

(News Release)
The Results of Radioactive Material Monitoring Surveys of Aquatic Organisms
(2012 Winter Samples)

<Simultaneously released to the Fukushima Prefecture Press Club>

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In accordance with the Comprehensive Radiation Monitoring Plan determined by the Monitoring Coordination Meeting, the Ministry of the Environment (MOE) is continuing radioactive materials monitoring in surface water and its sediment (rivers, lakes and headwaters, and coasts).

Samples of aquatic organisms taken mainly in Fukushima Prefecture (winter survey: sampling period: December 4, 2012-January 18, 2013) have been measured as part of MOE's efforts to monitor radioactive materials; the results have been compiled and are released here.

The monitoring results of radioactive materials in surface water bodies carried out to date can be found at the following web page: <http://www.env.go.jp/jishin/rmp.html#monitoring>

1. Survey Overview

(1) Survey Locations

Type	Surveyed Areas	Survey Locations, etc.	Survey Date
Rivers	A	Harasegawa River (Tributary)	December 5, 2012
	B	Abukumagawa River Surikamigawa River (Tributary), Taishobashi Bridge	December 6, 14, 2012
	C	Udagawa River	December 18, 2012
	D	Manogawa River	December 12, 13, 2012, January 18, 2013
	E	Niidagawa River	December 19, 2012
	F	Otagawa River	December 20, 2012
Lakes	G	Hayamako lake (Mano Dam)	December 10, 2012, January 18, 2013
	H	Akimotoko Lake	December 4, 2012
	I	Inawashiroko Lake South Shore	December 7, 2012
Sea Areas	J	Offshore of Abukumagawa River Estuary	December 11, 2012
	K	Offshore of Somashi City (Matsukawaura Lake)	December 10, 2012
	L	Offshore of Iwakishi City (Hisanohama Beach Offshore)	December 14, 24, 2012

(Map attached)

(2) Survey Method

Samples of aquatic organisms (aquatic insects, algae, crustaceans, shellfish, fishes, etc.) were collected and the concentration of radioactive materials (radioactive cesium (Cs-134 and Cs-137)) in each type of organisms was measured.

2. Survey Results Summary (See Annex for details)

(1) Rivers and Lakes (lower row in each case shows the results of 2012 fall surveys)

There are variations between each body of water and the types of organism collected, but in general, a decline in the concentrations of radioactive cesium can be seen compared to the fall survey. Furthermore, just as in previous surveys, the concentration of radioactive cesium in rivers and lakes is higher than in sea areas.

Type			Plant (algae)	Aquatic Insects	Crustacean	Shellfish	Fishes	Amphibians	CPOM (dry leaves, etc.)
Abukumagawa River System	Abukumagawa River A	Winter 2012	ND	67, 170 (2 species)	58	-	44-88 (4 species)	58, 140 (2 species)	380
		Fall 2012	9.3	54 (1 species)	30	24	33-172 (7 species)	52, 720 (2species)	350
	Abukumagawa River B	Winter 2012	19	26-132 (3 species)	-	63	35-170 (7 species)	82	235
		Fall 2012	68	14-208 (4 species)	54	63	35, 103 (5 species)	470	237
Udagawa River C		Winter 2012	-	61, 182 (2 species)	65	-	65-242 (3 species)	-	92
		Fall 2012	300	17-680 (4 species)	74, 74 (2species)	-	83-430 (4 species)	-	101
Manogawa River System	Hayama Lake G (Mano Dam)	Winter 2012	94	580	-	-	480-2,600 (4 species)	-	206
		Fall 2012	420	92,1, 100 (2 species)	-	-	193-5,400 (8 species)	-	320
	Manogawa River D	Winter 2012	0.97	61-470 (4 species)	-	-	51-590 (4 species)	790	231
		Fall 2012	540	113-510 (3 species)	224	440	1.1-800 (4 species)	1,110	510
Niidagawa River E		Winter 2012	-	91-980 (3 species)	420	-	238-1,040 (5 species)	-	580
		Fall 2012	-	165-1,770 (4 species)	410	230	320-1,220 (8 species)	1,620	890
Otagawa River F		Winter 2012	-	550-1,510 (3 species)	-	-	1,880-9,800 (4 species)	-	1,550
		Fall 2012	182	530, 820 (2 species)	1,320	-	450-2,440 (7 species)	-	1,740
Akimotoko Lake H		Winter 2012	4.7	-	120	-	58-197 (7 species)	-	59
		Fall 2012	16, 50 (2 species)	-	144	-	54-380 (6 species)	-	48
Inawashiroko Lake I (South Shore)		Winter 2012	6.3	-	-	1.7	4.7	ND	-
		Fall 2012	3.0, 13 (2 species)	-	-	9.0	39-181 (6 species)	43	-

*As for monitored specimen, including fish, the entire organism is used.

Starting with the 2012 fall survey, the following 4 species (categorized by feeding habit and type) of aquatic insects have been sampled and analyzed.

- Odonata (Dragonfly larva, carnivore)
- Corydalidae (carnivore)
- Perlidae (carnivore)
- Stenopsyche (omnivorous, detritivorous)

(2) Sea Areas (lower row in each case shows the results of 2012 fall surveys)

There are variations between each body of water and the type of organism collected, but in general, the levels of radioactive cesium are about the same as those seen in the fall survey. Furthermore, just as in previous surveys, the concentrations of radioactive cesium in sea areas are lower than in rivers and lakes.

Unit: Bq/kg-wet

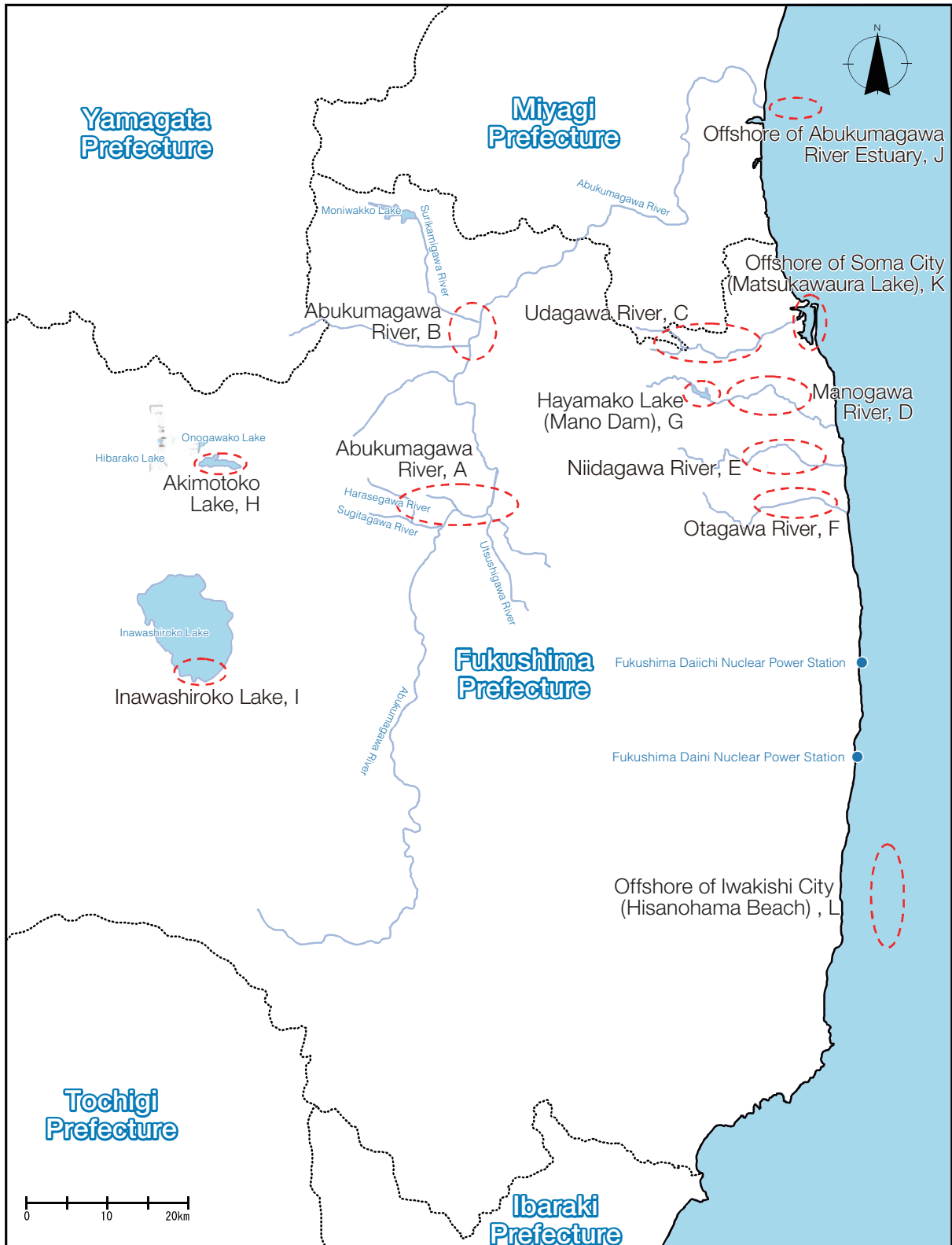
		Plants (algae)	Sea urchin, starfish, sea cucumber	Crustacean	Ragworms	Shellfish		Squid, octopus	Fishes
						Without shell	Shell		
Offshore of Abukumagawa River Estuary J	2012 Winter	—	—	—	—	—	—	—	5.1-19 (4 species)
	2012 Fall	—	—	ND	—	—	—	—	0.9-32 (7 species)
Somashi City Offshore K (Matsukawaura Lake)	2012 Winter	ND-1.6 (3 species)	—	15	—	3.2, 9.4 (2 species)	3.7, 63 (2 species)	—	8.6
	2012 Fall	ND, 4.1 (2 species)	—	13	6.4	ND,13 (2 species)	1.9,60 (2 species)	—	7.5, 23 (2 species)
Iwakishi City Offshore L (Hisanohama Beach)	2012 Winter	7.9	5.6, 73 (2 species)	—	—	3.0	23	—	13~139 (6 species)
	2012 Fall	8.7	12,42 (2 species)	—	—	5.1	16	—	6.7-118 (6 species)

*As for monitored specimen, including fish, the entire organism is used.

3. Future Plans

MOE will continue to measure the concentration of radioactive materials in aquatic organisms in 2013 (organisms collection conducted 3-4 times each year).

Radioactive Material Monitoring Survey Locations of Aquatic Organisms



Results of Aquatic Organisms Radionuclides Survey (Rivers 1)

Stn No.	Aquatic organism and others		Sample weight (kg-wet)	Sample number	Radioactive cesium (Bq/kg-wet)			Remarks **
					Total	Cs-134	Cs-137	
A b u k u m a g a w a R i v e r A	Alga	Spirogyra sp.	0.27	-	N.D.	N.D.(0.83)	N.D.(0.77)	-
	Aquatic insect (Odonata)	Calopteryx atrata	0.048	109	67	26	41	Juvenile
		Calopteryx sp.						
		Mnais costalis						
		Asiagomphus melaenops						
		Davidius nanus						
		Davidius sp.						
		Club-tailed dragonfly						
		Clubtail dragonfly (Sieboldius albardae)						
		Golden-ringed dragonfly						
		Macromia amphigena amphigena						
	Aquatic insect (Stenopsycha sp.)	Stenopsycha marmorata	0.076	405	170	60	110	Juvenile
	Crustacean	Atyidae	0.16	1760	58	22	36	Adult
	Fish	Cherry salmon	0.26	8	78	28	50	Adult
Amur minnow		0.14	37	44	16	28	Adult	
Dark chub		0.65	35	88	32	56	Adult	
Oriental weather loach		0.04	20	52	19	33	Adult	
Amphibian	Japanese fire belly newt	0.12	19	58	21	37	Adult	
	Frog and toad (tadpole)	0.020	20	140	48	92	Juvenile	
CPOM (Dry leaves, etc.)		0.76	-	380	140	240	-	
A b u k u m a g a w a R i v e r B	Alga	Spirogyra sp.	0.060	-	19	7.2	12	-
	Aquatic insect (Odonata)	Calopteryx atrata	0.027	134	38	13	25	Juvenile
		Calopteryx sp.						
		Anisogomphus maacki						
		Davidius nanus						
		Davidius sp.						
		Club-tailed dragonfly						
		Clubtail dragonfly (Sieboldius albardae)						
		Golden-ringed dragonfly						
		Macromia amphigena amphigena						
	Aquatic insect (Corydalidae)	Dobsonfly	0.019	53	26	9.8	16	Juvenile
	Aquatic insect (Stenopsycha sp.)	Stenopsycha marmorata	0.15	554	132	48	84	Juvenile
		Stenopsycha sauteri						
	Shellfish	Japanese freshwater snail	0.13	246	63	23	40	Adult
Fish	Common carp	3.13	1	97	36	61	Adult	
	Barbel steed	5.57	4	109	40	69	Adult	
	Japanese dace	0.070	21	56	20	36	Young fish	
	Tribolodon sp.	0.97	3	170	60	110	Adult	
	Amur minnow	0.070	20	35	14	21	Adult/young	
	Dark chub	0.10	10	56	20	36	Adult/young	
	Stone loach	0.18	18	40	14	26	Adult	
Amphibian	Wrinkled frog	0.090	12	82	30	52	Adult	
CPOM (Dry leaves, etc.)		1.03	-	235	85	150	-	

Results of Aquatic Organisms Radionuclides Survey (Rivers 2)

Stn No.	Aquatic organism and others		Sample weight (kg-wet)	Sample number	Radioactive cesium (Bq/kg-wet)			Remarks **
					Total	Cs-134	Cs-137	
U d a g a w a R i v e r C	Aquatic insect (Odonata)	Calopteryx cornelia	0.025	109	61	22	39	Juvenile
		Calopteryx sp.						
		Mnais costalis						
		Planaeschna milnei						
		Asiagomphus melaenops						
		Davidius fujiana						
		Davidius nanus						
		Davidius sp.						
		Club-tailed dragonfly						
		Clubtail dragonfly (Sieboldius albardae)						
		Sinogomphus flavolimbatus						
		Stylogomphus suzukii						
		Golden-ringed dragonfly						
	Aquatic insect (Stenopsyche sp.)	Stenopsyche marmorata	0.035	219	182	62	120	Juvenile
		Stenopsyche sauteri						
Crustacean	Atyidae	0.11	611	65	24	41	Adult	
Fish	Tribolodon sp.	0.14	16	94	35	59	Adult	
	Dark chub	0.13	42	65	24	41	Adult	
	Rhinogobius sp.	0.040	8	242	92	150	Adult	
CPOM (Dry leaves, etc.)		0.70	-	92	33	59	-	
M a n o g a w a R i v e r D	Zygnematales	Spirogyra sp.	0.079	-	0.97	N.D.(0.95)	0.97	-
	Aquatic insect (Odonata)	Calopteryx atrata	0.019	69	116	45	71	Juvenile
		Calopteryx cornelia						
		Boyeria maclachlani						
		Planaeschna milnei						
		Davidius nanus						
		Davidius sp.						
		Club-tailed dragonfly						
		Clubtail dragonfly (Sieboldius albardae)						
		Sinogomphus flavolimbatus						
		Stylogomphus suzukii						
		Macromia amphigena amphigena						
	Aquatic insect (Perlidae)	Kamimuria tibialis	0.018	370	61	23	38	Juvenile
		Kamimuria uenoi						
		Neoperla sp.						
		Oyamia sp.						
	Aquatic insect (Corydalidae)	Dobsonfly	0.024	74	105	36	69	Juvenile
		Parachauliodes continentalis						
	Aquatic insect (Stenopsyche sp.)	Stenopsyche marmorata	0.13	495	470	170	300	Juvenile
		Stenopsyche sauteri						
	Fish	Ayu (run-up)	1.38	80	193	73	120	Adult
		Tribolodon sp.	0.18	21	77	29	48	Young fish
		Pale chub	0.20	27	51	18	33	Adult
Rhinogobius sp.		0.12	44	590	220	370	Adult	
Amphibian	Frog and toad (tadpole)	0.009	8	790	310	480	Juvenile	
CPOM (Dry leaves, etc.)		1.2	-	231	81	150	-	

Results of Aquatic Organisms Radionuclides Survey (Rivers 3)

Stn No.	Aquatic organism and others		Sample weight (kg-wet)	Sample number	Radioactive cesium (Bq/kg-wet)			Remarks **
					Total	Cs-134	Cs-137	
N i d a g a w a R i v e r E	Aquatic insect (Odonata)	Calopteryx atrata	0.021	104	280	110	170	Juvenile
		Calopteryx sp.						
		Planaeschna milnei						
		Davidius nanus						
		Davidius sp.						
		Club-tailed dragonfly						
		Clubtail dragonfly (Sieboldius albardae)						
		Sinogomphus flavolimbatus						
		Macromia amphigena amphigena						
	Aquatic insect (Perlidae)	Kamimuria tibialis	0.040	509	91	33	58	Juvenile
		Kamimuria uenoi						
		Neoperla sp.						
		Oyamia sp.						
	Aquatic insect (Stenopsycha sp.)	Stenopsycha marmorata	0.031	134	980	370	610	Juvenile
		Stenopsycha sauteri						
	Crustacean	Japanese mitten crab	0.14	8	420	150	270	Adult
	Fish	Common carp	0.74	3	270	100	170	Adult/young
		Tribolodon sp.	0.24	20	490	180	310	Young fish
		Goby minnow	0.060	8	238	88	150	Adult/young
Pale chub		0.42	62	450	160	290	Adult	
Rhinogobius sp.		0.080	19	1,040	380	660	Adult	
CPOM (Dry leaves, etc.)		0.68	-	580	210	370	-	
O t a g a w a R i v e r F	Aquatic insect (Odonata)	Calopteryx atrata	0.028	101	1,220	460	760	Juvenile
		Mnais costalis						
		Boyeria maclachlani						
		Asiagomphus melaenops						
		Davidius nanus						
		Davidius sp.						
		Club-tailed dragonfly						
		Clubtail dragonfly (Sieboldius albardae)						
		Stylogomphus suzukii						
		Golden-ringed dragonfly						
		Macromia amphigena amphigena						
	Aquatic insect (Corydalidae)	Dobsonfly	0.021	60	550	200	350	Juvenile
		Parachauliodes continentalis						
	Aquatic insect (Stenopsycha sp.)	Stenopsycha marmorata	0.022	124	1,510	560	950	Juvenile
		Stenopsycha sauteri						
	Fish	Carassius sp.	0.070	2	2,020	720	1,300	Young fish
		Tribolodon sp.	0.13	19	2,070	770	1,300	Adult/young
		Japanese striped loach	0.030	27	1,880	680	1,200	Adult/young
		Rhinogobius sp.LD	0.020	4	9,800	3,600	6,200	Adult
CPOM (Dry leaves, etc.)		0.80	-	1,550	560	990	-	

Results of Aquatic Organisms Radionuclides Survey (Lakes)

Stn No.	Aquatic organism and others		Sample weight (kg-wet)	Sample number	Radioactive cesium (Bq/kg-wet)			Remarks **
					Total	Cs-134	Cs-137	
H M a n a k D o L a k e G	Algae	Spirogyra sp.	0.08	-	94	35	59	-
	Aquatic insect (Stenopsyche sp.)	Stenopsyche marmorata	0.037	261	580	210	370	Juvenile
		Stenopsyche sauteri						
	Fish	Smallmouth bass	1.3	1	2,600	900	1700	Adult
		Cherry salmon	0.080	4	480	180	300	Young fish/Adult
		Gin-buna	0.89	1	820	290	530	Adult
		Tribolodon sp.	1.5	3	1,010	370	640	Adult
	CPOM (Dry leaves, etc.)		1.1	-	206	76	130	-
A k i m o t t o k o L a k e H	Waterweed	Nuttall's waterweed	0.50	-	4.7	1.6	3.1	-
	Crustacean	Signal crayfish	2.4	43	120	41	79	Adult
	Fish	Largemouth bass	3.2	9	197	67	130	Adult
		Char	2.5	9	154	54	100	Adult
		Masu salmon	1.3	1	146	52	94	Adult
		Barbel steed	1.07	1	105	37	68	Adult
		Carassius sp.	0.71	5	119	42	77	Adult
		Tribolodon sp.	1.41	11	167	57	110	Adult
		Japanese smelt	0.21	46	58	22	36	Adult
	CPOM (Dry leaves, etc.)		1.2	-	59	21	38	-
L a i r o k e S o r e	Waterweed	Japanese spatterdock	0.63	-	6.3	2.3	4.0	-
	Shellfish	Japanese mystery snail	0.050	5	1.7	N.D.(1.2)	1.7	Adult
	Fish	Oriental weather loach	0.030	21	4.7	1.5	3.2	Adult
	Amphibian	Frog and toad (tadpole)	0.020	14	N.D.	N.D.(2.9)	N.D.(2.4)	Juvenile

Results of Aquatic Organisms Radionuclides Survey (Sea areas)

Stn No.	Aquatic organism and others		Sample weight (kg-wet)	Sample number	Radioactive cesium (Bq/kg-wet)			Remarks **
					Total	Cs-134	Cs-137	
E S R A g u k o f t i v a w e a m a r r y	Fish	Japanese sea bass	3.9	3	19	6.7	12	Adult
		Fat greenling	0.50	1	9.3	3.6	5.7	Adult
		Bastard halibut	3.0	4	6.3	2.4	3.9	Adult
		Panther puffer	0.72	3	5.1	1.8	3.3	Adult
O f f s h o r S o m a L e (M a s h i) C u k a w a u r a	Seegrass	Eelgrass	0.25	-	N.D.	N.D.(0.48)	N.D.(0.42)	-
		Alga	Monostroma nitidum	1.2	-	1.6	N.D.(0.90)	1.6
	Ulva pertusa Kjellman		0.55	-	N.D.	N.D.(0.90)	N.D.(0.92)	-
	Crustacean	Grapsid crab	0.17	120	15	5.5	9.1	Adult
	Shellfish	Pacific oyster (shell)	2.3	Large numbers	63	23	40	Adult
		Pacific oyster (without shell)	0.49		3.2	1.2	2.0	
		Manila clam (shell)	1.4	Large numbers	3.7	1.4	2.3	Adult
			Manila clam (without shell)		0.52	9.4	3.3	
	Fish	Yellowfin goby	0.090	5	8.6	3.0	5.6	Adult
	O B f e a s I c h w h o a r k O e i f (s f H h s i i h s o a C r n i e o t) h y L m a	Alga	Sea oak	1.3	-	7.9	3.0	4.9
Sea urchin			Sea urchin	2.3	78	73	26	47
		Northern sea urchin	2.0	20	5.6	2.2	3.4	Adult
Shellfish		Abalone (shell)	2.6	12	23	8.2	15	Adult
		Abalone(Without shell)	0.70		3.0	1.4	1.6	Adult
Fish		Japanese sea bass	5.0	2	15	5.1	9.4	Adult
		Fat greenling	1.7	3	87	32	55	Adult
		Bastard halibut	4.5	6	20.5	7.5	13	Adult
			Stomach contents(Small fish)	0.21	-	N.D.	N.D.(0.84)	N.D.(0.79)
		Marbled sole	2.3	3	54	20	34	Adult
	Bluefin searobin	1.5	4	13	5.4	7.1	Adult	
Ocellate spot skate	2.1	3	139	52	87	Adult		

*Aquatic organisms were sampled in multiple numbers in principle, and all of them (entirely) were used for analysis.

**Stomach contents shown in Remarks were removed before analysis, and all remaining parts of all samples were used for analysis.