]	Center Lake	ATSDR 2003 [c]	
				10	NA - 0.0721	0.0632 [a]	South Lake	ATSDR 2003 [c]	
Lake Lowell	Sucker	Mercury	40	0.027 - 0.515	0.171 [a]	NA	USEPA [f]		
	Carp	Mercury	38	0.042 - 0.363	0.165 [a]	NA	USEPA [f]		
Lake Pend Oreille	Trout	Mercury	14	0.285 - 0.93	0.421 [b]	1.46 - 5.9 kg	IDHW 2005 [d]		
	White Fish		15	0.163 - 0.354	0.264 [b]	0.52 - 0.94 kg	IDHW 2005 [d]		
Payette Lake	Lake Trout	Mercury	10	NA - 0.449	0.449 [a]	[k]	Essig and Kosterman [h]		
Payette River	Sucker	Mercury	27	0.186 - 0.276	0.232 [a]	[k]	Essig [g]		
Portneuf River	Cutthroat, Rainbow, and Brown Trout	Mercury	[a]	0.18 - 0.87	0.347 [a]	[k]	IDEQ 2007 [j]		
Priest Lake	Lake Trout	Mercury	10	NA - 0.255	0.255 [a]	[k]	Essig and Kosterman [h]		
Salmon Falls Creek	Rainbow Trout	Mercury	10	NA	0.28 [b]	15 - 18 inches	IDHW 2012 [e]		
	Smallmouth Bass		10	NA	0.99 [b]	11.5 - 14 inches	IDHW 2012 [e]		
	Walleye (under 16 inches)		10	NA	0.64 [b]	12 - 15.25 inches	IDHW 2012 [e]		
	Walleye (16-20 inches)		4	NA	0.95 [b]	16 - 19 inches	IDHW 2012 [e]		
	Walleye (over 20 inches)		1	NA	1.98 [b]	23.5 inches	IDHW 2012 [e]		
	Yellow Perch		10	NA	0.69 [b]	9.5 - 11 inches	IDHW 2012 [e]		
Shoofly Reservoir	Lahontan Cutthroat Trout	Mercury	10	NA - 0.502	0.502 [a]	[k]	Essig and Kosterman [h]		
South Fork Snake River	Brown Trout	Mercury	10	NA - 0.253	0.253 [a]	[k]	Essig [g]		
Weston Reservoir	Yellow Perch	Mercury	10	NA - 0.339	0.339 [a]	[k]	Essig and Kosterman [h]		

Notes:

- [a] Not specified
- [b] Geometric mean
- [c] Agency for Toxic Substances and Disease Registry (ATSDR). 2003. Health Consultation: Evaluation of Metals in Bullhead, Bass, and Kokanee from Lake Coeur D'Alene. Available at: <http://www.atsdr.cdc.gov/HAC/pha/PHA.asp?docid=1045&pg=0>.
- [d] Idaho Department of Health and Welfare (IDHW). 2005. Health Consultation: Evaluation of Mercury in Trout and White Fish From Lake Pend Oreille, Idaho. Available at: <http://www.atsdr.cdc.gov/HAC/pha/LakePendOreille/LakePendOreilleHC.pdf>.
- [e] Idaho Department of Health and Welfare (IDHW). 2012. Health Consultation: Mercury in Fish from Salmon Falls Creek Reservoir, Rogerson, Idaho. Available at: <http://www.healthandwelfare.idaho.gov/Portals/0/Health/EnvironmentalHealth/LHC%20SFCRFinal.pdf>.
- [f] United State Environmental Protection Agency (USEPA). 2014. National Listing of Fish Advisories Fish Tissue Search. Available at: <http://fishadvisoryonline.epa.gov/FishTissue.aspx>
- [g] Essig. 2010. Arsenic, Mercury, and Selenium in Fish Tissue and Water from Idaho's Major Rivers: A Statewide Assessment. Arsenic, mercury, and selenium fish tissue data collected in 2008 from the major rivers of the state.
- [h] Essig, D. and Kosterman, M. 2008. Arsenic, Mercury and Selenium in Fish Tissue from Idaho Lakes and Reservoirs: A Statewide Assessment. IDEQ. Arsenic, mercury, and selenium fish tissue data collected in 2007 from the lakes and reservoirs throughout the state.
- [i] Dai, X. and Ingham, M. 2009. Analysis of Total Mercury Concentrations in Fish Samples from Jordan Creek and Non-Jordan Creek Sites. IDEQ. Mercury fish tissue data from a variety of fish species from Jordan Creek as well as East Fork, Flint, and Louise Creeks. Data were collected in 2005.
- [j] IDEQ. 2007. Orofino Creek Mercury Monitoring Project. Mercury fish tissue data collected from salmonids in Orofino Creek. Data were collected in September 2007.
- [k] Data obtained from sources possibly not directly related to fish consumption advisories. Data is provided here for illustrative purposes.