

Nuclide Analysis Results of Fish and Shellfish (The Ocean Area Within 20km Radius of Fukushima Daiichi NPS)

[Categorized by the radioactive cesium level (by fish species, March - August)]

Total amount of radioactive cesium 134 and 137
Unit: Bq/kg (Raw)
Sampling period: March 29 - August 1, 2012
Guideline value (April 1, 2012 and later): 100Bq/kg

Fish	Maximum	Minimum	Number of measurements (Measurement results exceeding the guideline value)	Fish	Maximum	Minimum	Number of measurements
Greenling	25800	15.4	29(22)	Crimson sea bream	15.2	—	1
Sebastes cheni	1880	900	4 (4)	Sand eel	12.9	ND	4
Barfin flounder	1670	690	2 (2)	Pointhead flounder	8.3	4.1	2
Sea bass	1610	33	15 (9)	Yellowtail	6.5	ND	5
Microstomus achne	1260	ND	29 (18)	Korean flounder	4.8	ND	2
Flatfish	1190	5.6	36 (23)	Flathead flounder	4.1	—	1
Common Skete	1000	170	33 (33)	Alaska pollack	ND	—	1
Marbled sole	920	21.3	34 (20)	Balloonfish	ND	—	1
Spotbelly rockfish	830	—	1 (1)	Japanese butterfish	ND	—	1
Starry flounder	810	580	2 (2)				
Sea raven	670	25	7 (5)	Squids	Maximum	Minimum	Number of measurements
Schlegel's black rockfish	620	410	4 (4)	Loliginid	ND	—	9
Banded dogfish	490	4.4	6(1)	Andrea cuttlefish	ND	—	5
Stone flounder	390	29	6 (3)	Loligo bleekeri	ND	—	3
Dasyatis matsubarai	205	ND	7 (1)				
Stingray	201	55	4(2)	Octopuses	Maximum	Minimum	Number of measurements
Flathead (Platycephalus sp.)	187	—	1 (1)	Chestnutoctopus	9.1	ND	6
Smooth dogfish	169	4.7	4(1)	Octopus (Enteroctopus dofleini)	7.7	ND	13
Acanthopagrus schlegeli	160	94	2(1)	Common Octopus	ND	—	1
Drumfish	127	62	9(4)				
Sea robin	107	19.9	5(1)	Crustacea	Maximum	Minimum	Number of measurements
Pacific cod	107	16.7	11 (1)	Ovalipes punctatus	26	ND	12
Littlemouth flounder	103	13.5	7 (1)	Blue crab	25.3	ND	8
Pennahia argentata	69	15	7				
Common Japanese conger	66	21.4	2				
Roundnose flounder	57	4.5	7				
Lepidotrigla microptera	53	6.4	15				
Ridged-eye flounder	53	—	1				
Northern dogfish	50	ND	15				
Long shanny	47	16.4	3				
Lophius litilon	42	ND	15				
Common horse mackerel	38	10.7	5				
Pagrus major	38	14.9	4				
Slippery sole	36	21.6	4				
Dory	31	12.5	4				
Carcharhinus	27	—	1				
Salangichthys ishikawae	23	—	1				
Shark-skin flounder	17	ND	2				

Number of samples	55
Samples with cesium exceeding 100Bq/kg	23 (41.8%)
Number of measurements	419
Number of measurement results exceeding 100Bq/kg	160 (38.2%)

* Figures in parenthesis are ratios over 100 Bq/kg.

(Remark) ND for Cs134: approx. 3.1Bq/kg, Cs137: approx. 3.3Bq/kg

[Table 1 - 1. Results at Each Measurement Point (Part 1)]

Measurement Point (Date of Sampling)	Samples (Sample names in blue letters: 100Bq/kg or less)
T1 (May 17)	Marbled sole, Greenling, Pacific cod, Littlemouth flounder, Microstomus achne, Long shanny, Sea bass, Lepidotrigla microptera, Flatfish, Lophius litilon, Roundnose flounder, Northern dogfish, Andrea cuttlefish, Loliginid, Octpus (Enteroctopus) dofleini, Chestnutoctopus, Loligo bleekeri, Stone flounder
T1 (May 30)	Pacific cod, Greenling, Flatfish, Marbled sole, Common horse mackerel, Microstomus achne, Lepidotrigla microptera, Pennahia argentata, Dory, Lophius litilon, Chestnutoctopus, Loliginid, Andrea cuttlefish, Littlemouth flounder, Stone flounder, Common Skete
T1 (June 14)	Greenling, Microstomus achne, Lophius litilon, Flatfish, Lepidotrigla microptera, Common horse mackerel, Octpus (Enteroctopus) dofleini, Chestnutoctopus
T2 (May 17)	Greenling, Flatfish, Northern dogfish, Marbled sole, Littlemouth flounder, Slippery sole, Microstomus achne, Sea raven, Pacific cod, Common Japanese conger, Long shanny, Roundnose flounder, Lepidotrigla microptera, Chestnutoctopus, Korean flounder, Lophius litilon, Flathead flounder, Pointhead flounder, Loliginid, Octpus (Enteroctopus) dofleini, Loligo bleekeri
T2 (May 30)	Pacific cod, Greenling, Long shanny, Lepidotrigla microptera, Marbled sole, Slippery sole, Microstomus achne, Lophius litilon, Common horse mackerel, Pointhead flounder, Octpus (Enteroctopus) dofleini, Loliginid, Korean flounder, Chestnutoctopus, Common Octopus, Andrea cuttlefish
T2 (June 14)	Sea raven, Microstomus achne, Flatfish, Lepidotrigla microptera, Greenling, Lophius litilon, Littlemouth flounder, Common horse mackerel, Loliginid, Chestnutoctopus, Marbled sole
T3 (April 13)	Lepidotrigla microptera, Microstomus achne, Marbled sole, Stone flounder, Pacific cod, Ridged-eye flounder, Octpus (Enteroctopus) dofleini, Sea bass, Greenling, Flatfish, Common Skete
T3 (May 10)	Lepidotrigla microptera, Shark-skin flounder, Microstomus achne, Sea robin, Loliginid, Octpus (Enteroctopus) dofleini, Common Japanese conger, Marbled sole, Pacific cod, Roundnose flounder, Loligo bleekeri,
T3 (June 4)	Dasyatis matsubarai, Microstomus achne, Stone flounder, Marbled sole, Roundnose flounder, Lepidotrigla microptera, Lophius litilon, Pagrus major, Octpus (Enteroctopus) dofleini, Greenling, Common Skete, Flatfish
T3 (July 9)	Marbled sole, Stone flounder, Littlemouth flounder, Slippery sole, Dory, Lepidotrigla microptera, Lophius litilon, Octpus (Enteroctopus) dofleini, Greenling, Common Skete, Flatfish, Microstomus achne
T4 (April 26)	Lepidotrigla microptera, Lophius litilon, Roundnose flounder, Pacific cod, Flatfish, Balloonfish, Loliginid, Andrea cuttlefish, Microstomus achne, Greenling, Marbled sole, Common Skete
T4 (May 21)	Microstomus achne, Littlemouth flounder, Roundnose flounder, Sea bass, Pacific cod, Lophius litilon, Lepidotrigla microptera, Loliginid, Octpus (Enteroctopus) dofleini, Common Skete, Greenling, Marbled sole
T4 (June 18)	Flatfish, Lepidotrigla microptera, Crimson sea bream, Dory, Lophius litilon, Roundnose flounder, Octpus (Enteroctopus) dofleini, Loliginid, Northern dogfish, Andrea cuttlefish, Common Skete, Greenling, Marbled sole, Microstomus achne
T4 (July 9)	Littlemouth flounder, Flatfish, Slippery sole, Lepidotrigla microptera, Common Skete, Marbled sole
G1 (May 9)	Northern dogfish, Blue crab, Pennahia argentata, Ovalipes punctatus, Schlegel's black rockfish, Flatfish, Starry flounder, Common Skete, Marbled sole, Greenling, Sea raven
G1 (June 6)	Acanthopagrus schlegeli, Flatfish, Drumfish, Banded dogfish, Ovalipes punctatus, Blue crab, Sea bass, Schlegel's black rockfish, Stingray, Common Skete
G1 (July 4)	Greenling, Marbled sole, Drumfish, Stingray, Pennahia argentata, Banded dogfish, Yellowtail, Sea bass, Common Skete, Acanthopagrus schlegeli, Flatfish
G1 (August 1)	Drumfish, Flatfish, Sea bass, Carcharhinus, Blue crab, Greenling, Common Skete, Stingray
G2 (May 9)	Northern dogfish, Pennahia argentata, Alaska pollack, Ovalipes punctatus, Octpus (Enteroctopus) dofleini, Sebastes cheni, Flatfish, Microstomus achne, Marbled sole, Stone flounder, Sea raven, Common Skete, Greenling
G2 (June 6)	Drumfish, Marbled sole, Northern dogfish, Lophius litilon, Blue crab, Ovalipes punctatus, Starry flounder, Sea bass, Common Skete, Flatfish
G2 (July 4)	Flatfish, Marbled sole, Common horse mackerel, Pagrus major, Ovalipes punctatus, Yellowtail, Octpus (Enteroctopus) dofleini, Common Skete, Microstomus achne, Greenling
G2 (August 1)	Dasyatis matsubarai, Pagrus major, Smooth dogfish, Northern dogfish, Banded dogfish, Marbled sole, Ovalipes punctatus, Blue crab, Common Skete, Flatfish

[Table 1 - 2. Results at Each Measurement Point (Part 2)]

Measurement Point (Date of Sampling)	Samples (Sample names in blue letters: 100Bq/kg or less)
G3 (April 25)	Sand eel
G3 (May 25)	Greenling, Barfin flounder, Common Skete, Microstomus achne, Schlegel's black rockfish, Marbled sole, Dasyatis matsubarae, Flatfish, Drumfish
G3 (June 27)	Drumfish, Ovalipes punctatus, Smooth dogfish, Greenling, Microstomus achne, Common Skete, Marbled sole, Flatfish, Sea bass
G3 (July 18)	Marbled sole, Pagrus major, Blue crab, Ovalipes punctatus, Yellowtail, Northern dogfish, Dasyatis matsubarae Schlegel's black rockfish, Microstomus achne, Common Skete, Flatfish, Greenling
G4 (April 25)	Sand eel
G4 (May 25)	Pennahia argentata (Drumfishを含む), Sea robin, Sea bass, Lophius litilon, Ovalipes punctatus, Northern dogfish, Sebastes cheni, Common Skete, Sea raven, Microstomus achne, Greenling, Marbled sole, Flatfish
G4 (June 27)	Sea robin, Dory, Ovalipes punctatus, Octopus (Enteroctopus) doffeini, Yellowtail, Lophius litilon, Japanese butterflyfish, Microstomus achne, Common Skete, Greenling, Flatfish, Marbled sole, Sea bass
G4 (July 18)	Dasyatis matsubarae, Flatfish, Sea robin, Northern dogfish Microstomus achne, Common Skete, Marbled sole, Sea bass, Greenling
G5 (March 29)	Sand eel, Salangichthys ishikawae
G5 (April 7)	Northern dogfish, Pacific cod, Ovalipes punctatus, Sea bass, Flatfish, Common Skete, Spotbelly rockfish
G5 (April 11)	Northern dogfish, Ovalipes punctatus, Microstomus achne, Common Skete, Flatfish
G5 (May 2)	Lepidotrigla microptera, Marbled sole, Sebastes cheni, Flatfish, Sea raven, Microstomus achne, Common Skete, Greenling
G5 (June 16)	Pennahia argentata Common Skete, Microstomus achne, Marbled sole, Greenling, Flatfish
G6 (May 29)	Sand eel
G6 (April 7)	Northern dogfish, Pacific cod, Shark-skin flounder, Flatfish, Marbled sole, Sea raven
G6 (April 11)	Northern dogfish, Marbled sole, Microstomus achne, Common Skete, Pacific cod
G7 (May 30)	Stingray, Lophius litilon, Blue crab, Common Skete, Marbled sole, Banded dogfish, Microstomus achne, Sea bass, Flatfish, Drumfish
G7 (June 25)	Sea bass, Greenling, Marbled sole, Common Skete, Flatfish, Smooth dogfish, Drumfish
G7 (July 15)	Sea bass, Flatfish, Blue crab, Banded dogfish, Dasyatis matsubarae Barfin flounder, Greenling, Common Skete, Microstomus achne, Marbled sole, Drumfish
G8 (July 23)	Smooth dogfish, Yellowtail, Northern dogfish, Dasyatis matsubarae Common Skete, Microstomus achne, Marbled sole, Flathead (Platycephalus sp.) , Flatfish, Sea robin

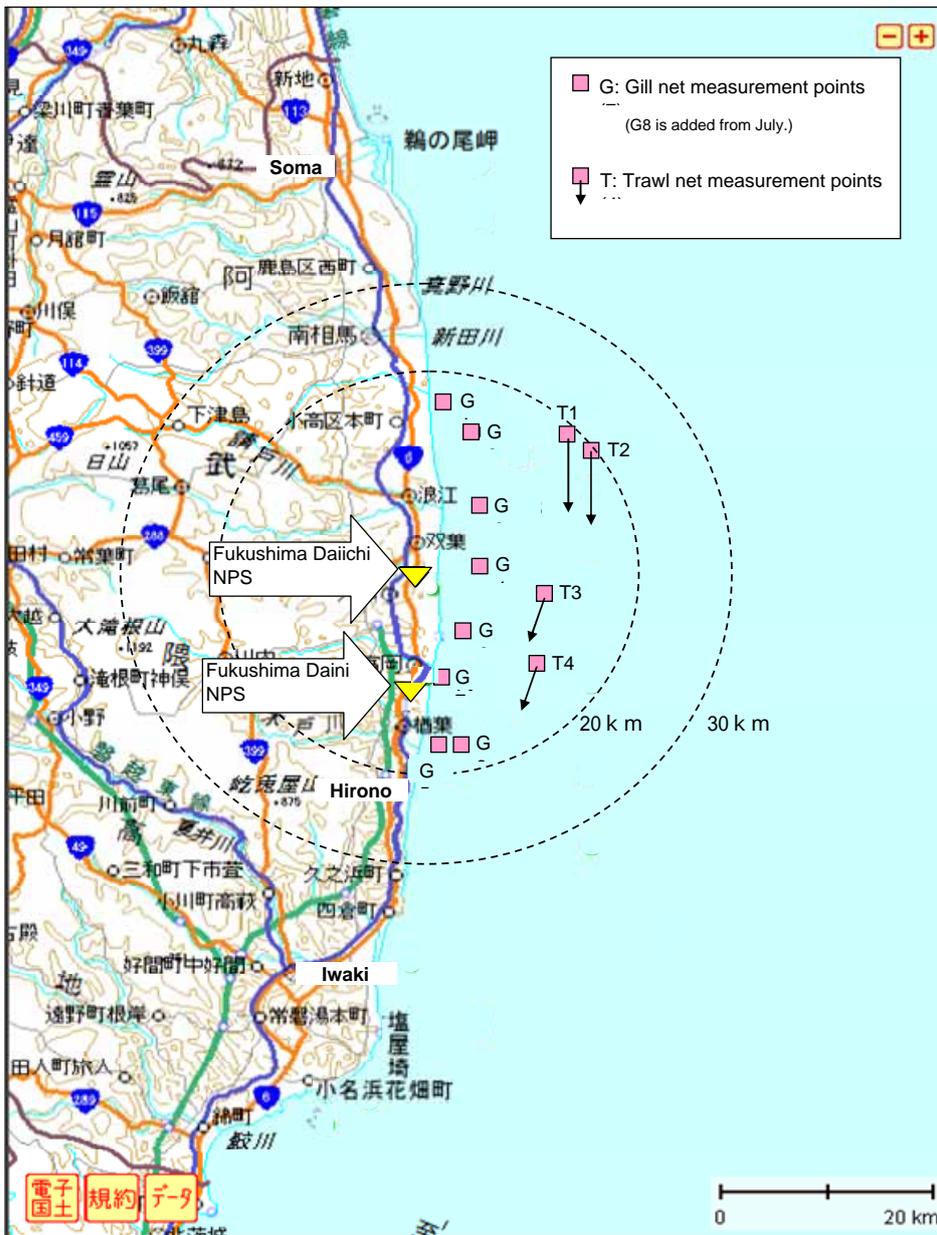
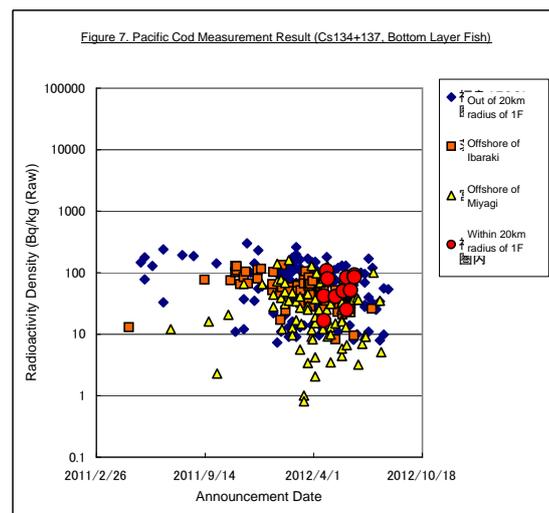
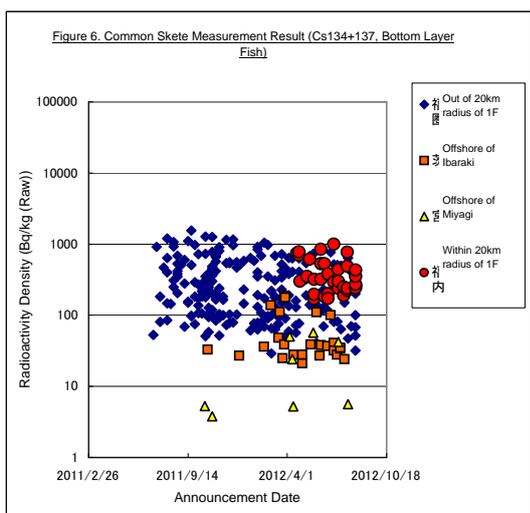
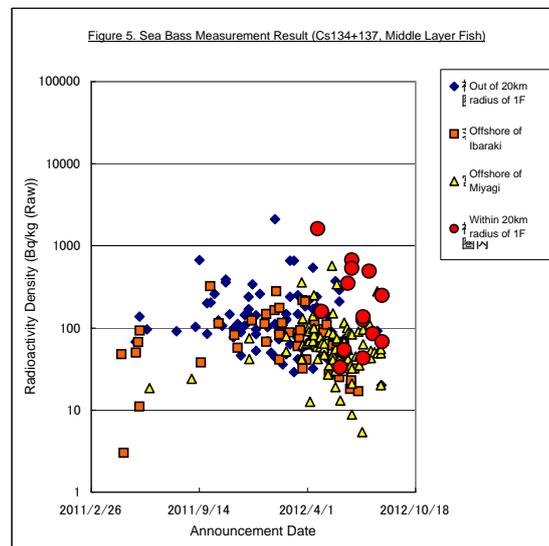
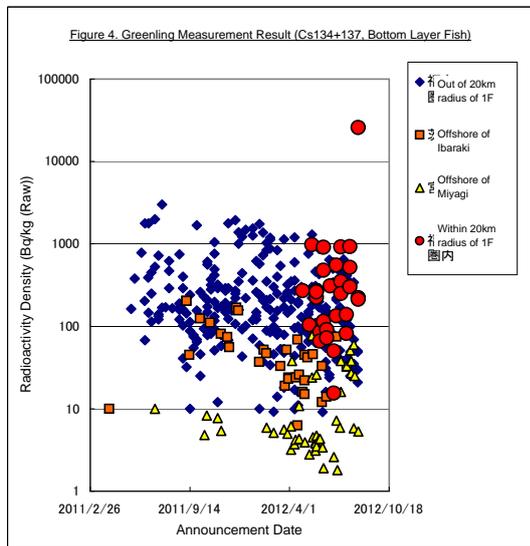
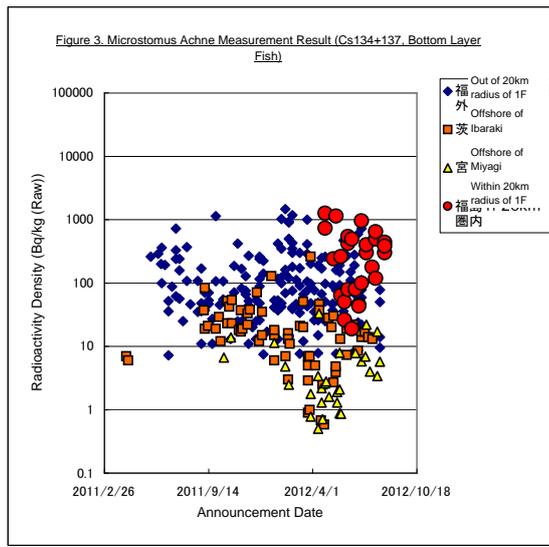
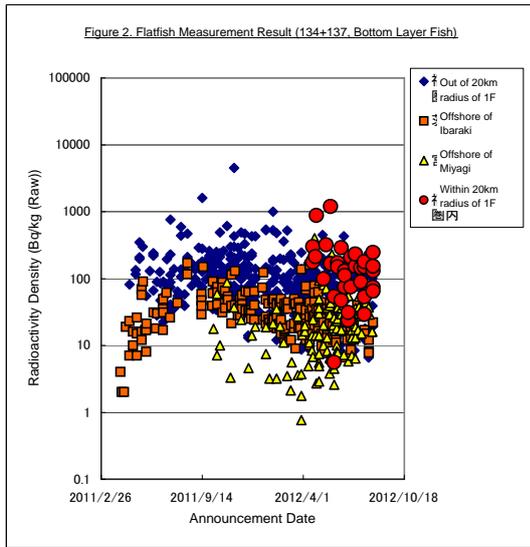


Figure 1. Fish and Shell Fish Measurement Points (as of August 2012)



(Remark) The measurement results of "Out of 20km radius of 1F", "Offshore of Ibaraki" and "Offshore of Miyagi" was obtained from the Japan Meteorological Agency website.

High Cesium Density Detected in Greenling

1. Background

High cesium density was detected in greenling sampled at around 1km offshore of Ota River ("G1" in Fig. 1) on August 1 during our fish and shellfish sampling. The same level of cesium density was detected as a result of testing (remeasurement) at the Fisheries Research Agency. Our measurement results were announced on Tuesday, August 21.

Sampling of greenling, marine soil (including bait organism) and seawater in a 2km square ocean area around 1km offshore of Ota River will be conducted once a week for a month. The density of radioactive cesium in the collected samples will be measured to identify the root cause of the high cesium level detected.

2. Measurement results

(1) Lengths and weights of the (2) greenling sampled

- Length: 43.9cm / Weight: 1.00kg

- Length: 41.5cm / Weight: 0.92kg

(2) Radioactivity density measurement result

Sum of radioactivity densities: 25,800 (Bq/Kg (Raw))

(Measurement was done by combining the muscle of the two greenling sampled)

[Reference]

1. The highest cesium densities found in the fish and shellfish sampling results in the Fisheries Agency database (Bq/Kg (Raw))

Sample	Sampling location	Announcement date	Total amount of cesium	Remarks
Sand eel	Offshore of Hisanohama	April 19, 2011	14,400	Highest density detected in saltwater fish
Landlocked salmon	Iitate Village (Nida River)	March 28, 2012	18,700	Highest density detected in freshwater fish
Greenling	Offshore of Hisanohama	July 20, 2011	3,000	Highest density detected in greenling

2. The highest cesium density found in our fish and shellfish sampling results
(Results obtained up until July 15, 2012) (Bq/Kg (Raw))

Sample	Sampling location	Announcement date	Total amount of cesium	Remarks
Sebastes cheni	Around 2km offshore of Kido River	May 2, 2012	1,880	("G5" in Fig.1)

3. Our sampling results of greenling (Obtained at around 1km offshore of Ota River)
(Bq/Kg (Raw))

Sample	Sampling location	Announcement date	Total amount of cesium	Remarks
Greenling	Around 1km offshore of Ota River	May 25, 2012	270	("G1" in Fig.1)
Greenling	Around 1km offshore of Ota River	July 24, 2012	82	
Greenling	Around 1km offshore of Ota River	August 21, 2012	25,800	