

NPAFC  
Doc. 545  
Rev.

**Recoveries of High-Seas Tags in Japan in 2000, and Tag  
Releases and Recoveries of Fin-Clipped Salmon from  
Japanese Research Vessel Surveys in the North Pacific Ocean  
in 2001**

by

**Masa-aki Fukuwaka<sup>1</sup>, Shigehiko Urawa<sup>2</sup>, Ikuo Ono<sup>2</sup>  
Nancy Davis<sup>3</sup>, and R. V. Walker<sup>3</sup>**

**<sup>1</sup>Hokkaido National Fisheries Research Institute, Fisheries Research Agency  
116 Katsurakoi, Kushiro 085-0802**

**<sup>2</sup>National Salmon Resources Center**

**2-2 Nakanoshima, Toyohira-ku, Sapporo 062-0922**

**<sup>3</sup>School of Aquatic and Fishery Sciences, University of Washington  
Box 355020, Seattle, WA 98195-5020**

**Submitted to the  
NORTH PACIFIC ANADROMOUS FISH COMMISSION  
by  
JAPAN**

**October 2001**

**THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:**

Fukuwaka, M., S. Urawa, I. Ono, N. Davis, and R. V. Walker. 2001. Recoveries of high-seas tags in Japan in 2000, and tag releases and recoveries of fin-clipped salmon from Japanese research vessel surveys in the North Pacific Ocean in 2001. (NPAFC Doc. 545). Hokkaido National Fisheries Research Institute, Fisheries Research Agency, 116 Katsurakoi, Kushiro 085-0802. 12 p.

# **Recoveries of High-Seas Tags in Japan in 2000, and Tag Releases and Recoveries of Fin-Clipped Salmon from Japanese Research Vessel Surveys in the North Pacific Ocean in 2001**

M. Fukuwaka<sup>1</sup>, S. Urawa<sup>2</sup>, I. Ono<sup>2</sup>, N. Davis<sup>3</sup>, and R. V. Walker<sup>3</sup>

<sup>1</sup> Hokkaido National Fisheries Research Institute, Fisheries Research Agency

<sup>2</sup> National Salmon Resources Center

<sup>3</sup> School of Aquatic and Fishery Sciences, University of Washington

## **ABSTRACT**

In the fall of 2000, fourteen tagged chum salmon were recovered along the Japanese coast and one tagged chum salmon was recovered in Russia from releases of tagged fish in the Bering Sea. Recoveries included one fish with an external data tag, one fish with an internal archival tag, and thirteen fish with disk tags. The tag recovery rate in 2000 (2.6%) was similar to rates from 1995 to 1999 (1.4-3.3%) except for 1998 (8.8%). In the summer of 2001, two Japanese salmon research vessels conducted 34 longline and 3 hook-and-line operations in the North Pacific Ocean and the Bering Sea. A total of 156 salmonids (21 sockeye, 72 chum, 21 pink, 39 coho salmon, and 3 steelhead trout) in the central North Pacific, 541 salmonids (11 sockeye, 406 chum, 120 pink, and 4 chinook salmon) in the Bering Sea, and 60 salmonids (10 sockeye, 8 chum, 13 pink, 25 coho, 2 chinook salmon, and 2 steelhead trout) in the eastern North Pacific were tagged with two disk tags (Fisheries Agency of Japan and Fisheries Research Institute) and released. Of these fish, 70 salmonids with externally-attached temperature-depth (LTD tag) tags were released in the central and eastern North Pacific and the Bering Sea, and 7 chum salmon with internally-inserted archival tags (AT tag) were released in the Bering Sea. During research surveys in the summer of 2001, five Japanese salmon research vessels recovered 57 salmonids lacking the adipose fin.

## **INTRODUCTION**

Japanese and U.S. cooperative high-seas tagging experiments were conducted

in 2000 and 2001. In this report, we summarize tags recovered from chum salmon that returned to Japanese coastal areas in the fall of 2000, and releases of high seas tags and recoveries of fin-clipped salmon collected by Japanese salmon research vessel surveys in the North Pacific Ocean during the summer of 2001.

## MATERIALS AND METHODS

### Recovery of high seas tags in 2000

In June and July 2000, 81 salmonids (12 sockeye, 52 chum, 3 pink, 11 coho salmon, and 3 steelhead trout) in the central North Pacific, 601 salmonids (12 sockeye, 575 chum, and 14 chinook salmon) in the Bering Sea and 32 salmonids (9 chum, 4 pink, and 17 coho, and 2 chinook salmon) in the eastern North Pacific were tagged and released by two Japanese salmon research vessels, the *Wakatake maru* and *Oshoro maru* (Fukuwaka et al. 2000). Of these releases, 12 salmonids with temperature-depth tags were released in the central North Pacific and the Bering Sea, 27 chum salmon with data loggers were released in the Bering Sea, 20 chum salmon with internal archival tags were released in the Bering Sea, and 19 salmonids with temperature tags were released in the eastern North Pacific.

Fish were tagged with two disk tags: one issued by the Fisheries Agency of Japan (FAJ) and a second disk tag issued by the Fisheries Research Institute, University of Washington (FRI). Both disk tags were placed on one plastic cinch strap and applied to the fish anterior to the dorsal fin. A few of the disk-tagged fish were selected for tagging with archival tags. Three types of archival tags were used in 2000 (Urawa et al. 2000, Walker et al. 2000). One type of archival tag, manufactured by Conservation Devices, Inc., Belmont, MA, records seawater temperature and depth (CDI tag). The tag used by FRI was attached externally in the dorsal musculature of the fish anterior to the dorsal fin. A second type of archival tag manufactured by the Lotek Marine Technologies Inc. (LMT), Newfoundland, Canada, records the fish's internal temperature, seawater temperature, light levels (for location), and depth (AT tag). This tag was used by the Hokkaido National Fisheries Research Institute (HNFRI) and was inserted into the peritoneal cavity of fish. The third type of archival tag, manufactured by the Little Leonard Co., Ltd., Japan, records swimming speed, depth, and temperature (DT tag). This tag was used by the National Institute of Polar Research and was attached externally on the dorsal side of the fish in the same location as the CDI tag.

The National Salmon Resources Center collected archival tags, disk tags, and data on recovery locations from salmon hatcheries, private fishermen, fishing

cooperative unions, or prefectural governments along the coast of northern Japan from chum salmon that returned to Japan coastal areas in the fall of 2000.

The National Research Institute of Far Seas Fisheries and the HNFRI conducted tagging experiments in the Bering Sea and the central North Pacific using the research vessel *Wakatake maru* from 1995 to 2000. We compared the recovery rate (number of recovered fish / number of tagged-and-released fish) in 2000 with rates from 1995 to 1999 (Ito 1995, Myers et al. 1995-1998, Ito and Ishida 1996, 1998, Walker et al. 1998, Ueno and Ishida 1999, Fukuwaka et al. 1999, 2000).

### **Releases of high seas tags in 2001**

In June and July of 2001, two Japanese research vessels, the *Wakatake maru* and *Oshoro maru*, conducted 34 longline (900 hachi) and 3 hook-and-line operations to attach archival and disk tags on salmonids. The disk tags used in 2001 were the same types used in 2000. Two types of archival tags were used (Fukuwaka et al. 2001, Walker et al. 2001). One type of archival tag, manufactured by CDI and LMT, records seawater temperature and depth (LTD tag). This tag, used by FRI, was attached externally in the dorsal musculature of the fish anterior to the dorsal fin. A second type of archival tag manufactured by the LMT, records the fish's internal temperature, seawater temperature, light levels (for location), and depth (AT tag). This tag was used by the HNFRI and was inserted into the peritoneal cavity of fish.

### **Collection of snouts from adipose fin-clipped salmonids in 2001**

Five salmon research vessels, the *Wakatake maru*, *Oshoro maru*, *Hokusei maru*, *Kaiun maru*, and *Kaiyo maru*, caught 17,665 salmonids in the western and central North Pacific, the Bering Sea, and the Gulf of Alaska from June through August, 2001. Salmon lacking the adipose fin were recovered during biological measurements. Snout samples were collected from these fish for later examination for coded-wire tags (CWT).

## **RESULTS**

### **Recovery of high seas tags in 2000**

In the fall of 2000, fourteen tagged chum salmon were recovered from areas along the coast of Japan, and one tagged chum salmon was recovered on the Japan Sea coast of Primorye, Russia (Table 1). Recoveries included one fish recovered with an external DT tag, one fish with an internal AT tag, and thirteen fish with disk tags. The

tag recovery rate in 2000 (2.6%) was similar to rates from 1995 to 1999 (1.4-3.3%) except for 1998 (8.8%, Table 2).

Unfortunately, three of the internal AT tags were lost. A recovered DT tag was sent to the University of Washington and an AT tag were sent to the Japan NUS Co. Ltd. for data analysis. The results of data analyses will be reported in another documents.

### **Releases of high seas tags in 2001**

In June and July 2001, 156 salmonids (21 sockeye, 72 chum, 21 pink, 39 coho salmon, and 3 steelhead trout) in the central North Pacific, 541 salmonids (11 sockeye, 406 chum, 120 pink, and 4 chinook salmon) in the Bering Sea, and 60 salmonids (10 sockeye, 8 chum, 13 pink, 25 coho, 2 chinook salmon, and 2 steelhead trout) in the eastern North Pacific were tagged and released by two Japanese salmon research vessels, the *Wakatake maru* and *Oshoro maru* (Table 3). Of these fish, 70 salmonids with externally-attached temperature-depth (LTD tag) tags were released in the central and eastern North Pacific and the Bering Sea, and 7 chum salmon with internally-inserted archival tags (AT tag) were released in the Bering Sea (Table 4).

### **Collection of snouts from adipose fin-clipped salmonids in 2001**

Fifty-four fin-clipped steelhead trout, two fin-clipped chinook salmon, one fin-clipped coho salmon, and one tagged pink salmon were recovered by Japanese salmon research vessels (Table 5). Snout samples were collected from fin-clipped fish and provided to the U.S. for inspection for CWTs.

## **ACKNOWLEDGMENTS**

We thank the captains, officers, and crews of all Japanese salmon research vessels for their careful collection of data and samples.

## **REFERENCES**

- Fukuwaka, M., S. Urawa, I. Ono, K. Umeda, M. Kawana, and R. V. Walker. 1999. Recoveries of high-seas tags in Japan, 1998, and 1999 tag releases and recoveries of fin-clipped salmon collected by Japanese salmon research vessels in the North Pacific Ocean. (NPAFC Doc. 416). Hokkaido National Fisheries Research Institute, Fisheries Agency of Japan, 116 Katsurakoi, Kushiro 085-0802. 11 p.

- Fukuwaka, M., S. Urawa, I. Ono, H. Tanaka, N. Davis, and R. V. Walker. 2000. Recoveries of high-seas tags in Japan in 1999, and tag releases and recoveries of fin-clipped salmon from Japanese research vessel surveys in the North Pacific Ocean in 2000. (NPAFC Doc. 482). Hokkaido National Fisheries Research Institute, Fisheries Research Agency, 116 Katsurakoi, Kushiro 085-0802. 12 p.
- Fukuwaka, M, N. Davis, A. Urano, T. Onuma, M. Akita, and S. Tsuchiya. 2001. International salmon research aboard the R/V *Wakatake maru* in the central North Pacific Ocean and Bering Sea during the summer of 2001. (NPAFC Doc. 546). 18 p. Hokkaido National Fisheries Research Institute, Fisheries Research Agency, 116 Katsurakoi, Kushiro 085-0802, Japan.
- Ito, S. 1995. Salmon tagging experiments and recovery of salmon lacking adipose fin collected by Japanese salmon research vessels in the North Pacific Ocean, 1995. Salmon Report Series 41:49-53. National Research Institute of Far Seas Fisheries, Shimizu, Shizuoka.
- Ito, S. and Y. Ishida 1996. Salmon tagging experiments and recovery of salmon lacking adipose fin collected by Japanese salmon research vessels in the North Pacific Ocean, 1996. Salmon Report Series 42: 30-37. National Research Institute of Far Seas Fisheries, Shimizu, Shizuoka.
- Ito, S. and Y. Ishida. 1998. Salmon tagging experiments and recovery of salmon lacking adipose fin collected by Japanese salmon research vessels in the North Pacific Ocean, 1997. Salmon Report Series 45:49-57. National Research Institute of Far Seas Fisheries, Shimizu, Shizuoka.
- Myers, K. W., R. V. Walker, N. D. Davis, W. S. Patton, K. Y. Aydin, E. K. Pikitch, and R. L. Burgner. 1995. Migrations, abundance, and origins of salmonids in offshore waters of the North Pacific – 1995. (NPAFC Doc. 152) FRI-UW-9506. University of Washington, Fisheries Research Institute, Box 357980, Seattle. 84 p.
- Myers, K. W., and R. V. Walker. 1996. Tag returns in 1996 – international high-seas salmon tagging. (NPAFC Doc. 193) FRI-UW-9618. University of Washington, Fisheries Research Institute, Box 357980, Seattle, WA 98195-7980. 5 p.
- Myers, K. W., N. D. Davis, R. V. Walker, M. Kaeriyama, and A. B. Dekshstein. 1997. Tag returns in 1997 – international high-seas salmon tagging. (NPAFC Doc. 255) FRI-UW-9707. University of Washington, Fisheries Research Institute, Box 357980, Seattle, WA 98195-7980. 7 p.
- Myers, K. W., N. D. Davis, R. V. Walker, and M. Fukuwaka. 1998. Tag returns in 1998 – international high-seas salmon tagging. (NPAFC Doc. 347.) FRI-UW-9809. Fisheries Research Institute, University of Washington, Seattle. 6 p.
- Ueno, Y. and Y. Ishida. 1999. Salmon tagging experiments and recovery of salmon

lacking adipose fin collected by Japanese salmon research vessels in the North Pacific Ocean, 1998. Salmon Report Series 47: 35-42. National Research Institute of Far Seas Fisheries, Shimizu, Shizuoka.

Urawa, S., K. Yamaya, N. Davis, H. Tanaka, and S. Tsuchiya. 2000. International salmon research aboard the R/V *Wakatake maru* in the central North Pacific Ocean and Bering Sea during the summer of 2000. (NPAFC Doc. 484). 21 p. National Salmon Resources Center, Fisheries Agency of Japan, 2-2 Nakanoshima, Toyohira-ku, Sapporo 062-0922, Japan.

Walker, R. V., K. W. Myers, N. D. Davis, K. Y. Aydin, H. R. Carlson, K. D. Friedland, G. W. Boehlert, S. Urawa, Y. Ueno, and G. Anma. 1998. Thermal habitat of migrating salmonids in the North Pacific Ocean and Bering Sea as recorded by temperature data tags in 1998. (NPAFC Doc. 350) FRI-UW-9813. Fisheries Research Institute, University of Washington, Seattle, WA, 28 p.

Walker, R.V., N.D. Davis, K.W. Myers, and M. Fukuwaka. 2000. Recoveries of high seas salmon tags in North America and releases of U.S. salmon data storage tags in the North Pacific Ocean and Bering Sea, 2000. (NPAFC Doc. 475) Fisheries Research Institute, University of Washington.

Walker, R.V., N.D. Davis, K.W. Myers, J.M. Murphy, and M. Fukuwaka. 2001. Recoveries of high seas salmon tags in North America and releases of U.S. salmon data storage tags in the North Pacific Ocean and Bering Sea, 2001. (NPAFC Doc.) Fisheries Research Institute, University of Washington.

Table 1. Releases and recoveries of high-seas tagged chum salmon returning to Japan and Russia in the fall of 2000. A hyphen indicates the information is not available. Age designation is the European method, where the first number is the number of freshwater annuli and the second number is the number of ocean annuli. FL: fork length, BW: body weight.

Japan tag no.	U.S. tag no.	Archival tag no.	Release					Recovery							
			Date	Lat	Long	FL (mm)	Age	Date	Lat	Long	Gear	Sex	FL (mm)	BW (g)	Location
EE4349	LL3556	-	Jun 30, 2000	55°30N	180°00	494	0.3	Nov 6, 2000	40°10N	141°53E	Setnet	-	-	-	Pacific C., Iwate Pref.
EE4376	LL3583	-	Jul 1, 2000	56°30N	180°00	540	0.3	Oct 30, 2000	43°24N	145°13E	River	F	590	2200	Nishibetsu R., Hokkaido
EE4390	LL3597	-	Jul 1, 2000	56°30N	180°00	560	0.3	Sep 11, 2000	43°18N	145°32E	Setnet	M	620	2800	Nemuro St., Hokkaido
EE4431	LL3638	-	Jul 2, 2000	57°30N	180°00	532	0.2	Oct 12, 2000	42°21N	142°26E	River	-	-	-	Shizunai R., Hokkaido
EE4478	LL3685	-	Jul 4, 2000	57°30N	179°00W	560	0.3	Aug 29, 2000	42°30N	143°28E	Setnet	F	582	2500	Pacific C., Hokkaido
EE4480	LL3687	-	Jul 4, 2000	57°30N	179°00W	550	0.3	Oct 25, 2000	43°30N	131°31E	?	F	605	1934	Narva Bay, Primorye
EE4580	LL3787	-	Jul 6, 2000	57°30N	178°00W	610	0.3	Oct 6, 2000	43°42N	145°06E	Setnet	F	600	3600	Nemuro St., Hokkaido
EE4581	LL3788	-	Jul 6, 2000	57°30N	178°00W	550	0.3	Oct 25, 2000	44°00N	145°11E	Setnet	M	-	1500	Nemuro St., Hokkaido
EE4587	LL3794	Not recovered	Jul 6, 2000	57°30N	178°00W	572	0.3	Oct 4, 2000	42°28N	143°26E	Setnet	-	-	-	Pacific C., Hokkaido
EE4588	LL3795	AT 1283	Jul 6, 2000	57°30N	178°00W	572	0.3	Oct 4, 2000	42°28N	143°26E	Setnet	F	-	-	Pacific C., Hokkaido
EE4614	LL3821	-	Jul 7, 2000	56°30N	178°00W	585	0.3	Oct 3, 2000	44°17N	145°21E	Setnet	-	600	-	Nemuro St., Hokkaido
EE4676	LL3883	-	Jul 8, 2000	56°30N	179°00W	610	0.4	Oct 2, 2000	43°42N	145°06E	Setnet	M	680	3400	Nemuro St., Hokkaido
EE4684	LL3891	Not recovered	Jul 8, 2000	56°30N	179°00W	634	0.3	Sep 17, 2000	45°18N	142°12E	Setnet	-	-	2780	Okhotsk Sea C., Hokkaido
EE4695	LL3902	Not recovered	Jul 9, 2000	56°30N	179°00E	632	0.3	Sep 30, 2000	42°10N	142°41E	Setnet	M	620	2500	Pacific C., Hokkaido
EE4709	LL3916	DT 20	Jul 9, 2000	56°30N	179°00E	685	0.4	Sep 16, 2000	43°19N	145°46E	Setnet	-	-	-	Pacific C., Hokkaido



Table 2. Number of tagged chum salmon released in the Bering Sea and the central North Pacific by the research vessel *Wakatake maru*, and recovered along the Japanese coast in 1995-2000. In 1995, fish were not tagged and released in the central North Pacific. Numbers in parentheses indicate number or recovery rate of archival-tagged fish.

Year	Region	Number of releases	Number of recoveries	Recovery rate (%)
1995	Bering Sea	128	4	3.1
1996	Bering Sea	619	9	1.4
	Central North Pacific	36	2	5.6
	Total	655	11	1.6
1997	Bering Sea	399	13	3.3
	Central North Pacific	5	0	0
	Total	404	13	3.2
1998	Bering Sea	734 (48)	71 (8)	9.7 (16.7)
	Central North Pacific	75	0	0
	Total	809 (48)	71 (8)	8.8 (16.7)
1999	Bering Sea	226 (31)	6 (3)	2.7 (9.7)
	Central North Pacific	15	0	0
	Total	241 (31)	6 (3)	2.5 (9.7)
2000	Bering Sea	575 (48)	15 (2)	2.6 (4.2)
	Central North Pacific	52 (2)	0	0
	Total	627 (50)	15 (2)	2.4 (4.0)

Table 3. Number of salmon caught by longline and hook-and-line operations, and number of fish tagged and released by the research vessel *Wakatake maru* and *Oshoro maru* in the summer of 2001. H&L: hook-and-line operation.

Region	Vessel	Date	Location	Number of fish caught							Number of fish released					
				Hachi	Sock	Chu	Pink	Coho	Chin	Steel	Sock	Chum	Pink	Coh	Chi	Steel
Central		Jun 15	41°00N 180°00	30	0	0	0	0	0	0	0	0	0	0	0	0
North		Jun 16	42°00N 180°00	30	0	0	0	0	0	0	0	0	0	0	0	0
Pacific		Jun 17	43°00N 180°00	30	0	1	0	2	0	0	0	1	0	2	0	0
		Jun 18	44°00N 180°00	30	0	21	0	45	0	3	0	16	0	32	0	3
<i>Wakatake maru</i>		Jun 19	45°00N 180°00	30	0	16	0	7	0	0	0	12	0	3	0	0
		Jun 20	46°00N 180°00	30	1	5	3	2	0	0	1	4	3	1	0	0
		Jun 22	47°00N 180°00	30	0	12	3	0	0	1	0	9	2	0	0	0
		Jun 23	47°30N 180°00	30	1	6	3	0	0	0	1	5	3	0	0	0
		Jun 24	48°30N 180°00	30	20	11	10	0	0	0	15	8	8	0	0	0
		Jun 25	49°30N 180°00	30	2	7	2	1	0	0	2	5	2	1	0	0
		Jun 26	50°30N 180°00	30	5	16	0	0	0	0	2	9	0	0	0	0
		Jun 27	51°30N 180°00	30	0	3	7	0	0	0	0	3	3	0	0	0
			Total		360	29	98	28	57	0	4	21	72	21	39	0
Bering Sea		Jun 28	52°30N 180°00	30	0	0	4	0	0	0	0	0	4	0	0	0
		Jun 29	53°30N 180°00	30	1	30	9	0	0	0	1	24	7	0	0	0
		Jun 30	54°30N 180°00	30	1	26	19	0	0	0	1	22	13	0	0	0
<i>Wakatake maru</i>		Jul 1	55°30N 180°00	30	0	77	17	0	0	0	0	56	11	0	0	0
		Jul 2	56°30N 180°00	30	0	32	1	0	0	0	0	24	1	0	0	0
		Jul 3	57°30N 180°00	30	3	4	3	0	0	0	3	2	1	0	0	0
		Jul 4	58°30N 180°00	30	0	2	0	0	0	0	0	2	0	0	0	0
		Jul 5	57°30N 179°00W	30	3	173	18	0	1	0	2	88	11	0	1	0
		Jul 6	57°30N 178°00W	30	1	75	15	0	2	0	1	53	10	0	2	0
		Jul 7	56°30N 178°00W	30	0	60	34	0	0	0	0	38	19	0	0	0
		Jul 8	56°30N 179°00W	30	0	26	12	0	0	0	0	16	7	0	0	0
		Jul 9	56°30N 179°00E	30	1	27	11	0	0	0	1	16	8	0	0	0
		Jul 10	56°30N 178°00E	30	1	12	3	0	0	0	1	5	2	0	0	0
		Jul 11	56°30N 177°00E	30	0	48	18	0	0	0	0	31	12	0	0	0
	Jul 12	57°30N 177°00E	30	0	27	12	0	0	0	0	16	10	0	0	0	
	Jul 13	56°30N 176°00E	30	1	21	4	0	1	0	1	13	4	0	1	0	
		Total		480	12	640	180	0	4	0	11	406	120	0	4	0
Eastern North Pacific		Jun 30	56°00N 145°00W	H&L	2	0	2	3	0	0	1	0	1	2	0	0
	Jul 1	56°08N 145°05W	10	1	4	3	9	1	0	1	3	3	9	1	0	
	Jul 2	54°59N 145°03W	10	1	1	0	0	0	1	0	1	0	0	0	1	
	Jul 3	53°59N 145°02W	10	0	0	3	5	0	0	0	0	3	4	0	0	
<i>Oshoro maru</i>	Jul 3	53°29N 145°00W	H&L	0	0	0	3	1	0	0	0	0	3	1	0	
	Jul 4	52°56N 145°01W	10	5	0	2	2	1	0	5	0	2	2	0	0	
	Jul 4	51°57N 144°56W	H&L	1	0	0	1	0	0	1	0	0	1	0	0	
	Jul 5	51°58N 144°54W	10	1	1	2	3	0	1	1	1	2	3	0	1	
	Jul 8	49°58N 144°55W	10	0	4	1	0	0	0	0	3	1	0	0	0	
		Total		60	11	10	13	26	3	2	9	8	12	24	2	2
		Total		900	52	748	221	82	7	6	41	486	153	63	6	5

Table 4. Tag numbers of disk tags and archival tags released by the research vessels *Wakatake maru* and *Oshoro maru* in summer of 2001.

Region	Vessel	Date	Location	Disk tag		Archival tag	
				FAJ tag	FRI tag No. fish	Tag No.	No. fish
Central		Jun 17	43°00N 180°00	LL3001-3003	LL4001-4003	3	
North		Jun 18	44°00N 180°00	LL3004-3054	LL4004-4054	51	LTD 1095
Pacific		Jun 19	45°00N 180°00	LL3055-3069	LL4055-4069	15	
		Jun 20	46°00N 180°00	LL3070-3078	LL4070-4078	9	LTD 1098
<i>Wakatake maru</i>		Jun 22	47°00N 180°00	LL3079-3089	LL4079-4089	11	
		Jun 23	47°30N 180°00	LL3090-3098	LL4090-4098	9	LTD 1158
		Jun 24	48°30N 180°00	LL3099-3129	LL4099-4129	31	LTD 1100, 1102, 1106, 1108, 1159, 1160, 1161
		Jun 25	49°30N 180°00	LL3130-3139	LL4130-4139	10	LTD 1109, 1110
		Jun 26	50°30N 180°00	LL3140-3150	LL4140-4150	11	LL 1112, 1113
		Jun 27	51°30N 180°00	LL3151-3156	LL4151-4156	6	
		Total		LL3001-3156	LL4001-4156	156	
Bering Sea		Jun 28	52°30N 180°00	LL3157-3160	LL4157-4160	4	
		Jun 29	53°30N 180°00	LL3161-3193	LL4161-4193	32	AT 895, 1058
		Jun 30	54°30N 180°00	LL3194-3229	LL4194-4229	36	LTD 1115, AT 1601, 1604
<i>Wakatake maru</i>		Jul 1	55°30N 180°00	LL3230-3296	LL4230-4296	67	AT 1599
		Jul 2	56°30N 180°00	LL3297-3321	LL4297-4321	25	AT 1607, 1628
		Jul 3	57°30N 180°00	LL3322-3327	LL4322-4327	6	LTD 1117, 1119, 1121
		Jul 4	58°30N 180°00	LL3328-3329	LL4328-4329	2	
		Jul 5	57°30N 179°00W	LL3330-3432	LL4330-4432	102	LTD 1162, 1163, 1164
		Jul 6	57°30N 178°00W	LL3433-3498	LL4433-4495	66	LTD 1165, 1167, 1168
		Jul 7	56°30N 178°00W	LL3499-3555	LL4499-4555	57	
		Jul 8	56°30N 179°00W	LL3556-3578	LL4556-4578	23	
		Jul 9	56°30N 179°00E	LL3579-3603	LL4579-4603	25	LTD 1169
		Jul 10	56°30N 178°00E	LL3604-3611	LL4604-4611	8	
		Jul 11	56°30N 177°00E	LL3612-3654	LL4612-4654	43	
		Jul 12	57°30N 177°00E	LL3655-3680	LL4655-4680	26	
		Jul 13	56°30N 176°00E	LL3681-3699	LL4681-4699	19	
		Total		LL3157-3699	LL4157-4699	541	
Eastern North Pacific		Jun 30	56°00N 145°00W		LL1639-1645	7	LTD 1293, 1297, 1301, 1304
		Jul 1	56°07N 145°00W	BB6441-6457	LL1651-1667	17	LTD 1290, 1292, 1295, 1296, 1307, 1310, 1311, 1314, 1316, 1319, 1320, 1321, 1322
<i>Oshoro maru</i>		Jul 2	55°00N 145°03W	BB6458-6459	LL1668-1669	2	LTD 1315, 1323
		Jul 3	53°59N 145°02W	BB6460-6466	LL1670-1676	7	LTD 1312, 1324, 1327, 1328, 1331, 1337
		Jul 3	53°29N 145°00W	KK1601-1604	LL1711-1714	4	LTD 1335, 1340
		Jul 4	52°56N 145°01W	BB6467-6475	LL1677-1685	9	LTD 1318, 1325, 1334, 1342, 1343, 1344, 1345
		Jul 4	51°57N 144°56W	KK1605-1606	LL1715-1716	2	LTD 1313, 1317
		Jul 5	51°58N 144°54W	BB6476-6483	LL1686-1693	8	LTD 1308, 1329, 1332, 1347, 1349
		Jul 8	49°58N 144°55W	BB6484-6487	LL1694-1697	4	LTD 926, 955, 958, 1336
		Total		BB6441-6487	LL1651-1697		
				KK1601-1606	LL1711-1716	60	
		Total				757	
							45
		Total					77

Table 5. Location and biological data for recovered fin-clipped and tagged salmonids caught by Japanese salmon research vessels in the summer of 2001. Numerals in the Gear column indicate mesh size (mm) of gillnet. LL: longline, Ad: adipose fin, LV: left ventral fin, Do: dorsal fin.

Research vessel	Date	Location		Gear	Species	Fork length (mm)	Body weight (g)	Sex	Gonad weight (g)	Clipped fin or tag number
<i>Wakatake maru</i>	Jun 18	43°00N	180°00	138	Steelhead	712	3500	Female	23	Ad
	Jun 18	43°00N	180°00	115	Steelhead	590	1900	Female	5	Ad
	Jun 18	43°00N	180°00	115	Steelhead	568	1800	Male	2	Ad
	Jun 18	43°00N	180°00	115	Steelhead	614	2450	Male	3	Ad, LV
	Jun 18	43°00N	180°00	115	Steelhead	622	2580	Male	5	Ad
	Jun 19	44°00N	180°00	115	Steelhead	574	1800	Male	1	Ad
	Jun 19	44°00N	180°00	115	Steelhead	654	2950	Female	15	Ad
	Jun 19	44°00N	180°00	115	Steelhead	574	2050	Female	7	Ad
	Jun 19	44°00N	180°00	115	Steelhead	576	1900	-	5	Ad
	Jun 19	44°00N	180°00	157	Steelhead	747	4500	Female	17	Ad
	Jun 19	44°00N	180°00	106	Steelhead	590	1980	Female	5	Ad, Do
	Jun 20	45°00N	180°00	138	Steelhead	690	2650	Female	32	Ad
	Jun 20	45°00N	180°00	138	Steelhead	642	2400	Female	8	Ad, LV
	Jun 20	45°00N	180°00	115	Steelhead	606	2080	Female	20	Ad
	Jun 20	45°00N	180°00	115	Steelhead	586	1960	Male	2	Ad
	Jun 20	45°00N	180°00	115	Steelhead	584	2000	Male	11	Ad
	Jun 20	45°00N	180°00	106	Steelhead	586	2050	Female	13	Ad, LV
	Jun 22	47°00N	180°00	LL	Steelhead	755	3950	Female	7	Ad
	Jun 23	47°00N	180°00	157	Steelhead	756	4250	Male	4	Ad
	Jul 8	56°30N	178°00W	121	Pink	460	1260	Male	86	LL3542, LL4542
<i>Oshoro maru</i>	Jul 1	56°01N	145°02W	82	Steelhead	554	1640	Female	20	Ad
	Jul 1	56°01N	145°02W	93	Steelhead	549	1680	Female	10	Ad
	Jul 1	56°01N	145°02W	121	Coho	580	2500	Female	51	Ad
	Jul 2	54°59N	145°01W	121	Steelhead	549	1700	Male	10	Ad
	Jul 2	54°59N	145°01W	115	Steelhead	611	2300	Female	14	Ad
	Jul 3	53°59N	145°01W	115	Steelhead	525	1480	Female	6	Ad
	Jul 3	53°59N	145°01W	63	Steelhead	330	310	Male	4	Ad
	Jul 3	53°59N	145°01W	121	Steelhead	580	2140	Female	7	Ad
	Jul 3	53°59N	145°01W	93	Steelhead	563	1740	Male	13	Ad
	Jul 3	53°59N	145°01W	121	Steelhead	686	2500	Female	29	Ad
	Jul 4	52°59N	144°59W	93	Steelhead	568	1900	Male	5	Ad
	Jul 4	52°59N	144°59W	138	Steelhead	712	3700	Male	49	Ad
	Jul 4	52°59N	144°59W	115	Steelhead	608	2500	Male	14	Ad
	Jul 4	52°59N	144°59W	115	Steelhead	510	1400	Female	5	Ad
	Jul 5	51°59N	144°59W	72	Steelhead	565	2100	Female	13	Ad
	Jul 5	51°59N	144°59W	115	Steelhead	608	2740	Male	3	Ad
	Jul 5	51°59N	144°59W	106	Steelhead	552	1820	Male	28	Ad
	Jul 5	51°59N	144°59W	115	Steelhead	532	1640	Female	9	Ad
	Jul 5	51°59N	144°59W	121	Steelhead	564	2000	Male	8	Ad
	Jul 5	51°59N	144°59W	121	Steelhead	604	2800	Female	28	Ad
	Jul 5	51°59N	144°59W	115	Steelhead	570	2100	Female	9	Ad
	Jul 5	51°59N	144°59W	93	Steelhead	590	2140	Female	6	Ad
	Jul 5	51°59N	144°59W	82	Steelhead	557	1600	Female	9	Ad
	Jul 5	51°59N	144°59W	82	Steelhead	463	1020	Male	1	Ad
	Jul 8	50°00N	145°00W	93	Steelhead	583	2360	Female	20	Ad
	Jul 8	50°00N	145°00W	106	Steelhead	564	2000	Female	12	Ad
	Jul 8	50°00N	145°00W	106	Steelhead	614	2500	Male	9	Ad
	Jul 8	50°00N	145°00W	72	Steelhead	751	4300	Male	6	Ad
	Jul 8	50°00N	145°00W	121	Chinook	529	2300	Female	11	Ad
	Jul 8	50°00N	145°00W	121	Steelhead	595	2620	Female	31	Ad
	Jul 8	50°00N	145°00W	121	Steelhead	579	2360	Female	21	Ad
	Jul 8	50°00N	145°00W	121	Steelhead	608	2660	Male	41	Ad
Jul 8	50°00N	145°00W	115	Steelhead	576	2460	Male	3	Ad	
Jul 8	50°00N	145°00W	115	Steelhead	558	1900	Female	20	Ad	
Jul 8	50°00N	145°00W	115	Steelhead	722	3300	Female	35	Ad	
Jul 8	50°00N	145°00W	115	Chinook	555	2400	Male	4	Ad	
Jul 8	50°00N	145°00W	115	Steelhead	584	2240	Female	9	Ad	
Jul 8	50°00N	145°00W	115	Steelhead	575	2300	Male	19	Ad	