

**Recoveries of High-Seas Tags in 2011 and Tag Releases in 2012 from
High-seas Research Vessel Surveys in the North Pacific Ocean**

by

**Working Group on Salmon Tagging
Committee on Scientific Research and Statistics
(CSRS)**

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ABSTRACT

A high seas tag was recovered from chum salmon along the Okhotsk Sea coast of Hokkaido, Japan in October 2011. In July and August 2012, tagging operations were conducted by the Japanese research vessel *Hokko maru*, and 70 chum salmon were released with tags (including 40 archival DSTs) in the Bering Sea.

INTRODUCTION

The Working Group on Salmon Tagging (WGST) was established by the Committee on Scientific Research and Statistics (CSRS) at the 15th Annual Meeting in 2007 to manage the INPFC-NPAFC tagging database and to coordinate high seas tagging activities of the Parties. This report summarizes releases of tagged high seas salmon in 2012 and recoveries of high seas tags by the Parties in 2011. This report covers updated information since our previous report was compiled (WGST, 2011).

MATERIALS AND METHODS

Releases of high seas tags in 2011

The Japanese research vessel *Hokko maru* conducted trawl and hook and line operations at 19 stations in the Bering Sea (Morita et al. 2011). Live chum salmon caught in healthy condition were stocked into a recovery tank. Each fish was tagged with two disk tags, one issued by FAJ and one issued by NPAFC. Both disk tags were placed on one plastic cinch strap and attached to the fish in an area anterior to the dorsal fin. In addition, small archival tags (model DST micro manufactured by Star-Oddi, Reykjavik, Iceland, size, 8.3 × 25.4 mm; weight in air, 3.3 g; number of records, 21,739 per sensor) were used to record seawater temperature and depth experienced by immature chum salmon. Archival tags were attached externally with nickel pins to the dorsal musculature of the fish anterior to the dorsal fin. The fork length was measured before the fish was released to the

sea.

Releases of high seas tags in 2012

The Japanese research vessel *Hokko maru* conducted trawl and hook and line operations at 19 stations in the Bering Sea (Sato et al. 2012). Live chum salmon caught in healthy condition were put into a recovery tank. Each fish was tagged with two (FAJ and NPAFC) disk tags like the previous tagging survey in 2011. In addition, small archival tags (model DST milli-F manufactured by Star-Oddi, Gardabaer, Iceland; size, 13 × 38.4 mm; weight in air, 9.2 g; number of records, 340,000 per sensor) were used to record seawater temperature and depth of immature chum salmon. Large archival tags (model DST magnetic manufactured by Star-Oddi, Gardabaer, Iceland, size, 15 × 46 mm; weight in air, 19 g; number of records, 4,000 per sensor) were used to record seawater temperature, depth, earth's magnetic field strength (in three directions), and tilt (in three directions) of the maturing chum salmon. From the magnetic field strength measurements a relative magnetic field vector is calculated, which can be put into models to find longitude and latitude of the fish. It is also a useful tool for recording compass directions.

Recovery of high seas tags

Scientists at the Pacific Biological Station in Canada, the National Salmon Resources Center in Japan, the Youngdong Inland Fisheries Research Institute in Korea, the Pacific Fisheries Research Centre (TINRO-Centre) and the Kamchatka Scientific Research Institute of Fisheries and Oceanography (KamchatNIRO) in Russia, the Auke Bay Laboratory and the University of Washington in the United States, and the NPAFC Secretariat were designated to collect recovery information. To increase awareness of the tag recovery program for the general public, posters displaying information on types of tags, attachment location, guidelines for collecting important recovery data, and how to report a tag recovery were placed on the NPAFC website (http://www.npafc.org/new/science_fishtag2.html).

RESULTS

Releases of high seas tags in 2011

Thirty chum salmon (336-530 mm in FL) were released with disk and small archival tags (model DST micro) during the late July (Table 1). In addition, 19 disk-tagged chum salmon were released during the *Hokko maru* cruise.

Releases of high seas tags in 2012

Thirty disk-tagged chum salmon were released into the Bering Sea (Table 2). In addition, 28 chum salmon were released with both disk and small archival tags (model DST milli-F), and 12

chum salmon were released with both disk and large archival tags (model DST magnetic) into the Bering Sea (Table 2).

Recovery of high seas tags

A female chum salmon tagged and released in the Bering Sea (58°29N, 179°59E) on July 31, 2011 was recovered by a set net along the Okhotsk Sea coast of Hokkaido, Japan (43°56N, 144°25E) on October 21, 2011 (Table 3).

ACKNOWLEDGMENTS

We thank scientists, the captain, officers, and crew onboard the R/V *Hokko maru* for their careful collection of data and samples. We are grateful to the individuals who returned tags.

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Table 1. Releases of high-seas tagged salmon in 2011. DS tag, data storage tag (model DST micro); HL, hook and line; T, surface trawl; FL, fork length.

No.	Japan tag #	NPAFC tag #	DS tag #	Date	Lat	Long	Gear	Species	FL (mm)
1	CC6301	NA5451		7/26/11	54°00N	174°53E	HL	Chum	520
2	CC6302	NA5452		7/26/11	54°00N	174°53E	HL	Chum	550
3	H1901	NA5402	5594	7/28/11	53°30N	179°58W	HL	Chum	530
4	CC6303	NA5453		7/28/11	53°30N	179°58W	HL	Chum	490
5	H1902	NA5403	5596	7/29/11	54°30N	179°58W	HL	Chum	410
6	CC6304	NA5454		7/29/11	54°30N	179°58W	HL	Chum	528
7	CC6305	NA5455		7/29/11	54°30N	179°58W	HL	Chum	570
8	CC6306	NA5456		7/29/11	54°30N	179°58W	HL	Chum	534
9	H1903	NA5404	5597	7/29/11	55°30N	179°59W	T	Chum	336
10	CC6307	NA5957		7/29/11	55°30N	179°59W	HL	Chum	538
11	H1904	NA5405	5598	7/29/11	55°30N	179°59W	HL	Chum	348
12	H1905	NA5406	5599	7/30/11	56°29N	179°57W	HL	Chum	442
13	CC6308	NA5458		7/30/11	56°29N	179°57W	HL	Chum	535
14	CC6309	NA5459		7/30/11	56°29N	179°57W	HL	Chum	511
15	H1906	NA5407	5600	7/30/11	56°29N	179°57W	HL	Chum	442
16	H1907	NA5408	5601	7/30/11	56°29N	179°57W	HL	Chum	416
17	CC6310	NA5460		7/30/11	56°29N	179°57W	HL	Chum	595
18	CC6311	NA5461		7/30/11	56°29N	179°57W	HL	Chum	478
19	CC6312	NA5462		7/30/11	56°29N	179°57W	HL	Chum	489
20	H1908	NA5409	5602	7/30/11	56°29N	179°57W	T	Chum	405
21	H1909	NA5410	5603	7/30/11	56°29N	179°57W	T	Chum	390
22	H1910	NA5414	5604	7/30/11	56°29N	179°57W	T	Chum	390
23	H1911	NA5601	5605	7/30/11	56°29N	179°57W	T	Chum	380
24	H1912	NA5602	5606	7/30/11	57°28N	179°59E	T	Chum	340
25	H1913	NA5603	5607	7/30/11	57°28N	179°59E	T	Chum	340
26	H1914	NA5604	5608	7/30/11	57°28N	179°59E	T	Chum	340
27	H1915	NA5605	5609	7/30/11	57°28N	179°59E	T	Chum	410
28	CC6313	NA5463		7/30/11	57°28N	179°59E	HL	Chum	470
29	CC6314	NA5464		7/30/11	57°28N	179°59E	HL	Chum	560
30	H1916	NA5606	5610	7/30/11	57°28N	179°59E	HL	Chum	380
31	CC6315	NA5465		7/30/11	57°28N	179°59E	HL	Chum	510
32	CC6316	NA5466		7/30/11	57°28N	179°59E	HL	Chum	550
33	H1917	NA5607	5611	7/30/11	57°28N	179°59E	HL	Chum	460
34	H1918	NA5608	5612	7/30/11	57°28N	179°59E	HL	Chum	435
35	H1919	NA5609	5613	7/30/11	57°28N	179°59E	HL	Chum	392
36	CC6317	NA5467		7/31/11	58°29N	179°59E	HL	Chum	532
37	H1920	NA5610	5614	7/31/11	58°29N	179°59E	HL	Chum	432
38	H1922	NA5612	5616	7/31/11	58°29N	179°59E	HL	Chum	452
39	CC6318	NA5468		7/31/11	58°29N	179°59E	HL	Chum	610
40	H1921	NA5611	5615	7/31/11	58°29N	179°59E	HL	Chum	440
41	H1923	NA5613	5617	7/31/11	58°29N	179°59E	HL	Chum	358

Table 1 (continued).

No.	Japan tag #	NPAFC tag #	DS tag #	Date	Lat	Long	Gear	Species	FL (mm)
42	H1924	NA5614	5618	7/31/11	58°29N	179°59E	HL	Chum	382
43	H1925	NA5615	5620	7/31/11	58°29N	179°59E	HL	Chum	396
44	H1926	NA5616	5622	7/31/11	58°29N	179°59E	HL	Chum	454
45	H1927	NA5617	5624	7/31/11	58°29N	179°59E	HL	Chum	450
46	H1928	NA5618	5626	7/31/11	58°29N	179°59E	HL	Chum	448
47	CC6319	NA5469		7/31/11	58°29N	179°59E	HL	Chum	522
48	H1929	NA5619	5627	7/31/11	58°29N	179°59E	T	Chum	368
49	H1930	NA5620	5628	7/31/11	58°29N	179°59E	T	Chum	356

Table 2. Releases of high-seas tagged salmon in 2012. DS tag, data storage tag; HL, hook and line; T, surface trawl; FL, fork length (mm).

No.	Japan tag #	NPAFC tag #	DS tag #	DS type	Date	Lat	Long	Gear	Species	FL
1	D1728	NA5415	625	Magnetic	7/28/12	52°34N	180°00	HL	Chum	520
2	D1729	NA5411	621	Magnetic	7/28/12	52°34N	180°00	HL	Chum	618
3	D1730	NA5470	587	Magnetic	7/28/12	53°31N	179°54W	HL	Chum	602
4	D1725	NA5471	607	Magnetic	7/28/12	53°31N	179°54W	HL	Chum	514
5	D1724	NA5477	623	Magnetic	7/28/12	53°31N	179°54W	HL	Chum	656
6	D1761	NA5441	705	Milli-F	7/28/12	53°31N	179°54W	HL	Chum	434
7	D1700	NA5430			7/28/12	53°31N	179°54W	T	Chum	332
8	D1698	NA5432			7/28/12	53°31N	179°54W	T	Chum	356
9	D1695	NA5419			7/28/12	53°31N	179°54W	T	Chum	376
10	D1694	NA5417			7/28/12	53°31N	179°54W	T	Chum	398
11	D1699	NA5422			7/28/12	53°31N	179°54W	T	Chum	620
12	D1692	NA5423			7/28/12	53°31N	179°54W	HL	Chum	508
13	D1693	NA5424			7/28/12	53°31N	179°54W	HL	Chum	500
14	D1734	NA5479	626	Magnetic	7/28/12	53°31N	179°54W	HL	Chum	578
15	D1777	NA5437	666	Milli-F	7/28/12	53°31N	179°54W	HL	Chum	448
16	D1722	NA5475	624	Magnetic	7/28/12	53°31N	179°54W	HL	Chum	570
17	D1726	NA5473	612	Magnetic	7/29/12	54°29N	179°52W	HL	Chum	576
18	D1751	NA5426	610	Magnetic	7/29/12	55°34N	180°00	HL	Chum	505
19	D1721	NA5472	691	Milli-F	7/29/12	55°34N	180°00	HL	Chum	342
20	D1697	NA5412			7/29/12	55°34N	180°00	HL	Chum	510
21	D1696	NA5413			7/29/12	55°34N	180°00	HL	Chum	482
22	D1755	NA5474	608	Magnetic	7/30/12	56°28N	179°54E	HL	Chum	650
23	D1759	NA5420	687	Milli-F	7/30/12	56°28N	179°54E	HL	Chum	424
24	D1757	NA5428	689	Milli-F	7/30/12	56°28N	179°54E	HL	Chum	443
25	D1760	NA5429	677	Milli-F	7/30/12	56°28N	179°54E	HL	Chum	421
26	H1686	NA5465			7/30/12	56°28N	179°54E	HL	Chum	432
27	H1682	NA5450			7/30/12	56°28N	179°54E	HL	Chum	494
28	H1690	NA5481			7/30/12	56°28N	179°54E	HL	Chum	472
29	H1683	NA5421	680	Milli-F	7/30/12	57°34N	179°54W	HL	Chum	442
30	H1684	NA5487			7/30/12	57°34N	179°54W	HL	Chum	444
31	D1756	NA5416	668	Milli-F	7/30/12	57°34N	179°54W	HL	Chum	418
32	D1754	NA5488	670	Milli-F	7/30/12	57°34N	179°54W	HL	Chum	396
33	H1687	NA5489			7/30/12	57°34N	179°54W	HL	Chum	468
34	H1685	NA5484			7/30/12	57°34N	179°54W	HL	Chum	446
35	H1681	NA5486			7/30/12	57°34N	179°54W	HL	Chum	402
36	H1689	NA5482			7/30/12	57°34N	179°54W	HL	Chum	454
37	D1727	NA5476	622	Magnetic	7/30/12	57°34N	179°54W	HL	Chum	562
38	H7678	NA5498			7/31/12	58°33N	179°53E	HL	Chum	516
39	D1753	NA5431	692	Milli-F	7/31/12	58°33N	179°53E	HL	Chum	426
40	H1673	NA5427			7/31/12	58°33N	179°53E	HL	Chum	464

Table 2 (continued).

No.	Japan tag #	NPAFC tag #	DS tag #	DS type	Date	Lat	Long	Gear	Species	FL
41	D1775	NA5436	665	Milli-F	7/31/12	58°33N	179°53E	HL	Chum	444
42	H1671	NA5490			7/31/12	58°33N	179°53E	HL	Chum	452
43	H1677	NA5491			7/31/12	58°33N	179°53E	HL	Chum	496
44	D1723	NA5478	611	Magnetic	7/31/12	58°33N	179°53E	HL	Chum	550
45	D1772	NA5438	702	Milli-F	8/1/12	58°04N	175°01W	HL	Chum	426
46	D1771	NA5439	707	Milli-F	8/1/12	58°04N	175°01W	HL	Chum	434
47	D1769	NA5440	683	Milli-F	8/2/12	56°01N	175°02W	HL	Chum	418
48	H1679	NA5492			8/2/12	56°01N	175°02W	HL	Chum	468
49	D1762	NA5497	667	Milli-F	8/2/12	56°01N	175°02W	HL	Chum	466
50	D1774	NA5435	699	Milli-F	8/2/12	56°01N	175°02W	HL	Chum	438
51	D1672	NA5496			8/2/12	56°01N	175°02W	HL	Chum	520
52	D1673	NA5442	675	Milli-F	8/2/12	56°01N	175°02W	HL	Chum	450
53	D1779	NA5434	701	Milli-F	8/2/12	55°01N	157°06W	HL	Chum	410
54	D1770	NA5433	698	Milli-F	8/2/12	55°01N	157°06W	HL	Chum	442
55	H1674	NA5494			8/2/12	55°01N	157°06W	HL	Chum	504
56	D1763	NA5445	664	Milli-F	8/2/12	55°01N	157°06W	T	Chum	416
57	D1780	NA5425	681	Milli-F	8/2/12	55°01N	157°06W	T	Chum	376
58	D1764	NA5446	688	Milli-F	8/2/12	55°01N	157°06W	T	Chum	368
59	H1676	NA5495			8/2/12	55°01N	157°06W	HL	Chum	468
60	H1680	NA5493			8/2/12	55°01N	157°06W	HL	Chum	480
61	D1766	NA5447	678	Milli-F	8/2/12	55°01N	157°06W	HL	Chum	444
62	D1773	NA5448	697	Milli-F	8/2/12	55°01N	157°06W	HL	Chum	418
63	D1767	NA5443	703	Milli-F	8/3/12	54°01N	174°57W	HL	Chum	430
64	H1688	NA5460			8/3/12	54°01N	174°57W	HL	Chum	490
65	H1691	NA5414			8/3/12	54°01N	174°57W	HL	Chum	542
66	H1938	NA5509			8/3/12	54°01N	174°57W	HL	Chum	492
67	H1933	NA5510			8/3/12	54°01N	174°57W	HL	Chum	470
68	D1776	NA5449	693	Milli-F	8/3/12	54°01N	174°57W	T	Chum	336
69	D1768	NA5444	674	Milli-F	8/3/12	54°01N	174°57W	T	Chum	338
70	D1765	NA5505	696	Milli-F	8/3/12	54°01N	174°57W	T	Chum	348

Table 3. Recoveries of high-seas tagged salmon in 2011. DS tag, data storage tag; F, female; FL, fork length (mm); BW, body weight (g); -, no data.

No.	Japan tag #	NPAFC tag #	DS tag #	Release						Recovery							
				Date	Lat	Long	Species	FL	Age	Date	Lat	Long	Gear	Sex	FL	BW	Location
1	CC6318	NA5468		7/31/11	58°29N	179°59E	Chum	610	-	10/21/11	43°56N	144°25E	Trap net	F	650	3300	Abashiri, Okhotsk Sea coast, Hokkaido