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**Recoveries of High-Seas Tags in Japan, 1998, and  
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Collected by Japanese Research Vessels  
in the North Pacific Ocean**

by

**Masa-aki Fukuwaka<sup>1</sup>, Shigehiko Urawa<sup>2</sup>, Ikuo Ono<sup>2</sup>  
Katsuhiko Umeda<sup>2</sup>, Morihiko Kawana<sup>2</sup>, and R. V. Walker<sup>3</sup>**

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

<sup>2</sup>**National Salmon Resources Center, Fisheries Agency of Japan  
2-2 Nakanoshima, Toyohira-ku, Sapporo 062-0922**

<sup>3</sup>**Fisheries Research Institute, University of Washington  
Box 355020, Seattle, WA 98195-5020**

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# **Recoveries of High-Seas Tags in Japan, 1998, and 1999 Tag Releases and Recoveries of Fin-Clipped Salmon Collected by Japanese Research Vessels in the North Pacific Ocean**

Masa-aki Fukuwaka <sup>1</sup>, Shigehiko Urawa <sup>2</sup>, Ikuo Ono <sup>2</sup>  
Katsuhiro Umeda <sup>2</sup>, Morihiko Kawana <sup>2</sup>, and R. V. Walker <sup>3</sup>

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

<sup>2</sup> National Salmon Resources Center, Fisheries Agency of Japan

<sup>3</sup> Fisheries Research Institute, University of Washington

## **ABSTRACT**

In the fall of 1998, 69 of 734 tagged-and-released chum salmon in the Bering Sea were recovered along the Japanese coast. Recoveries included 5 fish with external temperature tags, 3 fish with internal archival tags, and 61 fish with disk tags. The number of recoveries and the recovery rate of chum salmon released in the Bering Sea in 1998 were the largest in the 1995-1998 period. In 1999, two Japanese salmon research vessels conducted 36 longline and 8 hook-and-line operations in the North Pacific Ocean and its marginal seas. A total of 353 salmonids (9 sockeye, 226 chum, 116 pink, and 2 chinook salmon) in the Bering Sea, 106 salmonids (8 sockeye, 29 chum, 39 pink, 28 coho salmon, and 2 steelhead trout) in the eastern North Pacific, and 45 salmonids (7 sockeye, 15 chum, 18 pink, and 5 coho salmon) in the central North Pacific, were tagged with two disk tags (FAJ and FRI) and released. Of these, 55 fish were tagged externally with archival tags, and archival tags were inserted internally in 26 chum salmon in the Bering Sea. Four Japanese salmon research vessels recovered 67 salmonids lacking the adipose fin and/or other fins.

## **INTRODUCTION**

The Japan-U.S. cooperative high-seas tagging experiment was conducted in 1998 and 1999. We summarize tag recoveries in the fall of 1998 in Japan, releases of high seas tags in 1999, and recoveries of fin-clipped salmon collected by the Japanese

salmon research vessels in the North Pacific Ocean in 1999.

## MATERIALS AND METHODS

### Recovery of high seas tags in 1998

In June-July 1998, a total of 756 salmonids (9 sockeye, 734 chum, 4 pink, and 9 chinook salmon) in the Bering Sea, 28 salmonids (3 sockeye, 7 chum, 13 pink, and 4 coho salmon, and 1 steelhead) in the Gulf of Alaska, and 178 salmonids (15 sockeye, 115 chum, 9 pink, 25 coho, 1 chinook salmon, and 13 steelhead trout) in the central North Pacific Ocean, were tagged and released by two Japanese salmon research vessels, *Wakatake maru* and *Oshoro maru* (Ueno and Ishida 1998). A subset of the disk-tagged fish was released with an externally attached temperature tag, including 12 steelhead and one sockeye released in the central North Pacific Ocean, 3 sockeye, one chum, 4 pink, 3 coho, and one steelhead released in the Gulf of Alaska, and 23 chum salmon released in the central Bering Sea. Another subset of 25 disk-tagged chum salmon was released in the Bering Sea with internally inserted archival tags.

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 (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. Two types of archival tags were used. One type of archival tag, manufactured by the Kiwi Group, North Falmouth, MA, records seawater temperature (temperature tag). The temperature tag used by FRI was attached on the dorsal of fish externally. A second type of archival tag manufactured by Northwest Marine Technology (NMT), Shaw Island, WA, records the fish's internal temperature, seawater temperature, light levels (for location), and depth (NMT tag). The NMT tag used by FAJ was inserted into the peritoneal cavity of fish.

From fall of 1998 to spring of 1999, 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.

We compared recovery rate (number of recovered fish / number of tagged-and-released fish) with past data. The National Research Institute of Far Seas Fisheries (NRIFSF) conducted tagging experiments in the Bering Sea and the central North Pacific using the research vessel *Wakatake maru* from 1995 to 1998. Numbers of tagged fish and recovered fish were provided by NRIFSF (Ito 1995, Myers et al. 1995-1998,

Ito and Ishida 1996, 1998, Walker et al. 1998, Ueno and Ishida 1999).

### **Tagging and recovery on the high seas in 1999**

In June-July of 1999, two Japanese research vessels, the *Wakatake maru* and *Oshoro maru*, conducted 36 longline (865 hachi) and 8 hook-and-line operations to attach archival and disk tags on Pacific salmon. The internal archival tag and disk tags used in 1999 were the same types used in 1998. Two types of external archival tags manufactured by Conservation Devices, Inc., Watertown, MA, were used in 1999: the type used on the *Wakatake maru* was the Kiwi Ready Logger RL-05T that records seawater temperature (temperature tag), and that used on the *Oshoro maru* was the Model 31 temperature and pressure logger (CDI tag).

Four salmon research vessels, the *Wakatake maru*, *Oshoro maru*, *Hokusei maru*, and *Hokko maru*, caught 19,345 salmonids in the western and central North Pacific, the Bering Sea, and the Gulf of Alaska from June to August in 1998. 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 AND DISCUSSION**

### **Recovery of high seas tags in 1998**

In the fall of 1998, 69 tagged chum salmon were recovered along the Japanese coast (Table 1). Those include 5 fish with external temperature tags, 3 fish with internal archival tags, and 61 fish with disk tags. The number of recoveries and the recovery rate of chum salmon released in the Bering Sea in 1998 were the largest in the 1995-1998 period (Table 2).

### **Tagging and recovery on the high seas in 1999**

In June-July 1999, 353 salmonids (9 sockeye, 226 chum, 116 pink, and 2 chinook salmon) in the Bering Sea, 106 salmonids (8 sockeye, 29 chum, 39 pink, and 28 coho salmon, and 2 steelhead trout) in the eastern North Pacific, and 45 salmonids (7 sockeye, 15 chum, 18 pink, and 5 coho salmon) in the central North Pacific, were tagged and released by two Japanese salmon research vessels, the *Wakatake maru* and *Oshoro maru* (Table 3). Of these, 10 fish with temperature tags externally attached were released in the central North Pacific and the Bering Sea, 45 fish with CDI tags attached were released in the eastern North Pacific, and 26 chum salmon with NMT tags inserted internally were released in the Bering Sea (Table 4).

A total of 67 fin-clipped salmonids (2 sockeye, 1 pink, 12 coho, 1 chinook salmon, and 61 steelhead trout) was recovered by Japanese salmon research vessels (Table 5). Snout samples were collected from these fish and provided to the U.S. for CWT examination.

## ACKNOWLEDGMENTS

We thank the captains, officers and crew of the *Wakatake maru*, *Oshoro maru*, *Hokusei maru*, and *Hokko maru*, for their careful collection of data and samples.

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Table 1. Releases and recoveries of high seas tagged chum salmon returning to Japan in the fall of 1998. 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. Two recoveries, MM1222 (LL2170) and MM1333 (LL2281) were reported previously in Myers et al. (1998). (Myers et al. 1998 gave the recovery longitude of tag MM1222 incorrectly as 143°31E.)

| U.S. Tag. No. | Japan Tag No. | Arch. Tag # (Kiwi) | Arch. Tag # (NWMT) | Release |        |         |         |     | Recovery |        |         |           |     |         |        |                           |
|---------------|---------------|--------------------|--------------------|---------|--------|---------|---------|-----|----------|--------|---------|-----------|-----|---------|--------|---------------------------|
|               |               |                    |                    | Date    | Lat    | Long    | FL (mm) | Age | Date     | Lat    | Long    | Gear      | Sex | FL (mm) | BW (g) | Location                  |
| LL2170        | MM1222        | 259                | -                  | 3 Jul   | 52°30N | 179°30W | 622     | 0.3 | 4 Sep    | 42°39N | 143°37E | setnet    | M   | 650     | 3000   | Pacific, Hokkaido         |
| LL2186        | MM1238        | -                  | -                  | 4 Jul   | 53°30N | 179°30W | 526     | 0.2 | 2 Nov    | 44°03N | 144°16E | setnet    | -   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2214        | MM1266        | -                  | -                  | 4 Jul   | 53°30N | 179°30W | 530     | 0.3 | 14 Oct   | 41°56N | 143°16E | setnet    | M   | 570     | 1760   | Pacific, Hokkaido         |
| LL2222        | MM1274        | 255                | -                  | 4 Jul   | 53°30N | 179°30W | 560     | 0.3 | 10 Oct   | 44°13N | 143°40E | setnet    | M   | 610     | 2110   | Okhotsk Sea, Hokkaido     |
| LL2253        | MM1305        | -                  | -                  | 5 Jul   | 54°30N | 179°30W | 610     | 0.3 | 21 Sep   | 43°39N | 145°10E | setnet    | M   | 635     | 2500   | Nemuro St., Hokkaido      |
| LL2259        | MM1311        | -                  | -                  | 5 Jul   | 54°30N | 179°30W | 530     | 0.3 | 27 Oct   | 44°02N | 144°48E | setnet    | -   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2281        | MM1333        | -                  | 256                | 5 Jul   | 54°30N | 179°30W | 670     | 0.4 | 10 Sep   | 43°23N | 145°48E | setnet    | F   | 690     | 3700   | Nemuro St., Hokkaido      |
| LL2292        | MM1344        | -                  | -                  | 6 Jul   | 55°30N | 179°30W | 582     | 0.3 | 12 Sep   | 44°02N | 144°48E | setnet    | F   | 610     | 2200   | Okhotsk Sea, Hokkaido     |
| LL2340        | MM1392        | -                  | -                  | 6 Jul   | 55°30N | 179°30W | 589     | 0.4 | 31 Oct   | 43°24N | 145°13E | fish trap | F   | 605     | 2000   | Nishibetsu R, Hokkaido    |
| LL2346        | MM1398        | -                  | -                  | 6 Jul   | 55°30N | 179°30W | 619     | 0.4 | 1 Oct    | -      | -       | setnet    | -   | -       | -      | Nemuro St., Hokkaido      |
| LL2348        | MM1400        | 271                | -                  | 6 Jul   | 55°30N | 179°30W | 592     | 0.3 | 31 Oct   | 36°47N | 137°05E | fish trap | M   | 610     | 1800   | Sho R., Japan Sea, Toyama |
| LL2367        | MM1419        | -                  | -                  | 7 Jul   | 56°30N | 179°30W | 580     | 0.3 | 8 Oct    | 43°11N | 145°37E | setnet    | M   | 630     | 2200   | Pacific, Hokkaido         |
| LL2368        | MM1420        | -                  | -                  | 7 Jul   | 56°30N | 179°30W | 610     | 0.4 | 10 Oct   | 43°57N | 144°25E | setnet    | -   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2371        | MM1423        | -                  | -                  | 7 Jul   | 56°30N | 179°30W | 578     | 0.3 | 10 Oct   | 44°09N | 145°07E | setnet    | -   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2376        | MM1428        | -                  | -                  | 7 Jul   | 56°30N | 179°30W | 534     | 0.3 | 5 Oct    | 43°17N | 145°41E | setnet    | M   | 520     | 1550   | Nemuro St., Hokkaido      |
| LL2391        | MM1443        | -                  | -                  | 7 Jul   | 56°30N | 179°30W | 582     | 0.3 | 14 Sep   | 44°38N | 142°54E | setnet    | F   | 590     | 2400   | Okhotsk Sea, Hokkaido     |
| LL2393        | MM1445        | -                  | -                  | 7 Jul   | 56°30N | 179°30W | 576     | 0.3 | 10 Oct   | 44°05N | 145°01E | setnet    | F   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2396        | MM1448        | -                  | -                  | 7 Jul   | 56°30N | 179°30W | 556     | 0.3 | 1 Oct    | 44°03N | 144°16E | setnet    | -   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2400        | MM1452        | -                  | -                  | 7 Jul   | 56°30N | 179°30W | 572     | 0.3 | 21 Oct   | 44°40N | 142°52E | setnet    | -   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2403        | MM1455        | 274                | -                  | 7 Jul   | 56°30N | 179°30W | 680     | 0.4 | 24 Sep   | 44°19N | 145°21E | gillnet   | M   | 716     | -      | Shiretoko Pen., Hokkaido  |
| LL2412        | MM1464        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 539     | 0.3 | 16 Oct   | 44°03N | 144°16E | setnet    | -   | 620     | 2300   | Okhotsk Sea, Hokkaido     |
| LL2421        | MM1473        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 530     | 0.3 | 26 Sep   | 44°07N | 145°16E | setnet    | -   | -       | -      | Nemuro St., Hokkaido      |
| LL2423        | MM1475        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 510     | 0.3 | 16 Nov   | 40°10N | 141°53E | setnet    | M   | 530     | 1100   | Pacific, Iwate            |
| LL2429        | MM1481        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 594     | 0.3 | 26 Oct   | 43°48N | 145°06E | setnet    | F   | 620     | 2000   | Nemuro St., Hokkaido      |
| LL2439        | MM1491        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 556     | 0.3 | 7 Oct    | 43°38N | 145°12E | setnet    | F   | 580     | 2300   | Nemuro St., Hokkaido      |
| LL2446        | MM1498        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 508     | 0.2 | 26 Oct   | 43°34N | 145°22E | setnet    | -   | -       | -      | Nemuro St., Hokkaido      |
| LL2465        | MM1517        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 575     | 0.3 | 26 Oct   | 43°36N | 145°21E | setnet    | -   | -       | -      | Nemuro St., Hokkaido      |
| LL2478        | MM1530        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 554     | 0.3 | 2 Oct    | 44°09N | 145°07E | setnet    | -   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2479        | MM1531        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 590     | 0.3 | 2 Oct    | 44°18N | 145°18E | setnet    | -   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2486        | MM1538        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 543     | 0.3 | 13 Oct   | 44°12N | 145°21E | setnet    | M   | -       | 2000   | Nemuro St., Hokkaido      |
| LL2487        | MM1539        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 666     | 0.4 | 20 Oct   | 43°43N | 145°07E | setnet    | M   | 670     | 2400   | Nemuro St., Hokkaido      |
| LL2489        | MM1541        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 634     | 0.4 | 5 Oct    | 43°25N | 145°21E | setnet    | F   | 672     | 2900   | Nemuro St., Hokkaido      |
| LL2491        | MM1543        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 583     | 0.4 | 25 Sep   | 43°56N | 144°28E | setnet    | M   | 620     | 2700   | Okhotsk Sea, Hokkaido     |
| LL2496        | MM1548        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 604     | 0.3 | 7 Oct    | 44°06N | 144°16E | setnet    | -   | -       | -      | Okhotsk Sea, Hokkaido     |
| LL2505        | MM1557        | -                  | -                  | 8 Jul   | 57°30N | 179°30W | 564     | X.X | 22 Sep   | 44°22N | 145°22E | setnet    | F   | -       | 3000   | Nemuro St., Hokkaido      |

Table 1. Continued.

| U.S.<br>Tag<br>No. | Japan<br>Tag<br>No. | Arch.<br>Tag #<br>(Kiwi) | Arch.<br>Tag #<br>(NWMT) | Release |        |         |            |     | Recovery |        |         |           |     |            |           |                       |
|--------------------|---------------------|--------------------------|--------------------------|---------|--------|---------|------------|-----|----------|--------|---------|-----------|-----|------------|-----------|-----------------------|
|                    |                     |                          |                          | Date    | Lat    | Long    | FL<br>(mm) | Age | Date     | Lat    | Long    | Gear      | Sex | FL<br>(mm) | BW<br>(g) | Location              |
| LL2510             | MM1562              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 567        | 0.3 | 8 Oct    | 44°30N | 142°39E | setnet    | M   | 610        | 2400      | Okhotsk Sea, Hokkaido |
| LL2514             | MM1566              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 571        | 0.3 | 4 Dec    | 42°18N | 140°17E | setnet    | M   | 600        | 1850      | Pacific, Hokkaido     |
| LL2540             | MM1592              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 533        | 0.4 | 7 Oct    | 45°30N | 142°30E | setnet    | M   | 590        | 2100      | Okhosk Sea, Hokkaido  |
| LL2541             | MM1593              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 569        | 0.3 | 8 Oct    | 44°01N | 144°15E | setnet    | -   | -          | -         | Okhotsk Sea, Hokkaido |
| LL2547             | MM1599              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 570        | 0.3 | 13 Oct   | 43°21N | 145°48E | setnet    | F   | 570        | 1900      | Nemuro St., Hokkaido  |
| LL2550             | MM1602              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 545        | 0.3 | 20 Oct   | 44°02N | 145°14E | setnet    | M   | 570        | 1780      | Nemuro St., Hokkaido  |
| LL2554             | MM1606              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 598        | 0.3 | 26 Oct   | 42°08N | 141°02E | setnet    | M   | 620        | 1800      | Pacific, Hokkaido     |
| LL2562             | MM1614              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 589        | 0.3 | 1 Oct    | 43°57N | 144°22E | setnet    | M   | 640        | 2700      | Okhotsk Sea, Hokkaido |
| LL2570             | MM1622              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 580        | 0.3 | 18 Nov   | 44°38N | 142°54E | fish trap | -   | -          | -         | Shari R., Hokkaido    |
| LL2572             | MM1624              | -                        | -                        | 9 Jul   | 58°30N | 179°30W | 587        | 0.3 | 7 Oct    | 41°57N | 143°12E | setnet    | F   | 620        | 2480      | Pacific, Hokkaido     |
| LL2586             | MM1638              | -                        | -                        | 10 Jul  | 57°30N | 178°24W | 594        | 0.3 | 26 Nov   | 39°59N | 139°42E | setnet    | F   | 640        | 2000      | Japan Sea, Akita      |
| LL2606             | MM1658              | -                        | -                        | 10 Jul  | 57°30N | 178°24W | 544        | 0.3 | 14 Oct   | 43°37N | 145°15E | setnet    | M   | -          | -         | Nemuro St., Hokkaido  |
| LL2642             | MM1694              | -                        | -                        | 10 Jul  | 57°30N | 178°24W | 574        | 0.3 | 4 Nov    | 40°57N | 141°23E | setnet    | -   | -          | -         | Pacific, Aomori       |
| LL2649             | MM1701              | -                        | -                        | 10 Jul  | 57°30N | 178°24W | 600        | 0.4 | 1 Oct    | 44°10N | 145°19E | setnet    | M   | -          | 2700      | Nemuro St., Hokkaido  |
| LL2651             | MM1703              | -                        | -                        | 10 Jul  | 57°30N | 178°24W | 608        | 0.3 | 5 Oct    | 42°35N | 143°34E | setnet    | -   | -          | -         | Pacific, Hokkaido     |
| LL2653             | MM1705              | -                        | -                        | 10 Jul  | 57°30N | 178°24W | 590        | 0.3 | 16 Oct   | 44°09N | 145°07E | setnet    | -   | -          | -         | Okhotsk Sea, Hokkaido |
| LL2677             | MM1729              | -                        | -                        | 11 Jul  | 57°30N | 177°30W | 585        | 0.3 | 5 Oct    | 40°10N | 141°53E | setnet    | F   | 590        | 2100      | Pacific, Iwate        |
| LL2696             | MM1748              | -                        | -                        | 11 Jul  | 57°30N | 177°30W | 563        | 0.3 | 24 Oct   | 42°11N | 143°19E | setnet    | M   | 580        | 1900      | Pacific, Hokkaido     |
| LL2698             | MM1750              | -                        | -                        | 11 Jul  | 57°30N | 177°30W | 556        | 0.3 | 26 Oct   | 43°42N | 145°07E | setnet    | M   | 550        | 2200      | Nemuro St., Hokkaido  |
| LL2707             | MM1759              | -                        | -                        | 11 Jul  | 57°30N | 177°30W | 564        | 0.3 | 16 Oct   | 43°59N | 144°19E | setnet    | -   | 640        | 2400      | Okhotsk Sea, Hokkaido |
| LL2709             | MM1761              | -                        | -                        | 11 Jul  | 57°30N | 177°30W | 524        | 0.3 | 27 Oct   | 44°22N | 145°22E | setnet    | -   | -          | -         | Nemuro St., Hokkaido  |
| LL2727             | MM1779              | -                        | -                        | 12 Jul  | 56°30N | 177°30W | 559        | 0.3 | 22 Oct   | 43°38N | 145°12E | setnet    | F   | 580        | 1400      | Nemuro St., Hokkaido  |
| LL2730             | MM1782              | -                        | -                        | 12 Jul  | 56°30N | 177°30W | 524        | 0.2 | 27 Oct   | 43°39N | 145°10E | setnet    | -   | -          | 1800      | Nemuro St., Hokkaido  |
| LL2739             | MM1791              | -                        | -                        | 12 Jul  | 56°30N | 177°30W | 544        | 0.3 | 26 Oct   | 43°39N | 145°10E | setnet    | F   | 560        | 1800      | Nemuro St., Hokkaido  |
| LL2772             | MM1824              | 299                      | -                        | 12 Jul  | 56°30N | 177°30W | 577        | 0.3 | 5 Oct    | 43°41N | 145°09E | setnet    | F   | 590        | 2400      | Nemuro St., Hokkaido  |
| LL2773             | MM1825              | -                        | 895                      | 12 Jul  | 56°30N | 177°30W | 590        | 0.3 | 3 Oct    | 43°20N | 145°22E | setnet    | F   | 598        | 2000      | Nemuro St., Hokkaido  |
| LL2774             | MM1826              | -                        | 894                      | 12 Jul  | 56°30N | 177°30W | 570        | 0.3 | 10 Oct   | 43°51N | 145°06E | setnet    | F   | 590        | 2200      | Nemuro St., Hokkaido  |
| LL2805             | MM1857              | -                        | -                        | 14 Jul  | 56°30N | 179°30E | 600        | 0.3 | 24 Sep   | 44°57N | 142°36E |           | F   | 635        | 2600      | Okhosk Sea, Hokkaido  |
| LL2811             | MM1863              | -                        | -                        | 14 Jul  | 56°30N | 179°30E | 443        | 0.4 | 4 Nov    | 43°41N | 145°08E | setnet    | M   | 510        | 2000      | Nemuro St., Hokkaido  |
| LL2827             | MM1879              | -                        | -                        | 15 Jul  | 56°30N | 178°30E | 523        | 0.2 | 21 Oct   | 43°55N | 144°42E | setnet    | F   | 530        | 2900      | Okhotsk Sea, Hokkaido |
| LL2829             | MM1881              | -                        | -                        | 15 Jul  | 56°30N | 178°30E | 552        | 0.3 | 27 Oct   | 44°12N | 145°21E | setnet    | M   | -          | -         | Nemuro St., Hokkaido  |
| LL2848             | MM1900              | -                        | -                        | 15 Jul  | 56°30N | 178°30W | 645        | 0.4 | 18 Sep   | 43°55N | 144°42E | setnet    | -   | -          | -         | Okhotsk Sea, Hokkaido |
| LL2858             | MM1910              | -                        | -                        | 15 Jul  | 56°30N | 178°30E | 630        | 0.3 | 18 Sep   | 44°18N | 145°17E | setnet    | M   | 670        | 3100      | Okhotsk Sea, Hokkaido |
| LL2884             | MM1934              | -                        | -                        | 16 Jul  | 56°30N | 177°36E | 492        | 0.2 | 28 Oct   | -      | -       | -         | M   | 515        | 1800      | Nemuro St., Hokkaido  |

Table 2. Number of chum salmon tagged-and-released in the Bering Sea and the central North Pacific by the research vessel *Wakatake maru*, and recovered along the Japanese coast in 1995-1998. In 1995, no fish was released in the central North Pacific. Number in parenthesis indicates number of archival-tagged fish.

| Year | Region                | Number of release | Number of recovery | 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               | 12                 | 3.0               |
|      | Central North Pacific | 5                 | 0                  | 0                 |
|      | Total                 | 404               | 12                 | 3.0               |
| 1998 | Bering Sea            | 734 (48)          | 69 (8)             | 9.4 (16.7)        |
|      | Central North Pacific | 75                | 0                  | 0                 |
|      | Total                 | 809               | 69                 | 8.5               |

Table 3. Number of salmon caught by longline and hook-and-line operations, and number of tagged and released fish by the research vessels *Wakatake maru* and *Oshoro maru* in the summer of 1999. H&L: hook-and-line operation.

| Region               | Vessel                | Date           | Location       | Number of fish caught |      |      |      |      |      | Number of fish released |      |      |      |      |      |       |   |
|----------------------|-----------------------|----------------|----------------|-----------------------|------|------|------|------|------|-------------------------|------|------|------|------|------|-------|---|
|                      |                       |                |                | Hachi                 | Sock | Chum | Pink | Coho | Chin | Steel                   | Sock | Chum | Pink | Coho | Chin | Steel |   |
| Central              |                       | Jun 15         | 38°58N 179°59E | 30                    | 0    | 0    | 0    | 0    | 0    | 0                       | 0    | 0    | 0    | 0    | 0    | 0     |   |
| North                |                       | Jun 16         | 40°03N 179°58W | 30                    | 0    | 0    | 0    | 0    | 0    | 0                       | 0    | 0    | 0    | 0    | 0    | 0     |   |
| Pacific              |                       | Jun 17         | 40°59N 179°57W | 30                    | 0    | 0    | 0    | 0    | 0    | 0                       | 0    | 0    | 0    | 0    | 0    | 0     |   |
|                      |                       | Jun 18         | 42°02N 179°58W | 30                    | 0    | 3    | 0    | 4    | 0    | 1                       | 0    | 1    | 0    | 4    | 0    | 0     |   |
| <i>Wakatake maru</i> |                       | Jun 25         | 47°04N 179°59W | 30                    | 2    | 3    | 2    | 0    | 0    | 0                       | 2    | 1    | 1    | 0    | 0    | 0     |   |
|                      |                       | Jun 26         | 47°27N 179°58E | 30                    | 1    | 2    | 4    | 0    | 0    | 1                       | 0    | 1    | 1    | 0    | 0    | 0     |   |
|                      |                       | Jun 27         | 48°30N 180°00  | 30                    | 1    | 11   | 4    | 0    | 0    | 0                       | 0    | 6    | 1    | 0    | 0    | 0     |   |
|                      |                       | Jun 28         | 49°30N 180°00  | 30                    | 3    | 3    | 4    | 0    | 0    | 0                       | 1    | 2    | 0    | 0    | 0    | 0     |   |
|                      |                       | Jun 29         | 50°30N 180°00  | 30                    | 3    | 8    | 9    | 0    | 0    | 0                       | 1    | 4    | 4    | 0    | 0    | 0     |   |
|                      |                       | Jun 30         | 51°29N 179°58W | 30                    | 6    | 2    | 22   | 1    | 0    | 0                       | 3    | 0    | 11   | 1    | 0    | 0     |   |
|                      |                       | Total          |                | 300                   | 16   | 32   | 45   | 5    | 0    | 2                       | 7    | 15   | 18   | 5    | 0    | 0     |   |
| Bering Sea           |                       | Jul 1          | 52°30N 180°00  | 30                    | 4    | 2    | 15   | 1    | 0    | 0                       | 3    | 1    | 8    | 0    | 0    | 0     |   |
|                      |                       | Jul 2          | 53°31N 180°00  | 30                    | 1    | 3    | 25   | 0    | 1    | 0                       | 1    | 2    | 14   | 0    | 1    | 0     |   |
| <i>Wakatake maru</i> |                       | Jul 3          | 54°30N 180°00  | 30                    | 0    | 10   | 6    | 0    | 0    | 0                       | 0    | 3    | 2    | 0    | 0    | 0     |   |
|                      |                       | Jul 4          | 55°32N 179°59E | 30                    | 3    | 26   | 10   | 0    | 0    | 0                       | 3    | 19   | 4    | 0    | 0    | 0     |   |
|                      |                       | Jul 5          | 56°34N 180°00  | 30                    | 1    | 28   | 19   | 0    | 0    | 0                       | 1    | 16   | 7    | 0    | 0    | 0     |   |
|                      |                       | Jul 6          | 57°30N 180°00  | 30                    | 2    | 10   | 16   | 0    | 0    | 0                       | 0    | 7    | 8    | 0    | 0    | 0     |   |
|                      |                       | Jul 7          | 58°34N 179°54W | 30                    | 2    | 2    | 34   | 0    | 0    | 0                       | 1    | 1    | 17   | 0    | 0    | 0     |   |
|                      |                       | Jul 8          | 57°32N 179°02W | 30                    | 1    | 10   | 3    | 0    | 0    | 0                       | 0    | 5    | 1    | 0    | 0    | 0     |   |
|                      |                       | Jul 9          | 57°31N 178°02W | 30                    | 0    | 1    | 15   | 0    | 0    | 0                       | 0    | 1    | 6    | 0    | 0    | 0     |   |
|                      |                       | Jul 10         | 56°30N 178°00W | 30                    | 1    | 73   | 23   | 0    | 2    | 0                       | 0    | 44   | 8    | 0    | 1    | 0     |   |
|                      |                       | Jul 11         | 56°30N 179°05W | 30                    | 1    | 69   | 78   | 0    | 1    | 0                       | 0    | 52   | 14   | 0    | 0    | 0     |   |
|                      |                       | Jul 12         | 56°29N 179°57E | 30                    | 0    | 29   | 11   | 0    | 0    | 0                       | 0    | 25   | 4    | 0    | 0    | 0     |   |
|                      |                       | Jul 13         | 56°30N 178°57E | 30                    | 0    | 41   | 7    | 0    | 3    | 0                       | 0    | 32   | 5    | 0    | 0    | 0     |   |
|                      |                       | Jul 14         | 56°27N 177°53E | 30                    | 0    | 24   | 41   | 0    | 0    | 0                       | 0    | 18   | 18   | 0    | 0    | 0     |   |
|                      |                       |                | Total          |                       | 420  | 16   | 328  | 303  | 1    | 7                       | 0    | 9    | 226  | 116  | 0    | 2     | 0 |
|                      | Eastern North Pacific |                | Jun 23         | 52°40N 165°00W        | 10   | 0    | 0    | 0    | 0    | 0                       | 0    | 0    | 0    | 0    | 0    | 0     | 0 |
|                      | Jun 24                | 51°40N 165°00W | 15             | 0                     | 2    | 7    | 0    | 0    | 0    | 0                       | 2    | 5    | 0    | 0    | 0    |       |   |
|                      |                       | Jun 26         | 50°00N 164°56W | 10                    | 0    | 13   | 4    | 0    | 0    | 2                       | 0    | 10   | 4    | 0    | 0    | 2     |   |
|                      |                       | Jun 28         | 47°02N 165°00W | 10                    | 0    | 2    | 1    | 0    | 0    | 0                       | 0    | 2    | 0    | 0    | 0    | 0     |   |
| <i>Oshoro maru</i>   |                       | Jun 30         | 44°02N 165°00W | 10                    | 0    | 0    | 1    | 0    | 0    | 0                       | 0    | 0    | 1    | 0    | 0    | 0     |   |
|                      |                       | Jul 9          | 49°59N 145°00W | 10                    | 2    | 0    | 1    | 1    | 0    | 0                       | 2    | 0    | 0    | 1    | 0    | 0     |   |
|                      |                       | Jul 9          | 50°30N 145°00W | H&L                   | 0    | 0    | 0    | 2    | 0    | 0                       | 0    | 0    | 0    | 2    | 0    | 0     |   |
|                      |                       | Jul 9          | 51°00N 145°00W | H&L                   | 1    | 0    | 0    | 1    | 0    | 0                       | 1    | 0    | 0    | 1    | 0    | 0     |   |
|                      |                       | Jul 10         | 51°02N 144°57W | 10                    | 1    | 1    | 2    | 2    | 0    | 0                       | 1    | 1    | 2    | 2    | 0    | 0     |   |
|                      |                       | Jul 10         | 52°00N 145°00W | H&L                   | 0    | 0    | 2    | 0    | 0    | 0                       | 0    | 0    | 2    | 0    | 0    | 0     |   |
|                      |                       | Jul 11         | 52°02N 144°58W | 15                    | 1    | 6    | 3    | 2    | 0    | 0                       | 1    | 5    | 3    | 2    | 0    | 0     |   |
|                      |                       | Jul 11         | 52°30N 145°00W | H&L                   | 0    | 0    | 0    | 1    | 0    | 0                       | 0    | 0    | 0    | 1    | 0    | 0     |   |
|                      |                       | Jul 12         | 53°00N 144°58W | 15                    | 1    | 4    | 1    | 10   | 0    | 0                       | 1    | 3    | 1    | 8    | 0    | 0     |   |
|                      |                       | Jul 13         | 54°00N 144°58W | 15                    | 0    | 3    | 5    | 3    | 0    | 0                       | 0    | 3    | 4    | 3    | 0    | 0     |   |
|                      |                       | Jul 13         | 54°30N 145°00W | H&L                   | 0    | 0    | 0    | 1    | 0    | 0                       | 0    | 0    | 0    | 1    | 0    | 0     |   |
|                      |                       | Jul 13         | 55°00N 145°00W | H&L                   | 1    | 0    | 0    | 0    | 0    | 0                       | 1    | 0    | 0    | 0    | 0    | 0     |   |
|                      |                       | Jul 14         | 55°04N 144°57W | 15                    | 0    | 1    | 1    | 4    | 0    | 0                       | 0    | 1    | 1    | 3    | 0    | 0     |   |
|                      |                       | Jul 14         | 55°30N 145°00W | H&L                   | 0    | 0    | 1    | 1    | 0    | 0                       | 0    | 0    | 1    | 1    | 0    | 0     |   |
|                      |                       | Jul 14         | 56°00N 145°00W | H&L                   | 0    | 0    | 4    | 1    | 0    | 0                       | 0    | 0    | 4    | 1    | 0    | 0     |   |
|                      | Jul 15                | 56°10N 154°04W | 10             | 2                     | 2    | 15   | 3    | 0    | 0    | 1                       | 2    | 11   | 2    | 0    | 0    |       |   |
|                      |                       | Total          |                | 145                   | 9    | 34   | 48   | 32   | 0    | 2                       | 8    | 29   | 39   | 28   | 0    | 2     |   |
|                      |                       | Total          |                | 865                   | 41   | 394  | 396  | 38   | 7    | 4                       | 24   | 270  | 173  | 33   | 2    | 2     |   |

Table 4. Tag numbers of disk, internal, and external archival tags attached and released by the research vessels *Wakatake maru* and *Oshoro maru* in the summer of 1999.

| Region                | Vessel | Date           | Location       | Disk tag number |             |          | Internal arch. tag |          | External arch. tag |          |
|-----------------------|--------|----------------|----------------|-----------------|-------------|----------|--------------------|----------|--------------------|----------|
|                       |        |                |                | FAJ tag         | FRI tag     | No. fish | Tag No.            | No. Fish | Tag No.            | No. fish |
| Central               |        | Jun 18         | 42°02N 179°58W | HH2133-2137     | LL2904-2908 | 5        |                    |          |                    |          |
| North                 |        | Jun 25         | 47°04N 179°59W | HH2138-2143     | LL2909-2914 | 4        |                    |          | 225                | 1        |
| Pacific               |        | Jun 26         | 47°27N 179°58E | HH2144-2145     | LL2915-2916 | 2        |                    |          |                    |          |
|                       |        | Jun 27         | 48°30N 180°00  | HH2146-2153     | LL2917-2924 | 7        |                    |          |                    |          |
| <i>Wakatake maru</i>  |        | Jun 28         | 49°30N 180°00  | HH2154-2157     | LL2925-2928 | 3        |                    |          | 231                | 1        |
|                       |        | Jun 29         | 50°30N 180°00  | HH2158-2166     | LL2929-2937 | 9        |                    |          | 239                | 1        |
|                       |        | Jun 30         | 51°29N 179°58W | HH2167-2182     | LL2938-2953 | 15       |                    |          |                    |          |
| Bering Sea            |        | Jul 1          | 52°30N 180°00  | HH2183-2194     | LL2954-2965 | 12       |                    |          |                    |          |
|                       |        | Jul 2          | 53°31N 180°00  | HH2195-2212     | LL2966-2983 | 18       |                    |          | 236, 247           | 2        |
|                       |        | Jul 3          | 54°30N 180°00  | HH2213-2217     | LL2984-2988 | 5        |                    |          |                    |          |
| <i>Wakatake maru</i>  |        | Jul 4          | 55°32N 179°59E | HH2218-2244     | LL2989-3015 | 26       | 1238, 1239         | 2        | 253, 256           | 2        |
|                       |        | Jul 5          | 56°34N 180°00  | HH2245-2268     | LL3016-3039 | 24       | 1183, 1198         | 2        |                    |          |
|                       |        | Jul 6          | 57°30N 180°00  | HH2269-2283     | LL3040-3054 | 15       | 1182-1220          | 3        | 263                | 1        |
|                       |        | Jul 7          | 58°34N 179°54W | HH2284-2302     | LL3055-3073 | 19       |                    |          |                    |          |
|                       |        | Jul 8          | 57°32N 179°02W | HH2303-2308     | LL3074-3079 | 6        | 1179               | 1        |                    |          |
|                       |        | Jul 9          | 57°31N 178°02W | HH2309-2315     | LL3080-3086 | 7        | 1241               | 1        |                    |          |
|                       |        | Jul 10         | 56°30N 178°00W | HH2316-2368     | LL3087-3139 | 53       | 1033-1231          | 4        | 270, 284           | 2        |
|                       |        | Jul 11         | 56°30N 179°05W | HH2369-2434     | LL3140-3205 | 66       | 1036-1065          | 4        |                    |          |
|                       | Jul 12 | 56°29N 179°57E | HH2435-2463    | LL3206-3234     | 29          | 948-1051 | 4                  |          |                    |          |
|                       | Jul 13 | 56°30N 178°57E | HH2464-2500    | LL3235-3271     | 37          | 256-1120 | 4                  |          |                    |          |
|                       | Jul 14 | 56°27N 177°53E | HH2501-2536    | LL3272-3307     | 36          | 894      | 1                  |          |                    |          |
| Eastern North Pacific |        | Jun 24         | 51°40N 165°00W | BB2501-2507     | LL1301-1307 | 7        |                    |          |                    |          |
|                       | Jun 26 | 50°00N 164°56W | BB2508-2524    | LL1301-1324     | 16          |          |                    | 752      | 1                  |          |
| Pacific               |        | Jun 28         | 47°02N 165°00W | BB2525-2526     | LL1325-1326 | 2        |                    |          |                    |          |
|                       |        | Jun 30         | 44°02N 165°00W | BB2527          | LL1327      | 1        |                    |          |                    |          |
| <i>Oshoro maru</i>    |        | Jul 9          | 49°59N 145°00W | BB2528-2530     | LL1328-1330 | 3        |                    |          | 754, 755           | 2        |
|                       |        | Jul 9          | 50°30N 145°00W | BB2531-2532     | LL1331-1332 | 2        |                    |          | 756, 758           | 2        |
|                       |        | Jul 9          | 51°00N 145°00W | BB2533-2534     | LL1333-1334 | 2        |                    |          | 759, 760           | 2        |
|                       |        | Jul 10         | 51°02N 144°57W | BB2535-2540     | LL1335-1440 | 6        |                    |          | 779-786            | 5        |
|                       |        | Jul 10         | 52°00N 145°00W | BB2541-2542     | LL1341-1342 | 2        |                    |          | 785, 787           | 2        |
|                       |        | Jul 11         | 52°02N 144°58W | BB2543-2553     | LL1343-1353 | 11       |                    |          | 788-792            | 4        |
|                       |        | Jul 11         | 52°30N 145°00W | BB2554          | LL1354      | 1        |                    |          | 757                | 1        |
|                       |        | Jul 12         | 53°00N 144°58W | BB2555-2567     | LL1355-1367 | 13       |                    |          | 775-796            | 5        |
|                       |        | Jul 13         | 54°00N 144°58W | BB2568-2678     | LL1368-1378 | 10       |                    |          | 773-797            | 4        |
|                       |        | Jul 13         | 54°30N 145°00W | BB2579          | LL1379      | 1        |                    |          | 803                | 1        |
|                       |        | Jul 13         | 55°00N 145°00W | BB2580          | LL1380      | 1        |                    |          | 804                | 1        |
|                       |        | Jul 14         | 55°04N 144°57W | BB2581-2585     | LL1381-1385 | 5        |                    |          | 799                | 1        |
|                       |        | Jul 14         | 55°30N 145°00W | BB2586-2587     | LL1386-1387 | 2        |                    |          | 802, 806           | 2        |
|                       | Jul 14 | 56°00N 145°00W | BB2588-2592    | LL1388-1392     | 5           |          |                    | 704-768  | 3                  |          |
|                       | Jul 15 | 56°10N 154°04W | BB2593-2611    | LL1393-1410     | 16          |          |                    | 711-809  | 9                  |          |

Table 5. Catch location and biological data for fin-clipped salmonids caught by Japanese salmon research vessels in

1999. Ad: adipose fin, LV: left ventral fin, RV: right ventral fin.

| Research vessel      | Date           | Location       | Mesh (mm) | Species   | Fork length (mm) | Body weight (g) | Sex    | Gonad weight (g) | Clipped fin |
|----------------------|----------------|----------------|-----------|-----------|------------------|-----------------|--------|------------------|-------------|
| <i>Wakatake maru</i> | 20-Jun         | 43°00N 180°00  | 115       | Steelhead | 562              | 1770            | Male   | 6                | Ad+L or RV  |
|                      | 23-Jun         | 45°00N 180°00  | 115       | Steelhead | 797              | 1830            | Male   | 3                | Ad+LV       |
|                      | 25-Jun         | 46°00N 180°00  | 115       | Steelhead | 695              | 2900            | Female | 10               | Ad          |
|                      | 25-Jun         | 46°00N 180°00  | 115       | Steelhead | 704              | 3250            | Female | 10               | Ad          |
|                      | 25-Jun         | 46°00N 180°00  | 82        | Steelhead | 545              | 1640            | Male   | 2                | Ad+LV       |
|                      | 25-Jun         | 46°00N 180°00  | 121       | Steelhead | 749              | 4050            | Female | 50               | Ad          |
|                      | 26-Jun         | 47°00N 180°00  | 106       | Steelhead | 740              | 3150            | Male   | 5                | Ad          |
|                      | 27-Jun         | 47°30N 180°00  | 115       | Steelhead | 626              | 2100            | Female | 25               | Ad          |
| <i>Hokusei maru</i>  | 2-Aug          | 47°30N 175°29E | 118       | Steelhead | 661              | 3050            | Male   | 90               | Ad          |
| <i>Oshoro maru</i>   | 26-Jun         | 50°00N 165°00W | 115       | Steelhead | 600              | 1960            | Male   | 1                | Ad          |
|                      | 26-Jun         | 50°00N 165°00W | 115       | Steelhead | 558              | 1680            | Male   | 1                | Ad          |
|                      | 26-Jun         | 50°00N 165°00W | 121       | Steelhead | 494              | 2100            | Female | 12               | Ad          |
|                      | 26-Jun         | 50°00N 165°00W | 121       | Steelhead | 486              | 2040            | Male   | 1                | Ad+RV       |
|                      | 26-Jun         | 50°00N 165°00W | 121       | Steelhead | 580              | 2860            | Female | 14               | Ad          |
|                      | 26-Jun         | 50°00N 165°00W | 93        | Steelhead | 606              | 1920            | Male   | 3                | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 115       | Steelhead | 540              | 1470            | Female | 6                | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 115       | Steelhead | 572              | 1900            | Female | 7                | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 115       | Steelhead | 550              | 1790            | Female | 2                | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 121       | Steelhead | 600              | 2100            | Male   | 17               | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 121       | Steelhead | 620              | 2270            | Male   | 15               | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 72        | Steelhead | 568              | 1720            | Male   | 2                | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 82        | Steelhead | 452              | 1610            | Female | 15               | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 93        | Steelhead | 592              | 2050            | Male   | 1                | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 106       | Steelhead | 538              | 1600            | Female | 2                | Ad          |
|                      | 29-Jun         | 45°30N 165°00W | 106       | Steelhead | 596              | 2150            | Male   | 1                | Ad          |
|                      | 30-Jun         | 44°01N 165°01W | 115       | Steelhead | 602              | 2300            | Male   | 1                | Ad          |
|                      | 30-Jun         | 44°01N 165°01W | 115       | Steelhead | 544              | 1560            | Female | 3                | Ad          |
|                      | 30-Jun         | 44°01N 165°01W | 121       | Steelhead | 558              | 1990            | Female | 8                | Ad          |
|                      | 30-Jun         | 44°01N 165°01W | 121       | Steelhead | 594              | 2050            | Female | 1                | Ad          |
|                      | 30-Jun         | 44°01N 165°01W | 121       | Steelhead | 542              | 1600            | Female | 2                | Ad          |
|                      | 9-Jul          | 49°58N 144°58W | 115       | Coho      | 590              | 2860            | Male   | 100              | Ad          |
|                      | 9-Jul          | 49°58N 144°58W | 115       | Coho      | 620              | 3250            | Female | 50               | Ad          |
|                      | 9-Jul          | 49°58N 144°58W | 121       | Steelhead | 590              | 1980            | Male   | 2                | Ad          |
|                      | 9-Jul          | 49°58N 144°58W | 93        | Coho      | 610              | 2900            | Male   | 14               | Ad          |
|                      | 9-Jul          | 49°58N 144°58W | 106       | Coho      | 470              | 1330            | Female | 23               | Ad          |
|                      | 10-Jul         | 51°00N 144°59W | 115       | Coho      | 582              | 2700            | Female | 40               | Ad          |
|                      | 10-Jul         | 51°00N 144°59W | 115       | Coho      | 606              | 2780            | Female | 34               | Ad          |
|                      | 10-Jul         | 51°00N 144°59W | 121       | Steelhead | 560              | 1960            | Male   | 5                | Ad          |
|                      | 10-Jul         | 51°00N 144°59W | 93        | Steelhead | 562              | 1760            | Female | 8                | Ad          |
|                      | 11-Jul         | 52°00N 145°00W | 115       | Coho      | 590              | 2370            | Male   | 16               | Ad          |
|                      | 11-Jul         | 52°00N 145°00W | 55        | Steelhead | 305              | 255             | Male   | 1                | Ad          |
|                      | 11-Jul         | 52°00N 145°00W | 72        | Steelhead | 310              | 285             | Female | 2                | Ad          |
|                      | 11-Jul         | 52°00N 145°00W | 106       | Steelhead | 548              | 1580            | Female | 12               | Ad          |
|                      | 12-Jul         | 53°01N 145°00W | 115       | Sockeye   | 594              | 3000            | Female | 130              | Ad          |
|                      | 12-Jul         | 53°01N 145°00W | 115       | Steelhead | 540              | 1780            | Female | 10               | Ad          |
|                      | 12-Jul         | 53°01N 145°00W | 121       | Steelhead | 590              | 1860            | Male   | 1                | Ad          |
|                      | 12-Jul         | 53°01N 145°00W | 121       | Steelhead | 586              | 1860            | Female | 4                | Ad          |
|                      | 12-Jul         | 53°01N 145°00W | 121       | Steelhead | 610              | 2320            | Female | 14               | Ad          |
|                      | 12-Jul         | 53°01N 145°00W | 121       | Steelhead | 534              | 1750            | Female | 3                | Ad          |
|                      | 12-Jul         | 53°01N 145°00W | 72        | Steelhead | 312              | 320             | Male   | 1                | Ad          |
|                      | 12-Jul         | 53°01N 145°00W | 72        | Steelhead | 318              | 355             | Male   | 1                | Ad          |
| 12-Jul               | 53°01N 145°00W | 82             | Steelhead | 346       | 430              | Male            | 1      | Ad               |             |
| 12-Jul               | 53°01N 145°00W | 93             | Sockeye   | 454       | 1080             | Male            | 1      | Ad               |             |
| 12-Jul               | 53°01N 145°00W | 93             | Steelhead | 578       | 1880             | Male            | 10     | Ad               |             |
| 12-Jul               | 53°01N 145°00W | 93             | Steelhead | 562       | 1720             | Female          | 9      | Ad               |             |
| 13-Jul               | 54°00N 145°00W | 48             | Pink      | 468       | 1340             | Male            | 9      | Ad               |             |
| 13-Jul               | 54°00N 145°00W | 93             | Chinook   | 642       | 3480             | Male            | 2      | Ad               |             |
| 13-Jul               | 54°00N 145°00W | 106            | Coho      | 614       | 2620             | Female          | 42     | Ad               |             |
| 13-Jul               | 54°00N 145°00W | 138            | Steelhead | 564       | 1600             | Male            | 10     | Ad               |             |
| 14-Jul               | 55°00N 145°00W | 115            | Coho      | 644       | 2970             | Female          | 49     | Ad               |             |
| 14-Jul               | 55°00N 145°00W | 63             | Coho      | 638       | 3100             | Female          | 58     | Ad               |             |
| 14-Jul               | 55°00N 145°00W | 82             | Steelhead | 592       | 1860             | Male            | 4      | Ad               |             |
| 14-Jul               | 55°00N 145°00W | 106            | Coho      | 560       | 2240             | Female          | 58     | Ad               |             |
| 15-Jul               | 56°00N 145°00W | 115            | Coho      | 606       | 2720             | Female          | 60     | Ad               |             |
| 15-Jul               | 56°00N 145°00W | 115            | Steelhead | 592       | 2180             | Male            | 1      | Ad               |             |
| 15-Jul               | 56°00N 145°00W | 63             | Steelhead | 300       | 260              | Female          | 3      | Ad               |             |
| 15-Jul               | 56°00N 145°00W | 63             | Steelhead | 298       | 240              | Male            | 1      | Ad               |             |