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Recoveries of High-Seas Tags in Japan in 2004, and Tag Releases and Recoveries of Fin-Clipped Salmon from Japanese Research Vessel Surveys in the North Pacific Ocean in Summer of 2005

by

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Recoveries of High-Seas Tags in Japan in 2004, and Tag Releases and Recoveries of Fin-Clipped Salmon from Japanese Research Vessel Surveys in the North Pacific Ocean in Summer of 2005

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ABSTRACT

During 2004, 41 tagged chum and coho salmon were recovered along the Japanese and Russian coasts from releases of tagged fish in the Bering Sea and central North Pacific, in addition one pink was recovered by a research vessel just after the release. Recoveries from the Asian coast included 19 chum and one coho salmon with CTD, LTD, or IB archival tags, and 21 fish with only disk tags. The tag recovery rate for chum salmon released and recovered in 2004 (4.7%) was higher than the recovery rate since 1995 (1.6-3.6%), except for 1998 (8.8%) and 2001 (6.9%). From June to July 2005, two Japanese research vessels, *Wakatake maru* and *Oshoro maru*, conducted 28 longline (778 hachi) and three hook-and-line operations to attach archival and disk tags on salmonids. In June and July 2005, four salmonids (3 chum and 1 pink) in the western North Pacific, 146 salmonids (11 sockeye, 68 chum, 5 pink, 58 coho salmon, 1 chinook, and 3 steelhead trout) in the central North Pacific, and 237 salmonids (71 sockeye, 79 chum, 83 pink, and 4 chinook salmon) in the Bering Sea were tagged and released. Of these fish, 138 salmonids with IB, LTD, CTD, or geolocating tags were released in the central North Pacific and Bering Sea. During research surveys in summer of 2005, Japanese salmon research vessels recovered 31 salmonids lacking the adipose fin.

INTRODUCTION

Japanese and U.S. cooperative high-seas tagging experiments were conducted in 2005. In this report, we summarize tags recovered from salmon that returned to Japanese and Russian coastal areas in 2004. In addition, releases of high seas tags and collection of fin-clipped salmonids during Japanese salmon research vessel operations in the North Pacific Ocean in summer, 2005, are summarized.

MATERIALS AND METHODS

Recovery of high seas tags in 2004

In June and July 2004, 153 salmonids (10 sockeye, 71 chum, 14 pink, 56 coho, and 2 chinook salmon) in the central North Pacific and 905 salmon (48 sockeye, 782 chum, 35 pink, 5 coho, and 35 chinook salmon) in the Bering Sea were tagged and released by two Japanese research vessels, the *Wakatake maru* and *Kaiyo maru* (Nagasawa et al. 2004). Of these fish, 172 salmonids with temperature tags (IB tag), 115 salmonids with temperature-depth tags (LTD tag), and 19 salmonids with both conductivity-temperature-depth tags (CTD tag) were released in the central and eastern North Pacific and the Bering Sea.

Fish were tagged with two disk tags: one issued by the Fisheries Agency of Japan (FAJ) and a second disk tag issued by the School of Aquatic and Fishery Sciences, University of Washington (UW). 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. Four types of externally-attached archival tags were used by UW (Walker et al. 2004). Two tags are manufactured by Lotek Marine Technologies; one (model LTD_1100-500) records temperature and depth data. The other (model LTD_2400) records light, temperature, and depth and provides geolocation estimates based on light data. Another tag is a ThermoChron iButton data storage device manufactured by Dallas Semiconductor, Inc., and repackaged for fish tagging by AlphaMach, Inc. (model iBKrill). These tags record temperature data only. A fourth type of archival tag manufactured by Star-Oddi, Reykjavik, Iceland (model DST CTD), records seawater temperature, salinity, and depth. All archival tags were attached externally in the dorsal musculature of the fish anterior to the dorsal fin.

The National Salmon Resources Center collected archival tags, disk tags, and data on recovery locations from salmon hatcheries, private fishermen, fishing cooperative unions, and prefectural governments along the coast of northern Japan from chum salmon that returned to Japan coastal areas in fall of 2004. The KamchatNIRO reported a tag recovery in Russia.

We compared tag recovery rates (number of recovered fish / number of released fish) from 1995 to 2004 using the data from tagging experiments conducted by the *Wakatake maru* and *Kaiyo maru* in the central North Pacific and Bering Sea (Ito 1995, Myers et al. 1995-1998, Ito and Ishida 1996, 1998, Walker et al. 1998, Ueno and Ishida 1999, Fukuwaka et al. 1999-2003, Nagasawa et al. 2004).

Releases of high seas tags in summer of 2005

From June to July 2005, two Japanese research vessels, *Wakatake maru* and *Oshoro maru*, conducted 28 longline (778 hachi) and 3 hook-and-line operations to attach archival and

disk tags on salmonids. The disk tags used in 2005 were the same types used in 2004. Four types of archival tag were used in 2005, namely the temperature and depth recording LTD 1100-500, the temperature recording iBKrill, the salinity, temperature and depth recording DST CTD, and the geolocating tag LTD_2400 (Walker et al. 2003, 2004; Fukuwaka et al. 2005). Archival tags were placed externally in the dorsal musculature of the fish anterior to the dorsal fin.

Collection of snouts from adipose fin-clipped salmonids in 2005

Three salmon research vessels, the *Wakatake maru*, *Oshoro maru*, and *Kaiun maru* caught 10,384 salmonids in the western and central North Pacific, the Bering Sea, and the Gulf of Alaska from June through August, 2005. Salmon and steelhead trout lacking the adipose fin were recovered during biological measurements. Snout samples were collected from these fish for potential recovery of coded-wire tags (CWT).

RESULTS

Recovery of high seas tags in 2004

Forty-one tagged chum and coho salmon were recovered from areas along the coast of Japan and Russia during fall 2004, in addition one pink was recovered by a research vessel just after the release (Table 1). Twenty-one recoveries were from salmon tagged only with disk tags. Recoveries from the Asian coast included 19 chum and one coho salmon with CTD, LTD, or IB archival tags, but one LTD tag was missing in the sea and not recovered. The tag recovery rate for chum salmon released and recovered in 2004 (3.8%) was higher than the recovery rate since 1995 (1.6-3.6%), except for 1998 (8.8%) and 2001 (6.9%; Table 2).

Releases of high seas tags in 2005

In June and July 2005, four salmonids (3 chum and 1 pink) in the western North Pacific, 146 salmonids (11 sockeye, 68 chum, 5 pink, 58 coho salmon, 1 chinook, and 3 steelhead trout) in the central North Pacific, and 237 salmonids (71 sockeye, 79 chum, 83 pink, and 4 chinook salmon) in the Bering Sea were tagged and released by two Japanese research vessels, *Oshoro maru* and *Wakatake maru* (Tables 3 and 4). Of these fish, 138 salmonids with IB, LTD, CTD, or geolocating tags were released in the central North Pacific and Bering Sea.

Collection of snouts from adipose fin-clipped salmonids in 2005

Thirty-one fin-clipped steelhead trout were recovered by Japanese salmon research vessels (Table 5). Snouts were collected from these fish. On board the *Wakatake maru*, snouts were screened for the presence of the coded-wire tag using a tag detector, and three snouts

produced a positive response for a CWT. These snouts were retained and later sent to the Auke Bay Laboratory (U.S. National Marine Fisheries Service) for collection and reading of the coded-wire tags.

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Table 1. Recoveries of high-seas tagged salmon returning to Japan and Russia in 2004. 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 (mm), BW: body weight (g), -: no data, *: archival tag not recovered.

| Japan tag # | U.S. tag # | Archival tag # | Release | | | | | | Recovery | | | | | | | |
|-------------|------------|----------------|---------|---------|----------|--------|-----|-----|----------|----------------|------------------|--------|-----|-----|------|---|
| | | | Date | Lat | Long | Specie | FL | Age | Date | Lat | Long | Gear | Sex | FL | BW | Location |
| MM2705 | NN0705 | IBW188 | 7/13/04 | 57°30'N | 176°00'E | chum | 741 | 0.4 | 9/2/04 | 42°57'N | 144°07'E | setnet | F | 780 | 5200 | Shiranuka, Pacific coast, Hokkaido |
| MM2696 | NN0696 | IBW179 | 7/12/04 | 57°30'N | 177°00'E | chum | 608 | 0.4 | 9/21/04 | 43°23'N | 145°17'E | setnet | F | 615 | 2650 | Bekkai, Nemuro coast, Hokkaido |
| MM2237 | NN0237 | LTD5991 | 7/2/04 | 56°30'N | 180°00' | chum | 635 | 0.4 | 9/16/04 | 42°10'N | 143°20'E | setnet | M | 630 | 3500 | Hiroo, Pacific coast, Hokkaido |
| MM2687 | NN0687 | IBW153 | 7/11/04 | 56°30'N | 177°00'E | chum | 719 | 0.5 | 9/21/04 | 43°03'N | 144°24'E | river | F | 745 | 4430 | Kushiro River, Pacific coast, Hokkaido |
| MM2562 | NN0562 | LTD7469 | 7/9/04 | 56°30'N | 179°00'E | chum | 641 | 0.4 | 9/27/04 | 42°25'-42°33'N | 143°24'-143°31'E | - | M | - | - | Taiki, Pacific coast, Hokkaido |
| MM2421 | NN0421 | CTD1379 | 7/7/04 | 56°30'N | 178°00'W | chum | 591 | 0.4 | 9/21/04 | 43°08'N | 145°09'E | - | F | 680 | 3100 | Horoto River, Pacific coast, Hokkaido |
| MM2245 | NN0245 | LTD7430 | 7/2/04 | 56°30'N | 180°00' | chum | 605 | 0.3 | 9/29/04 | 42°47'N | 143°47'E | setnet | M | 700 | 3000 | Urahoru, Pacific coast, Hokkaido |
| MM2358 | NN0358 | IBW149 | 7/5/04 | 57°30'N | 179°00'W | chum | 637 | 0.3 | 10/2/04 | 43°13'N | 145°37'E | setnet | M | 700 | 3500 | Nemuro, Pacific coast, Hokkaido |
| BB1894 | LL7660 | IBK052 | 6/30/04 | 54°58'N | 175°05'W | chum | 555 | 0.3 | 10/6/04 | 44°17'N | 145°21'E | setnet | - | - | - | Rausu, Nemuro coast, Hokkaido |
| MM2581 | NN0581 | LTD7473 | 7/9/04 | 56°30'N | 179°00'E | chum | 640 | 0.4 | 10/1/04 | 42°05'N | 143°19'E | setnet | F | 670 | 2400 | Erimo, Pacific coast, Hokkaido |
| MM2209 | NN0209 | LTD5980 | 6/30/04 | 54°30'N | 180°00' | chum | 521 | 0.3 | 10/11/04 | 45°07'-45°13'N | 142°19'-142°26'E | setnet | F | 575 | 2201 | Hamatonbetsu, Okhotsk coast, Hokkaido |
| MM2670 | NN0670 | LTD7480 | 7/10/04 | 56°30'N | 178°00'E | chum | 615 | 0.3 | 9/24/04 | 42°57'N | 144°23'E | setnet | - | - | - | Kushiro, Pacific coast, Hokkaido |
| MM2198 | NN0198 | LTD5963* | 6/30/04 | 54°30'N | 180°00' | chum | 588 | 0.3 | 9/18/04 | 44°37'N | 142°56'E | setnet | - | - | - | Ohmu, Okhotsk coast, Hokkaido |
| MM2120 | NN0120 | | 6/27/04 | 51°30'N | 180°00' | chum | 631 | 0.4 | 9/28/04 | 44°06'N | 144°13'E | setnet | M | 685 | 3400 | Abashiri, Okhotsk coast, Hokkaido |
| BB2486 | LL7811 | LTD8105 | 7/5/04 | 55°30'N | 179°58'W | chum | 580 | ? | 9/28/04 | 43°59'N | 144°18'E | setnet | M | 619 | 2450 | Abashiri, Okhotsk coast, Hokkaido |
| MM2361 | NN0361 | | 7/6/04 | 57°30'N | 178°00'W | chum | 638 | 0.4 | 9/29/04 | 44°22'N | 143°21'E | setnet | - | - | - | Monbetsu, Okhotsk coast, Hokkaido |
| MM2462 | NN0462 | | 7/7/04 | 56°30'N | 178°00'W | chum | 562 | 0.3 | 10/1/04 | 43°59'N | 144°18'E | setnet | M | 583 | 2000 | Abashiri, Okhotsk coast, Hokkaido |
| MM2516 | NN0516 | | 7/8/04 | 56°30'N | 179°00'W | chum | 536 | 0.3 | 10/7/04 | 44°15'-44°16'N | 145°15'E | setnet | F | 600 | 2100 | Shiretoko, Okhotsk coast, Hokkaido |
| MM2296 | NN0296 | | 7/3/04 | 57°30'N | 180°00' | chum | 560 | 0.3 | 10/11/04 | 43°37'N | 145°14'E | setnet | M | 620 | 2400 | Shibetsu, Nemuro coast, Hokkaido |
| MM2370 | NN0370 | | 7/6/04 | 57°30'N | 178°00'W | chum | 597 | 0.3 | 9/10/04 | 45°03'-44°41'N | 142°30'-142°51'E | setnet | - | 640 | 2000 | Esashi, Okhotsk coast, Hokkaido |
| MM2568 | NN0568 | | 7/9/04 | 56°30'N | 179°00'E | chum | 546 | 0.3 | 10/19/04 | 44°20'-43°56'N | 145°19'-144°33'E | setnet | F | - | 2000 | Shari, Okhotsk coast, Hokkaido |
| MM2297 | NN0297 | | 7/3/04 | 57°30'N | 180°00' | chum | 555 | 0.3 | 10/21/04 | 43°36'-43°37'N | 145°15'E | setnet | - | - | - | Bekkai, Nemuro coast, Hokkaido |
| MM2424 | NN0424 | | 7/7/04 | 56°30'N | 178°00'W | chum | 555 | 0.3 | 10/25/04 | 44°01'N | 144°15'E | river | - | - | - | Abashiri R., Okhotsk coast, Hokkaido |
| MM2353 | NN0353 | | 7/5/04 | 57°30'N | 179°00'W | chum | 588 | 0.4 | 10/6/04 | 43°04'N | 145°12'-145°13'E | setnet | M | 670 | 2600 | Shibetsu, Nemuro coast, Hokkaido |
| N4845 | LL7871 | | 7/7/04 | 55°03'N | 174°57'E | chum | 610 | | 10/13/04 | 43°42'-43°43'N | 145°08'-145°09'E | setnet | F | 640 | 2200 | Shibetsu, Nemuro coast, Hokkaido |
| MM2702 | NN0702 | IBW185 | 7/13/04 | 57°30'N | 176°00'E | chum | 588 | 0.3 | 10/22/04 | 43°50'-43°51'N | 145°06'-145°07'E | setnet | M | 650 | 2200 | Shibetsu, Nemuro coast, Hokkaido |
| MM2541 | NN0541 | LTD7467 | 7/8/04 | 56°30'N | 179°00'W | chum | 583 | 0.3 | 10/22/04 | 43°49'N | 145°08'-145°09'E | setnet | M | 650 | 2800 | Shibetsu, Nemuro coast, Hokkaido |
| MM2688 | NN0688 | IBW154 | 7/11/04 | 56°30'N | 177°00'E | chum | 564 | 0.3 | 9/29/04 | 44°14'N | 145°21'-145°22'E | setnet | M | 698 | 3590 | Rausu, Nemuro coast, Hokkaido |
| BB1846 | LL7612 | IBK050 | 6/29/04 | 57°01'N | 175°03'W | chum | 585 | | 10/11/04 | 44°17'N | 145°21'E | setnet | F | - | 2000 | Rausu, Nemuro coast, Hokkaido |
| MM2602 | NN0602 | | 7/9/04 | 56°30'N | 179°00'E | chum | 579 | 0.3 | 10/20/04 | 44°12'N | 145°20'-145°21'E | setnet | M | 614 | 2520 | Rausu, Nemuro coast, Hokkaido |
| MM2615 | NN0615 | | 7/9/04 | 56°30'N | 179°00'E | chum | 568 | 0.3 | 10/25/04 | 43°51'-44°20'N | 145°06'-145°22'E | setnet | F | 617 | 1840 | Rausu, Nemuro coast, Hokkaido |
| MM2346 | NN0346 | | 7/5/04 | 57°30'N | 179°00'W | chum | 558 | 0.3 | 11/14/04 | 44°28'N | 142°20'E | river | F | 610 | 1900 | Teshio R., Japan Sea coast, Hokkaido |
| MM2345 | NN0345 | | 7/5/04 | 57°30'N | 179°00'W | chum | 587 | 0.3 | 10/7/04 | 43°43'N | 145°06'E | setnet | M | 630 | 2200 | Shibetsu, Nemuro coast, Hokkaido |
| MM2483 | NN0483 | | 7/7/04 | 56°30'N | 178°00'W | chum | 590 | 0.3 | 11/1/04 | 43°19'N | 145°46'-145°47'E | setnet | - | - | - | Nemuro, Pacific coast, Hokkaido |
| N4804 | LL7830 | | 7/5/04 | 55°30'N | 179°58'W | chum | 530 | | 10/?/04 | 42°24'-42°09'N | 143°19'-143°24'E | setnet | - | - | - | Hiroo, Pacific coast coast, Hokkaido |
| MM2650 | NN0650 | | 7/9/04 | 56°30'N | 179°00'E | chum | 529 | 0.3 | 10/16/04 | 44°03'N | 144°16'-144°17'E | setnet | M | 535 | 1600 | Abashiri, Okhotsk coast, Hokkaido |
| MM2480 | NN0480 | | 7/7/04 | 56°30'N | 178°00'W | chum | 565 | 0.3 | 9/20/04 | 45°19'-45°20'N | 142°12'-142°13'E | setnet | - | 600 | - | Sarufutsu, Okhotsk coast, Hokkaido (TL) |
| MM2395 | NN0395 | | 7/6/04 | 57°30'N | 178°00'W | chum | 618 | 0.4 | 8/15/04 | 56°15'N | 162°30'E | river | - | - | - | Kamtchatka R. East Kamtchatka, Russia |

Table 1. (continued)

| Japan | U.S. | Archival | Release | | | | | | Recovery | | | | | | | |
|--------|--------|----------|---------|---------|----------|--------|-----|-----|----------|---------|----------|----------|-----|-----|------|---------------------------------------|
| tag # | tag # | tag # | Date | Lat | Long | Specie | FL | Age | Date | Lat | Long | Gear | Sex | FL | BW | Location |
| MM2373 | NN0373 | IBW148 | 7/6/04 | 57°30'N | 178°00'W | pink | 459 | 0.4 | 7/7/04 | 56°30'N | 178°00'W | driftnet | - | - | - | Bering Sea |
| MM2469 | NN0469 | | 7/9/04 | 56°30'N | 178°00'W | chum | 541 | 0.3 | 10/15/04 | 47°15'N | 143°01'E | - | - | - | - | Cape Ostruy, E. Sakhalin |
| N4810 | LL7836 | LTD8106 | 7/5/04 | 55°30'N | 179°58'W | chum | 540 | 0.3 | 9/5/04 | 59°24'N | 143°16'E | river | F | 560 | 1950 | Kukhtuy R., N. Okhotsk coast, Russia |
| BB1924 | LL7690 | LTD8101 | 7/2/04 | 51°26'N | 175°02'W | coho | 650 | 0.4 | 8/20/04 | 56°15'N | 162°30'E | river | M | 570 | - | Kamtchatka R. East Kamtchatka, Russia |

Table 2. Number of tagged chum salmon released in the Bering Sea and the central North Pacific by the research vessels *Wakatake maru* and *Kaiyo maru*, and recovered along the Japanese coast and in Russia in 1995-2004. 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) |
| 2001 | Bering Sea | 406 (7) | 31 (1) | 7.6 (14.3) |
| | Central North Pacific | 72 | 2 | 2.8 |
| | Total | 478 (7) | 33 (1) | 6.9 (14.3) |
| 2002 | Bering Sea | 956 (45) | 26 (3) | 2.7 (6.7) |
| | Central North Pacific | 18 (3) | 0 | 0 |
| | Total | 974 (48) | 26 (3) | 2.7 (6.3) |
| 2003 | Bering Sea | 135 (40) | 6 (2) | 4.4 (5.0) |
| | Central North Pacific | 31 (0) | 0 | 0 |
| | Total | 166(40) | 6 (2) | 3.6 (5.0) |
| 2004 | Bering Sea | 782 (337) | 40 (19) | 5.1 (5.6) |
| | Central North Pacific | 71 (28) | 0 | 0 |
| | Total | 853 (365) | 40 (19) | 4.7 (5.2) |

Table 3. Number of salmon caught by longline and hook-and-line operations, and number of fish tagged and released by the research vessels, *Wakatake maru* and *Oshoro maru* in summer of 2005. H&L: hook-and-line operation, BS: Bering Sea, WNP: Western North Pacific, CNP: Central North Pacific, ENP: Eastern North Pacific.

| Region/ Vessel | Date | Latitude | Longitude | Hachi | Number of fish caught | | | | | | Number of fish released | | | | | |
|----------------------|---------|----------|-----------|-------|-----------------------|------|------|------|------|-------|-------------------------|------|------|------|------|-------|
| | | | | | Sock | Chum | Pink | Coho | Chin | Steel | Sock | Chum | Pink | Coho | Chin | Steel |
| WNP | 7/3/05 | 46°54'N | 165°04'E | 10 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 0 |
| <i>Oshoro maru</i> | 7/3/05 | 47°00'N | 165°00'E | H&L | 0 | 2 | 28 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7/4/05 | 48°30'N | 165°00'E | H&L | 3 | 3 | 23 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | | | 10 | 3 | 8 | 52 | 10 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 0 |
| CNP | 6/15/05 | 40°59'N | 180°00' | 30 | 0 | 2 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 |
| <i>Wakatake maru</i> | 6/16/05 | 41°57'N | 179°59'E | 30 | 0 | 2 | 0 | 52 | 0 | 1 | 0 | 2 | 0 | 39 | 0 | 1 |
| | 6/17/05 | 42°57'N | 179°59'W | 30 | 0 | 3 | 0 | 9 | 0 | 0 | 0 | 3 | 0 | 5 | 0 | 0 |
| | 6/18/05 | 44°02'N | 179°56'W | 30 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 2 |
| | 6/19/05 | 45°03'N | 179°56'W | 30 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| | 6/20/05 | 46°02'N | 179°58'W | 30 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | 6/21/05 | 47°01'N | 179°59'W | 30 | 0 | 3 | 2 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 0 |
| | 6/22/05 | 47°29'N | 179°58'E | 30 | 0 | 8 | 1 | 1 | 0 | 0 | 0 | 7 | 1 | 1 | 0 | 0 |
| | 6/23/05 | 48°30'N | 180°00' | 30 | 2 | 33 | 0 | 1 | 0 | 0 | 2 | 30 | 0 | 1 | 0 | 0 |
| | 6/24/05 | 49°30'N | 180°00' | 30 | 3 | 15 | 2 | 1 | 1 | 0 | 3 | 13 | 1 | 1 | 1 | 0 |
| | 6/25/05 | 50°30'N | 180°00' | 30 | 7 | 13 | 3 | 1 | 0 | 0 | 6 | 9 | 2 | 1 | 0 | 0 |
| | | Total | | | 330 | 12 | 79 | 8 | 79 | 1 | 4 | 11 | 68 | 5 | 58 | 1 |
| BS | 6/26/05 | 51°30'N | 180°00' | 30 | 3 | 2 | 1 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 |
| <i>Wakatake maru</i> | 6/27/05 | 52°30'N | 180°00' | 30 | 1 | 4 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 |
| | 6/28/05 | 53°30'N | 180°00' | 30 | 4 | 25 | 5 | 0 | 0 | 0 | 3 | 18 | 5 | 0 | 0 | 0 |
| | 6/29/05 | 54°30'N | 180°00' | 30 | 0 | 23 | 16 | 0 | 0 | 0 | 0 | 17 | 10 | 0 | 0 | 0 |
| | 6/30/05 | 55°32'N | 179°55'W | 30 | 6 | 18 | 10 | 0 | 0 | 0 | 6 | 12 | 7 | 0 | 0 | 0 |
| | 7/1/05 | 56°30'N | 179°55'E | 30 | 3 | 21 | 16 | 0 | 0 | 0 | 3 | 14 | 9 | 0 | 0 | 0 |
| | 7/2/05 | 57°31'N | 179°54'E | 30 | 4 | 3 | 8 | 0 | 1 | 0 | 4 | 0 | 5 | 0 | 0 | 0 |
| | 7/7/05 | 58°33'N | 179°53'W | 30 | 10 | 1 | 30 | 0 | 2 | 0 | 9 | 0 | 23 | 0 | 1 | 0 |
| | 7/8/05 | 57°30'N | 179°03'W | 30 | 2 | 6 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 2 | 0 |
| | 7/9/05 | 57°34'N | 177°57'W | 30 | 18 | 5 | 28 | 0 | 1 | 0 | 18 | 0 | 18 | 0 | 1 | 0 |
| | 7/10/05 | 56°32'N | 177°56'W | 30 | 16 | 10 | 5 | 0 | 0 | 0 | 16 | 4 | 1 | 0 | 0 | 0 |
| | 7/11/05 | 56°31'N | 178°53'W | 30 | 1 | 7 | 4 | 0 | 0 | 0 | 1 | 3 | 3 | 0 | 0 | 0 |
| 7/12/05 | 56°31'N | 179°06'E | 30 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | |
| 7/13/05 | 56°34'N | 177°58'E | 30 | 4 | 8 | 1 | 1 | 1 | 0 | 4 | 7 | 1 | 0 | 0 | 0 | |
| | Total | | | 420 | 74 | 133 | 126 | 1 | 7 | 0 | 71 | 79 | 83 | 0 | 4 | 0 |
| ENP | 7/25/05 | 50°00'N | 165°00'W | H&L | 5 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Oshoro maru</i> | 7/26/05 | 48°27'N | 164°53'W | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7/28/05 | 46°57'N | 164°54'W | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | | | 18 | 5 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | | | 778 | 94 | 229 | 186 | 90 | 8 | 5 | 82 | 150 | 89 | 58 | 5 | 3 |

Table 4. Tag numbers of disk tags and archival tags released in summer of 2005. BS: Bering Sea, WNP: western North Pacific, CNP: central North Pacific, ENP: eastern North Pacific.

| Region | Date | Location | | Disk tag | | | Archival tag | |
|---------|---------|----------|-------------|--------------------------|--------------------------|--|---|----------|
| | | | | FAJ tag | FRI tag | No. fish | Tag No. | No. fish |
| WNP | 7/3/05 | 46°54N | 165°04E | AA1331-1334 | LL4731-4734 | 4 | | 0 |
| CNP | 6/15/05 | 41°00N | 180°00 | MM3001-3004 | LL8101-8104 | 4 | | 0 |
| | 6/16/05 | 42°00N | 180°00 | MM3005-3046 | LL8105-8146 | 42 | TD8114-8116, 9414, 9415 | 5 |
| | 6/17/05 | 43°00N | 180°00 | MM3047-3054 | LL8147-8154 | 8 | TD9417, 9418, 9420 | 3 |
| | 6/18/05 | 44°00N | 180°00 | MM3055-3059 | LL8155-8159 | 5 | TD9421 | 1 |
| | 6/19/05 | 45°00N | 180°00 | MM3060-3062 | LL8160-8162 | 3 | | 0 |
| | 6/20/05 | 46°00N | 180°00 | MM3063-3063 | LL8163-8163 | 1 | | 0 |
| | 6/21/05 | 47°00N | 180°00 | MM3064-3067 | LL8164-8167 | 4 | IB K112 | 1 |
| | 6/22/05 | 47°30N | 180°00 | MM3068-3076 | LL8168-8176 | 9 | TD9422 | 1 |
| | 6/23/05 | 48°30N | 180°00 | MM3077-3109 | LL8177-8209 | 33 | TD9423-9428 | 6 |
| | 6/24/05 | 49°30N | 180°00 | MM3110-3128 | LL8210-8228 | 19 | TD9429-9432, IB K113, CTD1898 | 6 |
| | 6/25/05 | 50°30N | 180°00 | MM3129-3146 | LL8229-8246 | 18 | TD9433-9435, IB K114, K117, CTD 1900, 1902, GL A13245, A13250 | 9 |
| Total | | | | MM3001-3146 | LL8101-8246 | 146 | | 32 |
| BS | 6/26/05 | 51°30N | 180°00 | MM3147-3150 | LL8247-8250 | 4 | TD9436, 9437 | 2 |
| | 6/27/05 | 52°30N | 180°00 | MM3151-3154 | LL8251-8254 | 4 | IB K116 | 1 |
| | 6/28/05 | 53°30N | 180°00 | MM3155-3180 | LL8255-8280 | 26 | TD9438-9444, CTD2002, GL A13243 | 9 |
| | 6/29/05 | 54°30N | 180°00 | MM3181-3208 ^a | LL8281-8308 ^a | 27 | TD9445-9447, GL A13257 | 4 |
| | 6/30/05 | 55°30N | 180°00 | MM3209-3233 | LL8309-8333 | 25 | TD9448-9455, CTD1903, 1916, GL A13244, A13249 | 12 |
| | 7/1/05 | 56°30N | 180°00 | MM3234-3260 ^b | LL8334-8360 ^b | 26 | TD9456, 9458-9461, CTD2006, GL A13251-13253, A13259 | 10 |
| | 7/2/05 | 57°30N | 180°00 | MM3261-3269 | LL8361-8369 | 9 | TD9462-9464, GL A13254, 13255 | 5 |
| | 7/7/05 | 58°30N | 180°00 | MM3270-3303 ^c | LL8370-8403 ^c | 33 | TD9465-9468, 9470-9472, 9475-9477, 9479-9481, IB K103 | 14 |
| | 7/8/05 | 57°30N | 179°00W | MM3304-3307 | LL8404-8407 | 4 | TD9482, 9483, IB K111 | 3 |
| | 7/9/05 | 57°30N | 178°00W | MM3308-3344 | LL8408-8444 | 37 | TD9484-9493, 9511-9515, 9738, 9739, 10004-10006 | 20 |
| | 7/10/05 | 56°30N | 178°00W | MM3345-3365 | LL8445-8465 | 21 | TD10009-10019, 10022, GL A13260, A13261, A13263 | 15 |
| | 7/11/05 | 56°30N | 179°00W | MM3366-3372 | LL8466-8472 | 7 | TD10024, 10025, CTD2009, GL A13265 | 4 |
| | 7/12/05 | 56°30N | 179°00E | MM3373-3374 | LL8473-8474 | 2 | TD10026, CTD2015 | 2 |
| 7/13/05 | 56°30N | 178°00E | MM3375-3386 | LL8475-8486 | 12 | CTD2021, GL A13267, A13268, A13270, A13271 | 5 | |
| Total | | | | MM3147-3386 | LL8247-8486 | 237 | | 106 |
| Total | | | | AA1331-1334, MM3147-3386 | LL4731-4734, LL8247-8486 | 387 | | 138 |

^a MM3196, LL8296 not used.

^b MM3259, LL8359 not used.

^c MM3300, LL8400 not used.

Table 5. Location and biological data for recovered fin-clipped salmonids caught by Japanese salmon research vessels in summer of 2005.

| Research vessel | Date | Location | | Mesh (mm) | Species | Fork length (mm) | Body weight (g) | Sex | Gonad weight (g) | Clipped fin |
|-----------------|---------|----------|----------|-----------|-----------|------------------|-----------------|-----|------------------|-------------|
| <i>Wakatake</i> | 6/16/05 | 41°00'N | 180°00' | 121 | steelhead | 588 | 2210 | M | 7 | Adipose |
| <i>maru</i> | 6/16/05 | 41°00'N | 180°00' | 115 | steelhead | 676 | 3620 | F | 18.5 | Adipose |
| | 6/17/05 | 42°00'N | 180°00' | 138 | steelhead | 673 | 3530 | M | 3 | Adipose * |
| | 6/17/05 | 42°00'N | 180°00' | 93 | steelhead | 520 | 1780 | F | 6 | Adipose * |
| | 6/17/05 | 42°00'N | 180°00' | 82 | steelhead | 482 | 1150 | M | 3 | Adipose |
| | 6/17/05 | 42°00'N | 180°00' | 115 | steelhead | 578 | 2160 | F | 7 | Adipose |
| | 6/17/05 | 42°00'N | 180°00' | 115 | steelhead | 558 | 2000 | M | 2 | Adipose |
| | 6/17/05 | 42°00'N | 180°00' | 115 | steelhead | 566 | 1950 | M | 3 | Adipose * |
| | 6/18/05 | 43°00'N | 180°00' | 115 | steelhead | 554 | 1740 | M | 3 | Adipose |
| | 6/18/05 | 43°00'N | 180°00' | 115 | steelhead | 571 | 1890 | - | - | Adipose |
| | 6/18/05 | 43°00'N | 180°00' | 115 | steelhead | 547 | 1940 | M | 2 | Adipose |
| | 6/18/05 | 43°00'N | 180°00' | 115 | steelhead | 540 | 1740 | M | 3 | Adipose |
| | 6/19/05 | 44°00'N | 180°00' | 115 | steelhead | 568 | 1680 | F | 22 | Adipose |
| | 6/19/05 | 44°00'N | 180°00' | 115 | steelhead | 543 | 1420 | M | 1 | Adipose |
| | 6/19/05 | 44°00'N | 180°00' | 93 | steelhead | 538 | 1630 | M | 1 | Adipose |
| | 6/21/05 | 46°00'N | 180°00' | 93 | steelhead | 861 | 5270 | M | 2 | Adipose |
| | 6/21/05 | 46°00'N | 180°00' | 121 | steelhead | 738 | 3530 | - | - | Adipose |
| | 6/21/05 | 46°00'N | 180°00' | 115 | steelhead | 446 | 1590 | F | 14 | Adipose |
| | 6/21/05 | 46°00'N | 180°00' | 115 | steelhead | 650 | 2810 | F | 22 | Adipose |
| | 6/21/05 | 46°00'N | 180°00' | 115 | steelhead | 661 | 2630 | F | 19 | Adipose |
| | 6/21/05 | 47°00'N | 180°00' | LL | steelhead | 648 | 2550 | F | 17 | Adipose |
| | 6/22/05 | 47°00'N | 180°00' | 115 | steelhead | 746 | 3800 | M | 9 | Adipose |
| | 6/22/05 | 47°00'N | 180°00' | 115 | steelhead | 662 | 2930 | M | 13 | Adipose |
| | 6/22/05 | 47°00'N | 180°00' | 115 | steelhead | 735 | 3800 | F | 15 | Adipose |
| | 6/22/05 | 47°00'N | 180°00' | 93 | steelhead | 554 | 1620 | M | 13 | Adipose |
| <i>Oshoro</i> | 7/27/05 | 48°29'N | 164°58'W | 82 | steelhead | 696 | 4030 | F | 85 | Adipose |
| <i>maru</i> | 7/27/05 | 48°29'N | 164°58'W | 157 | steelhead | 740 | 4515 | F | 18 | Adipose |
| | 7/27/05 | 48°29'N | 164°58'W | 157 | steelhead | 668 | 3100 | F | 20 | Adipose |
| | 7/28/05 | 46°59'N | 164°57'W | 115 | steelhead | 562 | 2361 | F | 9 | Adipose |
| | 7/28/05 | 46°59'N | 164°57'W | 115 | steelhead | 568 | 2637 | F | 9 | Adipose |
| | 7/29/05 | 45°30'N | 165°00'W | 55 | steelhead | 589 | 2410 | M | 5 | Adipose |

* positive response for a CWT.