



Alaska Department of Environmental Conservation

Office of the State Veterinarian

Fish Monitoring Program

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Polybrominated Diphenyl Ethers (PBDEs) in Alaska's Fish

Fish Samples collected: 2001-2022

Concentration in $\mu\text{g/Kg}$ wet weight (parts per billion)

ND = Non-detect in greater than 50% of fish samples

Visit the Fish Monitoring Program webpage for more information:

<http://www.dec.alaska.gov/eh/vet/fish-monitoring-program>

For State of Alaska fish consumption recommendations visit:

<http://www.dhss.alaska.gov/dph/Epi/eph/Pages/fish/default.aspx>

Table 1: Total PBDEs in Alaskan Fishes

Species	Tissue	n	ND	$\mu\text{g/Kg}$ wet weight				
				Mean	SD	Median	Min	Max
Alaska Plaice	C-Muscle	1	0	0.03	NA	0.03	0.03	0.03
Arctic Char	Fillet	1	0	7.37	NA	7.37	7.37	7.37
Arctic Grayling	Whole Body	4	0	0.67	0.22	0.67	0.39	0.93
Bering Cisco	Fillet	5	0	0.11	0.05	0.10	0.05	0.16
Big Skate	Fillet	2	0	0.03	0.02	0.03	0.01	0.05
Blue Mussel	C-Invert_Whole	1	0	0.18	NA	0.18	0.18	0.18
Broad Whitefish	C-Muscle	3	0	0.08	0.01	0.08	0.07	0.09
Burbot	Fillet	1	0	0.35	NA	0.35	0.35	0.35
Capelin	C-Whole Body	1	0	0.07	NA	0.07	0.07	0.07
Chum Salmon	Fillet	50	0	0.18	0.10	0.17	0.05	0.53
Chum Salmon	C-Muscle	1	0	0.21	NA	0.21	0.21	0.21
Chum Salmon	Whole Body	2	0	0.32	0.07	0.32	0.27	0.37
Coho Salmon	Fillet	113	0	0.18	0.14	0.13	0.04	1.05
Coho Salmon	Belly	10	0	0.20	0.12	0.18	0.09	0.5
Coho Salmon	Whole Body	58	0	0.27	0.21	0.22	0.09	1.53
Coho Salmon	Eggs	19	0	0.28	0.14	0.24	0.12	0.68
Coho Salmon	C-Juvenile	1	0	0.22	NA	0.22	0.22	0.22
Dolly Varden	Fillet	1	0	3.47	NA	3.47	3.47	3.47
Dolly Varden	C-Whole Body	3	0	0.32	0.20	0.22	0.18	0.55
Dungeness Crab_Tissue	Invert_Muscle	2	0	0.07	0.02	0.07	0.06	0.09
Dusky Rockfish	Fillet	15	0	0.13	0.04	0.11	0.08	0.23
Eulachon	C-Whole Body	7	0	0.30	0.06	0.31	0.19	0.36
Humpback Whitefish	Fillet	12	0	0.07	0.05	0.06	0.02	0.22
Humpback Whitefish	Whole Body	2	0	0.20	0.09	0.20	0.13	0.27
King Salmon	Fillet	77	0	0.40	0.47	0.28	0.08	2.77
King Salmon	C-Muscle	1	0	0.14	NA	0.14	0.14	0.14
King Salmon	Whole Body	15	0	0.40	0.12	0.36	0.25	0.6
King Salmon	C-Juvenile	3	0	0.15	0.06	0.18	0.08	0.19
King Salmon	C-Whole Body	1	0	0.32	NA	0.32	0.32	0.32
Lake Trout	Fillet	11	0	1.24	1.10	0.85	0.33	4.26
Lake Trout	Whole Body	2	0	9.22	9.76	9.22	2.32	16.12
Least Cisco	Fillet	5	0	0.11	0.12	0.06	0.02	0.32
Least Cisco	Whole Body	1	0	0.16	NA	0.16	0.16	0.16
Longnose Skate	Fillet	2	0	0.09	0.06	0.09	0.05	0.13
Northern Pike	Fillet	11	0	0.08	0.05	0.06	0.04	0.18
Northern Pike	C-Muscle	6	0	0.26	0.26	0.13	0.04	0.67
Northern Pike	Whole Body	10	0	0.42	0.24	0.36	0.28	1.1

Table 1: Total PBDEs in Alaskan Fishes (*continued*)

Species	Tissue	n	ND	$\mu\text{g/Kg}$ wet weight				
				Mean	SD	Median	Min	Max
Northernrock Sole	C-Muscle	1	0	0.05	NA	0.05	0.05	0.05
Pacific Cod	Fillet	25	0	0.19	0.11	0.15	0.09	0.6
Pacific Halibut	Fillet	98	0	0.74	0.98	0.35	0.04	5.12
Pacific Halibut	C-Muscle	23	0	0.11	0.06	0.10	0.02	0.28
Pacific Herring	Fillet	1	0	0.32	NA	0.32	0.32	0.32
Pacific Herring	Eggs	1	0	0.21	NA	0.21	0.21	0.21
Pacific Herring	C-Whole Body	11	0	0.38	0.13	0.41	0.1	0.58
Pink Salmon	Fillet	24	0	0.27	0.15	0.22	0.11	0.61
Rainbow Trout	Fillet	4	0	1.45	0.37	1.39	1.07	1.94
Sablefish	Fillet	38	0	1.13	0.70	1.13	0.32	2.79
Sablefish	C-Muscle	4	0	0.58	0.83	0.21	0.07	1.81
Sablefish	Whole Body	3	0	1.43	0.48	1.62	0.88	1.79
Saffron Cod	Whole Body	9	0	0.07	0.08	0.04	0.03	0.29
Salmon Shark	Fillet	8	0	3.51	1.47	3.79	1.49	5.36
Sand Lance	C-Whole Body	1	0	0.12	NA	0.12	0.12	0.12
Sheefish	Fillet	26	0	0.31	0.18	0.34	0.04	0.73
Sheefish	Whole Body	5	0	0.60	0.30	0.70	0.18	0.9
Sheefish	Eggs	1	0	0.49	NA	0.49	0.49	0.49
Shortraker	Fillet	5	0	0.07	0.04	0.06	0.03	0.14
Rockfish								
Sleeper Shark	Fillet	1	0	1.89	NA	1.89	1.89	1.89
Snow Crab	C-Muscle	1	0	0.22	NA	0.22	0.22	0.22
Sockeye Salmon	Fillet	68	0	0.30	0.36	0.20	0.03	2.14
Sockeye Salmon	C-Muscle	1	0	0.09	NA	0.09	0.09	0.09
Sockeye Salmon	Whole Body	20	0	0.73	0.98	0.23	0.13	3.68
Sockeye Salmon	Eggs	2	0	0.36	0.24	0.36	0.19	0.53
Sockeye Salmon	C-Whole Body	7	0	0.75	1.59	0.16	0.12	4.35
Spiny Dogfish	Fillet	5	0	1.37	0.65	1.14	0.73	2.42
Starry Flounder	C-Whole Body	3	0	0.06	0.03	0.04	0.04	0.1
Walleye Pollock	Fillet	15	0	0.21	0.11	0.19	0.08	0.45
Yellowfin Sole	C-Muscle	1	0	0.04	NA	0.04	0.04	0.04

Note:

n= sample size

ND = non-detect

Mean = arithmetic mean

SD = standard deviation

C = Composite of multiple individuals

Table 2: PBDE Congener 47 in Alaskan Fishes

Species	Tissue	n	ND	$\mu\text{g/Kg}$ wet weight				
				Mean	SD	Median	Min	Max
Alaska Plaice	C-Muscle	1	0	0.01	NA	0.01	0.01	0.01
Arctic Char	Fillet	1	0	3.15	NA	3.15	3.15	3.15
Arctic Grayling	Whole Body	4	0	0.34	0.13	0.37	0.18	0.45
Bering Cisco	Fillet	5	0	0.04	0.02	0.04	0.02	0.07
Big Skate	Fillet	2	0	0.00	0.00	0.00	0.00	0.00
Blue Mussel	C-Invert_Whole	1	0	0.05	NA	0.05	0.05	0.05
Broad Whitefish	C-Muscle	3	0	0.02	0.01	0.02	0.02	0.04
Burbot	Fillet	1	0	0.15	NA	0.15	0.15	0.15
Capelin	C-Whole Body	1	0	0.02	NA	0.02	0.02	0.02
Chum Salmon	Fillet	50	0	0.02	0.01	0.02	0.01	0.07
Chum Salmon	C-Muscle	1	0	0.01	NA	0.01	0.01	0.01
Chum Salmon	Whole Body	2	0	0.05	0.01	0.05	0.04	0.05
Coho Salmon	Fillet	113	0	0.04	0.03	0.03	0.01	0.20
Coho Salmon	Belly	10	0	0.07	0.03	0.07	0.02	0.12
Coho Salmon	Whole Body	58	0	0.09	0.06	0.08	0.03	0.38
Coho Salmon	Eggs	19	0	0.10	0.06	0.09	0.04	0.31
Coho Salmon	C-Juvenile	1	0	0.09	NA	0.09	0.09	0.09
Dolly Varden	Fillet	1	0	1.40	NA	1.40	1.40	1.40
Dolly Varden	C-Whole Body	3	0	0.17	0.14	0.10	0.08	0.34
Dungeness Crab_Tissue	Invert_Muscle	2	0	0.03	0.01	0.03	0.02	0.03
Dusky Rockfish	Fillet	15	0	0.02	0.02	0.01	0.01	0.09
Eulachon	C-Whole Body	7	0	0.08	0.00	0.08	0.07	0.09
Humpback Whitefish	Fillet	12	0	0.02	0.03	0.01	0.00	0.10
Humpback Whitefish	Whole Body	2	0	0.09	0.05	0.09	0.06	0.13
King Salmon	Fillet	77	0	0.15	0.25	0.08	0.04	1.39
King Salmon	C-Muscle	1	0	0.03	NA	0.03	0.03	0.03
King Salmon	Whole Body	15	0	0.11	0.03	0.09	0.07	0.17
King Salmon	C-Juvenile	3	0	0.02	0.01	0.02	0.01	0.03
King Salmon	C-Whole Body	1	0	0.15	NA	0.15	0.15	0.15
Lake Trout	Fillet	11	0	0.48	0.51	0.30	0.09	1.90
Lake Trout	Whole Body	2	0	4.07	4.67	4.07	0.77	7.37
Least Cisco	Fillet	5	0	0.04	0.06	0.02	0.00	0.15
Least Cisco	Whole Body	1	0	0.05	NA	0.05	0.05	0.05
Longnose Skate	Fillet	2	0	0.01	0.01	0.01	0.00	0.02
Northern Pike	Fillet	11	0	0.02	0.02	0.02	0.01	0.07
Northern Pike	C-Muscle	6	0	0.08	0.11	0.04	0.01	0.30
Northern Pike	Whole Body	10	0	0.16	0.08	0.14	0.11	0.39

Table 2: PBDE Congener 47 in Alaskan Fishes (*continued*)

Species	Tissue	n	ND	$\mu\text{g/Kg}$ wet weight				
				Mean	SD	Median	Min	Max
Northernrock Sole	C-Muscle	1	0	0.01	NA	0.01	0.01	0.01
Pacific Cod	Fillet	25	0	0.02	0.01	0.02	0.01	0.05
Pacific Halibut	Fillet	98	0	0.45	0.72	0.15	0.01	3.67
Pacific Halibut	C-Muscle	23	0	0.04	0.03	0.02	0.01	0.10
Pacific Herring	Fillet	1	0	0.10	NA	0.10	0.10	0.10
Pacific Herring	Eggs	1	0	0.07	NA	0.07	0.07	0.07
Pacific Herring	C-Whole Body	11	0	0.16	0.06	0.16	0.02	0.22
Pink Salmon	Fillet	24	0	0.02	0.01	0.02	0.01	0.05
Rainbow Trout	Fillet	4	0	0.68	0.19	0.62	0.52	0.95
Sablefish	Fillet	38	0	0.69	0.51	0.65	0.03	1.72
Sablefish	C-Muscle	4	0	0.32	0.57	0.05	0.01	1.18
Sablefish	Whole Body	3	0	0.91	0.33	1.10	0.53	1.10
Saffron Cod	Whole Body	9	0	0.02	0.01	0.02	0.01	0.04
Salmon Shark	Fillet	8	0	2.19	1.01	2.28	0.88	3.54
Sand Lance	C-Whole Body	1	0	0.03	NA	0.03	0.03	0.03
Sheefish	Fillet	26	0	0.09	0.07	0.06	0.01	0.28
Sheefish	Whole Body	5	0	0.30	0.15	0.33	0.09	0.44
Sheefish	Eggs	1	0	0.23	NA	0.23	0.23	0.23
Shortraker Rockfish	Fillet	5	0	0.03	0.02	0.02	0.02	0.07
Sleeper Shark	Fillet	1	0	1.16	NA	1.16	1.16	1.16
Snow Crab	C-Muscle	1	0	0.00	NA	0.00	0.00	0.00
Sockeye Salmon	Fillet	68	0	0.08	0.17	0.04	0.00	0.93
Sockeye Salmon	C-Muscle	1	0	0.02	NA	0.02	0.02	0.02
Sockeye Salmon	Whole Body	20	0	0.23	0.33	0.07	0.04	1.16
Sockeye Salmon	Eggs	2	0	0.14	0.08	0.14	0.08	0.20
Sockeye Salmon	C-Whole Body	7	0	0.49	1.14	0.06	0.04	3.08
Spiny Dogfish	Fillet	5	0	0.70	0.40	0.58	0.35	1.37
Starry Flounder	C-Whole Body	3	0	0.02	0.01	0.02	0.01	0.03
Walleye Pollock	Fillet	15	0	0.01	0.01	0.01	0.01	0.03
Yellowfin Sole	C-Muscle	1	0	0.00	NA	0.00	0.00	0.00

Note:

n= sample size

ND = non-detect

Mean = arithmetic mean

SD = standard deviation

C = Composite of multiple individuals

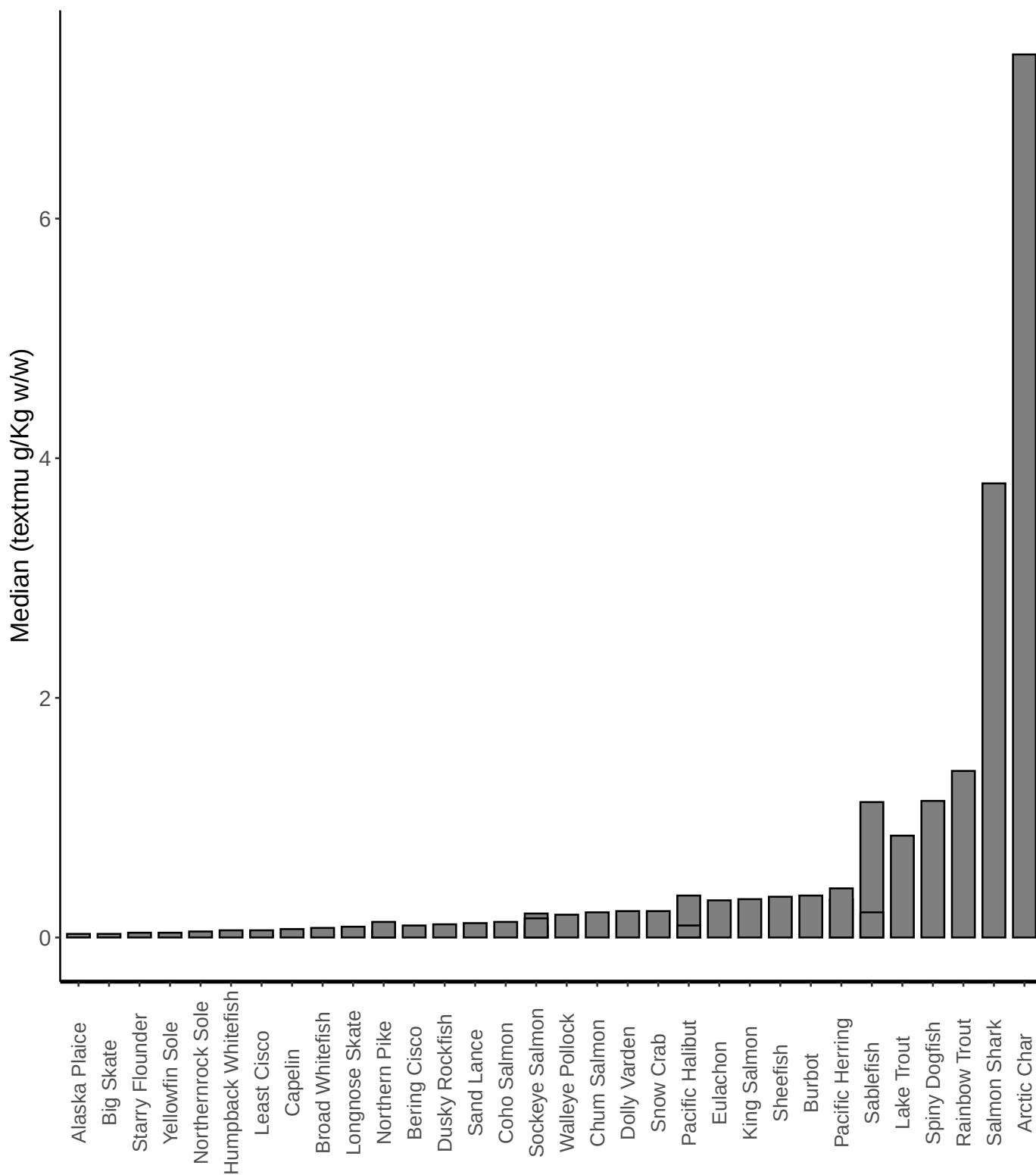


Figure 1: Total PBDE's in Alaskan Fish

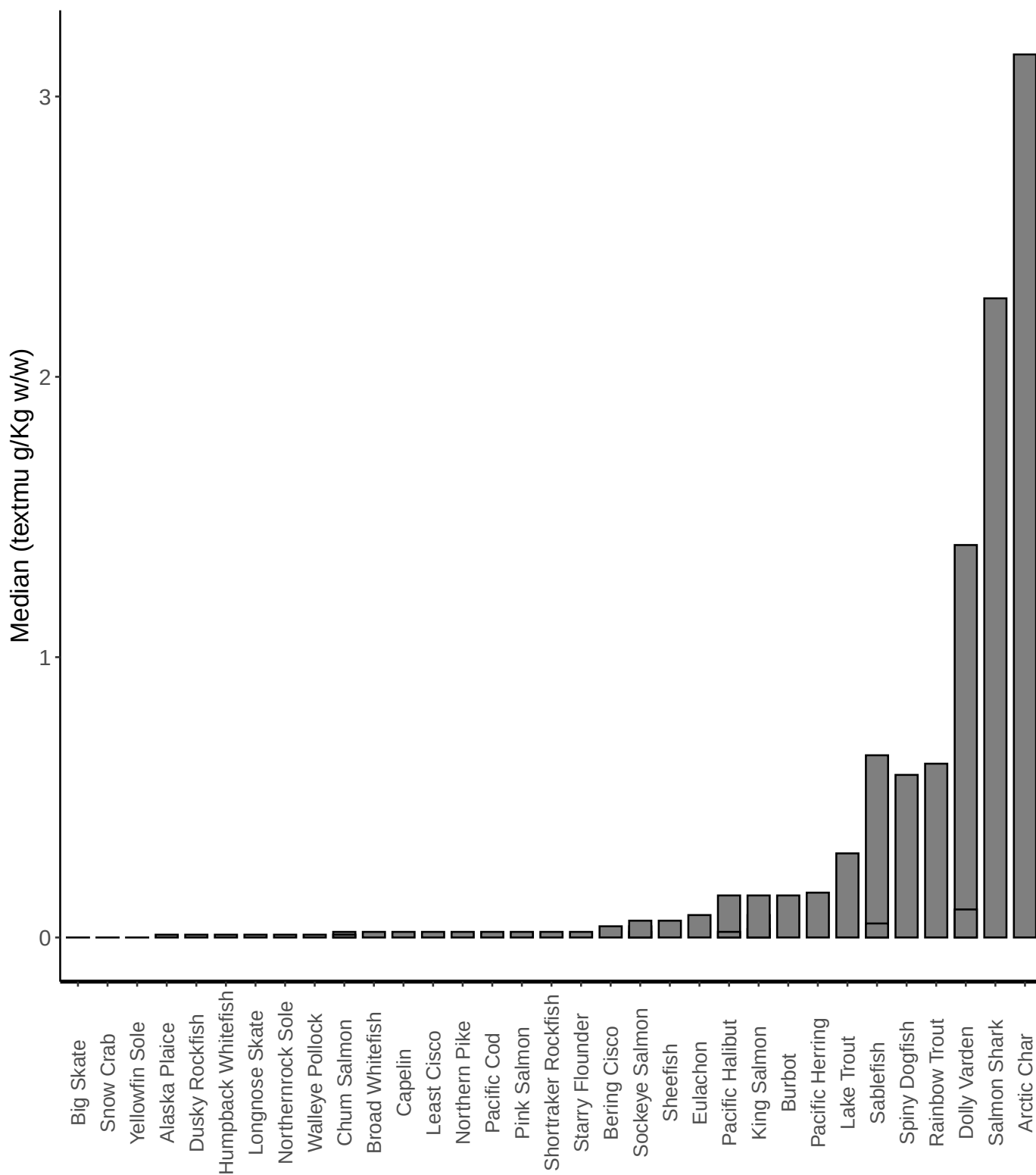


Figure 2: PBDE Congener 47 in Alaskan Fish