



Mercury in Fish: Alaska State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from four NPS units in Alaska: Denali, Glacier Bay, Lake Clark, and Wrangell-St. Elias national parks. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and Alaska-specific human health benchmarks

Park	Sampling Point	Species	n	Standard Length (mm)			Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)					Percent of individuals exceeding fish risk benchmarks			Percent of individuals exceeding avian risk benchmarks			Percent of individuals exceeding human risk benchmarks			Percent of individuals exceeding state human risk benchmarks							
				min	max	med	Percent Moisture	min	max	mean	se	med	min	max	mean	se	med	NOER (200 ng/g ww in whole-body)	LOER (300 ng/g ww in whole-body)	High-Sens. (90 ng/g ww in whole-body)	Moderate Sens. (180 ng/g ww in whole-body)	Low Sens. (270 ng/g ww in whole-body)	Unlim. Cons. (50 ng/g ww in muscle)	EPA Criteria (300 ng/g ww in muscle)	No Cons. (950 ng/g ww in muscle)	AK-DHSS 4 meal per week (150 ng/g ww in muscle)	AK-DHSS 3 meal per week (320 ng/g ww in muscle)	AK-DHSS 1 meal per week (640 ng/g ww in muscle)					
Denali	Lake Chilchukabena	northern pike	17	232	546	448	78.94	110.25	427.76	264.40	29.24	324.21	23.65	88.85	55.15	5.88	66.32	0.00	0.00	0.00	0.00	0.00	58.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Glacier Bay	Falls Creek	Dolly Varden	15	73	127	94	78.45	173.05	412.66	270.44	17.89	251.48	41.00	79.26	57.64	3.28	52.63	0.00	0.00	0.00	0.00	0.00	80.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	North Skidmore Lake	Dolly Varden	15	128	203	161	79.05	382.13	701.93	554.06	28.43	563.42	78.39	148.66	115.58	5.39	117.55	0.00	0.00	20.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lake Clark	Stonefly Lake	Dolly Varden	15	61	219	143	77.80	215.89	954.45	556.04	51.22	557.34	51.10	203.07	122.55	10.85	124.97	0.00	0.00	46.67	0.00	0.00	100.00	0.00	0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lake Clark	lake trout	28	364	648	474	77.15	1066.11	3038.99	1674.56	101.93	1482.07	237.71	690.98	380.28	22.12	340.59	53.57	14.29	100.00	78.57	21.43	100.00	75.00	0.00	100.00	64.29	3.57	0.00	0.00	0.00	0.00	0.00
	Lake Kontrashibuna	lake trout	16	315	398	361	76.83	151.01	1671.02	1006.17	107.22	1059.74	35.80	370.86	231.63	23.95	249.32	18.75	0.00	81.25	18.75	0.00	93.75	18.75	0.00	75.00	18.75	0.00	0.00	0.00	0.00	0.00	0.00
Wrangell-St. Elias	Telaquana Lake	lake trout	15	412	586	481	79.37	247.52	1403.28	609.42	92.45	433.00	54.81	269.30	123.65	17.84	91.09	0.00	0.00	26.67	0.00	0.00	100.00	0.00	0.00	0.00	26.67	0.00	0.00	0.00	0.00	0.00	0.00
	Copper Lake	arctic grayling	15	274	374	331	77.58	180.84	844.59	371.35	49.19	325.57	41.88	175.81	82.45	10.32	72.98	0.00	0.00	13.33	0.00	0.00	86.67	0.00	0.00	0.00	13.33	0.00	0.00	0.00	0.00	0.00	0.00
		kokanee	15	278	311	297	87.87	309.07	764.30	431.67	34.47	366.85	27.85	97.61	52.73	5.32	47.84	0.00	0.00	0.00	0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		lake trout	13	365	470	405	77.86	834.24	1397.50	1065.58	47.87	1071.86	188.24	331.63	235.84	11.32	222.17	0.00	0.00	100.00	15.38	0.00	100.00	15.38	0.00	100.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00
	Summit Lake	rainbow trout	15	123	405	234	77.32	187.93	332.22	238.35	10.89	224.60	42.43	75.83	54.02	2.50	53.41	0.00	0.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Tanada Lake	lake trout	13	418	542	457	74.57	1123.78	2995.08	1714.09	142.27	1551.24	278.00	632.34	428.55	29.36	416.92	84.62	23.08	100.00	84.62	38.46	100.00	84.62	0.00	100.00	84.62	0.00	0.00	0.00	0.00	0.00	0.00

1. Denali National Park

(Pg. 19, Eagles-Smith et al. 2014)

We sampled northern pike from a single lake in Denali NP. Despite their large size and position as top predators, northern pike from Denali NP had the lowest size-normalized Hg concentrations in the 400 mm SL size class (47.4 ng/g ww at 400 mm SL) and some of the lowest observed in the entire study. In fact, the THg concentrations in northern pike from Denali were similar or less than THg concentrations in smaller fish species from the other parks in Alaska (Wrangell-St. Elias, Lake Clark, Glacier Bay). Moreover, past work in Denali found similarly low THg concentrations in burbot (Lota lota) and whitefish (Landers and others, 2008). Such low Hg concentrations may be the result of this site's isolated nature. However, at other similarly isolated sites in Alaska, northern pike have been found to have consistently higher Hg concentrations (110–1,500 ng/g ww on average; Jewett and Duffy, 2007). Any additional sampling from Denali NP should aim to assess whether these data are representative of other water bodies and species in the park.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Lake Chilchukabena	63.9153	-151.5083	Northern Pike	Yes	5/DAY, 1 >30"	low

Comments (A. Blakesley): Accessible by air. Possible subsistence use.

2. Glacier Bay National Park

(Pg. 20, Eagles-Smith et al. 2014)

We sampled Dolly Varden from two lakes and one stream in Glacier Bay NP. Mean THg concentrations across these three sites (90.2 ng/g ww) were slightly above the global mean concentration in fish across all sites and parks in this study (77.7 ng/g ww). When modeled at 200 mm, the mean Hg concentration in fish from Glacier Bay NP (102.3 ng/g ww) was among the highest in the size class. However, we also observed a 3-fold variation in the mean concentrations among the three lakes indicating that local processes are likely important drivers of Hg bioaccumulation in fish within this park. The THg concentrations measured in Dolly Varden from Glacier Bay NP were similar to concentrations (40–230 ng/g ww) found in Dolly Varden from other sites in Alaska (Jewett and Duffy, 2007).

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Falls Creek	58.4443	-135.5988	Dolly Varden	YES	10 fish/day	n/a
North Skidmore Lake	58.8451	-136.6839	Dolly Varden	YES	10 fish/day	n/a
Stonefly Lake	58.9674	-136.3379	Dolly Varden	YES	10 fish/day	n/a

Comments (C. Soiseth, C. Sargeant): Recreational harvest of salmonids from park streams is subject to State of AK Sportfishing regulations. Very little recreational harvest, if any, is thought to occur on these stream systems due to their relative inaccessibility to anglers. Anglers typically tend to target larger species (i.e. sockeye and coho salmon) from more accessible areas (along or in close proximity to the road system) in either Bartlett Cove or Gustavus.

3. Lake Clark National Park

(Pg. 21, Eagles-Smith et al. 2014)

Lake trout from three lakes in Lake Clark NP were included in this study. Two of these sites (Lake Clark and Lake Kontrashibuna) were sampled in both 2011 and 2012, although Hg concentrations were not significantly different between the 2 years. Although THg concentrations across all sites within the park were among the highest observed in the 400 mm SLsize class, there was considerable variation among lakes within the park. The mean THg concentration in Lake Clark (365.2 ng/g ww) was more than 3-fold higher than that in Telaquana Lake (109.0 ng/g ww) and 1.8 than that in Lake Kontrashibuna (204.0 ng/g ww). At the lower end of this range, THg concentrations pose limited risk to park wildlife and human users. However, the concentrations observed in Lake Kontrashibuna exceeded the benchmark for reproductive impairment to piscivorous birds, and the tissue-based criterion for fish toxicity. Moreover, fish from Lake Clark exceeded these benchmarks and the EPA criterion for protection of human health.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Lake Clark	60.0187	-154.7574	Lake Trout	YES	4 lake trout / day	n/a
Lake Kontrashibuna	60.1795	-154.2223	Lake Trout	YES	4 lake trout / day	n/a
Telaquana Lake	60.9520	-153.7625	Lake Trout	YES	2 lake trout / day	n/a

Comments (J. Shearer)

4. Wrangell-St. Elias National Park and Preserve

(Pg. 23, Eagles-Smith et al. 2014)

Lake-specific mean fish THg concentrations from the three lakes sampled at Wrangell-St. Elias NP spanned nearly 8-fold between rainbow trout from Summit Lake (53.3 ng/g ww) and Lake Trout from Tanada Lake (416.6 ng/g ww), which had the highest mean Hg concentration of any site from all of the parks examined in this study. After size-adjusting fish THg concentrations, we found that concentrations in 200 mm SL fish from Copper Lake (147.4 ng/g ww) were substantially higher than those from Summit Lake (65.4 ng/g ww). The mean size-adjusted THg concentration for 400 mm SL fish from Copper Lake (242.0 ng/g ww) and Tanada Lake (321.2 ng/g ww) approached or exceeded the 24 EPA fish tissue criterion, the avian reproductive impairment benchmark, and the tissue-based criterion for fish toxicity. Tanada Lake was one of the few lakes in the present study in which a relatively high proportion of fish were expected to exceed upper benchmarks for fish toxicity, reproductive impairment in low sensitivity birds, and at the largest sizes sampled, the no-consumption guideline proposed by the GLAG. The cause of such high concentrations in some fish from Wrangell-St. Elias NP is unclear and may reflect some combination of local biogeochemical processes that stimulate methylmercury production, the ecological structure of the lake's food web, or physiological characteristics of the fish themselves. For example, fish with high Hg concentrations may be exceptionally old and thus may have accumulated large quantities of Hg over their extended lives. Alternatively, fish in such northern lakes may grow slowly compared to fish in warmer, more productive systems resulting in little biodilution of ingested Hg through somatic growth.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Copper Lake	62.4256	-143.5550	arctic grayling	YES	NONE	n/a
			kokanee	YES	NONE	
			kokanee	YES	NONE	
			lake trout	YES	NONE	
			lake trout	YES	NONE	
Summit Lake	61.3156	-144.1919	rainbow trout	YES	10 fish/day, 1>18"	n/a
Tanada	62.4258	-143.3717	lake trout	YES	NONE	n/a

Comments (M. McCormick): Both Copper and Tanada Lakes are used by subsistence fishermen as well as by sports fishermen. There are no figures (subsistence users don't always remember to get permits), but we do know, in particular, that there are numerous people who ice fish for burbot and lake trout in these lakes during the winter months.



Mercury in Fish: Arizona State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from one NPS unit in Arizona: Grand Canyon National Park. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and Arizona-specific human health benchmarks

Park	Sampling Point	Species	Standard Length (mm)			Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)					Percent of individuals exceeding fish risk benchmarks			Percent of individuals exceeding avian risk benchmarks					Percent of individuals exceeding human risk benchmarks			Percent of individuals exceeding state human risk benchmarks*		
			n	Percent Moisture		min	max	mean	se	med	min	max	mean	se	med	NOER (200 ng/g ww in whole-body)	LOER (300 ng/g ww in whole-body)	High-Sens. (90 ng/g ww in whole-body)	Moderate Sens. (180 ng/g ww in whole-body)	Low Sens. (270 ng/g ww in whole-body)	Unlim. Cons. (50 ng/g ww in muscle)	EPA Criteria (300 ng/g ww in muscle)	No Cons. (950 ng/g ww in muscle)	CA - OEHA Unlim. Cons. (70 ng/g ww in muscle)	CA - OEHA 1 meal per week (150 ng/g ww in muscle)	CA - OEHA No Cons. (440 ng/g ww in muscle)			
				min	max																						med		
Lassen Volcanic	Horseshoe Lake	brook trout	15	197	305	245	78.48	236.09	2308.46	949.30	123.41	897.41	47.85	493.36	205.64	26.84	188.79	6.67	0.00	86.67	6.67	6.67	93.33	6.67	0.00	86.67	80.00	6.67	
	Ridge Lake	brook trout	17	143	210	188	78.83	257.17	876.56	565.59	51.01	562.08	51.72	189.80	120.26	11.24	116.05	0.00	0.00	35.29	0.00	0.00	100.00	0.00	0.00	82.35	29.41	0.00	
	Summit Lake	brook trout	15	165	346	192	77.28	134.12	332.73	198.49	13.93	196.00	28.63	72.68	44.99	3.02	45.89	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	6.67	0.00	0.00	
Sequoia - Kings Canyon	Bench Lake	brook trout	15	92	165	136	77.97	59.83	204.76	105.10	10.48	97.21	13.41	42.95	22.93	2.13	20.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Center Basin Lake	golden trout	45	100	157	138	79.72	124.53	735.98	365.27	23.02	345.72	32.25	124.47	71.46	3.72	70.74	0.00	0.00	0.00	0.00	0.00	73.33	0.00	0.00	53.33	0.00	0.00	
	Kern Point Lake	rainbow trout	15	73	252	167	78.32	56.57	383.27	214.16	22.67	229.66	13.33	79.60	45.72	4.56	48.83	0.00	0.00	0.00	0.00	0.00	40.00	0.00	0.00	6.67	0.00	0.00	
Yosemite	Lake 10310	rainbow X golden trout	15	108	224	169	77.33	99.55	465.22	217.74	25.07	194.27	23.49	94.54	48.51	5.00	43.71	0.00	0.00	0.00	0.00	0.00	46.67	0.00	0.00	6.67	0.00	0.00	
	Mildred Lake	brook trout	15	101	168	144	79.99	52.15	372.54	138.91	21.97	108.63	12.89	64.33	26.76	3.56	22.17	0.00	0.00	0.00	0.00	0.00	13.33	0.00	0.00	0.00	0.00	0.00	
	Spillway Lake	brook trout	15	117	269	206	78.57	324.27	5277.77	1146.09	321.26	844.78	72.15	1108.57	238.87	66.54	189.25	13.33	6.67	53.33	13.33	6.67	100.00	13.33	6.67	100.00	53.33	6.67	
			15	124	263	206	77.91	109.63	408.27	187.05	20.03	155.60	24.95	84.16	40.75	3.90	36.23	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	6.67	0.00	0.00	

1. Grand Canyon National Park

(Pg. 20, Eagles-Smith et al. 2014)

At the three sites we sampled in Grand Canyon NP, unadjusted mean THg concentrations (76 ng/g ww) were similar to the average across all fish in the study. However, size adjusted (200 mm SL) THg concentrations were among the highest in the size class (101.2 ng/g ww) across all parks. Moreover, size-adjusted THg concentrations in Shinumo Creek (178.8 ng/g ww) were more than 2-fold higher than those in the other two sites (71.5 and 81.0 ng/g ww), suggesting that Hg exposure within the park is variable.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Bright Angel Creek	36.1228	-112.0800	Brown Trout	Yes	none	
			Rainbow Trout	Yes	none	
Havasu Creek	36.2980	-112.7402	Rainbow Trout	Yes	none	
Shinumo Creek	36.2515	-112.3319	Rainbow Trout	Yes	none	

Comments (B. Healy): Special use by Havasupai tribal lands.



Mercury in Fish: California State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from three NPS units in California: Lassen Volcanic, Sequoia-Kings Canyon, and Yosemite national parks. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and California-specific human health benchmarks

Park	Sampling Point	Species	n	Standard Length (mm)			Percent Moisture	Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)				
				min	max	med		min	max	mean	SE	med	min	max	mean	SE	med
				Lassen Volcanic	Horseshoe Lake	brook trout		15	197	305	245	78.48	236.09	2308.46	949.30	123.41	897.41
	Ridge Lake	brook trout	17	143	210	188	78.83	257.17	876.56	565.59	51.01	562.08	51.72	189.80	120.26	11.24	116.05
	Summit Lake	brook trout	15	165	346	192	77.28	134.12	332.73	198.49	13.93	196.00	28.63	72.68	44.99	3.02	45.89
Sequoia - Kings Canyon	Bench Lake	brook trout	15	92	165	136	77.97	59.83	204.76	105.10	10.48	97.21	13.41	42.95	22.93	2.13	20.90
	Center Basin Lake	golden trout	45	100	157	138	79.72	124.53	735.98	365.27	23.02	345.72	32.25	124.47	71.46	3.72	70.74
	Kern Point Lake	rainbow trout	15	73	252	167	78.32	56.57	383.27	214.16	22.67	229.66	13.33	79.60	45.72	4.56	48.83
		rainbow X golden trout	15	108	224	169	77.33	99.55	465.22	217.74	25.07	194.27	23.49	94.54	48.51	5.00	43.71
	Lake 10310	brook trout	15	101	168	144	79.99	52.15	372.54	138.91	21.97	108.63	12.89	64.33	26.76	3.56	22.17
Yosemite	Mildred Lake	brook trout	15	117	269	206	78.57	324.27	5277.77	1146.09	321.26	844.78	72.15	1108.57	238.87	66.54	189.25
	Spillway Lake	brook trout	15	124	263	206	77.91	109.63	408.27	187.05	20.03	155.60	24.95	84.16	40.75	3.90	36.23

Park	Sampling Point	Species	Percent of individuals exceeding fish risk benchmarks			Percent of individuals exceeding avian risk benchmarks			Percent of individuals exceeding human risk benchmarks			Percent of individuals exceeding state human risk benchmarks*		
			NOER (200 ng/g ww in whole-body)	LOER (300 ng/g ww in whole-body)	High-Sens. (90 ng/g ww in whole-body)	Moderate Sens. (180 ng/g ww in whole-body)	Low Sens. (270 ng/g ww in whole-body)	Unlim. Cons. (50 ng/g ww in muscle)	EPA Criteria (300 ng/g ww in muscle)	No Cons. (950 ng/g ww in muscle)	CA - OEHHA Unlim. Cons. (70 ng/g ww in muscle)	CA - OEHHA 1 meal per week (150 ng/g ww in muscle)	CA - OEHHA No Cons. (440 ng/g ww in muscle)	
			Lassen Volcanic	Horseshoe Lake	brook trout	6.67	0.00	86.67	6.67	6.67	93.33	6.67	0.00	86.67
	Ridge Lake	brook trout	0.00	0.00	35.29	0.00	0.00	100.00	0.00	0.00	82.35	29.41	0.00	
	Summit Lake	brook trout	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	6.67	0.00	0.00	
Sequoia - Kings Canyon	Bench Lake	brook trout	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Center Basin Lake	golden trout	0.00	0.00	0.00	0.00	0.00	73.33	0.00	0.00	53.33	0.00	0.00	
	Kern Point Lake	rainbow trout	0.00	0.00	0.00	0.00	0.00	40.00	0.00	0.00	6.67	0.00	0.00	
		rainbow X golden trout	0.00	0.00	0.00	0.00	0.00	46.67	0.00	0.00	6.67	0.00	0.00	
	Lake 10310	brook trout	0.00	0.00	0.00	0.00	0.00	13.33	0.00	0.00	0.00	0.00	0.00	
Yosemite	Mildred Lake	brook trout	13.33	6.67	53.33	13.33	6.67	100.00	13.33	6.67	100.00	53.33	6.67	
	Spillway Lake	brook trout	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	6.67	0.00	0.00	

* California Office of Environmental Health Hazard Assessment Methylmercury Advisory Tissue Levels (ATLs) for women aged 18-45 years and children aged 1-17 (Table 2; Klasing and Brodberg 2008).

1. Lassen Volcanic National Park

(Pg. 21, Eagles-Smith et al. 2014)

There was greater than 4-fold variation in mean fish THg concentrations among the three lakes that brook trout were sampled from in Lassen Volcanic NP. Mercury concentrations were lowest in Summit Lake (43.7 ng/g ww), whereas Ridge Lake (111.3 ng/g w) and Horseshoe Lake (180.7 ng/g ww) had concentrations above the mean concentration for all fish in this study. Some of this variation in Hg concentrations among lakes in the park was due to the size of fish. After adjusting fish THg concentrations to a 200 mm SL fish size, the variation among lakes was substantially reduced. Size-based risk assessments were conducted for Horseshoe and Summit Lakes, and the resulting risk profiles contrast sharply. Our modeled risk estimates suggest that there is limited toxicological risk to fish, wildlife or humans across the fish size range in Summit Lake. Conversely, brook trout from Horseshoe Lake were modeled to reach concentrations of concern for tissue-based fish toxicity and risk to even the least sensitive species of avian consumers within the range of sizes sampled. Furthermore, a high proportion of fish from Horseshoe Lake were modeled to exceed the EPA criterion for protection of human health at sizes exceeding 280 mm SL.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Horseshoe Lake	40.4724	-121.3358	Brook Trout	YES	5 fish/day	Low
Ridge Lake	40.4138	-121.4630	Brook Trout	YES	5 fish/day	Low
Summit Lake	40.4929	-121.4233	Brook Trout	YES	5 fish/day	moderate

Comments (M. Magnuson): We have two campgrounds at Summit Lake, Summit Lake North and Summit Lake South. For Summit Lake North we had a total of 2,972 visitors and for Summit South we had 3,045 visitors. These figures are only for those who were camping at the campground and does not include day use visitation. Of all these visitors I would guess that only a few hundred of them actually fish in Summit Lake. Although we do not have any stats for Horseshoe and Ridge Lakes I would guess that there are only a few people that fish these. So maybe 100 or less for each lake per year. Besides Manzanita Lake, the lakes in the park do not have much fishing pressure. And being that you have to hike a bit to get to Ridge and Horseshoe Lakes makes it less popular for most people to fish them.

2. Sequoia-Kings Canyon National Park

(Pg. 23, Eagles-Smith et al. 2014)

Four high-altitude lakes were sampled from Sequoia-Kings Canyon NPs. The mean fish THg concentration across all these sites (43.8 ng/g ww) was below the study-wide average across all fish analyzed in this study. Size-adjusted (200 mm SL) THg concentrations remained similarly low in all but Center Basin Lake, where the mean THg concentrations in golden trout increased to 207.3 ng/g ww. However, based on the size distribution of our sample of 30 individuals, 200 mm fish are likely rare in this population. Furthermore, two of the lakes from Sequoia-Kings Canyon NPs were sampled in 2008 (Center Basin Lake) or 2009 (Kern Point Lake) and again in 2012. Comparisons between sampling years indicate that Hg concentrations in fish from Kern Point Lake were remained similar between years, whereas Hg concentrations in Center Basin Lake fish were higher in 2012 than in 2008. Landers and others (2008) reported Hg concentrations higher than those observed in the current study from two additional high-altitude lakes in Sequoia-Kings Canyon NPs (Pear and Emerald Lakes), demonstrating that even among high-altitude lakes with potentially limited Hg inputs, fish THg concentrations can be quite variable.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Lake 10310	36.9591	-118.4354	brook trout	YES	10 in possession, 10/day	low
Center Basin	36.7305	-118.3959	rainbow x golden trout	YES	10 in possession, 5/day	low
Kern Point	36.6013	-118.4319	rainbow x golden trout	YES	10 in possession, 5/day	low

Comments (D. Boiano): Bench Lk=Lake 10310. All lakes in remote, high elevation wilderness.

3. Yosemite National Park

(Pg. 24, Eagles-Smith et al. 2014)

The two sites sampled at Yosemite NP display starkly contrasting patterns of Hg concentrations. At one site, Spillway Lake, fish THg concentrations were uniformly low; the site mean (38.7 ng/g ww) was one-half of the study-wide mean across all parks. In contrast, THg concentrations in fish from Mildred Lake (174.4 ng/g ww) were more than twice the study-wide mean. Moreover, individual fish concentrations had a 15-fold range within the lake. Importantly, the highest individual fish THg concentration in the entire study (1,109 ng/g ww) was measured in a brook trout from Mildred Lake. This was the only fish that exceeded the no-consumption guideline proposed by the GLAG, and was 1.6-times greater than the next highest concentration measured in this study. The source of such variation within a lake is unclear, but future efforts should aim to identify the factors regulating accumulation in individuals and determining whether this variability is representative of other lakes in the park.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Mildred Lake	37.8202	-119.4407	brook trout	YES	10 in possession, 5 trout/day	n/a
Spillway	37.8408	-119.2321	brook trout	YES	10 in possession, 5 trout/day	n/a

Comments (N. Daniele): An add'l 10 brook trout <10 in. may be kept per day.



Mercury in Fish: Colorado State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from three NPS units in Colorado: Great Sand Dunes, Mesa Verde, and Rocky Mountain national parks. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and Colorado-specific human health benchmarks

Park	Sampling Point	Species	n	Standard Length (mm)			Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)					Percent of individuals exceeding fish risk benchmarks			Percent of individuals exceeding avian risk benchmarks			Percent of individuals exceeding human risk benchmarks			Percent of individuals exceeding state human risk benchmarks					
				Percent Moisture			min	max	mean	se	med	min	max	mean	se	med	NOER (200 ng/g ww in whole-body)	LOER (300 ng/g ww in whole-body)	High-Sens. (90 ng/g ww in whole-body)	Moderate Sens. (180 ng/g ww in whole-body)	Low Sens. (270 ng/g ww in whole-body)	Unlim. Cons. (50 ng/g ww in muscle)	EPA Criteria (300 ng/g ww in muscle)	No Cons. (950 ng/g ww in muscle)	CDPHE Unlim. Cons. (46 ng/g ww in muscle)	CDPHE Advisory Screening (300 ng/g ww in muscle)	CDPHE Do Not Cons. (933 ng/g ww in muscle)				
				min	max	med																									
Great Sand Dunes	Medano Lake	cutthroat trout	15	110	212	163	78.63	243.79	774.20	343.26	32.97	306.17	52.80	136.55	72.10	5.23	65.59	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	14.29	0.00	0.00
	Sand Creek	rainbow x golden trout	14	153	258	182	75.44	125.71	233.09	161.17	9.07	158.23	29.10	60.56	39.55	2.25	39.22	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	14.29	0.00	0.00	0.00	0.00	
Mesa Verde	Mancos River	speckled dace	10	43	69	56	72.35	113.94	302.56	189.87	18.32	179.77	31.52	75.43	52.20	4.75	50.62	0.00	0.00	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rocky Mountain	Black Lake	brook trout	15	126	226	193	79.10	131.67	466.98	277.48	24.71	254.59	28.55	92.38	56.93	4.56	52.60	0.00	0.00	0.00	0.00	0.00	60.00	0.00	0.00	80.00	0.00	0.00	80.00	0.00	0.00
	Colorado River	brown trout	20	152	413	253	78.50	249.77	782.93	438.83	28.73	409.20	55.53	162.93	94.21	6.08	86.25	0.00	0.00	5.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00
		sucker spp.	20	145	292	178	78.03	522.54	1432.94	729.52	55.97	649.69	113.09	317.64	160.79	12.97	139.43	0.00	0.00	50.00	5.00	0.00	100.00	5.00	0.00	100.00	5.00	0.00	100.00	5.00	0.00
	Fall River	brown trout	20	166	338	232	78.96	175.58	516.36	287.36	23.56	246.64	37.52	106.19	59.88	4.53	53.39	0.00	0.00	0.00	0.00	0.00	60.00	0.00	0.00	65.00	0.00	0.00	65.00	0.00	0.00
		sucker spp.	20	220	359	265	78.82	429.71	2629.36	1087.02	153.04	841.31	96.31	528.28	228.18	31.22	179.93	20.00	5.00	65.00	20.00	10.00	100.00	20.00	0.00	100.00	20.00	0.00	100.00	20.00	0.00
	Fern Lake	cutthroat trout	15	126	270	207	79.28	97.44	618.47	314.42	33.65	291.55	21.10	101.00	63.75	5.75	64.48	0.00	0.00	0.00	0.00	0.00	80.00	0.00	0.00	80.00	0.00	0.00	80.00	0.00	0.00
	Fourth Lake	brook trout	15	146	206	177	79.02	156.87	505.91	353.54	27.59	355.53	33.08	110.24	73.67	5.53	73.17	0.00	0.00	0.00	0.00	0.00	86.67	0.00	0.00	86.67	0.00	0.00	86.67	0.00	0.00
	Haynack Lake	cutthroat trout	15	141	340	250	78.90	48.23	206.27	102.31	11.31	101.24	10.52	37.96	21.18	2.15	20.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lake Haiyaha	cutthroat trout	15	182	309	264	75.17	45.45	129.08	77.58	5.60	76.51	9.89	28.26	19.11	1.26	18.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lake Louise	cutthroat trout	14	222	314	277	78.58	148.88	451.26	278.65	24.53	267.33	34.75	81.67	58.19	3.92	57.09	0.00	0.00	0.00	0.00	0.00	57.14	0.00	0.00	78.57	0.00	0.00	78.57	0.00	0.00
Lake Nanita	cutthroat trout	23	111	260	203	79.29	125.58	1116.61	409.91	56.35	307.14	26.21	241.65	83.17	11.05	62.93	0.00	0.00	17.39	0.00	0.00	69.57	0.00	0.00	73.91	0.00	0.00	73.91	0.00	0.00	
Lone Pine Lake	brook trout	14	91	178	148	76.66	163.32	429.22	255.47	17.96	237.94	37.52	101.45	59.44	4.16	58.80	0.00	0.00	0.00	0.00	0.00	71.43	0.00	0.00	85.71	0.00	0.00	85.71	0.00	0.00	
Mills Lake	rainbow x cutthroat trout	15	167	295	230	79.29	164.81	837.42	474.18	54.34	496.61	41.63	159.91	95.27	9.80	102.14	0.00	0.00	13.33	0.00	0.00	80.00	0.00	0.00	80.00	0.00	0.00	80.00	0.00	0.00	
Mirror Lake	brook trout	30	115	238	218	79.78	86.43	2396.36	856.56	115.55	780.20	18.41	443.05	167.79	21.48	155.82	10.00	0.00	56.67	16.67	0.00	76.67	16.67	0.00	76.67	16.67	0.00	76.67	16.67	0.00	
Poudre Lake	brook trout	30	108	264	215	77.17	215.66	1009.21	404.87	41.33	327.47	50.99	211.57	90.64	8.36	74.44	0.00	0.00	16.67	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	
Sky Pond	brook trout	15	162	246	218	78.12	47.46	303.83	160.64	20.30	161.43	10.91	59.52	34.09	3.77	34.99	0.00	0.00	0.00	0.00	0.00	13.33	0.00	0.00	26.67	0.00	0.00	26.67	0.00	0.00	
Spruce Lake	cutthroat trout	15	148	242	213	79.81	171.97	852.50	501.60	59.01	517.08	39.97	160.80	97.20	9.89	103.79	0.00	0.00	20.00	0.00	0.00	86.67	0.00	0.00	86.67	0.00	0.00	86.67	0.00	0.00	
Ten Lake Park	cutthroat trout	14	206	288	234	76.56	173.99	489.66	308.92	29.21	276.60	44.15	107.72	71.13	5.74	66.51	0.00	0.00	0.00	0.00	0.00	92.86	0.00	0.00	92.86	0.00	0.00	92.86	0.00	0.00	
The Loch	cutthroat trout	15	148	285	228	79.58	80.97	696.06	243.50	49.05	166.59	16.91	129.03	47.96	8.80	36.36	0.00	0.00	0.00	0.00	0.00	26.67	0.00	0.00	33.33	0.00	0.00	33.33	0.00	0.00	
Upper Hutcheson Lake	cutthroat trout	15	183	250	206	79.66	93.19	202.04	154.40	7.32	159.31	21.21	37.91	31.16	1.26	32.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Ypsilon Lake	cutthroat trout	30	115	275	225	78.61	83.10	968.62	341.00	38.88	276.99	16.59	180.82	70.86	7.32	58.65	0.00	0.00	10.00	0.00	0.00	60.00	0.00	0.00	73.33	0.00	0.00	73.33	0.00	0.00	

1. Great Sand Dunes National Park

(Pg. 21, Eagles-Smith et al. 2014)

Mercury concentrations in fish from one of the two sites (Medano Lake; 70.1 ng/g ww) sampled in Great Sand Dunes NP were similar to the average across parks, whereas fish from the second site (Sand Creek; 52.7 ng/g ww) were considerably lower. Based on these data, the risk of Hg exposure to wildlife is likely low at these sites; however, data from these two sites may not adequately characterize risk at other locations within the park.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Medano	37.8564	-105.4847	Cutthroat Trout	NO	n/a	n/a
Sand Creek	37.9350	-105.5230	Pike's Peak	YES	NONE	n/a

Comments (P. Bovin): "Pike's Peak" is a blend of two subspecies of *Clarki virginalis* outside of the Rio Grande drainages. Also, there probably has been some hybridization with rainbow trout species that were formerly stocked in the drainage. Currently, present stocking is done with Rio Grande cutthroat trout.

2. Mesa Verde National Park

(Pg. 22, Eagles-Smith et al. 2014)

Speckled dace were sampled from a single location, the Mancos River, in Mesa Verde NP. Despite the small size of these fish (43–69 mm SL), their THg mean concentration (74.9 ng/g ww) was to the study-wide mean value. However, the THg concentrations from speckled dace from the lone site in Mesa Verde NP were much lower than those measured in dace from nearby Capitol Reef and Zion NPs. This difference suggests that the high concentrations observed in dace from these other parks is not solely due to some aspect of this species biology, but may reflect environmental processes occurring at the site or watershed scale.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
GLCA_Mancos River	37.2204	-108.3410	Speckled Dace	n/a	n/a	None

Comments (G. San Miguel): Mancos R. section of park closed to public and fishing is not permitted within the park.

3. Rocky Mountain National Park

(Pg. 23, Eagles-Smith et al. 2014)

We sampled 19 sites in Rocky Mountain NP, allowing us to more rigorously examine within park variability in Hg concentrations among sites. Overall, the mean Hg concentration in fish from Rocky Mountain NP (ng/g ww) was slightly lower than the study-wide mean across all parks. Across sites within Rocky Mountain NP, concentrations varied by more than 6.5-fold between the sites with the lowest (Lake Haiyaha; 19.8 ng/g ww) and highest (Mirror Lake; 121.2 ng/g ww) concentrations. Our models of Hg risk suggest that most of the sites we sampled from Rocky Mountain NP had fish THg concentrations below the benchmarks of risk that we selected. However, brook trout from Mirror Lake and suckers from the Colorado and Fall Rivers are likely to exceed both the EPA human health criterion level and the avian reproductive impairment benchmark when the fish exceed 250 mm SL. In addition, we examined inter-annual variation at four sites in Rocky Mountain NP. At two of these sites (Nanita Lake and Mirror Lake), we found that there was no significant difference between the years sampled, whereas fish THg concentrations at Poudre Lake and Ypsilon Lake were significantly lower in 2012 compared to 2009. Additionally, two of the lakes sampled in this study (Mills Lake and Lone Pine Lake) also were sampled for another study in 2003 (Landers and others, 2008). Rainbow trout THg concentrations in Mills Lake were higher (87.5 ng/g) than in 2003 (less than 60 ng/g ww). Whereas THg concentrations in brook trout from Lone Pine Lake were lower (57.8 ng/g ww) than in 2003 (approximately 70 ng/g ww). Consistent with the results from Mount Rainer NP, our more intensive sampling at Rocky Mountain NP indicates substantial variation among sites, highlighting the importance of sampling multiple sites when characterizing the risk of Hg exposure within a national park.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Black Lake	40.2653	-105.6410	brook trout	YES	18 total: 8 any size, remaining 10 <8 inches	low
Colorado River Sun Valley Ranch	40.2773	-105.8504	brown trout	YES	2 total, must be ≥10 inches	heavy
			sucker spp.	YES	NONE	
Fall River-Cascade Cottages	40.4014	-105.6063	brown trout	YES	2 total, must be ≥10 inches	heavy
			sucker spp.	YES	NONE	
Fern Lake	40.3368	-105.6763	cutthroat trout	NO	n/a	moderate
Fourth Lake	40.2218	-105.6861	brook trout	YES	18 total: 8 any size, remaining 10 <8 in.	low

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Haynach Lake	40.3467	-105.7646	cutthroat trout	YES	2 total, must be ≥10 inches	moderate
Lake Haiyaha	40.3047	-105.6622	cutthroat trout	YES	2 total, must be ≥10 inches	moderate
Lake Louise	40.5083	-105.6206	cutthroat trout	NO	n/a	low
Lake Nanita	40.2560	-105.7165	cutthroat trout	YES	2 total, must be ≥10 inches	low
Lone Pine Lake	40.2327	-105.7232	brook trout	YES	18 total: 8 any size, remaining 10 <8 inches	low
Mills Lake	40.2895	-105.6417	rainbow x cutthroat trout	YES	2 total, must be ≥10 inches	moderate
Mirror Lake	40.5380	-105.6984	brook trout	YES	18 total: 8 any size, remaining 10 <8 inches	low
Poudre Lake	40.4222	-105.8089	brook trout	YES	18 total: 8 any size, remaining 10 <8 inches	moderate
Sky Pond	40.2782	-105.6688	brook trout	YES	18 total: 8 any size, remaining 10 <8 inches	low
Spruce Lake	40.3423	-105.6871	cutthroat trout	NO	n/a	moderate
Ten Lake Park	40.2104	-105.7194	cutthroat trout	NO	n/a	low
The Loch	40.2925	-105.6570	cutthroat trout	YES	2 total, must be ≥10 inches	moderate
Upper Hutcheson Lake	40.1736	-105.6470	cutthroat trout	NO	n/a	low
Ypsilon Lake	40.4436	-105.6633	cutthroat trout	NO	n/a	moderate

Comments (M. Watry)



Mercury in Fish: Montana State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from one NPS unit in Montana: Glacier National Park. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and Montana-specific human health benchmarks

Park	Sampling Point	Species	n	Standard Length (mm)			Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)					Percent of individuals exceeding fish risk benchmarks			Percent of individuals exceeding avian risk benchmarks					Percent of individuals exceeding human risk benchmarks			Percent of individuals exceeding state human risk benchmarks		
				min	max	median	min	max	mean	se	median	min	max	mean	se	median	NOER (200 ng/g ww in whole-body)	LOER (300 ng/g ww in whole-body)	High-Sens. (90 ng/g ww in whole-body)	Moderate Sens. (180 ng/g ww in whole-body)	Low Sens. (270 ng/g ww in whole-body)	Unlim. Cons. (50 ng/g ww in muscle)	EPA Criteria (300 ng/g ww in muscle)	No Cons. (950 ng/g ww in muscle)	MT - DHHS 2 meal per week for vulnerable groups (100 ng/g ww in muscle)	MT - DHHS 1 meal per week for vulnerable groups (170 ng/g ww in muscle)	MT - DHHS no consumption for vulnerable groups (660 ng/g ww in muscle)			
Glacier	Lake McDonald	bull trout	5	386	494	442	74.34	963.55	1140.73	1023.44	32.50	986.05	237.23	290.20	262.37	9.10	260.47	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00	100.00	100.00	0.00	
		lake whitefish	10	371	431	391	78.80	782.72	1341.69	1045.69	54.26	1007.68	167.34	297.85	222.03	12.56	214.36	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00	90.00	0.00		

1. Glacier National Park

(Pg. 20, Eagles-Smith et al. 2014)

Lake whitefish and bull trout were sampled from Lake McDonald in Glacier NP. Both species had high Hg concentrations relative to the mean across all fish in the study, and after accounting for the effects of size and species, fish from Glacier NP were some of the highest in the large (400 mm SL) size class. Mercury concentrations in Glacier NP fish approached or exceeded the EPA criterion for protection of human health and the level at which reproductive impairment to piscivorous birds could occur. Additionally, Hg concentrations in many individuals exceeded the level at which tissue-based toxicity to fish is a concern. This is particularly important considering bull trout is federally listed as threatened under the endangered species act. Because we only sampled fish from a single lake, we cannot assess whether these data are representative of other lakes in the park. However, Landers and others (2008) found that fish from two other lakes within Glacier NP had the lowest Hg concentrations among the 14 lakes measured across national parks in the West. These contrasting results suggest that substantial variation in Hg concentrations exists among water bodies within Glacier NP and more detailed analysis of local processes may be necessary to effectively manage risk.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Lake McDonald	48.5691	-113.9362	Bull Trout	NO	n/a	
			Lake Whitefish	YES	NONE	

Comments (C. Downs): Consumptive use of whitefish is low; anglers focus on other species such as kokanee and lake trout.



Mercury in Fish: Nevada State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from one NPS unit in Nevada: Great Basin National Park. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and Nevada-specific human health benchmarks

Park	Sampling Point	Species	n	Standard Length (mm)			Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)					Percent of individuals exceeding fish risk benchmarks		Percent of individuals exceeding avian risk benchmarks			Percent of individuals exceeding human risk benchmarks			
				min	max	median	Percent Moisture	min	max	mean	se	median	min	max	mean	se	median	NOER (200 ng/g ww in whole-body)	LOER (300 ng/g ww in whole-body)	High-Sens. (90 ng/g ww in whole-body)	Moderate Sens. (180 ng/g ww in whole-body)	Low Sens. (270 ng/g ww in whole-body)	Unlim. Cons. (50 ng/g ww in muscle)	EPA Criteria (300 ng/g ww in muscle)	No Cons. (950 ng/g ww in muscle)
Great Basin	Baker Lake	brook trout	9	200	252	231	79.48	122.65	435.06	224.70	38.60	179.83	25.95	85.46	46.08	7.94	34.75	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00
	Lehman Creek	brook trout	15	127	167	152	78.21	85.27	250.37	166.11	10.71	166.61	19.02	54.28	36.05	2.20	35.39	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00
	Snake Creek	brook trout	15	122	204	145	77.78	118.70	245.64	203.83	8.25	204.04	26.22	55.56	45.29	1.86	45.53	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00

1. Great Basin National Park

(Pg. 21, Eagles-Smith et al. 2014)

We sampled brook trout from two creeks and a lake in Great Basin NP. Among these three sites Hg concentrations were uniformly among the lowest measured in the current study suggesting that at the time of sampling the ecological risk posed by Hg in these systems is likely low. Atmospheric dry deposition in Great Basin NP was among the highest measured in six western national parks (Wright and others, 2014).

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Baker Lake	38.9577	-114.3100	Brook trout	YES	10 fish in possession	Low
Lehman Creek	38.9246	-114.2381	Brook trout	YES	10 fish in possession	Low
Snake Creek	39.0147	-114.2428	Brook trout	YES	10 fish in possession	low

Comments (M. Pepper):

Baker Lake spp: Lahontan cutthroat, brook trout; Lehman Creek spp: brown trout, brook trout, rainbow trout- low fishing pressure but slightly higher in developed campgrounds; Snake Creek spp: Bonneville cutthroat, brook trout, brown trout- low fishing pressure but slightly higher in developed campgrounds



Mercury in Fish: Oregon State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from one NPS unit in Oregon: Crater Lake National Park. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and Oregon-specific human health benchmarks

Park	Sampling Point	Species	n	Standard Length (mm)			Total Mercury (ng/g, dry-weight)				Total Mercury (ng/g, wet-weight)				Percent of individuals exceeding fish risk benchmarks			Percent of individuals exceeding avian risk benchmarks			Percent of individuals exceeding human risk benchmarks			Percent of individuals exceeding state human risk benchmarks				
				min	max	med	Percent Moisture	min	max	mean	se	med	min	max	mean	se	med	NOER (200 ng/g ww in whole-body)	LOER (300 ng/g ww in whole-body)	High-Sens. (90 ng/g ww in whole-body)	Moderate Sens. (180 ng/g ww in whole-body)	Low Sens. (270 ng/g ww in whole-body)	Unlim. Cons. (50 ng/g ww in muscle)	EPA Criteria (300 ng/g ww in muscle)	No Cons. (950 ng/g ww in muscle)	OR- DEQ Unlim. Cons. (40 ng/g ww in muscle)	OHA 4 meal per month for vulnerable population (200 ng/g ww in muscle)	OHA 4 meal per month for less vulnerable population (600 ng/g ww in muscle)
Crater Lake	Crater Lake	kokanee	15	172	265	201	75.09	129.65	263.82	171.05	9.87	158.70	31.13	67.68	42.83	2.83	37.69	0.00	0.00	0.00	0.00	0.00	13.33	0.00	0.00	46.67	0.00	0.00
		rainbow trout	12	137	370	269	80.70	89.33	416.52	201.22	32.43	156.94	16.83	75.98	38.17	5.66	30.66	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	41.67	0.00	0.00

1. Crater Lake National Park

(Pg. 19, Eagles-Smith et al. 2014)

Kokanee and rainbow trout were sampled from two sites in Crater Lake NP. The two species had similar Hg concentrations and were among the lowest measured in this study, ranging from 16.8 to 76.0 ng/g ww. Overall our results indicate that Hg concentrations in fish from Crater Lake are unlikely to put fish or avian consumers at risk.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Chaski Slide, Crater Lake	42.9057	-122.1017	Kokanee	Yes	None	n/a
			Rainbow Trout	Yes	None	
Eagle Point, Crater Lake			Kokanee	Yes	None	n/a
			Rainbow Trout	Yes	None	

Comments (D. Hering): No bag limit. Species are non-native. Visitor access to the lakeshore is limited, and these specific locations where samples were collected are generally inaccessible to anglers. However the lake is the main attraction at the park and a large # of visitors take boat tours, swim, and (to a lesser extent) fish in the lake every summer.



Mercury in Fish: Utah State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from two NPS units in Utah: Capitol Reef and Zion national parks. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and Utah-specific human health benchmarks

Park	Sampling Point	Species	n	Standard Length (mm)			Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)					Percent of individuals exceeding fish risk benchmarks		Percent of individuals exceeding avian risk benchmarks			Percent of individuals exceeding human risk benchmarks			
				Percent Moisture													NOER	LOER	High-Sens.	Moderate Sens.	Low Sens.	Unlim. Cons.	EPA Criteria	No Cons.	
				min	max	med	min	max	mean	se	med	min	max	mean	se	med	(200 ng/g ww in whole-body)	(300 ng/g ww in whole-body)	(90 ng/g ww in whole-body)	(180 ng/g ww in whole-body)	(270 ng/g ww in whole-body)	(50 ng/g ww in muscle)	(300 ng/g ww in muscle)	(950 ng/g ww in muscle)	
Capitol Reef	Freemont River #1	speckled dace	15	46	74	54	68.25	320.08	1395.04	839.04	76.97	896.25	107.38	466.28	266.55	25.77	287.42	66.67	33.33	100.00	80.00	60.00	NA	NA	NA
	Freemont River #4	speckled dace	15	55	71	60	71.22	299.77	1002.48	562.84	50.97	518.01	88.50	312.31	162.25	15.75	142.39	20.00	6.67	93.33	26.67	6.67	NA	NA	NA
	Freemont River #7	speckled dace	15	53	99	65	70.44	331.14	1693.03	804.64	104.69	734.20	100.95	469.84	237.19	30.32	217.33	60.00	26.67	100.00	60.00	33.33	NA	NA	NA
Zion	E. Fork Virgin River	speckled dace	15	40	61	50	72.67	233.99	998.29	593.52	66.35	603.97	63.41	268.71	161.28	17.57	166.32	33.33	0.00	80.00	40.00	0.00	NA	NA	NA
	N. Fork Virgin River	speckled dace	15	34	44	39	75.04	499.38	706.04	604.02	19.44	605.16	117.54	185.35	150.80	5.51	145.81	0.00	0.00	100.00	6.67	0.00	NA	NA	NA

1. Capitol Reef National Park

(Pg. 19, Eagles-Smith et al. 2014)

All fish sampled from Capitol Reef NP were speckled dace, a small insectivorous “forage fish.” Despite their intermediate position in the food web, these fish contained some of the highest Hg concentrations measured in this study, exceeding those measured in many of the largest predatory fish. As smaller fish, speckled dace serve as potential prey items for predatory fishes and piscivorous birds, and dietary Hg concentrations at these levels are associated with biochemical and reproductive effects in fish (Depew and others, 2012a), as well as reproductive impairment in birds (Depew and others, 2012b). Moreover, such high Hg concentrations suggest that other invertebrate-feeding organisms in the park could be at risk. Amphibians and riparian- or aquatic invertebrate-feeding birds are two groups in particular that are both sensitive to Hg, and likely to be exposed due to their foraging ecology (Bergeron and others, 2011a, 2011b; Jackson and others, 2011; Metts and others, 2012; Willson and Hopkins, 2013). However, we only sampled a single species at three sites in Capitol Reef NP, all of which were along the Freemont River. Therefore, we are unable to speculate whether the fish communities throughout the park contain similarly high concentrations, or whether these values were the result of a localized process. Future sampling of additional sites and species within the park is necessary to fill this important knowledge gap.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Freemont River-Station 1	38.2827	-111.1157	Speckled dace	n/a	n/a	
Freemont River-Station 4	38.2815	-111.1794	Speckled dace	n/a	n/a	
Freemont River-Station 7	32.2856	-111.2416	Speckled dace	n/a	n/a	

Comments (S. Borthwick): No recreational fishing for speckled dace; no human consumption of this species. Consumption isn't a concern.

2. Zion National Park

(Pg. 24, Eagles-Smith et al. 2014)

As in Capitol Reef NP, all fish sampled from Zion NP were speckled dace and displayed high Hg concentrations (241.5 ng/g ww) for a small, low trophic level fish. At both sites along the Virgin River, mean Hg concentrations were more than 3-fold higher than the study-wide mean concentration. Furthermore, variation within and between these isolated sites was very low. As in Capitol Reef, the potential for dace to serve as prey for higher trophic position consumers, and indicators of Hg exposure in other invertebrate-feeding taxa, suggest that more research should examine factors regulating Hg accumulation in the lower trophic levels of these systems.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
VIRGIN RIVER E. FORK	37.1594	-112.9686	speckled dace	n/a	n/a	low
VIRGIN RIVER N. FORK	37.2413	-112.9588	speckled dace	n/a	n/a	none

Comments (D. Sharrow): Species consumed along N Fork are introduced trout, mostly Brown. Perception of the annual # of people fishing in Zion Canyon is 10 or less (no hard data).



Mercury in Fish: Washington State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from three NPS units in Washington: Mount Rainer, North Cascades, and Olympic national parks. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and Washington-specific human health benchmarks

Park	Sampling Point	Species	n	Standard Length (mm)			Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)					Percent of individuals exceeding fish risk benchmarks			Percent of individuals exceeding avian risk benchmarks			Percent of individuals exceeding human risk benchmarks			Percent of individuals exceeding state human risk benchmarks*						
				min	max	med	Percent Moisture					min	max	mean	se	med	min	max	mean	se	med	NOER (200 ng/g ww in whole-body)	LOER (300 ng/g ww in whole-body)	High-Sens. (90 ng/g ww in whole-body)	Moderate Sens. (180 ng/g ww in whole-body)	Low Sens. (270 ng/g ww in whole-body)	Unlim. Cons. (50 ng/g ww in muscle)	EPA Criteria (300 ng/g ww in muscle)	No Cons. (950 ng/g ww in muscle)	WA - DOH Interim Fish Criterion (150 ng/g ww in muscle)	EPA Fish Tissue Residual Criterion (300 ng/g ww in muscle)	EPA National Toxics Rule (825 ng/g ww in muscle)
							min	max	med																							
Mount Rainer	Bench Lake (L227)	brook trout	6	237	298	260	79.72	80.44	363.29	187.97	40.60	167.57	18.21	74.95	37.75	8.22	32.42	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Golden Lake (LM17)	brook trout	16	36	229	45	79.66	122.86	936.76	279.60	62.89	171.55	27.47	198.51	55.78	12.27	34.84	0.00	0.00	18.75	6.25	0.00	56.25	6.25	0.00	12.50	6.25	0.00	0.00	0.00		
	Green Lake (LC07)	cutthroat trout	6	214	285	263	79.27	257.09	397.70	322.61	20.06	322.37	55.68	78.89	66.60	3.30	66.77	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Lake George (LN02)	torrent sculpin	16	37	62	49	75.96	169.25	596.03	254.32	25.19	224.91	40.57	149.93	61.45	6.49	54.75	0.00	0.00	6.25	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Louise Lake (LZ21)	brook trout	6	145	192	174	81.56	289.80	909.63	507.54	92.36	454.07	55.48	125.87	89.15	10.41	86.49	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Lower Deadwood Lake (LW33)	rainbow trout	11	185	353	227	78.59	164.62	1322.55	458.96	97.23	326.71	37.04	210.45	93.01	15.11	70.85	0.00	0.00	18.18	0.00	0.00	90.91	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	
		threespine stickleback	6	34	59	39	71.40	140.28	408.22	209.62	42.23	165.12	39.83	113.57	59.47	11.40	49.13	0.00	0.00	16.67	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Lower Palisades Lake (LH12)	brook trout	19	180	365	293	78.17	261.78	716.66	550.34	28.48	575.09	60.94	151.96	119.44	5.78	128.02	0.00	0.00	21.05	0.00	0.00	100.00	0.00	0.00	5.26	0.00	0.00	0.00	0.00		
	Wetland 1244	brook trout	7	122	179	155	80.51	212.08	538.82	317.59	46.04	293.70	43.42	99.22	60.89	7.66	57.09	0.00	0.00	0.00	0.00	0.00	57.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Wetland 1614	cutthroat trout	7	89	135	100	76.37	678.43	1437.25	1002.21	106.50	919.07	140.09	384.49	243.44	36.92	199.56	42.86	28.57	100.00	42.86	42.86	100.00	42.86	0.00	85.71	42.86	0.00	0.00	0.00		
	Unnamed lake (LW05)	cutthroat trout	11	195	278	235	78.96	258.62	1169.99	646.60	89.28	672.40	57.16	237.39	134.44	17.86	139.17	0.00	0.00	54.55	0.00	0.00	100.00	0.00	0.00	45.45	0.00	0.00	0.00	0.00		
	Unnamed pond (LH11)	brook trout	15	122	201	156	75.86	151.76	634.99	303.47	39.01	262.64	36.96	148.35	71.70	8.33	61.52	0.00	0.00	6.67	0.00	0.00	73.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Wetland 583	brook trout	9	131	188	161	76.39	53.21	178.29	87.07	12.98	72.14	12.51	43.34	20.58	3.16	16.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Unnamed wetland (LH15)	cutthroat trout	14	187	276	214	78.04	166.30	705.11	342.47	49.20	296.67	35.98	146.58	73.34	9.60	62.75	0.00	0.00	7.14	0.00	0.00	64.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Mowich Lake (LM04)	torrent sculpin	9	53	105	99	75.94	147.39	361.82	281.35	28.25	328.64	34.46	92.46	67.51	6.89	76.01	0.00	0.00	11.11	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA			
Reflection Lake (LN19)	brook trout	21	114	227	174	79.92	163.79	1869.33	504.22	88.20	329.14	35.64	313.85	96.01	14.51	70.22	0.00	0.00	19.05	4.76	0.00	71.43	4.76	0.00	14.29	4.76	0.00	0.00	0.00			
Snow Lake	brook trout	13	179	239	208	79.35	103.51	364.09	202.00	20.77	188.67	22.11	73.38	41.56	4.15	39.22	0.00	0.00	0.00	0.00	0.00	30.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	cutthroat trout	2	193	241	217	78.94	97.08	176.15	136.62	39.54	136.62	21.33	35.47	28.40	7.07	28.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Upper Deadwood Lake (LW32)	rainbow trout	7	203	305	270	78.50	133.72	422.51	236.90	39.95	209.99	30.38	83.09	49.95	7.36	45.54	0.00	0.00	0.00	0.00	0.00	28.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Park	Sampling Point	Species	n	Standard Length (mm)			Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)					Percent of individuals exceeding fish risk benchmarks			Percent of individuals exceeding avian risk benchmarks			Percent of individuals exceeding human risk benchmarks			Percent of individuals exceeding state human risk benchmarks*						
				min	max	med	min	max	mean	se	med	min	max	mean	se	med	NOER (200 ng/g ww in whole-body)	LOER (300 ng/g ww in whole-body)	High-Sens. (90 ng/g ww in whole-body)	Moderate Sens. (180 ng/g ww in whole-body)	Low Sens. (270 ng/g ww in whole-body)	Unlim. Cons. (50 ng/g ww in muscle)	EPA Criteria (300 ng/g ww in muscle)	No Cons. (950 ng/g ww in muscle)	WA - DOH Interim Fish Criterion (150 ng/g ww in muscle)	EPA Fish Tissue Residual Criterion (300 ng/g ww in muscle)	EPA National Toxics Rule (825 ng/g ww in muscle)					
																												Percent Moisture				
North Cascades	George Lake	rainbow trout	10	171	226	183	80.15	120.45	349.68	235.75	25.28	243.57	22.40	71.13	46.90	5.10	48.48	0.00	0.00	0.00	0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Middle Blum Lake	brook trout	15	91	220	145	80.30	96.82	1041.80	372.72	69.30	303.56	22.46	209.30	70.78	12.84	57.56	0.00	0.00	6.67	0.00	0.00	53.33	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00	
	Upper Wilcox Lake	cutthroat trout	12	170	248	205	78.17	145.18	673.18	285.62	42.89	260.34	30.78	142.67	62.36	9.22	57.93	0.00	0.00	8.33	0.00	0.00	58.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Olympic	Gladys Lake	brook trout	30	150	182	167	81.31	289.62	775.87	464.42	24.25	454.70	53.88	150.63	86.58	4.44	83.88	0.00	0.00	3.33	0.00	0.00	100.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	
	Hagen Lake	cutthroat trout	15	175	238	215	79.98	247.86	750.83	493.74	41.50	503.10	51.74	143.60	97.92	7.63	99.41	0.00	0.00	6.67	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Hoh Lake	brook trout	15	142	185	166	81.97	385.26	1202.42	742.30	70.30	655.59	75.53	208.84	132.31	11.56	118.77	0.00	0.00	33.33	0.00	0.00	100.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	
	Sun Up Lake	cutthroat trout	30	219	269	248	80.02	263.85	609.18	434.92	15.39	443.70	55.14	124.01	86.79	3.08	88.03	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Upper Lena Lake	rainbow trout	27	149	198	175	81.84	198.34	589.40	381.55	21.64	368.62	34.91	97.86	68.66	3.57	67.87	0.00	0.00	0.00	0.00	0.00	74.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

* from Fischnaller, Anderson and Norton 2003, Washington Department of Ecology publication No. 03-03-026

1. Mount Rainier National Park

(Pg. 22, Eagles-Smith et al. 2014)

Mount Rainer NP is one of two parks in which we sampled a large number of sites in order to characterize intra-park variation. Although the average fish THg concentration across the 17 sites from which fish were sampled (71.5 ng/g ww) was similar to the study-wide mean across all fish, we found a 12-fold range in mean concentrations among sites before accounting for the effects of size. Size normalized Hg concentrations in the 200 mm SL size class were even more variable among sites. The highest mean concentration at a site (193.2 ng/g ww) was nearly 23-fold higher than the lowest site mean concentration (8.5 ng/g ww). Such extreme variation among sites in Mount Rainer NP suggests that local-scale factors play an important role in determining the ecological risk of Hg and emphasizes the need to sample from multiple locations in order to accurately characterize Hg risk to park resources as a whole.

Site		Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Deadwood upper/southern	LW32	46.8890	-121.5248	rainbow trout	YES	NONE	moderate
Green	LC07			cutthroat trout	YES	NONE	moderate
unnamed (Bear Park)	LW05	46.9561	-121.5719	cutthroat trout	YES	NONE	low-moderate
unnamed (small pond NE of Lower Palisades)	LH11	46.9554	-121.5932	brook trout	YES	NONE	moderate-low
Lower Palisades	LH12	46.9533	-121.5903	brook trout	YES	NONE	moderate
Mowich	LM04			kokanee	YES	NONE	Heavy
				torrent sculpin	YES	NONE	
Deadwood lower/northern	LW33	46.8871	-121.5227	brook trout	YES	NONE	moderate
Deadwood upper/southern	LW32	46.8890	-121.5248	rainbow trout	YES	NONE	moderate
				threespine stickleback	YES	NONE	
Golden (largest)	LM17	46.8887	-121.9002	brook trout	YES	NONE	moderate
Tipsoo	LO02			rainbow trout	n/a	n/a	Heavy
George	LN02	46.7917	-121.9040	torrent sculpin	YES	NONE	moderate
Louise	LZ21	46.7704	-121.7157	brook trout	YES	NONE	Heavy
Reflection (largest)	LN19	46.7693	-121.7294	brook trout	n/a	n/a	
wetland Nisqually watershed (part of lm22)	1244	46.7704	-121.7259	brook trout	YES	NONE	Low
Snow	LZ29	46.7570	-121.6992	brook trout	YES	NONE	moderate-heavy
				cutthroat trout	YES	NONE	
wetland Nisqually watershed	1614	46.74006	-121.8836	cutthroat trout	YES	NONE	low-none
wetland Nisqually watershed	1620			cutthroat trout	YES	NONE	low-none
Unnamed - Green Park Lake	LH15	46.9517	-121.6178	cutthroat trout	YES	NONE	low-moderate

Comments (B. Samora): Fishing not permitted at LO02 (Tipsoo) and LN19 (Reflection). LW33/LW32 (Deadwood) and LC07 (Green) popular for fishing.

2. North Cascades National Park

(Pg. 22, Eagles-Smith et al. 2014)

All three of the sites sampled in North Cascades NP had mean Hg concentrations below the average of all fish sampled in this study. After standardizing the fish to 200 mm SL, the mean Hg concentration in fish from North Cascades NP (73.3 ng/g ww) was similar to the mean of 200 mm fish across all parks. These data suggest that the ecological risk of Hg at the three sites sampled in North Cascades NP is low relative to many of the other parks. However, given the variation demonstrated among sites in this study, the limited sampling it is difficult to generalize across other sites in the park without more extensive sampling.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Gorge Lake	48.7061	-121.1723	Rainbow trout	YES	5 fish/day	
Middle Blum	48.7500	-121.4956	Brook trout	YES	5 fish/day	
Upper Wilcox	48.6011	-121.1717	Cutthroat trout	YES	5 fish/day	

Comments (A. Rawhouser)

3. Olympic National Park

(Pg. 22, Eagles-Smith et al. 2014)

Mercury concentrations in fish across the five lakes sampled in Olympic NP (85.0 ng/g ww) were slightly higher than the mean concentration across the entire study. However, we found substantial variability in fish THg concentrations among lakes. In particular, size-adjusted THg concentrations in fish from Hoh Lake (253.0 ng/g ww) were more than 3.5-fold higher than those in Gladys Lake (71.5 ng/g ww), which had the lowest site-specific THg concentrations in the park. Our models of Hg risk to consumers reflects these higher concentrations and suggest that fish in Hoh Lake are likely to approach or exceed the EPA criterion for protection of human health and the avian benchmark for reproductive impairment above 180 mm. These results are similar to those reported by Landers and others (2008), who found Hg concentrations in fish from Hoh Lake were among the highest measured during their screening of national parks.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Gladys	47.8767	-123.3578	brook trout	YES	NONE	heavy
Hagen	47.6192	-123.2680	cutthroat trout	YES	NONE	low
Hoh	47.8988	-123.7863	brook trout	YES	NONE	heavy
Upper Lena Lake	47.6331	-123.2080	rainbow trout	YES	NONE	heavy
Sun Up	47.5314	-123.4862	cutthroat trout	YES	NONE	low

Comments (S. Fradkin): All of these sites are high elevation lakes that were historically fishless, and the park has an interest in ultimately removing fish from these systems. Visitor use a qualitative measure. All are backcountry lakes so visitation is a relative measure, and these lakes are ice-free for only 3-4 months during the year.



Mercury in Fish: Wyoming State Summary

Eagles-Smith et al. (2014) analyzed mercury (Hg) in fish from two NPS units in Wyoming: Grand Teton and Yellowstone national parks. Information provided here includes the following: summary statistics compared to state-specific health benchmarks; park findings; sport fishing regulations at the sites sampled, along with bag/size limits and visitor use.

USGS Data Summary

Comparison to wildlife health benchmarks and Wyoming-specific human health benchmarks

Park	Sampling Point	Species	n	Standard Length (mm)			Total Mercury (ng/g, dry-weight)					Total Mercury (ng/g, wet-weight)					Percent of individuals exceeding fish risk benchmarks		Percent of individuals exceeding avian risk benchmarks			Percent of individuals exceeding human risk benchmarks				
				Percent Moisture													NOER	LOER	High-Sens.	Moderate Sens.	Low Sens.	Unlim. Cons.	EPA Criteria	No Cons.		
				min	max	med	min	max	mean	se	med	min	max	mean	se	med	(200 ng/g ww in whole-body)	(300 ng/g ww in whole-body)	(90 ng/g ww in whole-body)	(180 ng/g ww in whole-body)	(270 ng/g ww in whole-body)	(50 ng/g ww in muscle)	(300 ng/g ww in muscle)	(950 ng/g ww in muscle)		
Grand Teton	Death Canyon	cutthroat trout	15	162	253	214	74.85	66.35	118.82	92.49	4.06	98.26	16.56	29.44	23.17	0.89	23.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grizzly Bear Lake	cutthroat trout	15	219	315	254	77.71	114.46	470.42	258.12	29.79	243.62	24.97	99.04	56.83	6.18	49.63	0.00	0.00	0.00	0.00	0.00	46.67	0.00	0.00	
	Lake Solitude	cutthroat trout	15	137	278	236	78.17	77.21	303.94	142.18	14.85	126.62	16.23	58.75	30.61	2.78	27.93	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	
Yellowstone	Beula Lake	cutthroat trout	15	204	300	234	77.19	273.71	645.13	478.52	23.31	486.85	61.39	145.00	109.11	5.25	113.55	0.00	0.00	6.67	0.00	0.00	100.00	0.00	0.00	
	Grebe Lake	arctic grayling	15	128	255	153	77.28	225.27	837.48	393.83	42.55	322.25	48.36	190.65	89.95	10.04	74.59	0.00	0.00	6.67	0.00	0.00	93.33	0.00	0.00	
		rainbow trout	15	152	273	243	77.05	378.28	905.01	655.53	40.95	658.43	84.27	202.16	150.77	9.82	144.74	0.00	0.00	53.33	0.00	0.00	100.00	0.00	0.00	
	Lewis Lake	brown trout	15	109	394	147	76.56	195.89	652.13	317.47	34.79	271.94	46.20	147.75	74.12	7.95	61.14	0.00	0.00	6.67	0.00	0.00	80.00	0.00	0.00	
	Yellowstone Lake	cutthroat trout	15	243	294	261	73.73	197.24	624.66	415.77	36.93	380.12	44.59	192.48	109.39	10.59	92.23	0.00	0.00	20.00	0.00	0.00	93.33	0.00	0.00	
lake trout		15	240	325	262	78.04	276.01	1193.21	574.58	62.54	569.65	55.29	312.20	128.80	16.90	125.70	0.00	0.00	26.67	6.67	0.00	100.00	6.67	0.00		

1. Grand Teton National Park

(Pg. 20, Eagles-Smith et al. 2014)

Mercury concentrations in fish from the two lakes and one stream sampled in Grand Teton NP were consistently among the lowest measured in this study. It is unclear whether these low concentrations are the result of low local inputs of Hg, the Hg methylation potential of the water bodies measured, or some biological characteristic of the fish.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Death Canyon	43.6702	-110.8745	Cutthroat Trout	YES	3 trout/day, no more than 1 >16 in.; and no more than 1 cutthroat >12 in.	LOW
Grizzly Bear Lake	43.8027	-110.8107	Cutthroat Trout	YES	6 trout/day or in possession, no more than 3 shall be cutthroat; and no more than 1 cutthroat >12 in.	MODERATE
Lake Solitude	43.7926	-110.8448	Cutthroat Trout	YES	6 trout/day or in possession, no more than 3 shall be cutthroat; and no more than 1 cutthroat >12 in.	N/A

Comments (S. Cain): Death Canyon site - very little fishing pressure. Grizzly Bear Lake - Popular fishing spot but not easy to get to. At some point in the past there were pack trips that took people to Grizzly Bear Lake to fish. If you look at camper nights over the past 4 years we averaged 53.25 camper nights per year. We have no idea how many of these people also fished.

Lake Solitude - No information. The north fork of Cascade obviously gets a lot of use - for 2013 there were 1950 camper nights not to mention all the day users. No information about fishing available.

2. Yellowstone National Park

(Pg. 24, Eagles-Smith et al. 2014)

Across all lakes, mean fish THg concentrations in Yellowstone NP (101.2 ng/g ww) were above the study-wide mean value from all parks. Size adjusted THg concentrations for 200 mm SL fish (119.8 ng/g ww) were among the highest measured in this study. Importantly, natural geothermal Hg sources occur throughout Yellowstone, though it is unclear if those sources play a role in fish bioaccumulation.

Site	Latitude	Longitude	Species	Catch-and-kill?	Harvest Limits?	Visitor Use?
Beula Lake	44.1598	-110.7670	cutthroat trout	NO	N/A	
Grebe Lake	44.7516	-110.5578	arctic grayling	NO	N/A	
			rainbow trout	YES	unlimited harvest	
Lewis Lake	44.3068	-110.6305	brown trout	YES	1 fish/day	
Yellowstone Lake	44.4659	-110.3330	cutthroat trout	NO	N/A	
			lake trout	YES	must kill regulation	

Comments (T. Koel): Yellowstone (lake trout) - must kill regulation; every lake trout must be killed but may be discarded and not consumed.