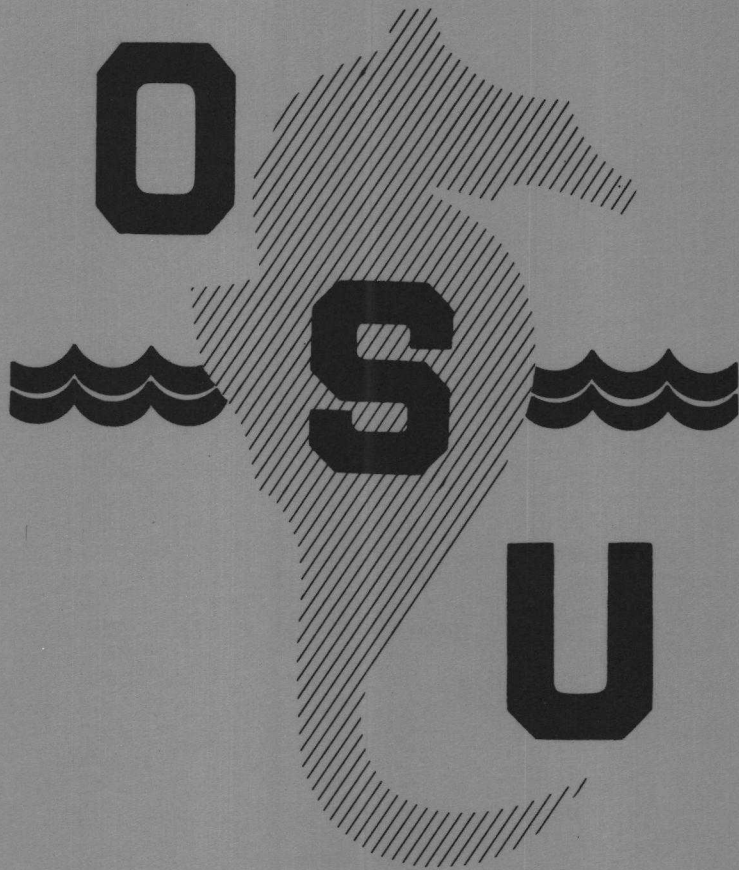


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# OCEANOGRAPHY



OREGON STATE UNIVERSITY

**STUDIES OF JUVENILE  
SALMONIDS OFF THE OREGON  
AND WASHINGTON COAST,  
1982**

by  
J. P. Fisher, W. G. Pearcy and  
A. W. Chung

Oregon State University  
Sea Grant College Program  
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Reference 83-2  
January 1983  
Cruise Report

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Oregon State University  
Corvallis, Oregon 97331

CRUISE REPORT

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#### CRUISE PERSONNEL

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## INTRODUCTION

The School of Oceanography, Oregon State University, conducted three cruises (May 19-June 2, June 7-22, and September 4-14) in 1982 to study the distribution, abundance, migration, growth and feeding habits of juvenile salmonids during their first summer in the ocean. This is the second year we have had a series of cruises during the summer months and the fourth year that we have sampled the Oregon and Washington coasts during June. The purpose of this report is to describe the sampling area and methods used for the 1982 cruises and to present some preliminary results.

## METHODS

## Vessel and Gear

The Pacific Warwind, a 28-m (92-ft) commercial drum purse seiner was chartered for these cruises. A herring purse seine of 32 mm ( $1\frac{1}{4}$ -in) stretch measure mesh and approximately 495 m long was used to collect salmonids and associated nekton. All sets were round hauls, where the net was laid out in a circle by seiner and skiff. A depth gauge attached to the bottom of the net indicated that the seine fished to depths of 50-67 m. Each set sampled approximately  $19,100 \text{ m}^2$  and  $955,000$  to  $1,280,000 \text{ m}^3$ .

## Sampling Area

Sets were made at stations generally 5 nautical miles apart along transect lines extending from Waatch Point, Washington to the Siuslaw River, Oregon in May and from the Quinault River, Washington to Yachats, Oregon in June and September (Figs. 1 and 2). We sampled from as close to the coast as we could safely set the seine (to approximately the 55-m contour) out to 20 miles. If salmon were present at the 20 mile station an attempt was made to sample out to 25 or 30

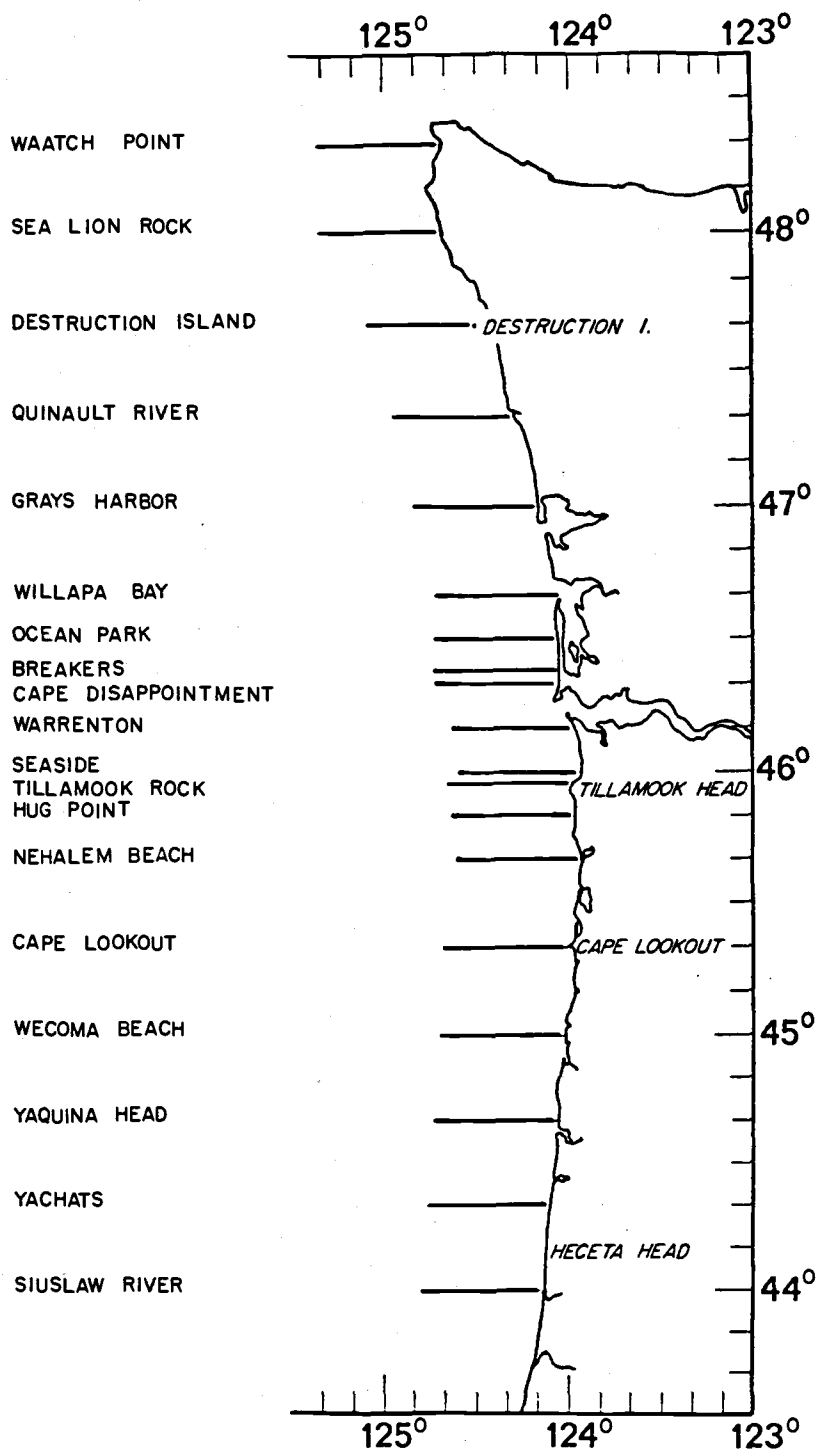


Figure 1. Names and locations of transect lines sampled during 1982.

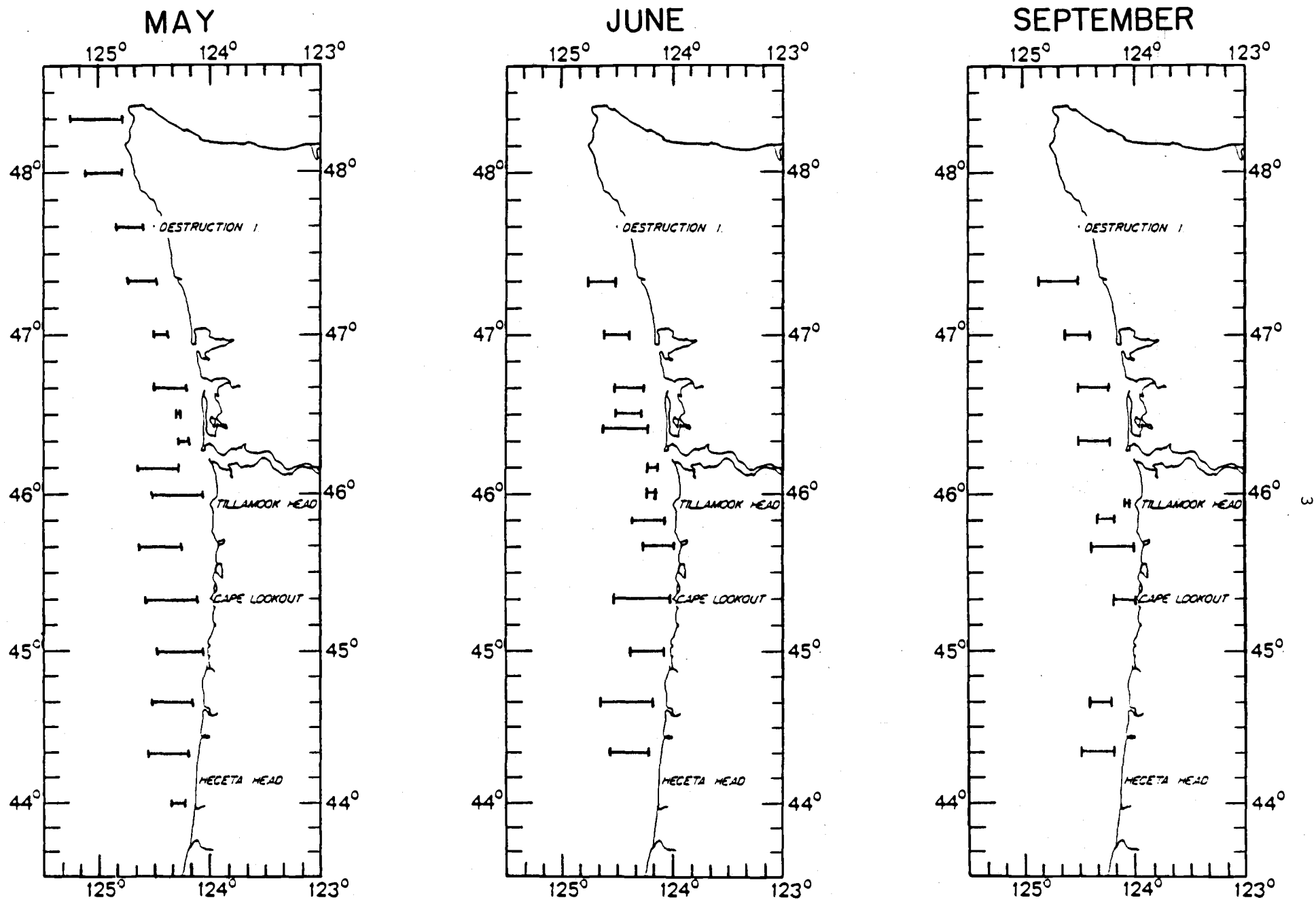


Figure 2. Locations of transect lines sampled during the May, June, and September cruises.

miles. At the Destruction Island, Quinault River, Grays Harbor and Willapa Bay transects, where the shelf is quite shallow, the closest sets to shore were at 10 miles. Sets were made to within 6 to 8 miles of shore at the other Washington transects. Off Oregon, where the shelf is steeper, sets were generally to within 3 to 5 miles of shore.

Sixteen transects were sampled during the May cruise, 13 during the June cruise and 10 during the September cruise (Fig. 2). Set locations were determined by Loran C coordinates and water depth as determined with the ship's depth recorder. A total of 173 purse seine sets were made during the three cruises. Of these, 17 were aborted or were non-quantitative because of gear problems or bad sea conditions. Locations of purse seine sets along with some environmental data are listed in Appendix A.

#### Environmental Data

Surface water samples were taken at each purse seine station. Temperatures were measured and water samples were obtained for later salinity determinations with a Guildline Autosalinometer (Model 8400). Salinity and temperature profiles of the water column were obtained at most stations with a self-contained Applied Microsystems CTD-12.

Ocean surface temperatures over the area from Leadbetter Point, Washington to Cape Lookout, Oregon and from the shore out to 30 miles were measured with an infrared radiometer (Barnes PRT-5) from on an aircraft at an altitude of 1000 ft on June 8, 1982. This flight was operated by personnel from the Environmental Remote Sensing Applications Laboratory at O.S.U.

Water clarity was measured with a 30-cm Secchi disk. Ambient light intensity was measured at deck level using a Spectra Lumicon light meter.



To estimate surface chlorophyll concentrations a 500 ml water sample was taken at each station about one meter below the surface and filtered through a 0.3  $\mu\text{m}$  glass fiber filter. The filtrate was frozen and chlorophyll-a and phaeophytin-a were extracted from the filtrate at a later time with 90% acetone, and their concentrations were measured using a model-10 Turner Designs fluorometer.

Zooplankton tows were made at several stations using a 70-cm mouth diameter, 0.333 mm Nitex mesh, cylindrical-conical plankton net. Zooplankton sampling was not extensive due to time constraints.

#### Pigment Marking of Coho Smolts

To increase the number of marked coho smolts produced by Oregon Aqua-Foods, Inc. (OAF) in the ocean during September, 835,229 smolts were spray marked with fluorescent pigment prior to their transport from OAF's Springfield hatchery to the release facility on Yaquina Bay. These fish were marked in two groups. The first group, marked with red pigment, was released August 1 to 3, 1983; the second group, marked with yellow pigment, was released August 29 to September 1, 1982. Based on studies of pigment retention and mortality of fish prior to release, we estimate that about 350,000 fish with red marks and 295,000 with yellow marks were actually released into the ocean. All coho collected during September <300 mm fork length (FL) were checked under ultraviolet light for pigment marks.

#### Processing the Catch at Sea

The purse seine catch was either dipnetted from the seine bunt, lifted aboard in the bunt or brailed aboard. Large catches of jellyfish were quite common and a rough estimate was made of their total volume in each set. Species

were counted and individual bell diameters were measured from a subsample of jellyfish. Fishes and squids were also identified and counted and lengths were measured. Stomachs were removed from possible predators on juvenile salmonids (black rockfish, hake, blue shark, etc.) and preserved in 10% formalin. Selected whole fishes and squids were also preserved.

Juvenile salmonids. Small salmonids were anesthetized with MS 222, identified, measured to the nearest millimeter (FL), checked for adipose clips and other external marks, individually wrapped in plastic bags (along with a label identifying set number, species and length) and frozen.

Adult salmonids. Adult salmonids were anesthetized with MS 222, identified, measured, sampled for scales, and examined for adipose clips and other marks. Heads from adipose clipped adults were removed, labeled and frozen for later recovery of coded wire tags.

Kidney smears were taken from 65 adult coho, 36 adult chinook and 1 adult chum salmon for a study of bacterial kidney disease (BKD) by Craig Banner, Department of Microbiology, O.S.U. Stomachs were removed and preserved from all adult salmon killed.

Most adults were released after they were measured and scale samples removed. In order to trace movements of adult salmon in the ocean 194 coho, 73 chinook, 4 chum and 1 sockeye were tagged with orange Floy tags below the dorsal fin using a Dennison Mark II tagging gun. The Floy tags were supplied by the ODFW Marine Regional Office, Newport, Oregon. Fish were released after they had recovered from the anaesthetic in a tank of circulating sea water. All fish were active when released to the ocean, although sometimes badly descaled.

## Laboratory Processing of Juvenile Salmonids

Each frozen juvenile salmon was given a serial number (collection year, seine set number and fish sequence number), weighed in its tared plastic bag, re-identified, and examined for fluorescent pigment marks (September) under ultraviolet light, and re-examined for adipose fin clip and other marks. Scales from a subsample of 25 fish of each salmonid species from each set were removed from the preferred area (see Scarnecchia, 1979) mounted on gum cards and acetate impressions made in preparation for future growth studies. Heads from individuals with adipose fin clips were removed and sent to the Oregon Department of Fish and Wildlife for coded wire tag removal and decoding. Stomach contents from 10 fish of each species for each set were removed, weighed and preserved in 5% buffered formalin. Kidney smears from these fish were examined for BKD by the Department of Microbiology, O.S.U.

## RESULTS

### Ocean Conditions

Upwelling was exceptionally strong during May 1982. The Bakun upwelling index for 45°N-125°W reached its highest value for May since 1967. As a result of the strong northerly winds and upwelling, the sea surface temperatures were cool off Oregon and Washington, averaging 10.8°C at the stations sampled. Temperatures 20-30 miles offshore were all less than 12.3°C, indicating a broad zone of cool water during this month. The chlorophyll-a content of surface water was much higher during May than the other periods, indicating a high standing stocks of phytoplankton.

Upwelling during June was not strong and the upwelling index was about the same as in June of other years in the late 70's and early 80's. Sea surface

temperatures averaged 11.6°C during this month, but temperatures were cooler (8.8-9.2°C) south of Nehalem Beach where upwelled water with high salinity (>33‰) was present. Sea surface temperatures measured with the infrared radiometer on June 8, 1982 during the aircraft overflight showed a weak inshore-offshore gradient (Fig. 3). Highest temperatures (>13°C) converged in the area north of Cape Disappointment, and lowest temperatures (<10°C) were found nearshore south of Nehalem. The sea surface temperatures measured from the seiner from 9 to 15 miles offshore, Willapa Bay to Warrenton, on June 10 were very similar to those measured from the aircraft in the same area.

During the September cruise surface temperatures were warm, averaging 15.3°C. Cooler water of 14.5°C or less was only encountered south of the Columbia River and temperatures less than 13°C were only found within 3 miles of shore south of Nehalem Beach.

#### Catch of Salmonids

Seven species of salmonids occurred in the purse seine collections (Table 1; Appendix B). Juvenile coho that had entered the ocean in spring or summer 1982 were the most common salmonid during all three cruises. (These are designated as .0 age, where the digit to the left of the period indicates the years spent in fresh water and the digit to the right indicates years in the ocean.) These .0 age coho comprised 58% of the total salmonid catch. Juvenile chinook salmon were the next most numerous salmonid (16% of the catch). They were common in catches during the May and June cruises but few were caught in September. Numbers of 0.0 age chum salmon, on the other hand, increased during the cruises and they were the second most numerous salmonid during the September cruise. Juvenile steelhead and cutthroat trout and pink and sockeye salmon were collected, but they were not

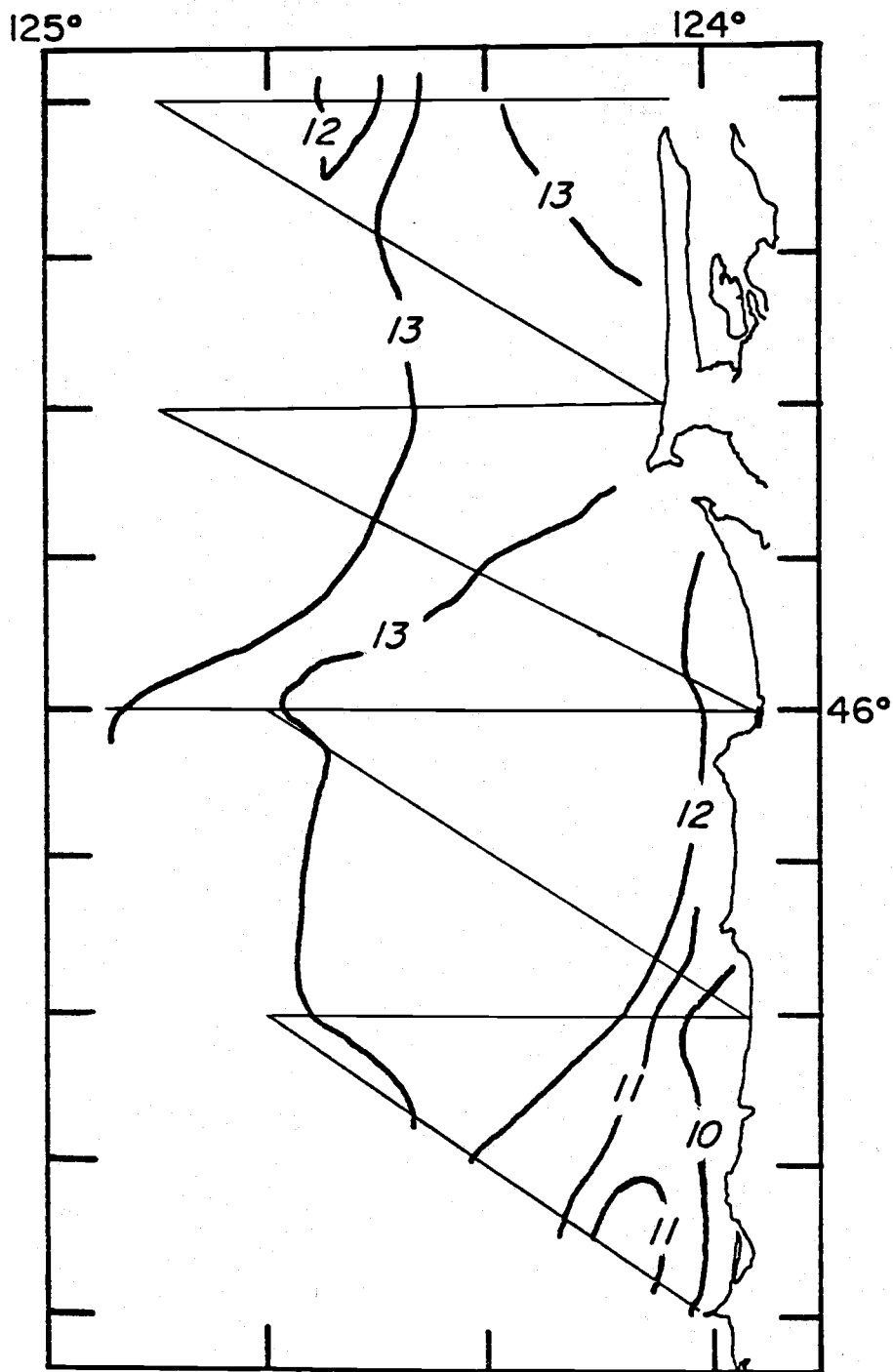


Figure 3. Sea-surface isotherms on June 8, 1982. Temperatures were measured with an infrared radiometer along the aircraft tract lines indicated.

Table 1. Summary of catch of salmonids and CWT recoveries in 1982.

|           | May                |       |      | June |                    |       | Sept. |      |                    | Total |      |       |       |      |      |  |
|-----------|--------------------|-------|------|------|--------------------|-------|-------|------|--------------------|-------|------|-------|-------|------|------|--|
|           | Length<br>(mm, FL) | Total | #CWT | %CWT | Length<br>(mm, FL) | Total | #CWT  | %CWT | Length<br>(mm, FL) | Total | #CWT | %CWT  | Total | #CWT | %CWT |  |
| Coho      | 101-300            | 529   | 26   | 4.9  | 101-300            | 825   | 40    | 4.8  | 101-420            | 384   | 22   | 5.7   | 1738  | 88   | 5.1  |  |
|           | 301+               | 210   | 6    | 2.9  | 301+               | 121   | 2     | 1.7  | 421+               | 25    | 1    | 4.0   | 356   | 9    | 2.5  |  |
| Chinook   | 101-400            | 225   | 17   | 7.6  | 101-400            | 228   | 16    | 7.0  | 101-400            | 8     | 1    | 12.5  | 461   | 34   | 7.4  |  |
|           | 401+               | 50    | 1    | 2.0  | 401+               | 39    | 0     | 0.0  | 401+               | 10    | 0    | 0.0   | 99    | 1    | 1.0  |  |
| Steelhead | 161-260            | 33    | 1    | 3.0  | 201-220            | 2     | 0     | 0.0  | --                 | 0     | --   | --    | 35    | 1    | 2.9  |  |
| Cutthroat | 181-360            | 8     | --   | --   | 181-350            | 9     | --    | --   | --                 | 0     | --   | --    | 17    | --   | --   |  |
| Chum      | 121-130            | 1     | --   | --   | 91-170             | 55    | --    | --   | 151-230            | 155   | --   | --    | 211   | --   | --   |  |
|           | 321+               | 5     | --   | --   | 351+               | 1     | --    | --   | 351+               | 0     | --   | --    | 6     | --   | --   |  |
| Pink      | --                 | 0     | --   | --   | --                 | 0     | --    | --   | 151-190            | 47    | --   | --    | 47    | --   | --   |  |
| Sockeye   | 550                | 1     | --   | --   | 111-170            | 21    | --    | --   | 161-170            | 1     | --   | --    | 23    | --   | --   |  |
|           |                    |       |      |      |                    |       |       |      |                    |       |      | Total | 2993  |      |      |  |
| No. Sets  |                    | 62    |      |      |                    | 56    |       |      |                    | 38    |      |       |       | 156  |      |  |

numerous. All the 0.0 age pink were captured during the September cruise. Maturing (.1+) coho, chinook, chum and sockeye salmon were also captured.

A total of 88 juvenile coho (5.1%) and 34 juvenile chinook (7.4%) had coded wire tags. Details on the release and recapture of fish with CWT's are given in Appendix C.

#### Coho Length-Frequency Distributions

Length-frequency distributions of coho for each cruise and three different areas are given in Figure 4. The size separation of juveniles (age .0) from adult fish (age .1) was distinct for all three months. During May most juveniles were between 121 and 210 mm FL and during June between 121 and 250 mm FL.

During September the coast-wide catch of juveniles was trimodal, with three modes north of the Columbia, two modes between Seaside and Nehalem and only one mode from Cape Lookout south. Average size decreased from north to south. The wide size range of juvenile coho (131 mm to 410 mm) in September was due to the presence of both recently released Oregon Aqua-Food's coho and juveniles that had entered the ocean earlier in the season.

Very few adult coho were collected in September compared to May and June (Fig. 4). The adults may have been close inshore, or their depth distribution may have changed making them less available to the purse seine during this period when surface seawater temperatures were warm.

#### Catch Per Set of Juvenile Coho

During May the mean catch per set was low north of the Columbia River, increased between Warrenton and Nehalem, and was high south of Cape Lookout (Table 2). Two exceptionally large catches of juvenile coho were made on the

# COHO

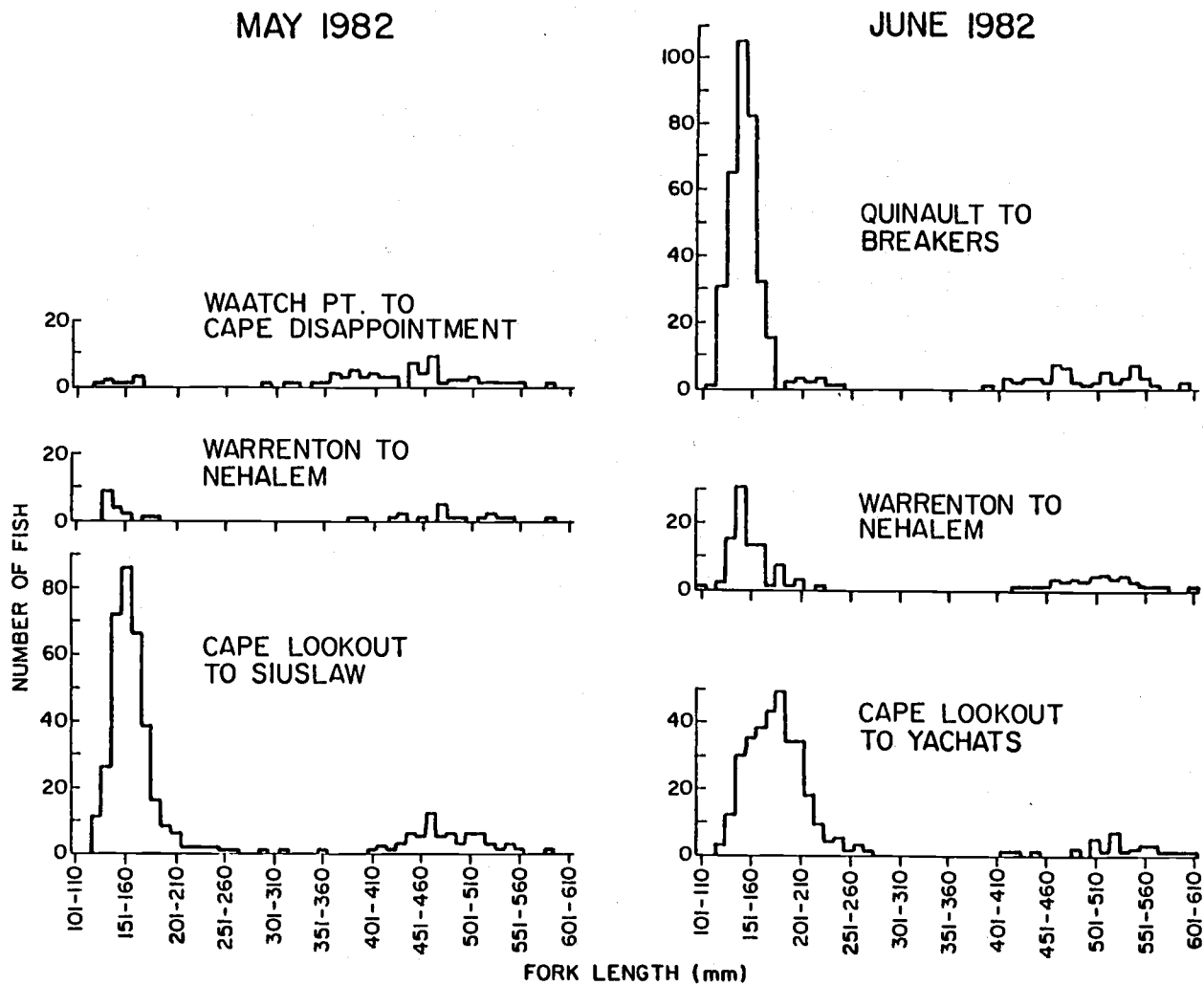


Figure 4. Length-frequency distributions of coho for the May, June and September cruises.



# COHO

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1982

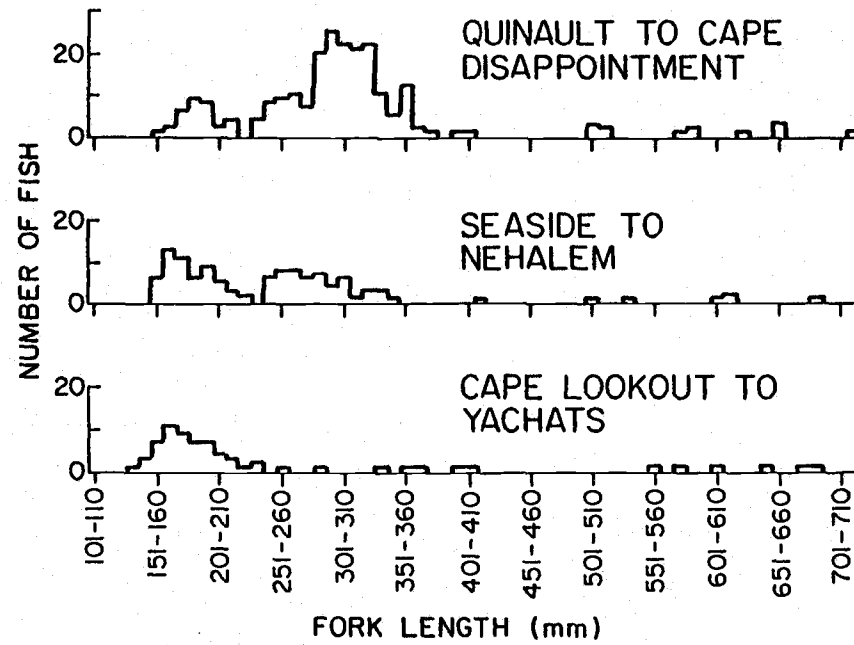


Figure 4. (cont.)

Table 2. Number of sets and mean catch per set of juvenile coho and chinook by area and cruise.

| Species          | Area                          | No. of sets/(catch per set) |          |           |
|------------------|-------------------------------|-----------------------------|----------|-----------|
|                  |                               | May                         | June     | September |
| Juvenile Coho    | Waatch Pt. to<br>Cape Disapp. | 27(0.4)                     | 21(16.6) | 19(11.1)  |
|                  | Warrenton to<br>Nehalem       | 13(1.3)                     | 10(8.8)  | 7(16.1)   |
|                  | Cape Lookout<br>to Siuslaw    | 22(22.8)                    | 25(15.6) | 12(7.4)*  |
| Juvenile Chinook | Waatch Pt. to<br>Cape Disapp. | 27(1.9)                     | 21(10.0) | 19(0.2)   |
|                  | Warrenton to<br>Nehalem       | 13(7.1)                     | 10(0.8)  | 7(0.0)    |
|                  | Cape Lookout<br>to Siuslaw    | 22(3.6)                     | 25(0.4)  | 12(0.9)*  |

\*Adjusted to correct for the smaller area fished by the shorter seine in the last 8 sets (Appendix B).

Wecoma Beach transect in May (Appendix B), but even excluding these the mean catch per set (6.6) was still much higher in this southern area than in the two areas to the north.

The mean catch per set of juvenile coho during the June cruise was ~~almost~~ as high north of the Columbia as south of Cape Lookout. During September mean catch per set was higher north of Cape Lookout than south of Cape Lookout.

#### Recoveries of Marked Juvenile Coho

Over the summer 88 CWT and 6 fluorescent pigment marked juvenile coho were collected (Table 1; Appendix C). Eight of 96 juvenile coho with missing adipose fins (8.3%) had no CWT's.

Recovery data for major hatchery groups of CWT juvenile coho are summarized by cruise and area in Table 3. During May most CWT juvenile coho were collected south of Cape Lookout. Most of these originated from Columbia River hatcheries, released about one month prior to recapture. All but one fish were collected south of where they entered the ocean; the one exception was a fish that had been released 76 days earlier.

Both catch per set (Table 2) and distribution of CWT juvenile coho (Table 3) indicate a southward movement of small juvenile coho in the ocean off Oregon and Washington during May 1982. This movement may have been active or passive. As mentioned earlier, upwelling was strong during May resulting in relatively strong surface currents that may have transported the smolts to the south.

The composition of the CWT catch indicates that some fish in a release group tend to stay together during their downstream and early ocean migrations. In two sets within two miles of each other on the Wecoma Beach transect 17 CWT Columbia River fish were collected; 4 were released from Cowlitz hatchery on

Table 3. Summary by month and area of days since release, north-south distance between point of ocean entrance and ocean capture, and size of CWT and pigment marked juvenile coho.

| Cruise | Area                    | Hatchery Group                | n  | Days since Release:<br>Mean (Range) | North-South Distance<br>from Ocean Entrance<br>(naut. miles):<br>Mean (Range) | Fork Length (mm):<br>Mean (Range) |
|--------|-------------------------|-------------------------------|----|-------------------------------------|---|-----------------------------------|
| May    | Warrenton to Nehalem    | 1980 Brood-Columbia River     | 1  | 25                                  | 6 S   | 138                               |
| May    | Cape Lookout to Siuslaw | 1980 Brood-Columbia River     | 21 | 30 (26-33)                          | 76 S (74 S - 95 S)  | 155 (136-188)                     |
|        |                         | 1980 Brood-Coastal Washington | 2  | 12,0-35                             | 114 S, 141 S  | 133,143                           |
|        |                         | 1980 Brood-Coastal Oregon     | 2  | 31,76                               | 2 S, 61 N   | 147,193                           |
| June   | Quinault to Breakers    | 1980 Brood-Coastal Washington | 13 | 27 (12-49)                          | 13 S (25 S - 20 N)  | 154 (127-224)                     |
|        |                         | 1980 Brood-Columbia River     | 2  | 17,35                               | 15 N, 8 N   | 137,147                           |
| June   | Warrenton to Nehalem    | 1980 Brood-Columbia River     | 3  | 19,20,38                            | 35 S, 34 S, 25 S  | 136,146,204                       |
| June   | Cape Lookout to Yachats | 1980 Brood-Coastal Washington | 1  | 51                                  | 80 S  | 145                               |
|        |                         | 1980 Brood-Columbia River     | 12 | 37 (18-50)                          | 58 S (54 S - 80 S)  | 167 (141-205)                     |
|        |                         | 1980 Brood-Coastal Oregon     | 9  | 72 (30-97)                          | 46 N (18 N - 80 N)  | 203 (162-274)                     |

Table 3. (cont.)

| Cruise | Area                                    | Hatchery Group                | n  | Days since Release:<br>Mean (Range) | North-South Distance<br>from Ocean Entrance<br>(naut. miles):<br>Mean (Range) | Fork Length (mm):<br>Mean (Range) |
|--------|---|-------------------------------|----|-------------------------------------|---|-----------------------------------|
| Sept.  | Quinault to<br>Cape Disap-<br>pointment | 1980 Brood-<br>Columbia River | 10 | 116 (87-157)                        | 43 N (5N - 65 N)  | 316 (268-373)                     |
|        |   | 1980 Brood-<br>Coastal Oregon | 1  | 129                                 | 85 N  | 352                               |
|        |   | 1981 Brood-<br>OAF            | 4  | 32 (10-62)                          | 113 N (103 N - 143 N)   | 199 (181-242)                     |
| Sept.  | Seaside to<br>Nehalem                   | 1980 Brood-<br>Coastal Oregon | 1  | 131                                 | 45 N  | 336                               |
|        |   | 1981 Brood-<br>OAF            | 5  | 50 (15-86)                          | 79 N (79 N)   | 207 (166-246)                     |
| Sept.  | Cape Lookout<br>to Yachats              | 1981 Brood-<br>OAF            | 5  | 16 (12-21)                          | 31 N (18 S - 44 N)  | 177 (155-204)                     |
|        |   | 1980 Brood-<br>OAF            | 1  | 130                                 | 17 S  | 408                               |

May 3, 3 from Sandy on April 30, 4 from Lower Kalama on May 3, 3 from Eagle Creek on May 3-6, 2 from Big Creek on April 28 and 29 and one from Speelyai on May 4 (Appendix C).

During June CWT juvenile coho were collected both north and south of the Columbia. Most (87%) of those collected north of the Columbia were from coastal Washington hatcheries, released less than one month prior to recapture. These fish show little net north-south movement (Table 3). Columbia River fish made up only 13% of recovered CWT's north of the Columbia and were not found farther than 15 miles north of the mouth of the Columbia River. South of the Columbia, Columbia River fish accounted for 60% of CWT recoveries. During June, coho from coastal Oregon hatcheries that had been released early in the spring were generally the largest size ( $\bar{x}$  = 203 mm FL). These juvenile CWT coho were the only ones that were consistently collected to the north of where they had entered the ocean (Table 3). They also made up a higher percentage (41%) of the catch south of Cape Lookout in June than in May (8%). No OAF coho smolts with CWT's were collected in May or June.

During the September cruise, all juvenile coho with CWT's collected north of the Columbia River were from Columbia River, coastal Oregon or OAF hatcheries. No coastal Washington CWT fish were collected in any of the regions sampled. Six Columbia River and 1 OAF juvenile coho were collected on the most northerly transect (Quinault River). Most of the large (268 mm - 373 mm FL) coho with CWT's collected north of the Columbia River were Columbia River fish released three to five months previously (Table 3).

South of the Columbia, 11 of 12 CWT or pigment marked juvenile coho were from the OAF release site. These ranged in size from 155 to 246 mm FL and probably made up many of the fish in this size mode during September in all regions (Fig. 4).

Net movement of most juvenile coho during September 1982 was to the north. All but two of the CWT .0 age coho were collected north of where they entered the ocean. One of these was a very large (408 mm FL) male with well developed testes, probably a jack (Table 3).

Summarizing ocean movements of juvenile coho during the summer of 1982:

1) Net movement off Oregon and Washington during May 1982 was generally to the south. 2) Little evidence was found for northward migration of Columbia River or coastal Oregon juvenile coho into the waters off Washington by early to mid June. 3) Fish originating from Columbia River and Oregon hatcheries clearly had migrated to the north by September, while coho from coastal Washington hatcheries apparently had migrated out of the sampling area.

#### Chinook Length-Frequency Distributions

The varied life histories of chinook salmon caused a broad size range of .0 age chinook collected during May and June (Fig. 5). The length range of .0 age chinook was estimated from our catches of CWT fish. Fork lengths of CWT chinook released from fall 1981 through spring 1982 ranged from 139 mm to 316 mm in the May 1982 collections and from 150 mm to 340 mm in June 1982 collections (Table 4). In this report "juvenile" chinook are defined to be those 400 mm FL or less for the May and June cruises.

#### Catch Per Set of Juvenile Chinook

During the May cruise, catch per set of juvenile chinook was lowest north of the Columbia River, as it was for juvenile coho (Table 2). Catch per set was highest from Warrenton to Nehalem. During June, catch per set was high north of the Columbia River and very low elsewhere. During September very few chinook salmon were caught and the catch per set was very low.

# CHINOOK

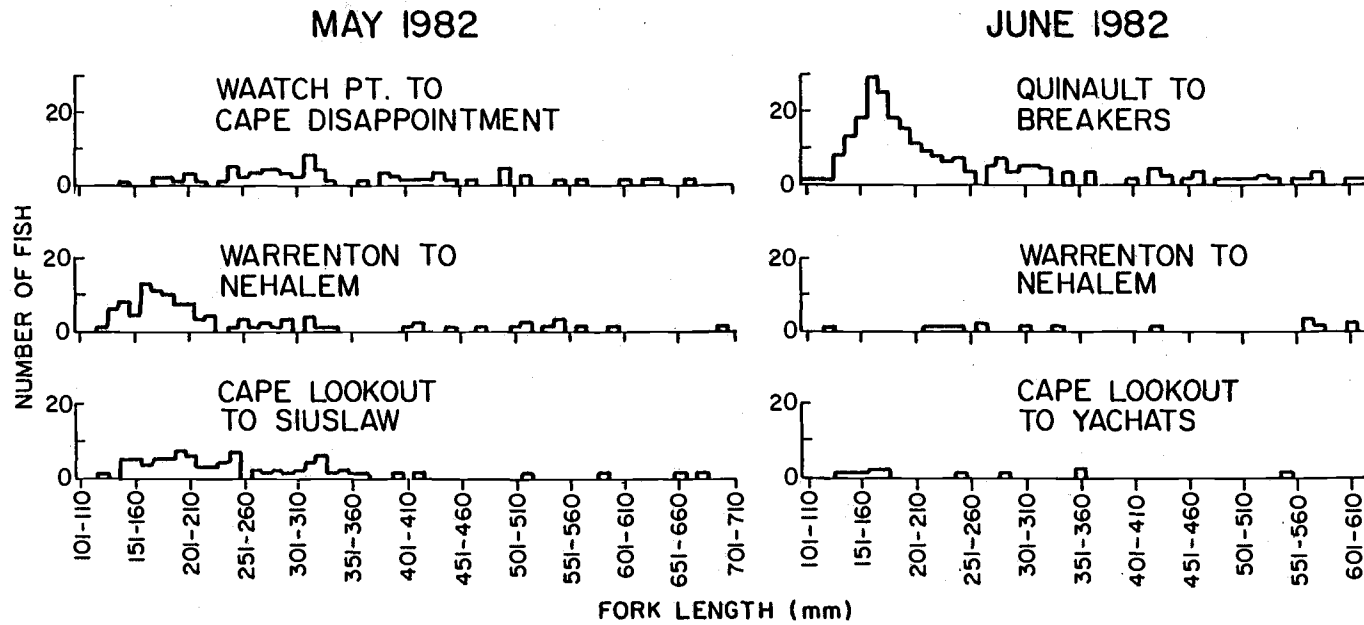


Figure 5. Length-frequency distributions of chinook salmon for the May and June cruises.



Table 4. Summary by month and area of days since release, north-south distance between point of ocean entrance and ocean capture, and size of CWT and pigment marked juvenile chinook.

| Cruise | Area                                      | Hatchery Group   | n  | Days since Release:<br>Mean (Range) | North-South Distance<br>from Ocean Entrance<br>(naut. miles):<br>Mean (Range) | Fork Length (mm):<br>Mean (Range) |
|--------|---|--|----|-------------------------------------|---|-----------------------------------|
| May    | Waatch Point<br>to Cape<br>Disappointment | 1980 Brood-<br>Coastal Washington                      | 1  | 47                                  | 54 S  | 203                               |
|        |   | 1980 Brood-<br>Domsea (Coastal<br>Oregon-Fall release) | 1  | ~143-174                            | 150 N   | 270                               |
| May    | Warrenton to<br>Nehalem                   | 1980 Brood-<br>Columbia River                          | 6  | 63(47-73)                           | 15 S (15 S)   | 183 (139-213)                     |
| May    | Cape Lookout<br>to Siuslaw                | 1980 Brood-<br>Columbia River                          | 6  | 61(41-76)                           | 61 S (55 S - 94 S)  | 220 (173-302)                     |
|        |   | 1980 Brood-<br>Columbia River<br>(Fall release)        | 1  | 204                                 | 74 S  | 306                               |
|        |   | 1980 Brood-<br>Coastal Oregon                          | 1  | 91                                  | 40 N  | 248                               |
|        |   | 1980 Brood-<br>Coastal Oregon<br>(Fall release)        | 1  | 247                                 | 73 N  | 316                               |
| June   | Quinault to<br>Breakers                   | 1980 Brood-<br>Columbia River                          | 12 | 81(59-88)                           | 18 N (8N - 26 N)  | 224 (140-287)                     |
|        |   | 1980 Brood-<br>Columbia River<br>(Fall release)        | 1  | 219                                 | 25 N  | 150                               |
|        |   | 1980 Brood-<br>Domsea (Coastal<br>Oregon-Fall release) | 1  | ~161-191                            | 150 N   | 309                               |

Table 4. (cont.)

| Cruise | Area                       | Hatchery Group                | n | Days since Release:<br>Mean (Range) | North-South Distance<br>from Ocean Entrance<br>(naut. miles):<br>Mean (Range) | Fork Length (mm):<br>Mean (Range) |
|--------|----------------------------|-------------------------------|---|-------------------------------------|---|-----------------------------------|
| June   | Cape Lookout<br>to Yachats | 1980 Brood-<br>Columbia River | 1 | 97                                  | 55 S  | 284                               |
|        |                            | 1978 Brood-<br>Columbia River | 1 | 831 ~ 330                           | 55 S  | 355                               |
| Sept.  | Cape Lookout<br>to Yachats | 1980 Brood-<br>Columbia River | 1 | 166                                 | 116 S   | 340                               |

#### Recoveries of CWT Juvenile Chinook

Most juvenile chinook with CWT's were recovered in May south of where they entered the ocean (Table 4). All CWT Columbia River chinook were found south of the Columbia River mouth. The only juvenile chinook found north of where they entered the ocean were coastal Oregon fish released at least 91 days prior to recapture.

During June there was a dramatic increase in catch per set of juvenile chinook north of the Columbia River (Table 2; Fig. 5). Nearly all the CWT fish caught here were from Columbia River hatcheries, indicating migration of these juvenile chinook as far north as the Willapa Bay transect (Table 4). Both CWT juveniles collected south of the Columbia River in June were Columbia River fish, as was the one CWT juvenile collected in September.

The CWT data indicate a general southward movement of juvenile chinook during May but northward movement in June. The very low abundance of juvenile chinook in September suggests that they had either moved out of the sampling area, or had become less available to capture with the purse seine, perhaps due to a change in depth distribution.

#### Length-Frequency Distributions of Chum and Sockeye Salmon and Steelhead and Cutthroat Trout.

Very few 0.0 age chum were collected in May. During June most 0.0 age chum were between 121 mm and 170 mm FL and were most common south of Cape Lookout (Table 5). During September 0.0 age chum were 151 mm to 230 mm FL and were most common north of the Columbia.

No juvenile sockeye were collected in May. During June they were between 111 mm and 170 mm FL and were most common north of the Columbia (Table 5). Only one juvenile sockeye was collected during the September cruise.

Table 5. Size-frequency distributions of chum, sockeye and pink salmon by month and area.

| Fork Length (mm) | CHUM (June) <sup>1</sup> |                      |                         | CHUM (Sept) <sup>2</sup> |                    |                         | SOCKEYE (June) <sup>3</sup> |                      |                         | PINK (Sept) <sup>4</sup> |                    |                         |
|------------------|--------------------------|----------------------|-------------------------|--------------------------|--------------------|-------------------------|-----------------------------|----------------------|-------------------------|--------------------------|--------------------|-------------------------|
|                  | Quinault to Breakers     | Warrenton to Nehalem | Cape Lookout to Yachats | Quinault to Cape Disapp. | Seaside to Nehalem | Cape Lookout to Yachats | Quinault to Breakers        | Warrenton to Nehalem | Cape Lookout to Yachats | Quinault to Cape Disapp. | Seaside to Nehalem | Cape Lookout to Yachats |
| <100             |                          | 1                    |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 101-110          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 111-120          |                          |                      |                         |                          |                    |                         | 1                           |                      |                         |                          |                    |                         |
| 121-130          |                          |                      | 3                       |                          |                    |                         | 8                           |                      |                         |                          |                    |                         |
| 131-140          |                          | 2                    | 10                      |                          |                    |                         | 6                           |                      |                         |                          |                    |                         |
| 141-150          |                          | 1                    | 24                      |                          |                    |                         | 2                           | 1                    |                         |                          |                    |                         |
| 151-160          |                          |                      | 11                      | 3                        |                    |                         | 1                           |                      |                         | 7                        |                    |                         |
| 161-170          |                          |                      | 3                       | 19                       |                    |                         | 1                           |                      | 1                       | 10                       |                    |                         |
| 171-180          |                          |                      |                         | 35                       |                    |                         |                             |                      |                         | 8                        |                    |                         |
| 181-190          |                          |                      |                         | 35                       |                    | 1                       |                             |                      |                         | 3                        |                    |                         |
| 191-200          |                          |                      |                         | 8                        |                    |                         |                             |                      |                         |                          |                    |                         |
| 201-210          |                          |                      |                         | 2                        |                    |                         |                             |                      |                         |                          |                    |                         |
| 211-220          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 221-230          |                          |                      |                         | 1                        |                    |                         |                             |                      |                         |                          |                    |                         |
| 231-240          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 241-250          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 251-260          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 261-270          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 271-280          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 281-290          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 291-300          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 301-310          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 311-320          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 321-330          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 331-340          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 341-350          |                          |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |
| 351+             | 1                        |                      |                         |                          |                    |                         |                             |                      |                         |                          |                    |                         |

1 May: 2 chum 123mm, 754 mm (Cape Lookout to Siuslaw R.); 2 chum 738 mm, 703 mm (Warrenton to Nehalem); 2 chum 324 mm, 353 mm (Waatch Pt.)

2 51 chum not measured

3 One 550 mm sockeye caught in May (Quinault R.); one 161 mm sockeye caught in September (Quinault R.)

Table 6. Size-frequency distributions of cutthroat and steelhead by month and area.

| Fork Length (mm) | CUTTROAT (May)             |                      |                         | CUTTROAT (June) <sup>1</sup> |                      |                         | STEELHEAD (May)            |                      |                         | STEELHEAD (June)     |                      |                         |
|------------------|----------------------------|----------------------|-------------------------|------------------------------|----------------------|-------------------------|----------------------------|----------------------|-------------------------|----------------------|----------------------|-------------------------|
|                  | Waatch Pt. to Cape Disapp. | Warrenton to Nehalem | Cape Lookout to Siuslaw | Quinault to Breakers         | Warrenton to Nehalem | Cape Lookout to Yachats | Waatch Pt. to Cape Disapp. | Warrenton to Nehalem | Cape Lookout to Siuslaw | Quinault to Breakers | Warrenton to Nehalem | Cape Lookout to Yachats |
| <100             | •                          |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 101-110          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 111-120          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 121-130          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 131-140          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 141-150          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 151-160          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 161-170          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 171-180          |                            |                      |                         |                              |                      |                         | 4                          | 2                    | 1                       |                      |                      |                         |
| 181-190          |                            |                      |                         | 1                            |                      |                         |                            | 2                    | 3                       |                      |                      |                         |
| 191-200          |                            |                      |                         |                              |                      |                         | 1                          | 2                    |                         |                      |                      |                         |
| 201-210          |                            |                      |                         |                              |                      |                         | 2                          |                      | 1                       | 1                    |                      |                         |
| 211-220          |                            |                      |                         |                              |                      |                         |                            |                      | 1                       | 1                    |                      |                         |
| 221-230          |                            |                      |                         | 1                            |                      |                         | 5                          |                      | 1                       |                      |                      |                         |
| 231-240          |                            |                      | 3                       |                              |                      |                         |                            |                      | 1                       |                      |                      |                         |
| 241-250          |                            |                      | 2                       |                              | 1                    |                         | 1                          | 1                    | 1                       |                      |                      |                         |
| 251-260          |                            |                      |                         |                              |                      |                         | 1                          |                      | 1                       |                      |                      |                         |
| 261-270          |                            |                      |                         | 2                            |                      |                         |                            |                      |                         |                      |                      |                         |
| 271-280          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 281-290          |                            |                      |                         |                              |                      |                         |                            |                      | 1                       |                      |                      |                         |
| 291-300          |                            |                      |                         |                              | 1                    |                         |                            |                      |                         |                      |                      |                         |
| 301-310          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 311-320          |                            |                      |                         | 1                            |                      |                         |                            |                      |                         |                      |                      |                         |
| 321-330          |                            |                      | 1                       |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 331-340          |                            |                      |                         |                              |                      |                         |                            |                      |                         |                      |                      |                         |
| 341-350          |                            |                      |                         |                              | 1                    |                         |                            |                      |                         |                      |                      |                         |
| 351-360          |                            |                      | 2                       |                              |                      |                         |                            |                      |                         |                      |                      |                         |

<sup>1</sup> No Cutthroat or Steelhead were caught in September

Juvenile pink salmon were collected only during September north of the Columbia. They were between 151 mm and 190 mm FL.

Juvenile steelhead trout were most common during May and were fairly evenly distributed along the coast (Table 6). They were rare during June and did not occur in September collections.

Cutthroat trout were most common south of Cape Lookout during May and north of Cape Lookout in June. They ranged from 181 mm to 360 mm in the collections (Table 6). They were not collected during September.

#### Bacterial Kidney Disease (BKD)

To date 228 juvenile chinook salmon collected in the ocean during 1982 have been examined for BKD. Thirty-six (16%) were infected. Of 325 juvenile coho examined, 17 (5%) had BKD. Of 186 juvenile chinook from 1981 ocean collections, 18 (10%) had BKD; of 974 juvenile coho, 26 (3%) had BKD. The incidence of BKD was higher in juvenile chinook than in juvenile coho for fish collected during 1981 and 1982 (Craig Banner, Department of Microbiology, O.S.U.).

#### Recoveries of Floy-tagged Adult Salmon

Tags from 17 coho and three chinook salmon were returned to us. Most of these fish were caught over 30 days after being tagged and released (range 6-146 days). Over half were recovered less than 30 miles north or south of the latitude of release, indicating little net north-south migration. Four coho tagged off Washington were recovered in British Columbia (Table 7).

#### REFERENCE

- Scarnecchia, D.L. 1979. Factors affecting coho salmon production in Oregon. M.S. Thesis, Oregon State University, Corvallis, OR, 100 pp.

Table 7. Summary of recoveries of floy tagged salmon through December, 1982.

| Floy Tag Number | Set No. | Location Tagged     | Location Recovered                                 | Date Tagged | Date Recovered | Species | Days Between Release and Recovery |
|-----------------|---------|---------------------|--|-------------|----------------|---------|-----------------------------------|
| 218             | 002     | 9.9 mi Waatch Pt.   | Canadian Fishery                                   | 5/19/82     | --             | CO      | --                                |
| 225 + 226       | 003     | 14.7 mi Waatch Pt.  | 12 mi off Tatoosh Is.                              | 5/19/82     | 7/20/82        | CO      | 62                                |
| 228             | 003     | 14.7 mi Waatch Pt.  | Southern Puget Sound                               | 5/19/82     | 9/18/82        | CO      | 122                               |
| 242 + 243       | 007     | 6.2 mi Sea Lion Rk. | Landed Sekiu, WA                                   | 5/20/82     | 9/18/82        | CO      | 121                               |
| 262 + 263       | 019     | 10.1 mi Grays Hbr.  | Estevan to Tofino, BC                              | 5/22/82     | (7/15/82)?     | CO      | 54                                |
| 288             | 023     | 9.7 mi Willapa Bay  | Banks of the Fraser R.<br>(not attached to a fish) | 5/23/82     | --             | Chin    | --                                |
| 289 + 290       | 025     | 15.1 mi Willapa Bay | Cape Disappointment                                | 5/23/82     | 7/1/82         | CO      | 39                                |
| 393             | 056     | 10.3 mi Wecoma Bch. | Straits of Juan De Fuca                            | 5/31/82     | 9/8/82         | CO      | 100                               |
| 398             | 056     | 10.3 mi Wecoma Bch. | South of Columbia R.<br>Buoy #2                    | 5/31/82     | 7/1/82         | CO      | 31                                |
| 438             | 056     | 10.3 mi Wecoma Bch. | Cape Meares  | 5/31/82     | 7/10/82        | CO      | 40                                |
| 444             | 056     | 10.3 mi Wecoma Bch. | Off Yachats  | 5/31/82     | 7/6/82         | Chin    | 36                                |
| 517 + 518       | 072     | 14.9 mi Quinault R. | Robertson Cr. Hatch. BC                            | 6/7/82      | 10/28/82       | CO      | 143                               |
| 611             | 089     | 8.4 mi Breakers     | Columbia Gillnet<br>River Miles 18 to 52           | 6/11/82     | 11/4/82        | CO      | 146                               |
| 612 + 613       | 089     | 8.4 mi Breakers     | Off South Jetty of<br>Columbia R.                  | 6/11/82     | 7/31/82        | Chin    | 50                                |
| 616 + 618       | 089     | 8.4 mi Breakers     | Cowlitz Hatchery                                   | 6/11/82     | 10/26/82       | CO      | 137                               |
| 619             | 089     | 8.4 mi Breakers     | Near Columbia R.                                   | 6/11/82     | 6/22/82        | CO      | 11                                |
| 640 + 641       | 091     | 16.2 mi Breakers    | Near Ilwaco  | 6/11/82     | 7/6/82         | CO      | 25                                |
| 693 + 694       | 098     | 4.0 mi Hug Pt.      | No information                                     | 6/13/82     | --             | CO      | --                                |
| 724 + 725       | 129     | 8.2 mi Cape Lookout | Inside Depoe Bay                                   | 6/22/82     | 6/28/82        | CO      | 6                                 |
| 727             | 107     | 8.7 mi Cape Lookout | Cascade Hd. to<br>Heceta Hd.                       | 6/16/82     | 7/19-25/82     | CO      | 33                                |

Appendix A. Purse seine set locations and environmental data, 1982.

| Set No. | Date   | Transect      | Distance Offshore |         | Time Start | Depth (m) | Bearing (°true) | Temp. °C | Sal. (‰) | Light (fc) | Secchi (m) | Chl. a | Phae. a | CTD   | Plankton |         |             |
|---------|--------|---------------|-------------------|---------|------------|-----------|-----------------|----------|----------|------------|------------|--------|---------|-------|----------|---------|-------------|
|         |        |               | (n.mi)            | Lat.    |            |           |                 |          |          |            |            |        |         |       | Long.    | Tow No. | Comments    |
| 001     | May 19 | Waatch Pt.    | 5.3               | 48 20.8 | 124 49.6   | 1123      | 62              |          |          |            |            |        |         |       |          |         |             |
| 002     | May 19 | Waatch Pt.    | 9.9               | 48 19.8 | 124 54.5   | 1256      | 318             | 50       | 10.8     | 32.2       | 1300       | 9.0    | 5.518   | 0.407 |          |         |             |
| 003     | May 19 | Waatch Pt.    | 14.7              | 48 20.3 | 125 01.9   | 1426      | 218             | 60       | 10.4     | 31.7       | 1200       | 7.0    | 3.920   | 0.203 |          |         |             |
| 004     | May 19 | Waatch Pt.    | 20.1              | 48 20.0 | 125 09.6   | 1600      | 143             | --       | 11.5     | 31.4       | 1200       | 4.0    | 14.617  | 1.529 |          |         |             |
| 005     | May 19 | Waatch Pt.    | 24.7              | 48 20.2 | 125 16.7   | 1734      | 137             | 50       | 12.2     | 30.9       | 1000       | 10.0   | 0.823   | 0.223 |          |         |             |
| 006     | May 19 | Waatch Pt.    | 5.7               | 48 20.2 | 124 49.9   | 2025      | 59              | 250      | 11.8     | 30.8       | 500        | 7.5    | 0.871   | 0.290 |          |         |             |
| 007     | May 20 | Sea Lion Rock | 6.2               | 47 58.8 | 124 49.4   | 0837      | 55              | 0        | 9.5      | 32.7       | 100        | 8.0    | 2.823   | 0.323 |          |         |             |
| 008     | May 20 | Sea Lion Rock | 10.4              | 47 59.7 | 124 56.2   | 1320      | 93              | 220      | 11.0     | 31.0       | 250        | 10.0   | 0.968   | 0.310 |          |         | 82-Z1       |
| 009     | May 20 | Sea Lion Rock | 14.9              | 47 59.8 | 125 03.1   | 1505      | 121             | 125      | 11.7     | 30.7       | 400        | 10.0   | 0.484   | 0.271 | x        |         | 82-Z2       |
| 010     | May 20 | Sea Lion Rock | 20.2              | 48 00.3 | 125 10.8   | 1839      | 154             | 50       | 12.0     | 30.8       | 700        | 10.0   | 0.358   | 0.130 | x        |         | 82-Z3       |
| 011     | May 21 | Destruct. Is. | 10.3              | 47 39.9 | 124 39.0   | 0701      | 55              | 260      | 11.9     | 30.9       | 200        | 13.0   | 0.329   | 0.136 |          |         |             |
| 012     | May 21 | Destruct. Is. | 10.7              | 47 40.2 | 124 39.6   | 0802      | 55              | 20       | 10.0     | 31.6       | 200        | 5.0    | 9.738   | 0.000 |          |         | Aborted     |
| 013     | May 21 | Destruct. Is. | 11.2              | 47 40.3 | 124 40.7   | 0921      | 59              | --       | --       | --         | 150        | --     | --      | --    |          |         | Aborted     |
| 014     | May 21 | Destruct. Is. | 15.1              | 47 40.3 | 124 46.1   | 1113      | 80              | 57       | --       | --         | 200        | --     | --      | --    |          |         |             |
| 015     | May 21 | Destruct. Is. | 20.3              | 47 39.8 | 124 53.4   | 1335      | 115             | 30       | 11.2     | 31.2       | 700        | 5.0    | 4.259   | 0.155 | x        |         |             |
| 016     | May 21 | Quinault R.   | 19.9              | 47 20.4 | 124 46.6   | 1700      | 329+*           | 52       | 12.1     | 30.9       | 700        | 11.0   | 0.348   | 0.267 | x        |         |             |
| 017     | May 21 | Quinault R.   | 14.6              | 47 20.3 | 124 38.9   | 1849      | 93              | 20       | 11.7     | 30.9       | 500        | 10.0   | 0.600   | 0.074 | x        |         |             |
| 018     | May 21 | Quinault R.   | 9.9               | 47 20.3 | 124 32.1   | 2024      | 57              | 5        | 11.4     | 31.3       | 400        | 8.0    | 0.532   | 0.165 | x        |         |             |
| 019     | May 22 | Grays Harbor  | 10.1              | 47 00.0 | 124 24.9   | 1305      | 57              | 60       | 10.1     | 31.9       | 60         | --     | 21.296  | 0.774 |          |         |             |
| 020     | May 22 | Grays Harbor  | 14.8              | 46 59.9 | 124 31.9   | 1646      | 79              | 325      | 11.6     | 32.1       | 300        | 3.5    | 5.847   | 0.960 |          |         | 82-Z4       |
| 021     | May 22 | Grays Harbor  | 9.9               | 46 59.8 | 124 24.7   | 2016      | 55              | 300      | 11.7     | 32.2       | 700        | 5.0    | 2.964   | 0.738 | x        |         | 82-Z5       |
| 022     | May 23 | Willapa Bay   | 9.7               | 46 40.4 | 124 18.2   | 1023      | 62              | 80       | 11.4     | 32.1       | 90         | --     | --      | --    |          |         |             |
| 023     | May 23 | Willapa Bay   | 9.7               | 46 40.4 | 124 18.2   | 1137      | 62              | 52       | 10.5     | 31.6       | 700        | 4.0    | 5.953   | 1.539 |          |         |             |
| 024     | May 23 | Willapa Bay   | 13.8              | 46 41.1 | 124 24.3   | 1315      | 82              | --       | --       | --         | --         | --     | --      | --    |          |         | Repeat Set  |
| 025     | May 23 | Willapa Bay   | 15.1              | 46 40.3 | 124 25.9   | 1406      | 90              | 70       | --       | --         | --         | --     | --      | --    |          |         | Aborted     |
| 026     | May 23 | Willapa Bay   | 20.0              | 46 40.1 | 124 32.0   | 1715      | 124             | --       | 11.4     | 32.3       | 725        | 2.5    | 12.197  | 0.348 | x        |         |             |
| 027     | May 23 | Willapa Bay   | 8.3               | 46 39.8 | 124 15.9   | 2000      | 51              | 110      | 11.5     | 31.5       | 600        | 4.5    | 10.164  | 0.987 | x        |         |             |
| 028     | May 24 | Ocean Park    | 9.6               | 46 30.4 | 124 17.6   | 702       | 62              | --       | 11.2     | 31.8       | 150        | --     | 2.081   | 0.532 |          |         |             |
| 029     | May 24 | Cape Disapp.  | 7.0               | 46 20.7 | 124 13.7   | 903       | 49              | 60       | 10.8     | 31.5       | --         | --     | 7.357   | 1.007 |          |         |             |
| 030     | May 24 | Cape Disapp.  | --                | --      | --         | --        | --              | --       | 11.4     | 31.1       | 625        | 6.0    | 2.904   | 0.581 |          |         |             |
| 031     | May 24 | Cape Disapp.  | 9.8               | 46 19.6 | 124 18.0   | 1408      | 150             | --       | 13.0     | 14.6       | --         | --     | --      | --    |          |         | Aborted     |
| 032     | May 27 | Seaside       | 5.6               | 46 00.2 | 124 03.5   | 1009      | 53              | 50       | 11.8     | 31.0       | 800        | 4.5    | 4.646   | 0.697 |          |         |             |
| 033     | May 27 | Seaside       | 5.7               | 46 00.4 | 124 03.6   | 1235      | 57              | 60       | 10.7     | 25.0       | 440        | 2.0    | 3.146   | 0.803 |          |         | Aborted     |
| 034     | May 27 | Seaside       | 10.1              | 46 00.3 | 124 10.0   | 1413      | 86              | --       | 10.4     | 31.2       | 800        | 2.0    | --      | --    |          |         |             |
| 035     | May 27 | Seaside       | 10.0              | 46 00.0 | 124 10.0   | 1555      | 88              | --       | 10.4     | 30.0       | 1200       | 3.0    | 5.421   | 1.084 |          |         |             |
| 036     | May 27 | Seaside       | 14.7              | 45 59.8 | 124 16.9   | 1816      | 119             | --       | 11.0     | 31.2       | 1000       | 3.5    | 5.421   | 0.620 |          |         |             |
| 037     | May 27 | Seaside       | 20.5              | 46 00.0 | 124 25.0   | 2002      | 143             | --       | 11.4     | 32.2       | 600        | 4.0    | 8.228   | 1.646 |          |         |             |
| 038     | May 27 | Seaside       | 25.0              | 46 00.2 | 124 31.3   | 2131      | 152             | East     | 10.6     | 32.2       | 100        | 3.5    | --      | --    |          |         |             |
| 039     | May 28 | Warrenton     | 14.8              | 46 09.3 | 124 19.1   | 1212      | 106             | 50       | 10.3     | 31.9       | .06        | --     | 8.954   | 1.500 |          |         |             |
| 040     | May 28 | Warrenton     | 21.5              | 46 09.4 | 124 28.9   | 1601      | 135             | --       | 12.3     | 17.6       | 1000       | 1.0    | 3.388   | 0.910 | x        |         | 82-Z6       |
| 041     | May 28 | Warrenton     | 22.3              | 46 07.6 | 124 29.0   | 1736      | 134             | 150      | 10.3     | 32.0       | 700        | 3.5    | 18.876  | 0.871 | x        |         | 82-Z7       |
| 042     | May 28 | Warrenton     | 24.6              | 46 10.2 | 124 33.9   | 1920      | 155             | 140      | 10.8     | 32.0       | 450        | 4.0    | --      | --    |          |         | Aborted     |
| 043     | May 28 | Warrenton     | 30.2              | 46 10.2 | 124 41.7   | 2054      | 366             | 150      | 11.2     | 31.8       | 160        | 6.0    | 4.937   | 0.407 |          |         | Repeat Set. |
| 044     | May 30 | Nehalem       | 5.4               | 45 40.7 | 124 03.8   | 1005      | 71              | 160      | 11.4     | 31.7       | 25         | 5.0    | 1.500   | 0.532 |          |         | Aborted     |
| 045     | May 30 | Nehalem       | 10.0              | 45 40.6 | 124 10.4   | 1121      | 108             | 200      | 9.3      | 33.1       | 500        | 5.0    | 8.518   | 1.239 | x        |         |             |
| 046     | May 30 | Nehalem       | 15.2              | 45 40.3 | 124 17.8   | 1305      | 141             | 110      | 11.4     | 31.5       | 750        | 4.5    | 6.582   | 0.387 | x        |         |             |
| 047     | May 30 | Nehalem       | 19.9              | 45 40.3 | 124 24.6   | 1506      | 166             | 100      | 12.0     | 29.2       | 1000       | 3.5    | 6.776   | 0.891 | x        |         |             |
|         |        |               |                   |         |            |           |                 |          | 12.2     | 27.4       | 800        | 3.5    | 5.034   | 0.542 | x        |         |             |

\* Depth from navigation chart



## Appendix A. (cont.)

| Set No. | Date    | Transect     | Distance Offshore |            | Time Start | Depth (m) | Bearing (°true) | Temp. °C | Sal. (‰) | Light (fc) | Secchi (m) | Chl. a | Phae. a | CTD   | Plankton |                   |
|---------|---------|--------------|-------------------|------------|------------|-----------|-----------------|----------|----------|------------|------------|--------|---------|-------|----------|-------------------|
|         |         |              | (n.mi)            | Lat. Long. |            |           |                 |          |          |            |            |        |         |       | Tow No.  | Comments          |
| 048     | May 30  | Cape Lookout | 5.2               | 45 19.9    | 124 05.5   | 1921      | 88              | 200      | 10.6     | 32.0       | 400        | 3.5    | 16.940  | 1.065 |          |                   |
| 049     | May 30  | Cape Lookout | 4.6               | 45 20.2    | 124 04.9   | 2021      | 88              | 200      | 10.4     | 32.0       | 40         | --     | --      | --    |          | Repeat Set        |
| 050     | May 31  | Cape Lookout | 9.3               | 45 20.7    | 124 12.4   | 0742      | 148             | 150      | 9.8      | 32.3       | 200        | 7.0    | 7.163   | 1.665 | x        |                   |
| 051     | May 31  | Cape Lookout | 14.8              | 45 20.1    | 124 19.4   | 0952      | 192             | 150      | 10.8     | 31.3       | 300        | 6.0    | 3.098   | 1.723 | x        |                   |
| 052     | May 31  | Cape Lookout | 19.2              | 45 20.9    | 124 25.8   | 1140      | 366             | 170      | 11.3     | 31.0       | 250        | 6.0    | 2.323   | 0.581 | x        |                   |
| 053     | May 31  | Cape Lookout | 25.1              | 45 20.0    | 124 33.7   | 1400      | 454             | 170      | 11.7     | 30.8       | 400        | 5.0    | 2.323   | 0.581 | x        |                   |
| 054     | May 31  | Wecoma Beach | 19.7              | 44 59.5    | 124 28.4   | 1659      | 346             | 170      | 11.8     | 31.8       | 400        | 7.5    | 0.836   | 0.348 | x        |                   |
| 055     | May 31  | Wecoma Beach | 15.0              | 45 00.9    | 124 21.7   | 1841      | 201             | 130      | 11.2     | 31.6       | 400        | 8.0    | 1.162   | 0.465 | x        |                   |
| 056     | May 31  | Wecoma Beach | 10.3              | 45 00.4    | 124 15.0   | 2109      | 146             | 200      | 10.2     | 31.6       | 0.5        | --     | 1.404   | 0.629 | x        |                   |
| 057     | June 1  | Wecoma Beach | 3.2               | 45 00.9    | 124 04.9   | 0748      | 59              | 150      | 9.7      | 32.7       | 400        | 3.0    | 21.296  | 1.936 |          |                   |
| 058     | June 1  | Wecoma Beach | 3.3               | 45 00.3    | 124 05.2   | 0852      | 60              | 140      | --       | --         | 150        | --     | --      | --    |          |                   |
| 059     | June 1  | Wecoma Beach | 5.1               | 45 00.6    | 124 07.7   | 1124      | 88              | --       | 10.6     | 32.4       | 750        | 3.5    | 15.004  | 3.001 | 82-Z8    | Repeat Set        |
| 060     | June 1  | Yaquina Head | 5.2               | 44 40.4    | 124 10.8   | 1425      | 60              | 170      | 10.8     | 32.3       | 750        | 3.0    | 10.164  | 1.162 |          |                   |
| 061     | June 1  | Yaquina Head | 9.7               | 44 40.9    | 124 17.7   | 1545      | 82              | 140      | 10.8     | 33.1       | 300        | 3.5    | 7.550   | 0.348 | x        |                   |
| 062     | June 1  | Yaquina Head | 14.5              | 44 40.7    | 124 24.4   | 1711      | 90              | 160      | 11.3     | 31.8       | 300        | 7.5    | 1.936   | 0.620 | x        |                   |
| 063     | June 1  | Yaquina Head | 19.5              | 44 41.3    | 124 31.4   | 1850      | 137             | --       | 11.5     | 32.5       | 400        | 12.0   | 0.465   | 0.197 | x        |                   |
| 064     | June 2  | Yachats      | 19.8              | 44 20.0    | 124 33.5   | 0534      | 93              | 320      | 10.4     | 32.2       | 7.0        | 5.0    | 4.259   | 0.852 | x        |                   |
| 065     | June 2  | Yachats      | 14.5              | 44 20.0    | 124 26.2   | 0715      | 90              | 340      | 9.9      | 33.2       | 100        | 2.5    | 17.424  | 3.485 | x        |                   |
| 066     | June 2  | Yachats      | 10.4              | 44 19.7    | 124 20.6   | 0846      | 79              | 40       | 9.3      | 32.9       | 150        | 3.5    | 12.342  | 1.597 | x        |                   |
| 067     | June 2  | Yachats      | 4.5               | 44 19.7    | 124 12.4   | 1041      | 59              | 20       | 9.4      | 33.2       | 300        | 3.5    | 16.456  | 4.453 | x        |                   |
| 068     | June 2  | Siuslaw R.   | 4.6               | 43 59.6    | 124 14.6   | 1400      | 73              | 60       | 9.9      | 32.9       | 175        | 3.0    | 8.954   | 1.210 | x        |                   |
| 069     | June 2  | Siuslaw R.   | 9.9               | 44 00.3    | 124 24.8   | 1550      | 110             | --       | 10.2     | 33.0       | 600        | 3.5    | 13.310  | 3.533 | x        |                   |
| 070     | June 2  | Siuslaw R.   | 14.8              | 44 00.0    | 124 28.7   | 1740      | 128             | 20       | 10.7     | 32.2       | 300        | 7.0    | 5.808   | 1.162 | x        | Aborted           |
| 071     | June 7  | Quinalt R.   | 10.0              | 47 20.0    | 124 32.1   | 0626      | 57              | ~100     | 11.3     | 32.8       | 82         | 8.0    | 0.465   | 0.197 | x        |                   |
| 072     | June 7  | Quinalt R.   | 14.9              | 47 20.3    | 124 39.3   | 0815      | 95              | 30       | 10.8     | 32.4       | 150        | 4.5    | 7.986   | 1.249 | x        |                   |
| 073     | June 7  | Quinalt R.   | 19.2              | 47 20.6    | 124 45.9   | 1028      | 159             | --       | 11.7     | 31.8       | 200        | 10.0   | 0.736   | 0.275 | x        |                   |
| 074     | June 7  | Quinalt R.   | 15.4              | 47 20.0    | 124 39.9   | 1210      | 101             | 75       | --       | --         | 300        | 4.5    | --      | --    |          | Aborted           |
| 075     | June 7  | Grays Harbor | 20.1              | 47 00.0    | 124 39.5   | 1608      | 104             | 30       | 11.5     | 31.8       | 300        | 8.5    | 0.891   | 0.271 |          |                   |
| 076     | June 7  | Grays Harbor | 15.1              | 47 00.2    | 124 32.1   | 1736      | 79              | 55       | 10.8     | 32.3       | 150        | 6.0    | 4.646   | 0.000 |          |                   |
| 077     | June 7  | Grays Harbor | 10.0              | 47 00.3    | 124 24.8   | 1907      | 57              | 130      | 12.3     | 31.3       | 150        | 5.5    | --      | --    |          |                   |
| 078     | June 7  | Grays Harbor | 10.0              | 47 00.3    | 124 24.8   | 2002      | 57              | 70       | --       | --         | --         | --     | --      | --    | x        | Repeat Set        |
| 079     | June 8  | Willapa Bay  | 9.4               | 46 40.7    | 124 17.8   | 0646      | 62              | 110      | 12.1     | 28.2       | 80         | 3.5    | --      | --    | x        | 82-Z9             |
| 080     | June 8  | Willapa Bay  | 11.4              | 46 40.5    | 124 20.6   | 0851      | 71              | 130      | 12.4     | 27.0       | 150        | --     | 4.840   | 0.736 |          |                   |
| 081     | June 8  | Willapa Bay  | 17.2              | 46 40.9    | 124 29.2   | 1045      | 97              | 70       | 11.6     | 30.9       | 360        | 6.5    | 2.517   | 0.097 | x        |                   |
| 082     | June 10 | Willapa Bay  | 10.7              | 46 40.2    | 124 19.4   | 0723      | 70              | 75       | 11.9     | 31.4       | 110        | 6.5    | 2.323   | 0.581 |          |                   |
| 083     | June 10 | Willapa Bay  | 14.9              | 46 40.4    | 124 25.6   | 0902      | 88              | 125      | 11.6     | 32.2       | 200        | 6.0    | 3.001   | 0.484 | x        |                   |
| 084     | June 10 | Willapa Bay  | 19.1              | 46 40.8    | 124 32.0   | 1041      | 119             | 100      | 11.7     | 32.1       | 330        | 8.0    | 1.520   | 0.722 | x        |                   |
| 085     | June 10 | Ocean Park   | 20.1              | 46 30.0    | 124 32.4   | 1243      | ~560*           | --       | 11.7     | 32.1       | 400        | 8.0    | 0.213   | 0.221 | x        |                   |
| 086     | June 10 | Ocean Park   | 14.9              | 46 30.0    | 124 25.0   | 1430      | 99              | 170      | 12.3     | 31.6       | 420        | 6.0    | 1.549   | 0.426 | x        |                   |
| 087     | June 10 | Ocean Park   | 10.0              | 46 30.3    | 124 18.0   | 1616      | 68              | 110      | 11.8     | 31.7       | 350        | 3.5    | 8.131   | 0.278 |          |                   |
| 088     | June 10 | Ocean Park   | 9.8               | 46 29.8    | 124 17.5   | 1705      | 66              | 140      | 11.7     | --         | 280        | --     | --      | --    |          | 82-Z10 Repeat Set |
| 089     | June 11 | Breakers     | 8.4               | 46 22.7    | 124 15.6   | 0730      | 60              | 70       | 11.6     | 31.4       | 250        | 4.5    | 5.808   | 0.697 |          |                   |
| 090     | June 11 | Breakers     | 10.3              | 46 23.1    | 124 18.2   | 0940      | 71              | 80       | 12.5     | 31.6       | 170        | 5.0    | 3.678   | 0.503 | x        |                   |
| 091     | June 11 | Breakers     | 16.2              | 46 22.9    | 124 26.8   | 1128      | 110             | 20       | 12.4     | 32.0       | 300        | 7.0    | 1.162   | 0.348 | x        |                   |
| 092     | June 11 | Breakers     | 20.2              | 46 23.3    | 124 32.5   | 1259      | 139             | 50       | 12.0     | 31.8       | 200        | 9.0    | 0.436   | 0.145 |          |                   |
| 093     | June 11 | Warrenton    | 7.8               | 46 10.0    | 124 09.5   | 1609      | 57              | 0        | 10.8     | 29.0       | 380        | 4.0    | 2.420   | 1.065 |          |                   |
| 094     | June 11 | Warrenton    | 11.2              | 46 09.9    | 124 14.3   | 1737      | 88              | 345      | --       | --         | 230        | 2.0    | --      | --    |          | Aborted           |
| 095     | June 12 | Seaside      | 9.7               | 46 00.6    | 124 09.4   | 0840      | 84              | 90       | 12.4     | 26.5       | 230        | 5.0    | 4.259   | 0.794 |          |                   |

\* Depth from navigation chart

## Appendix A. (cont.)

| Set No. | Date    | Transect     | Distance Offshore |         |          | Time Start | Depth (m) | Bearing (°true) | Temp. °C | Sal. (‰) | Light (fc) | Secchi |         |       | Plankton |  |                  | Comments |
|---------|---------|--------------|-------------------|---------|----------|------------|-----------|-----------------|----------|----------|------------|--------|---------|-------|----------|--|------------------|----------|
|         |         |              | (n.mi)            | Lat.    | Long.    |            |           |                 |          |          |            | Chl. a | Phae. a | CTD   | Tow No.  |  |                  |          |
| 096     | June 12 | Seaside      | 10.4              | 46 00.2 | 124 10.5 | 1000       | 88        | 55              | 12.4     | 26.3     | 200        | --     | --      | --    | x        |  | Repeat Set       |          |
| 097     | June 12 | Seaside      | 12.8              | 46 00.8 | 124 13.8 | 1113       | 95        | 85              | 12.6     | 26.5     | 150        | 5.0    | 3.291   | 0.891 |          |  |                  |          |
| 098     | June 13 | Hug Point    | 4.0               | 45 51.2 | 124 03.5 | 0959       | 68        | 85              | 12.6     | 26.1     | 230        | 5.0    | 2.517   | 0.736 |          |  |                  |          |
| 099     | June 13 | Hug Point    | 7.5               | 45 49.9 | 124 08.3 | 1149       | 90        | 50              | 13.1     | 26.1     | 280        | 8.0    | 2.517   | 0.503 |          |  | Aborted          |          |
| 100     | June 13 | Hug Point    | 16.4              | 45 50.3 | 124 21.0 | 1521       | 137       | --              | 13.3     | 30.0     | 240        | 7.0    | 0.920   | 1.113 |          |  |                  |          |
| 101     | June 13 | Hug Point    | 12.1              | 45 50.3 | 124 14.7 | 1647       | 124       | 60              | 13.0     | 26.6     | 170        | 6.0    | 1.868   | 0.536 |          |  |                  |          |
| 102     | June 14 | Nehalem      | 3.7               | 45 39.6 | 124 01.6 | 1945       | 59        | --              | 11.5     | 30.1     | 85         | 3.0    | 11.053  | 1.859 |          |  |                  |          |
| 103     | June 14 | Nehalem      | 4.9               | 45 40.0 | 124 03.3 | 0736       | 68        | 90              | 10.9     | 30.9     | 300        | 3.0    | 8.712   | 3.833 |          |  |                  |          |
| 104     | June 14 | Nehalem      | 9.9               | 45 40.6 | 124 10.3 | 1040       | 108       | 100             | 12.1     | 28.9     | 160        | 7.0    | 2.033   | 0.871 |          |  |                  |          |
| 105     | June 14 | Nehalem      | 15.1              | 45 40.6 | 124 17.6 | 1240       | --        | 125             | 12.6     | 29.4     | 320        | 8.0    | 1.258   | 0.484 |          |  | Not quantitative |          |
| 106     | June 16 | Cape Lookout | 5.0               | 45 20.0 | 124 05.3 | 0621       | 146       | 100             | 8.8      | 33.0     | 100        | 11.0   | 0.678   | 0.484 | x        |  |                  |          |
| 107     | June 16 | Cape Lookout | 8.7†              | 45 20.4 | 124 12.3 | 0818       | 148       | 130             | 11.1     | 31.8     | 300        | 6.5    | 1.162   | 0.465 | x        |  |                  |          |
| 108     | June 16 | Cape Lookout | 9.1†              | 45 20.4 | 124 12.9 | 1037       | 15        | --              | 11.2     | --       | 250        | 6.0    | --      | --    |          |  | Repeat Set       |          |
| 109     | June 17 | Wecoma Beach | 3.5               | 45 00.0 | 124 05.4 | 1455       | 62        | 110             | 9.2      | 33.0     | 360        | 10.0   | 0.687   | 0.347 |          |  |                  |          |
| 110     | June 17 | Wecoma Beach | 10.3              | 45 00.3 | 124 15.0 | 1723       | 152       | 115             | 10.6     | 32.1     | 180        | 7.5    | 1.113   | 0.397 | x        |  |                  |          |
| 111     | June 18 | Yaquina Head | 14.3†             | 44 40.5 | 124 24.7 | 0949       | 93        | 80              | 9.7      | 32.5     | 800        | 15.5   | 0.513   | 0.207 | x        |  |                  |          |
| 112     | June 18 | Yaquina Head | 20.0              | 44 40.2 | 124 31.5 | 1130       | 134       | 85              | 11.8     | 32.1     | 900        | 10.5   | 1.089   | 0.218 | x        |  |                  |          |
| 113     | June 18 | Yaquina Head | 25.2              | 44 40.0 | 124 38.7 | 1316       | 285       | 110             | 13.4     | 31.9     | 900        | 7.5    | 1.791   | 0.474 | x        |  |                  |          |
| 114     | June 18 | Yaquina Head | 29.3†             | 44 40.6 | 124 45.5 | 1512       | ~95*      | --              | 13.8     | 31.5     | 850        | 8.0    | 1.210   | 0.300 | x        |  |                  |          |
| 115     | June 19 | Yaquina Head | 10.1              | 44 39.4 | 124 17.5 | 1856       | 77        | 300             | 9.2      | 33.0     | 350        | 12.0   | 0.426   | 0.108 | x        |  |                  |          |
| 116     | June 19 | Yaquina Head | 5.1               | 44 40.2 | 124 10.7 | 2033       | 60        | 240             | 8.9      | 33.8     | 48         | 10.0   | 0.407   | 0.128 |          |  |                  |          |
| 117     | June 19 | Yachats      | 4.7               | 44 19.8 | 124 12.7 | 1427       | 60        | 310             | 11.3     | 33.5     | 500        | 2.5    | 17.182  | 2.856 |          |  |                  |          |
| 118     | June 19 | Yachats      | 9.8               | 44 20.0 | 124 19.6 | 1600       | 77        | 60              | 11.4     | 33.5     | 350        | 4.5    | 10.745  | 0.058 | x        |  |                  |          |
| 119     | June 19 | Yachats      | 15.5              | 44 20.0 | 124 27.5 | 1750       | 93        | 95              | 9.8      | 33.2     | 200        | 7.0    | 3.485   | 0.232 | x        |  |                  |          |
| 120     | June 19 | Yachats      | 19.9              | 44 20.0 | 124 33.6 | 1920       | 95        | 58              | 9.6      | 32.8     | 120        | 10.0   | 1.452   | 0.523 |          |  |                  |          |
| 121     | June 20 | Wecoma Beach | 3.6               | 44 59.6 | 124 05.8 | 0945       | 64        | --              | 10.3     | 32.8     | 200        | 5.5    | 1.113   | 0.304 |          |  |                  |          |
| 122     | June 20 | Wecoma Beach | 10.4              | 45 00.3 | 124 15.1 | 1310       | 148       | 110             | 12.9     | 30.2     | 400        | 5.0    | 1.723   | 0.449 | x        |  |                  |          |
| 123     | June 20 | Wecoma Beach | 15.2              | 45 00.0 | 124 22.1 | 1454       | 205       | 120             | 13.1     | 30.6     | 200        | 7.0    | 1.162   | 0.348 | x        |  |                  |          |
| 124     | June 20 | Wecoma Beach | 15.2              | 45 00.0 | 124 22.1 | 1652       | 203       | --              | 13.1     | --       | 280        | --     | --      | --    |          |  | Repeat Set       |          |
| 125     | June 21 | Cape Lookout | 19.0†             | 45 20.6 | 124 26.2 | 0848       | ~22*      | 140             | 12.7     | 30.4     | 230        | 6.5    | 1.307   | 0.436 | x        |  |                  |          |
| 126     | June 21 | Cape Lookout | 24.0†             | 45 20.5 | 124 33.7 | 1133       | ~59*      | 100             | 13.3     | 30.4     | 490        | 6.5    | 0.997   | 0.397 | x        |  |                  |          |
| 127     | June 21 | Cape Lookout | 19.8              | 45 20.1 | 124 26.3 | 1405       | ~26*      | 140             | 13.2     | 30.0     | 500        | 6.0    | --      | --    |          |  | Repeat Set       |          |
| 128     | June 21 | Cape Lookout | 1.3               | 45 19.8 | 123 59.9 | 1850       | 11        | --              | 9.0      | 33.6     | 150        | 4.5    | --      | --    |          |  |                  |          |
| 129     | June 22 | Cape Lookout | 8.2†              | 45 20.4 | 124 12.0 | 0633       | 141       | 120             | 11.4     | 31.6     | 180        | 4.5    | 3.388   | 0.678 | x        |  |                  |          |
| 130     | June 22 | Cape Lookout | 14.5†             | 45 20.6 | 124 19.7 | 0849       | 190       | --              | 12.1     | 31.1     | 400        | 4.5    | 3.098   | 0.852 | x        |  |                  |          |
| 131     | Sept. 4 | Quinalt R.   | 9.9               | 47 19.8 | 124 31.7 | 0810       | 57        | 230             | 15.2     | 30.9     | 150        | 3.5    | 4.356   | 1.104 | x        |  |                  |          |
| 132     | Sept. 4 | Quinalt R.   | 14.7              | 47 20.3 | 124 39.0 | 1204       | 93        | 90              | 15.4     | 31.5     | 450        | 6.5    | 1.549   | 0.310 | x        |  |                  |          |
| 133     | Sept. 4 | Quinalt R.   | 20.2              | 47 20.0 | 124 46.9 | 1452       | ~571*     | 80              | 15.1     | --       | 600        | 10.0   | 0.561   | 0.275 |          |  |                  |          |
| 134     | Sept. 4 | Quinalt R.   | 20.0              | 47 19.8 | 124 46.6 | 1540       | ~571*     | 210             | 16.1     | 31.7     | 280        | --     | --      | --    | x        |  | Not quantitative |          |
| 135     | Sept. 4 | Quinalt R.   | 25.3              | 47 20.0 | 124 54.2 | 1749       | ~686*     | 85              | 16.8     | 32.0     | 300        | 14.0   | 0.165   | 0.079 | x        |  | Not quantitative |          |
| 136     | Sept. 5 | Grays Harbor | 9.8               | 47 00.0 | 124 24.6 | 0703       | 55        | --              | 14.8     | 31.5     | 50         | 12.0   | 0.639   | 0.281 | x        |  |                  |          |
| 137     | Sept. 5 | Grays Harbor | 12.7              | 46 59.8 | 124 28.6 | 0925       | 70        | 160             | 15.0     | 31.8     | 400        | 13.0   | 0.503   | 0.170 |          |  |                  |          |
| 138     | Sept. 5 | Grays Harbor | 15.2              | 47 00.4 | 124 32.4 | 1041       | 77        | 90              | 15.5     | 32.1     | 500        | 7.5    | 1.139   | 0.305 |          |  |                  |          |
| 139     | Sept. 5 | Grays Harbor | 15.1              | 46 59.5 | 124 32.2 | 1157       | 79        | 90              | 15.6     | 31.9     | 700        | 6.0    | --      | --    | x        |  | Repeat Set       |          |
| 140     | Sept. 5 | Grays Harbor | 20.3              | 47 00.0 | 124 39.8 | 1452       | 106       | 70              | 17.0     | 31.4     | --         | 8.5    | 0.358   | 0.165 | x        |  |                  |          |
| 141     | Sept. 5 | Willapa Bay  | 8.7               | 46 40.0 | 124 16.6 | 1843       | 55        | 65              | 16.2     | 30.0     | 400        | 7.0    | 1.065   | 0.213 |          |  |                  |          |
| 142     | Sept. 6 | Willapa Bay  | 8.3               | 46 40.2 | 124 16.3 | 0638       | 55        | 140             | 15.8     | 29.0     | 5          | 6.5    | 5.421   | 0.620 |          |  |                  |          |

† Off a cape or point

\* Depth from navigation chart

## Appendix A. (cont.)

| Set No. | Date     | Transect      | Distance Offshore |            | Time Start | Depth (m) | Bearing (°true) | Temp. °C | Sal. (‰) | Light (fc) | Secchi (m) | Chl. a | Phae. a | CTD   | Plankton Tow No. | Comments         |
|---------|----------|---------------|-------------------|------------|------------|-----------|-----------------|----------|----------|------------|------------|--------|---------|-------|------------------|------------------|
|         |          |               | (n.mi)            | Lat. Long. |            |           |                 |          |          |            |            |        |         |       |                  |                  |
| 143     | Sept. 6  | Willapa Bay   | 12.4              | 46 40.4    | 124 22.1   | 0835      | 77              | 140      | 16.1     | --         | 450        | 7.5    | 2.710   | 0.310 |                  |                  |
| 144     | Sept. 6  | Willapa Bay   | 12.0              | 46 40.3    | 124 21.5   | 0945      | 77              | --       | 16.1     | --         | 550        | 6.0    | --      | --    | x                | Repeat Set       |
| 145     | Sept. 6  | Willapa Bay   | 14.9              | 46 40.0    | 124 25.6   | 1105      | 88              | 140      | 16.1     | 31.1       | 700        | 12.5   | 1.036   | 0.161 | x                |                  |
| 146     | Sept. 6  | Willapa Bay   | 20.2              | 46 39.9    | 124 33.0   | 1309      | 126             | 245      | 16.5     | 31.4       | 350        | 11.5   | 0.490   | 0.149 | x                |                  |
| 147     | Sept. 6  | Cape Disapp.  | 19.4              | 46 20.4    | 124 31.5   | 1730      | 137             | 145      | 15.4     | 25.8       | 190        | 4.0    | 7.938   | 0.658 |                  |                  |
| 148     | Sept. 6  | Cape Disapp.  | 14.9              | 46 20.0    | 124 25.1   | 2007      | 126             | 330      | 15.5     | 25.4       | 0.1        | --     | 5.905   | 0.949 | x                |                  |
| 149     | Sept. 6  | Cape Disapp.  | 7.0               | 46 20.0    | 124 14.0   | 0643      | 53              | 110      | 15.6     | 24.9       | 110        | 4.0    | 7.725   | 0.569 | x                | 82-212           |
| 150     | Sept. 7  | Cape Disapp.  | 10.0              | 46 20.1    | 124 18.2   | 0948      | 79              | 150      | 15.8     | 25.2       | 558        | 4.0    | 9.293   | 0.000 | x                |                  |
| 151     | Sept. 7  | Cape Disapp.  | 9.2               | 46 20.1    | 124 17.7   | 1050      | 77              | 155      | --       | --         | --         | --     | --      | --    |                  |                  |
| 152     | Sept. 7  | Cape Disapp.  | 15.5              | 46 20.0    | 124 26.2   | 1237      | 128             | 140      | 16.5     | --         | 400        | 4.0    | 4.308   | 0.571 |                  | Repeat Set       |
| 153     | Sept. 7  | Seaside       | 19.3              | 45 59.0    | 124 23.6   | 1634      | 137             | 270      | 17.4     | --         | 250        | 4.5    | 3.098   | 0.387 |                  | Aborted          |
| 154     | Sept. 8  | Tillamook Rk. | 2.4               | 45 56.3    | 124 02.9   | 0744      | 57              | 260      | 14.1     | 31.8       | 350        | 4.5    | 4.066   | 2.207 | x                | Not quantitative |
| 155     | Sept. 8  | Tillamook Rk. | 5.1               | 45 56.3    | 124 06.7   | 1002      | 79              | 255      | 15.0     | 31.5       | 250        | 7.5    | 1.113   | 0.165 | x                |                  |
| 156     | Sept. 9  | Hug Point     | 9.3               | 45 50.5    | 124 11.2   | 1046      | 104             | 195      | 16.5     | --         | 200        | 4.5    | 1.682   | 0.515 | x                |                  |
| 157     | Sept. 9  | Hug Point     | 15.1              | 45 50.4    | 124 19.1   | 1345      | 144             | 40       | 16.6     | 29.1       | 300        | 7.0    | 1.210   | 0.184 | x                |                  |
| 158     | Sept. 9  | Nehalem       | 20.1              | 45 40.2    | 124 35.0   | 1640      | 172             | 35       | 16.7     | 31.2       | 400        | 9.0    | 0.552   | 0.122 | x                |                  |
| 159     | Sept. 9  | Nehalem       | 14.8              | 45 39.2    | 124 17.4   | 1810      | 143             | 100      | 15.9     | 31.4       | 200        | 7.5    | 0.968   | 0.310 |                  |                  |
| 160     | Sept. 9  | Nehalem       | 3.1               | 45 40.0    | 124 00.8   | 2050      | 55              | 23       | 15.2     | 31.5       | --         | --     | 1.055   | 0.211 | x                |                  |
| 161     | Sept. 11 | Cape Lookout  | 2.0+              | 45 20.7    | 124 02.3   | 1707      | 55              | 70       | 13.9     | 32.0       | --         | 5.5    | --      | --    | x                |                  |
| 162     | Sept. 11 | Cape Lookout  | 4.9               | 45 21.1    | 124 05.4   | 1903      | 88              | 70       | 14.4     | 31.8       | 4          | 5.0    | --      | --    |                  |                  |
| 163     | Sept. 12 | Cape Lookout  | 4.2+              | 45 20.7    | 124 05.3   | 0717      | 84              | 75       | 14.8     | 31.7       | 50         | 6.5    | 4.162   | 0.949 | x                | Repeat Set       |
| 164     | Sept. 12 | Cape Lookout  | 9.8               | 45 20.0    | 124 12.2   | 0912      | 143             | --       | 15.8     | 31.5       | 180        | 8.0    | 0.891   | 0.248 | x                |                  |
| 165     | Sept. 12 | Cape Lookout  | 5.6               | 45 20.5    | 124 08.0   | 1104      | 104             | 130      | 14.5     | 31.9       | 300        | 5.0    | 3.001   | 0.832 |                  | Not quantitative |
| 166     | Sept. 13 | Yaquina Head  | 6.7               | 44 40.2    | 124 13.2   | 1705      | 68              | 85       | 14.0     | 32.3       | 200        | 6.0    | 2.023   | 0.532 | x                |                  |
| 167     | Sept. 14 | Yaquina Head  | 10.3              | 44 40.2    | 124 17.9   | 0706      | 80              | 120      | 13.4     | 32.9       | 70         | 5.0    | 2.396   | 0.926 | x                |                  |
| 168     | Sept. 14 | Yaquina Head  | 14.9              | 44 40.1    | 124 24.5   | 0900      | 93              | 100      | 13.7     | 32.1       | 175        | 7.5    | 1.694   | 0.687 | x                |                  |
| 169     | Sept. 14 | Yachats       | 15.1              | 44 20.0    | 124 27.0   | 1217      | 93              | 160      | 13.9     | 32.8       | 400        | 11.0   | 1.094   | 0.091 | x                |                  |
| 170     | Sept. 14 | Yachats       | 10.5              | 44 19.8    | 124 20.5   | 1402      | 79              | 190      | 13.5     | --         | 300        | 7.5    | 2.497   | 0.499 |                  |                  |
| 171     | Sept. 14 | Yachats       | 4.7               | 44 19.9    | 124 12.6   | 1534      | 55              | 175      | 13+      | 32.9       | --         | 9.0    | 1.113   | 0.745 |                  |                  |
| 172     | Sept. 14 | Yachats       | 3.1               | 44 19.1    | 124 10.7   | 1629      | 51              | 150      | 13.0     | 33.1       | 300        | 6.5    | 2.710   | 1.007 | x                |                  |
| 173     | Sept. 14 | Yachats       | 2.8               | 44 18.6    | 124 10.4   | 1735      | 51              | 175      | 12.4     | --         | 150        | 5.5    | 2.807   | 1.723 |                  |                  |

+ Off a cape or point

## Appendix B. Catch of salmonids by set.

MAY 1982 CRUISE

| Set # | Date   | Transect/distance<br>From Shore (n.mi) | Depth<br>(meters) | Temp<br>(°C) | Coho              |            | Chinook           |            | Chum              |            | Sockeye           |            | Steelhead<br>164-260mm | Cutthroat<br>181-360mm |
|-------|--------|--|-------------------|--------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|------------------------|------------------------|
|       |        |  |                   |              | 101-<br>300<br>mm | 301+<br>mm | 101-<br>400<br>mm | 401+<br>mm | 101-<br>280<br>mm | 281+<br>mm | 101-<br>280<br>mm | 281+<br>mm |                        |                        |
| 001   | May 19 | Waatch Pt.                             | 5.3               | 62           | 10.8              | 0          | 13                | 2          | 0                 |            |                   |            |                        |                        |
| 002   | May 19 | Waatch Pt.                             | 9.9               | 318          | 10.4              | 1          | 8                 |            |                   | 0          | 2                 |            |                        |                        |
| 003   | May 19 | Waatch Pt.                             | 14.7              | 218          | 11.5              | 0          | 3                 |            |                   |            |                   |            |                        |                        |
| 004   | May 19 | Waatch Pt.                             | 20.1              | 143          | 12.2              |            |                   |            |                   |            |                   |            |                        |                        |
| 005   | May 19 | Waatch Pt.                             | 24.7              | 137          | 11.8              | 0          | 1                 |            |                   |            |                   |            |                        |                        |
| 006   | May 19 | Waatch Pt.                             | 5.7               | 59           | 9.5               |            |                   |            |                   |            |                   |            |                        |                        |
| 007   | May 20 | Sea Lion Rock                          | 6.2               | 55           | 11.0              | 0          | 6                 |            |                   |            |                   |            |                        |                        |
| 008   | May 20 | Sea Lion Rock                          | 10.4              | 93           | 11.7              | 0          | 1                 |            |                   |            |                   |            | 6                      |                        |
| 009   | May 20 | Sea Lion Rock                          | 19.9              | 121          | 12.0              |            |                   |            |                   |            |                   |            | 3                      |                        |
| 010   | May 20 | Sea Lion Rock                          | 20.2              | 154          | 11.9              |            |                   |            |                   |            |                   |            |                        |                        |
| 011*  | May 21 | Destruction Is.                        | 10.3              | 55           | 10.0              |            |                   |            |                   |            |                   |            |                        |                        |
| 012*  | May 21 | Destruction Is.                        | 10.7              | 55           | --                | 0          | 1                 |            |                   |            |                   |            |                        |                        |
| 013   | May 21 | Destruction Is.                        | 11.2              | 59           | --                | 0          | 1                 | 2          | 0                 |            |                   |            |                        |                        |
| 014   | May 21 | Destruction Is.                        | 15.1              | 80           | 11.2              |            |                   |            |                   |            |                   |            |                        |                        |
| 015   | May 21 | Destruction Is.                        | 20.3              | 115          | 12.1              |            |                   |            |                   |            |                   |            |                        |                        |
| 016   | May 21 | Quinalt R.                             | 19.9              | 329          | 11.7              | 1          | 0                 | 3          | 0                 |            |                   |            | 1                      |                        |
| 017   | May 21 | Quinalt R.                             | 14.6              | 93           | 11.4              |            |                   |            |                   |            |                   |            |                        |                        |
| 018   | May 21 | Quinalt R.                             | 9.9               | 57           | 10.1              | 2          | 1                 | 3          | 0                 |            | 1                 |            | 1                      |                        |
| 019   | May 22 | Grays Harbor                           | 10.1              | 57           | 11.6              | 0          | 20                | 0          | 7                 |            |                   |            |                        |                        |
| 020   | May 22 | Grays Harbor                           | 14.8              | 79           | 11.7              | 0          | 1                 | 1          | 0                 |            |                   |            |                        |                        |
| 021   | May 22 | Grays Harbor                           | 9.9               | 55           | 11.4              | 1          | 0                 | 1          | 1                 |            |                   |            |                        |                        |
| 022   | May 23 | Willapa Bay                            | 9.7               | 62           | 10.5              | 2          | 1                 | 12         | 5                 |            |                   |            |                        |                        |
| 023   | May 23 | Willapa Bay                            | 9.7               | 62           | --                | 0          | 1                 | 3          | 1                 |            |                   |            | 1                      |                        |
| 024*  | May 23 | Willapa Bay                            | 13.8              | 82           | --                |            |                   | 2          | 1                 |            |                   |            |                        |                        |
| 025   | May 23 | Willapa Bay                            | 15.1              | 90           | 11.4              | 1          | 9                 | 6          | 0                 |            |                   |            | 1                      |                        |
| 026   | May 23 | Willapa Bay                            | 20.0              | 124          | 11.5              |            |                   |            |                   |            |                   |            |                        |                        |
| 027   | May 23 | Willapa Bay                            | 8.3               | 51           | 11.2              |            |                   | 2          | 1                 |            |                   |            |                        |                        |
| 028   | May 24 | Ocean Park                             | 9.6               | 62           | 10.8              |            |                   | 1          | 4                 |            |                   |            |                        |                        |
| 029   | May 24 | Cape Disapp.                           | 7.0               | 49           | 11.4              | 1          | 0                 | 5          | 1                 |            |                   |            |                        |                        |
| 030*  | May 24 | Cape Disapp.                           | --                | --           | 13.0              |            |                   |            |                   |            |                   |            |                        |                        |
| 031   | May 24 | Cape Disapp.                           | 9.8               | 150          | 11.8              | 1          | 0                 | 10         | 2                 |            |                   |            | 1                      |                        |
| 032*  | May 27 | Seaside                                | 5.6               | 53           | 10.7              |            |                   |            |                   |            |                   |            |                        |                        |
| 033   | May 27 | Seaside                                | 5.7               | 57           | 10.4              | 0          | 1                 | 4          | 0                 |            |                   |            |                        |                        |
| 034   | May 27 | Seaside                                | 10.1              | 86           | 10.4              | 0          | 1                 | 24         | 0                 |            |                   |            |                        |                        |
| 035   | May 27 | Seaside                                | 10.0              | 88           | 11.0              |            |                   | 10         | 1                 |            |                   |            | 1                      |                        |
| 036   | May 27 | Seaside                                | 14.7              | 119          | 11.4              | 2          | 0                 | 19         | 9                 |            |                   |            | 1                      |                        |
| 037   | May 27 | Seaside                                | 20.5              | 143          | 10.6              | 0          | 3                 | 11         | 0                 |            |                   |            |                        |                        |
| 038   | May 27 | Seaside                                | 25.0              | 152          | 10.3              | 1          | 0                 | 12         | 0                 |            |                   |            |                        |                        |

| Set # | Date   | Transect/distance<br>From Shore (n.mi) | Depth<br>(meters) | Temp<br>(°C) | Coho              |            | Chinook           |            | Chum              |            | Sockeye           |            | Steelhead<br>164-260mm | Cutthroat<br>181-360mm |
|-------|--------|--|-------------------|--------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|------------------------|------------------------|
|       |        |  |                   |              | 101-<br>300<br>mm | 301+<br>mm | 101-<br>400<br>mm | 401+<br>mm | 101-<br>280<br>mm | 281+<br>mm | 101-<br>280<br>mm | 281+<br>mm |                        |                        |
| 039   | May 28 | Warrenton                              | 14.8              | 166          | 12.3              | 12         | 1                 | 4          | 4                 |            |                   |            |                        |                        |
| 040*  | May 28 | Warrenton                              | 21.5              | 135          | 10.3              | 0          | 1                 |            |                   |            |                   |            |                        |                        |
| 041   | May 28 | Warrenton                              | 22.3              | 134          | 10.8              | 0          | 5                 |            |                   | 0          | 1                 |            | 4                      |                        |
| 042   | May 28 | Warrenton                              | 24.6              | 155          | 11.2              |            |                   | 3          | 0                 |            |                   |            | 4                      |                        |
| 043*  | May 28 | Warrenton                              | 30.2              | 366          | 11.4              |            |                   |            |                   |            |                   |            |                        |                        |
| 044   | May 30 | Nehalem                                | 5.4               | 71           | 9.3               |            |                   |            |                   |            |                   |            |                        |                        |
| 045   | May 30 | Nehalem                                | 10.0              | 108          | 11.4              | 0          | 4                 | 1          | 0                 |            |                   |            |                        |                        |
| 046   | May 30 | Nehalem                                | 15.2              | 141          | 12.0              | 1          | 1                 | 3          | 2                 | 0          | 1                 |            |                        |                        |
| 047   | May 30 | Nehalem                                | 19.9              | 166          | 12.2              | 1          | 2                 | 1          | 0                 |            |                   |            |                        |                        |
| 048   | May 30 | Cape Lookout                           | 5.2               | 88           | 10.6              | 16         | 3                 | 4          | 0                 |            |                   |            |                        |                        |
| 049   | May 30 | Cape Lookout                           | 4.6               | 88           | 10.4              | 15         | 2                 | 5          | 1                 |            |                   |            |                        | 1                      |
| 050   | May 31 | Cape Lookout                           | 9.3               | 148          | 9.8               |            |                   |            |                   |            |                   |            |                        |                        |
| 051   | May 31 | Cape Lookout                           | 14.8              | 192          | 10.8              | 3          | 1                 | 5          | 0                 |            |                   |            |                        |                        |
| 052   | May 31 | Cape Lookout                           | 19.2              | 366          | 11.3              | 4          | 0                 | 1          | 0                 |            |                   | 5          |                        |                        |
| 053   | May 31 | Cape Lookout                           | 25.1              | 454          | 11.7              |            |                   |            |                   |            |                   | 1          |                        |                        |
| 054   | May 31 | Wecoma Beach                           | 19.7              | 346          | 11.8              | 2          | 0                 | 1          | 0                 |            |                   |            |                        |                        |
| 055   | May 31 | Wecoma Beach                           | 15.0              | 201          | 11.2              | 8          | 0                 |            |                   |            |                   | 1          | 4                      |                        |
| 056   | May 31 | Wecoma Beach                           | 10.3              | 146          | 10.2              | 5          | 101               | 18         | 4                 |            |                   | 1          |                        |                        |
| 057   | June 1 | Wecoma Beach                           | 3.2               | 59           | 9.7               | 16         | 0                 | 7          | 0                 |            |                   |            |                        |                        |
| 058   | June 1 | Wecoma Beach                           | 3.3               | 60           | --                | 41         | 0                 | 7          | 1                 | 0          | 1                 |            |                        |                        |
| 059   | June 1 | Wecoma Beach                           | 5.1               | 88           | 10.6              | 329        | 9                 | 13         | 2                 |            |                   |            |                        | 3                      |
| 060   | June 1 | Yaquina Head                           | 5.2               | 60           | 10.8              | 8          | 2                 |            |                   |            |                   |            |                        |                        |
| 061   | June 1 | Yaquina Head                           | 9.7               | 82           | 10.8              | 25         | 0                 | 1          | 0                 |            |                   |            |                        |                        |
| 062   | June 1 | Yaquina Head                           | 14.5              | 90           | 11.3              | 10         | 0                 | 9          | 0                 |            |                   | 1          |                        |                        |
| 063   | June 1 | Yaquina Head                           | 19.5              | 137          | 11.5              |            |                   |            |                   |            |                   |            |                        |                        |
| 064   | June 2 | Yachats                                | 19.8              | 93           | 10.4              | 2          | 2                 | 1          | 0                 | 1          | 0                 |            |                        |                        |
| 065   | June 2 | Yachats                                | 14.5              | 90           | 9.9               | 6          | 1                 | 0          | 1                 |            |                   |            |                        |                        |
| 066   | June 2 | Yachats                                | 10.4              | 79           | 9.3               | 0          | 2                 |            |                   |            |                   |            |                        |                        |
| 067   | June 2 | Yachats                                | 4.5               | 59           | 9.4               | 2          | 1                 | 2          | 0                 |            |                   |            |                        |                        |
| 068   | June 2 | Siuslaw R.                             | 4.6               | 73           | 9.9               | 6          | 0                 | 5          | 1                 |            |                   |            |                        |                        |
| 069   | June 2 | Siuslaw R.                             | 9.9               | 110          | 10.2              | 4          | 0                 | 0          | 1                 |            |                   |            |                        |                        |
| 070*  | June 2 | Siuslaw R.                             | 14.8              | 128          | 10.7              |            |                   | 1          | 0                 |            |                   |            |                        |                        |

\*Aborted Set

## Appendix B. (cont.)

## JUNE 1982 CRUISE

| Set # | Date    | Transect/distance<br>From Shore (n.mi) | Depth<br>(meters) | Temp<br>(°C) | Coho              |            | Chinook           |            | Chum              |            | Sockeye           |            | Steelhead<br>164-260mm | Cutthroat<br>181-260mm |
|-------|---------|--|-------------------|--------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|------------------------|------------------------|
|       |         |  |                   |              | 101-<br>300<br>mm | 301+<br>mm | 101-<br>400<br>mm | 401+<br>mm | 101-<br>280<br>mm | 281+<br>mm | 101-<br>280<br>mm | 281+<br>mm |                        |                        |
| 071   | June 7  | Quinault R.                            | 10.0              | 57           | 11.3              | 0          | 8                 | 0          | 4                 |            |                   |            |                        |                        |
| 072   | June 7  | Quinault R.                            | 14.9              | 95           | 10.8              | 13         | 8                 | 1          | 0                 |            | 1                 | 0          |                        |                        |
| 073   | June 7  | Quinault R.                            | 19.2              | 159          | 11.7              | 0          | 2                 | 3          | 0                 |            |                   |            |                        |                        |
| 074*  | June 7  | Quinault R.                            | 15.4              | 101          | --                | 0          | 1                 |            |                   |            |                   |            |                        |                        |
| 075   | June 7  | Grays Harbor                           | 20.1              | 104          | 11.5              | 0          | 2                 |            |                   |            |                   |            |                        |                        |
| 076   | June 7  | Grays Harbor                           | 15.1              | 79           | 10.8              |            |                   | 2          | 0                 |            | 1                 | 0          |                        |                        |
| 077   | June 7  | Grays Harbor                           | 10.0              | 57           | 12.3              | ↖22↗       | 3                 | 9          | 1                 |            | 2                 | 0          |                        |                        |
| 078   | June 7  | Grays Harbor                           | 10.0              | 57           | --                | ↘57↙       | 3                 | 4          | 1                 |            | 4                 | 0          | 1                      | 1                      |
| 079   | June 8  | Willapa Bay                            | 9.4               | 62           | 12.1              | 44         | 1                 | 13         | 3                 |            | 1                 | 0          |                        | 1                      |
| 080   | June 8  | Willapa Bay                            | 11.4              | 71           | 12.4              | 17         | 0                 | 5          | 3                 |            | 1                 | 0          |                        |                        |
| 081   | June 8  | Willapa Bay                            | 17.2              | 97           | 11.6              | 80         | 0                 | 25         | 0                 |            | 4                 | 0          |                        |                        |
| 082   | June 10 | Willapa Bay                            | 10.7              | 70           | 11.9              | 27         | 2                 | 50         | 1                 |            |                   |            |                        |                        |
| 083   | June 10 | Willapa Bay                            | 14.9              | 88           | 11.6              | 0          | 11                | 12         | 0                 |            | 2                 | 0          | 1                      |                        |
| 084   | June 10 | Willapa Bay                            | 19.1              | 119          | 11.7              |            |                   |            |                   |            |                   |            |                        |                        |
| 085   | June 10 | Ocean Park                             | 20.1              | 560          | 11.7              | 1          | 0                 |            |                   |            | 1                 | 0          |                        |                        |
| 086   | June 10 | Ocean Park                             | 14.9              | 99           | 12.3              | 31         | 2                 | 41         | 0                 |            | 2                 | 0          |                        |                        |
| 087   | June 10 | Ocean Park                             | 10.0              | 68           | 11.8              | 20         | 0                 | 9          | 1                 |            |                   |            |                        | 1                      |
| 088   | June 10 | Ocean Park                             | 9.8               | 66           | 11.7              | 28         | 1                 | 15         | 1                 | 0          | 1                 |            |                        | 2                      |
| 089   | June 11 | Breakers                               | 8.4               | 60           | 11.6              | 2          | 7                 | 13         | 12                |            |                   |            |                        |                        |
| 090   | June 11 | Breakers                               | 10.3              | 71           | 12.5              | 5          | 0                 | 4          | 2                 |            |                   |            |                        |                        |
| 091   | June 11 | Breakers                               | 16.2              | 110          | 12.4              | 1          | 4                 | 1          | 1                 |            |                   |            |                        |                        |
| 092   | June 11 | Breakers                               | 20.2              | 139          | 12.0              |            |                   | 2          | 0                 |            |                   |            |                        |                        |
| 093   | June 11 | Warrenton                              | 7.8               | 57           | 10.8              | 0          | 4                 | 1          | 5                 |            |                   |            |                        | 1                      |
| 094*  | June 11 | Warrenton                              | 11.2              | 88           | --                |            |                   |            |                   |            |                   |            |                        |                        |
| 095   | June 12 | Seaside                                | 9.7               | 84           | 12.4              | 7          | 2                 | 1          | 1                 | 1          | 0                 |            |                        | 1                      |
| 096   | June 12 | Seaside                                | 10.4              | 88           | 12.4              | 7          | 2                 | 3          | 0                 |            |                   |            |                        |                        |
| 097   | June 12 | Seaside                                | 12.8              | 95           | 12.6              | 6          | 0                 | 0          | 1                 |            |                   |            |                        |                        |
| 098   | June 13 | Hug Point                              | 4.0               | 68           | 12.6              | 1          | 4                 | 2          | 0                 |            |                   |            |                        |                        |
| 099*  | June 13 | Hug Point                              | 7.5               | 90           | 13.1              |            |                   |            |                   |            |                   |            |                        |                        |
| 100   | June 13 | Hug Point                              | 16.4              | 137          | 13.3              | 1          | 0                 |            |                   |            |                   |            |                        |                        |
| 101   | June 13 | Hug Point                              | 12.1              | 124          | 13.0              | 7          | 0                 |            |                   |            |                   |            |                        |                        |
| 102   | June 14 | Nehalem                                | 3.7               | 59           | 11.5              | 42         | 0                 | 1          | 0                 |            |                   |            |                        |                        |
| 103   | June 14 | Nehalem                                | 4.9               | 68           | 10.9              |            |                   |            |                   |            |                   |            |                        |                        |
| 104   | June 14 | Nehalem                                | 9.9               | 108          | 12.1              | 17         | 23                |            |                   |            |                   |            |                        | 1                      |
| 105*  | June 14 | Nehalem                                | 15.1              | --           | 12.6              |            |                   |            |                   | 3          | 0                 | 1          | 0                      |                        |
| 106   | June 16 | Cape Lookout                           | 5.0               | 146          | 8.8               |            |                   |            |                   |            |                   |            |                        |                        |
| 107   | June 16 | Cape Lookout                           | 8.7               | 148          | 11.1              | 67         | 6                 |            |                   |            |                   |            |                        |                        |
| 108   | June 16 | Cape Lookout                           | 9.1               | 15           | 11.2              | 105        | 0                 | 2          | 0                 |            |                   |            |                        |                        |

## JUNE 1982 CRUISE (cont.)

| Set # | Date    | Transect/distance<br>From Shore (n.mi) | Depth<br>(meters) | Temp<br>(°C) | Coho              |            | Chinook           |            | Chum              |            | Sockeye           |            | Steelhead<br>164-260mm | Cutthroat<br>181-260mm |
|-------|---------|--|-------------------|--------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|------------------------|------------------------|
|       |         |  |                   |              | 101-<br>300<br>mm | 301+<br>mm | 101-<br>400<br>mm | 401+<br>mm | 101-<br>280<br>mm | 281+<br>mm | 101-<br>280<br>mm | 281+<br>mm |                        |                        |
| 109   | June 17 | Wecoma Beach                           | 3.5               | 62           | 9.2               |            |                   |            |                   |            |                   |            |                        |                        |
| 110   | June 17 | Wecoma Beach                           | 10.3              | 152          | 10.6              |            |                   |            |                   |            |                   |            |                        |                        |
| 111   | June 18 | Yaquina Head                           | 14.3              | 93           | 9.7               |            |                   |            |                   |            |                   |            |                        |                        |
| 112   | June 18 | Yaquina Head                           | 20.0              | 134          | 11.8              | 2          | 1                 |            |                   |            |                   |            |                        |                        |
| 113   | June 18 | Yaquina Head                           | 25.2              | 285          | 13.4              | 1          | 4                 |            |                   |            |                   |            |                        |                        |
| 114   | June 18 | Yaquina Head                           | 29.3              | 95           | 13.8              |            |                   |            |                   |            |                   |            |                        |                        |
| 115   | June 19 | Yaquina Head                           | 10.1              | 77           | 9.2               | 13         | 0                 | 1          | 0                 |            |                   |            |                        |                        |
| 116   | June 19 | Yaquina Head                           | 5.1               | 60           | 8.9               |            |                   | 0          | 1                 |            |                   |            |                        |                        |
| 117   | June 19 | Yachats                                | 4.7               | 60           | 11.3              | 2          | 0                 | 2          | 0                 |            |                   |            |                        |                        |
| 118   | June 19 | Yachats                                | 9.8               | 77           | 11.4              |            |                   | 0          | 1                 |            |                   |            |                        |                        |
| 119   | June 19 | Yachats                                | 15.5              | 93           | 9.8               |            |                   |            |                   |            |                   |            |                        |                        |
| 120   | June 19 | Yachats                                | 19.9              | 95           | 9.6               |            |                   |            |                   |            |                   |            |                        |                        |
| 121   | June 20 | Wecoma Beach                           | 3.6               | 64           | 10.3              |            |                   |            |                   |            |                   |            |                        |                        |
| 122   | June 20 | Wecoma Beach                           | 10.4              | 148          | 12.9              |            |                   |            |                   |            |                   |            |                        |                        |
| 123   | June 20 | Wecoma Beach                           | 15.2              | 205          | 13.1              | 10         | 0                 |            | 5                 | 0          |                   |            |                        |                        |
| 124   | June 20 | Wecoma Beach                           | 15.2              | 203          | 13.1              | 10         | 9                 |            |                   |            |                   |            |                        | 1                      |
| 125   | June 21 | Cape Lookout                           | 19.0              | 22           | 12.7              | 39         | 0                 |            | 23                | 0          |                   |            |                        |                        |
| 126   | June 21 | Cape Lookout                           | 24.0              | 59           | 13.3              | 7          | 0                 |            |                   |            |                   |            |                        |                        |
| 127   | June 21 | Cape Lookout                           | 19.8              | 26           | 13.2              | 1          | 1                 |            |                   |            |                   |            |                        |                        |
| 128   | June 21 | Cape Lookout                           | 1.3               | 11           | 9.0               |            |                   |            |                   |            |                   |            |                        |                        |
| 129   | June 22 | Cape Lookout                           | 8.2               | 141          | 11.4              | 7          | 8                 | 5          | 0                 |            |                   |            |                        |                        |
| 130   | June 22 | Cape Lookout                           | 14.5              | 190          | 12.1              | 125        | 2                 | 1          | 0                 | 23         | 0                 | 1          | 0                      |                        |

\*Aborted Set

## Appendix B. (cont.)

## SEPTEMBER 1982 CRUISE

| Set # | Date     | Transect/distance<br>From Shore (n.mi) | Depth<br>(meters) | Temp<br>(°C) | Coho              |            | Chinook           |            | Chum              |            | Pink              |            | Sockeye           |            |   |
|-------|----------|--|-------------------|--------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|---|
|       |          |  |                   |              | 101-<br>420<br>mm | 421+<br>mm | 101-<br>400<br>mm | 401+<br>mm | 101-<br>280<br>mm | 281+<br>mm | 101-<br>280<br>mm | 281+<br>mm | 101-<br>280<br>mm | 281+<br>mm |   |
| 131   | Sept. 4  | Quinault R.                            | 9.9               | 57           | 15.2              | 50         | 5                 | 1          | 3                 |            |                   |            |                   |            |   |
| 132   | Sept. 4  | Quinault R.                            | 14.7              | 93           | 15.4              | 4          | 1                 | 1          | 0                 | 13         | 0                 | 1          | 0                 | 1          | 0 |
| 133   | Sept. 4  | Quinault R.                            | 20.2              | 571          | 15.1              | 0          | 1                 |            |                   | 13         | 0                 |            |                   |            |   |
| 134*  | Sept. 4  | Quinault R.                            | 20.0              | 571          | 16.1              | 1          | 0                 |            |                   | 3          | 0                 |            |                   |            |   |
| 135*  | Sept. 4  | Quinault R.                            | 25.3              | 686          | 16.8              |            |                   |            |                   |            |                   |            |                   |            |   |
| 136   | Sept. 5  | Grays Harbor                           | 9.8               | 55           | 14.8              | 1          | 0                 |            |                   | 119        | 0                 | 44         | 0                 |            |   |
| 137   | Sept. 5  | Grays Harbor                           | 12.7              | 70           | 15.0              | 1          | 0                 |            |                   |            |                   |            |                   |            |   |
| 138   | Sept. 5  | Grays Harbor                           | 15.2              | 77           | 15.5              | 5          | 1                 |            |                   |            |                   |            |                   |            |   |
| 139   | Sept. 5  | Grays Harbor                           | 15.1              | 79           | 15.6              | 12         | 0                 |            |                   | 6          | 0                 | 2          | 0                 |            |   |
| 140   | Sept. 5  | Grays Harbor                           | 20.3              | 106          | 17.0              | 1          | 0                 |            |                   |            |                   |            |                   |            |   |
| 141   | Sept. 5  | Willapa Bay                            | 8.7               | 55           | 16.2              | 1          | 0                 |            |                   |            |                   |            |                   |            |   |
| 142   | Sept. 6  | Willapa Bay                            | 8.3               | 55           | 15.8              | 1          | 0                 |            |                   |            |                   |            |                   |            |   |
| 143   | Sept. 6  | Willapa Bay                            | 12.4              | 77           | 16.1              | 13         | 0                 |            |                   |            |                   |            |                   |            |   |
| 144   | Sept. 6  | Willapa Bay                            | 12.0              | 77           | 16.1              | 2          | 0                 | 1          | 0                 |            |                   |            |                   |            |   |
| 145   | Sept. 6  | Willapa Bay                            | 14.9              | 88           | 16.1              | 5          | 0                 |            |                   |            |                   |            |                   |            |   |
| 146   | Sept. 6  | Willapa Bay                            | 20.2              | 126          | 16.5              |            |                   |            |                   |            |                   |            |                   |            |   |
| 147   | Sept. 6  | Cape Disapp.                           | 19.4              | 137          | 15.4              |            |                   |            |                   |            |                   |            |                   |            |   |
| 148   | Sept. 6  | Cape Disapp.                           | 14.9              | 126          | 15.5              | 7          | 0                 |            |                   |            |                   |            |                   |            |   |
| 149   | Sept. 7  | Cape Disapp.                           | 7.0               | 53           | 15.6              | 31         | 5                 | 1          | 2                 |            |                   |            |                   |            |   |
| 150   | Sept. 7  | Cape Disapp.                           | 10.0              | 79           | 15.8              | 56         | 0                 | 0          | 1                 |            |                   |            |                   |            |   |
| 151   | Sept. 7  | Cape Disapp.                           | 9.2               | 77           | --                | 21         | 0                 |            |                   |            |                   |            |                   |            |   |
| 152*  | Sept. 7  | Cape Disapp.                           | 15.5              | 128          | 16.5              |            |                   |            |                   |            |                   |            |                   |            |   |
| 153*  | Sept. 7  | Seaside                                | 19.3              | 137          | 17.4              |            |                   |            |                   |            |                   |            |                   |            |   |
| 154   | Sept. 8  | Tillamook                              | 2.4               | 57           | 14.1              | 98         | 4                 | 0          | 4                 |            |                   |            |                   |            |   |
| 155   | Sept. 8  | Tillamook                              | 5.1               | 79           | 15.0              | 11         | 0                 |            |                   |            |                   |            |                   |            |   |
| 156   | Sept. 9  | Hug Point                              | 9.3               | 104          | 16.5              |            |                   |            |                   |            |                   |            |                   |            |   |
| 157   | Sept. 9  | Hug Point                              | 15.1              | 144          | 16.6              |            |                   |            |                   |            |                   |            |                   |            |   |
| 158   | Sept. 9  | Nehalem B.                             | 20.1              | 172          | 16.7              |            |                   |            |                   |            |                   |            |                   |            |   |
| 159   | Sept. 9  | Nehalem B.                             | 14.8              | 143          | 15.9              |            |                   |            |                   |            |                   |            |                   |            |   |
| 160   | Sept. 9  | Nehalem B.                             | 3.1               | 55           | 15.2              | 1          | 2                 |            |                   |            |                   |            |                   |            |   |
| 161   | Sept. 11 | Cape Lookout                           | 2.0               | 55           | 13.9              | 3          | 3                 |            |                   |            |                   |            |                   |            |   |



## SEPTEMBER 1982 CRUISE (cont.)

| Set # | Date     | Transect/distance<br>From Shore (n.mi) | Depth<br>(meters) | Temp<br>(°C) | Coho              |            | Chinook           |            | Chum              |            | Pink              |            | Sockeye           |            |
|-------|----------|--|-------------------|--------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
|       |          |  |                   |              | 101-<br>420<br>mm | 421+<br>mm | 101-<br>400<br>mm | 401+<br>mm | 101-<br>280<br>mm | 281+<br>mm | 101-<br>280<br>mm | 281+<br>mm | 101-<br>280<br>mm | 281+<br>mm |
| 162   | Sept. 11 | Cape Lookout                           | 4.9               | 88           | 14.4              | 26         | 0                 |            |                   |            |                   |            |                   |            |
| 163   | Sept. 12 | Cape Lookout                           | 4.2               | 84           | 14.8              | 14         | 0                 |            |                   |            |                   |            |                   |            |
| 164   | Sept. 12 | Cape Lookout                           | 9.8               | 143          | 15.8              |            |                   |            |                   |            |                   |            |                   |            |
| 165*  | Sept. 12 | Cape Lookout                           | 5.6               | 104          | 14.5              |            |                   |            |                   | 1          | 0                 |            |                   |            |
| 166** | Sept. 13 | Yaquina Head                           | 6.7               | 68           | 14.0              | 7          | 0                 |            |                   |            |                   |            |                   |            |
| 167** | Sept. 14 | Yaquina Head                           | 10.3              | 80           | 13.4              | 1          | 1                 |            |                   |            |                   |            |                   |            |
| 168** | Sept. 14 | Yaquina Head                           | 14.9              | 93           | 13.7              | 1          | 0                 |            |                   |            |                   |            |                   |            |
| 169** | Sept. 14 | Yachats                                | 15.1              | 93           | 13.9              | 1          | 0                 |            |                   |            |                   |            |                   |            |
| 170** | Sept. 14 | Yachats                                | 10.5              | 79           | 13.5              |            |                   |            |                   |            |                   |            |                   |            |
| 171** | Sept. 14 | Yachats                                | 4.7               | 55           | 13+               | 2          | 1                 |            |                   |            |                   |            |                   |            |
| 172** | Sept. 14 | Yachats                                | 3.1               | 51           | 13.0              | 7          | 0                 | 3          | 0                 |            |                   |            |                   |            |
| 173** | Sept. 14 | Yachats                                | 2.8               | 51           | 12.4              | 0          | 1                 | 1          | 0                 |            |                   |            |                   |            |

\* Aborted or non-quantitative sets

\*\*Only 310 m of sein set

Appendix C. Release and recovery data for individual CWT and pigment marked salmonids collected in 1982.

1980 and 1981 Brood Juvenile Coho<sup>1</sup>

| Purse Seine Set | I.D. No. | Transect     | Brood Yr | Tag Code | Agency | Hatchery     | Ocean Entry Site | Release Date   | Recovery Date | Days Since Release | N-S Distance from Ocean Entry | Length at Recovery |
|-----------------|----------|--------------|----------|----------|--------|--------------|------------------|----------------|---------------|--------------------|-------------------------------|--------------------|
| 62              | 003      | Yaquina      | 80       | 5-8-45   | QDNR   | Wild         | Queets R.        | 27/IV-20/VI/82 | 1/VI/82       | 0-35               | 141 S                         | 143                |
| 72              | 001      | Quinalt      | 80       | 5-10-19  | QDNR   | Wild         | Queets R.        | 15/V-11/VI/82  | 7/VI/82       | 0-23               | 12 S                          | 127                |
| 77              | 001      | Grays Hbr.   | 80       | 63-23-57 | WDF    | Wild         | Grays Hbr.       | V/82           | 7/VI/82       | ~7-37              | 5 N                           | 150                |
| 87              | 002      | Ocean Park   | 80       | 63-23-58 | WDF    | Wild         | Grays Hbr.       | V/82           | 10/VI/82      | ~10-40             | 25 S                          | 128                |
| 82              | 001      | Willapa Bay  | 80       | 63-24-04 | WDF    | Humptulips   | Grays Hbr.       | 24/V/82        | 10/VI/82      | 17                 | 15 S                          | 150                |
| 88              | 002      | Ocean Park   | 80       | 63-24-4  | WDF    | Humptulips   | Grays Hbr.       | 24/V/82        | 10/VI/82      | 17                 | 25 S                          | 149                |
| 59              | 016      | Wecoma       | 80       | 63-24-8  | WDF    | Simpson      | Grays Hbr.       | 20/V/82        | 10/VI/82      | 12                 | 144 S                         | 133                |
| 88              | 001      | Ocean Park   | 80       | 63-24-8  | WDF    | Simpson      | Grays Hbr.       | 20/V/82        | 10/VI/82      | 21                 | 25 S                          | 133                |
| 86              | 004      | Ocean Park   | 80       | 63-24-15 | WDF    | Wild         | Grays Hbr.       | 20/V/82        | 10/VI/82      | 21                 | 25 S                          | 167                |
| 81              | 002      | Willapa Bay  | 80       | 63-25-48 | WDF    | Wild         | Grays Hbr.       | V/82           | 8/VI/82       | ~8-38              | 14 S                          | 144                |
| 81              | 006      | Willapa Bay  | 80       | 63-22-49 | WDF    | Wild         | Grays Hbr.       | V/82           | 8/VI/82       | ~8-38              | 73 S                          | 168                |
| 82              | 004      | Willapa Bay  | 80       | 63-24-1  | WDF    | Naselle R.   | Willapa Bay      | 6/V/82         | 10/VI/82      | 35                 | 1 S                           | 224                |
| 78              | 032      | Grays Hbr.   | 80       | 63-24-02 | WDF    | Nemah        | Willapa Bay      | 26/IV/82       | 7/VI/82       | 42                 | 20 N                          | 165                |
| 79              | 001      | Willapa Bay  | 80       | 63-24-02 | WDF    | Nemah        | Willapa Bay      | 26/IV/82       | 8/VI/82       | 43                 | 0 -                           | 133                |
| 107             | 007      | Cape Lookout | 80       | 63-24-2  | WDF    | Nemah        | Willapa Bay      | 26/IV/82       | 16/VI/82      | 51                 | 80 S                          | 145                |
| 78              | 031      | Grays Hbr.   | 80       | 63-24-09 | WDF    | Willapa      | Willapa Bay      | 19/IV/82       | 7/VI/82       | 49                 | 20 N                          | 160                |
| 59              | 002      | Wecoma       | 80       | 63-23-3  | WDF    | Lower Kalama | Columbia R.      | 3/V/82         | 1/VI/82       | 29                 | 74 S                          | 164                |
| 59              | 012      | Wecoma       | 80       | 63-23-03 | WDF    | Lower Kalama | Columbia R.      | 3/V/82         | 1/VI/82       | 29                 | 74 S                          | 160                |
| 59              | 013      | Wecoma       | 80       | 63-23-03 | WDF    | Lower Kalama | Columbia R.      | 3/V/82         | 1/VI/82       | 29                 | 74 S                          | 169                |
| 59              | 015      | Wecoma       | 80       | 63-23-03 | WDF    | Lower Kalama | Columbia R.      | 3/V/82         | 1/VI/82       | 29                 | 74 S                          | 161                |
| 108             | 005      | Cape Lookout | 80       | 63-23-3  | WDF    | Lower Kalama | Columbia R.      | 3/V/82         | 16/VI/82      | 44                 | 55 S                          | 205                |
| 59              | 009      | Wecoma       | 80       | 63-23-4  | WDF    | Speelyai     | Columbia R.      | 4/V/82         | 1/VI/82       | 28                 | 74 S                          | 148                |
| 131             | 003      | Quinalt      | 80       | 63-23-05 | WDF    | Speelyai     | Columbia R.      | 2/VI/82        | 4/IX/82       | 94                 | 65 N                          | 330                |
| 57              | 002      | Wecoma       | 80       | 63-23-63 | WDF    | Grays R.     | Columbia R.      | 30/IV/82       | 1/VI/82       | 32                 | 74 S                          | 161                |
| 56              | 002      | Wecoma       | 80       | 63-24-23 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 31/V/82       | 28                 | 75 S                          | 141                |
| 59              | 001      | Wecoma       | 80       | 63-24-27 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 1/VI/82       | 29                 | 74 S                          | 164                |
| 58              | 002      | Wecoma       | 80       | 63-24-36 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 1/VI/82       | 29                 | 75 S                          | 136                |
| 59              | 003      | Wecoma       | 80       | 63-24-36 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 1/VI/82       | 29                 | 74 S                          | 158                |
| 107             | 003      | Cape Lookout | 80       | 63-24-37 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 16/VI/82      | 44                 | 55 S                          | 164                |
| 130             | 005      | Cape Lookout | 80       | 63-24-38 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 22/VI/82      | 50                 | 54 S                          | 141                |
| 59              | 006      | Wecoma       | 80       | 63-24-39 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 1/VI/82       | 29                 | 74 S                          | 149                |
| 39              | 014      | Warrenton    | 80       | 63-24-46 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 28/V/82       | 25                 | 6 S                           | 138                |
| 131             | 005      | Quinalt      | 80       | 63-24-48 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 4/IX/82       | 124                | 65 N                          | 316                |
| 131             | 001      | Quinalt      | 80       | 63-24-49 | WDF    | Cowlitz      | Columbia R.      | 3/V/82         | 4/IX/82       | 122                | 65 N                          | 332                |
| 102             | 002      | Nehalem      | 80       | 63-25-16 | WDF    | Washougal    | Columbia R.      | 25/V/82        | 13/VI/82      | 19                 | 35 S                          | 136                |
| 90              | 001      | Breakers     | 80       | 63-25-18 | WDF    | Washougal    | Columbia R.      | 25/V/82        | 11/VI/82      | 17                 | 8 N                           | 137                |
| 123             | 003      | Wecoma       | 80       | 63-25-19 | WDF    | Washougal    | Columbia R.      | 25/V/82        | 20/VI/82      | 26                 | 75 S                          | 155                |
| 125             | 002      | Cape Lookout | 80       | 63-25-26 | WDF    | Washougal    | Columbia R.      | 25/V/82        | 21/VI/82      | 27                 | 54 S                          | 165                |
| 104             | 001      | Nehalem      | 80       | 63-25-29 | WDF    | Washougal    | Columbia R.      | 25/V/82        | 14/VI/82      | 20                 | 34 S                          | 146                |
| 150             | 004      | Cape Disapp. | 80       | 63-25-30 | WDF    | Washougal    | Columbia R.      | 25/V/82        | 7/IX/82       | 105                | 5 N                           | 270                |
| 130             | 003      | Cape Lookout | 80       | 7-13-10  | ODFW   | Big Creek    | Columbia R.      | 29/IV/82       | 22/VI/82      | 23                 | 54 S                          | 193                |
| 59              | 004      | Wecoma       | 80       | 7-15-11  | ODFW   | Big Creek    | Columbia R.      | 29/IV/82       | 1/VI/82       | 33                 | 74 S                          | 153                |
| 130             | 002      | Cape Lookout | 80       | 7-26-48  | ODFW   | Big Creek    | Columbia R.      | 3/VI/82        | 22/VI/82      | 19                 | 54 S                          | 173                |
| 58              | 004      | Wecoma       | 80       | 7-26-49  | ODFW   | Big Creek    | Columbia R.      | 28/IV/82       | 1/VI/82       | 34                 | 75 S                          | 142                |
| 62              | 001      | Yaquina      | 80       | 9-2-11   | ODFW   | Big Creek    | Columbia R.      | 29/IV/82       | 1/VI/82       | 33                 | 95 S                          | 188                |
| 131             | 006      | Quinalt      | 80       | 7-24-27  | ODFW   | Cascade      | Columbia R.      | 9/VI/82        | 4/IX/82       | 87                 | 65 N                          | 279                |

## Appendix C. (cont.)

## 1980 and 1981 Brood Juvenile Coho (cont.)

| Purse Seine Set | I.D. No. | Transect      | Brood Yr | Tag Code | Agency | Hatchery    | Ocean Entry Site | Release Date | Recovery Date | Days Since Release | N-S Distance from Ocean Entry | Length at Recovery |
|-----------------|----------|---------------|----------|----------|--------|-------------|------------------|--------------|---------------|--------------------|-------------------------------|--------------------|
| 125             | 001      | Cape Lookout  | 80       | 7-24-32  | ODFW   | Cascade     | Columbia R.      | 3/VI/82      | 21/VI/82      | 18                 | 54 S                          | 160                |
| 131             | 002      | Quinalt       | 80       | 7-24-34  | ODFW   | Cascade     | Columbia R.      | 3/VI/82      | 4/IX/82       | 93                 | 65 N                          | 320                |
| 150             | 003      | Cape Disapp.  | 80       | 7-25-49  | ODFW   | Sandy       | Columbia R.      | 3/IV/82      | 7/IX/82       | 157                | 5 N                           | 268                |
| 150             | 001      | Cape Disapp.  | 80       | 7-25-50  | ODFW   | Sandy       | Columbia R.      | 30/IV/82     | 7/IX/82       | 130                | 5 N                           | 353                |
| 59              | 008      | Wecoma        | 80       | 7-25-56  | ODFW   | Sandy       | Columbia R.      | 30/IV/82     | 1/VI/82       | 32                 | 74 S                          | 153                |
| 61              | 002      | Yaquina       | 80       | 7-25-56  | ODFW   | Sandy       | Columbia R.      | 30/IV/82     | 1/VI/82       | 32                 | 94 S                          | 163                |
| 59              | 007      | Wecoma        | 80       | 7-25-57  | ODFW   | Sandy       | Columbia R.      | 30/IV/82     | 1/VI/82       | 32                 | 74 S                          | 152                |
| 59              | 011      | Wecoma        | 80       | 7-25-57  | ODFW   | Sandy       | Columbia R.      | 30/IV/82     | 1/VI/82       | 32                 | 74 S                          | 150                |
| 108             | 001      | Cape Lookout  | 80       | 7-25-57  | ODFW   | Sandy       | Columbia R.      | 30/IV/82     | 16/VI/82      | 47                 | 55 S                          | 163                |
| 123             | 001      | Wecoma        | 80       | 7-25-58  | ODFW   | Sandy       | Columbia R.      | 30/IV/82     | 20/VI/82      | 51                 | 75 S                          | 174                |
| 131             | 004      | Quinalt       | 80       | 5-10-35  | FWS    | Eagle Cr.   | Columbia R.      | 6/V/82       | 4/IX/82       | 121                | 65 N                          | 373                |
| 59              | 017      | Wecoma        | 80       | 5-10-35  | FWS    | Eagle Cr.   | Columbia R.      | 6/V/82       | 1/VI/82       | 26                 | 74 S                          | 156                |
| 86              | 003      | Ocean Pk      | 80       | 5-10-36  | FWS    | Eagle Cr.   | Columbia R.      | 6/V/82       | 10/VI/82      | 35                 | 15 N                          | 147                |
| 58              | 001      | Wecoma        | 80       | 5-10-37  | FWS    | Eagle Cr.   | Columbia R.      | 3/V/82       | 1/VI/82       | 29                 | 75 S                          | 146                |
| 101             | 010      | Hug Pt.       | 80       | 5-10-38  | FWS    | Eagle Cr.   | Columbia R.      | 6/V/82       | 13/VI/82      | 38                 | 25 S                          | 204                |
| 130             | 004      | Cape Lookout  | 80       | 5-10-38  | FWS    | Eagle Cr.   | Columbia R.      | 6/V/82       | 22/VI/82      | 47                 | 54 S                          | 156                |
| 127             | 001      | Cape Lookout  | 80       | 5-10-39  | FWS    | Eagle Cr.   | Columbia R.      | 6/V/82       | 21/VI/82      | 46                 | 55 S                          | 156                |
| 143             | 001      | Willapa Bay   | 80       | 5-10-39  | FWS    | Eagle Cr.   | Columbia R.      | 6/V/82       | 6/IX/82       | 123                | 25 N                          | 317                |
| 58              | 003      | Wecoma        | 80       | 5-10-40  | FWS    | Eagle Cr.   | Columbia R.      | 6/V/82       | 1/VI/82       | 26                 | 75 S                          | 147                |
| 107             | 004      | Cape Lookout  | 80       | 7-24-55  | ODFW   | Salmon R.   | Salmon R.        | 15/III/82    | 16/VI/82      | 93                 | 18 N                          | 162                |
| 59              | 014      | Wecoma        | 80       | 7-24-56  | ODFW   | Salmon R.   | Salmon R.        | 1/V/82       | 1/VI/82       | 31                 | 2 S                           | 147                |
| 130             | 001      | Cape Lookout  | 80       | 7-24-56  | ODFW   | Salmon R.   | Salmon R.        | 1/V/82       | 22/VI/82      | 52                 | 18 N                          | 212                |
| 107             | 002      | Cape Lookout  | 80       | 7-24-58  | ODFW   | Siletz      | Siletz Bay       | 1/V/82       | 16/VI/82      | 46                 | 25 N                          | 204                |
| 150             | 005      | Cape Disapp.  | 80       | 7-24-58  | ODFW   | Siletz      | Siletz Bay       | 1/V/82       | 7/IX/82       | 129                | 85 N                          | 352                |
| 160             | 001      | Nehalam       | 80       | 7-24-58  | ODFW   | Siletz      | Siletz Bay       | 1/V/82       | 9/IX/82       | 131                | 45 N                          | 336                |
| 108             | 003      | Cape Lookout  | 80       | 7-24-6   | ODFW   | Fall Cr.    | Alsea R.         | 1/V/82       | 16/VI/82      | 46                 | 55 N                          | 210                |
| 107             | 006      | Cape Lookout  | 80       | 7-25-34  | ODFW   | Fall Cr.    | Alsea R.         | 15/III/82    | 16/VI/82      | 93                 | 55 N                          | 274                |
| 108             | 004      | Cape Lookout  | 80       | 7-25-34  | ODFW   | Fall Cr.    | Alsea R.         | 15/III/82    | 16/VI/82      | 93                 | 55 N                          | 200                |
| 112             | 001      | Yaquina       | 80       | 7-25-8   | ODFW   | Butte Falls | Siuslaw R.       | 11-27/V/81   | 18/VI/82      | 22-38              | 30 N                          | 165                |
| 61              | 001      | Yaquina       | 80       | 7-24-3   | ODFW   | Rock Creek  | Winchester Bay   | 17/III/82    | 1/VI/82       | 76                 | 61 N                          | 193                |
| 124             | 001      | Wecoma        | 80       | 7-24-3   | ODFW   | Rock Creek  | Winchester Bay   | 17/III/82    | 20/VI/82      | 95                 | 80 N                          | 198                |
| 123             | 002      | Wecoma        | 80       | 7-24-4   | ODFW   | Rock Creek  | Winchester Bay   | 15/III/82    | 20/VI/82      | 97                 | 80 N                          | 205                |
| 155             | 001      | Tillamook Rk. | 81       | 60-05-16 | OAF    | OAF         | Yaquina Bay      | 14/VI/82     | 8/IX/82       | 86                 | 79 N                          | 246                |
| 150             | 002      | Cape Disapp.  | 81       | 60-05-33 | OAF    | OAF         | Yaquina Bay      | 7/VII/82     | 7/IX/82       | 62                 | 103 N                         | 242                |
| 154             | 001      | Tillamook Rk. | 81       | 60-05-40 | OAF    | OAF         | Yaquina Bay      | 24/VIII/82   | 8/IX/82       | 15                 | 79 N                          | 184                |
| 172             | 001      | Yachats       | 81       | 60-05-40 | OAF    | OAF         | Yaquina Bay      | 24/VIII/82   | 14/IX/82      | 21                 | 18 S                          | 204                |
| 163             | 001      | Cape Lookout  | 81       | 60-05-41 | OAF    | OAF         | Yaquina Bay      | 24/VIII/82   | 12/IX/82      | 19                 | 43 N                          | 186                |
| 162             | 001      | Cape Lookout  | 81       | 60-05-42 | OAF    | OAF         | Yaquina Bay      | 24/VIII/82   | 11/IX/82      | 18                 | 44 N                          | 157                |
| 154             | 002      | Tillamook Rk. | 81       | 60-05-55 | OAF    | OAF         | Yaquina Bay      | 26/VI/82     | 8/IX/82       | 74                 | 79 N                          | 245                |
| 151             | 001      | Cape Disapp.  | 81       | 60-05-60 | OAF    | OAF         | Yaquina Bay      | 17/VIII/82   | 8/XI/82       | 21                 | 103 N                         | 182                |
| 171             | 001      | Yachats       | 80       | 60-41-48 | OAF    | OAF         | Yaquina Bay      | 7/V/82       | 14/IX/82      | 130                | 17 S                          | 408                |

## Appendix C. (cont.)

1979 and 1980 Brood Adult Coho<sup>1</sup>

| Purse Seine Set | I.D. No. | Transect   | Brood Yr | Tag Code | Agency | Hatchery       | Ocean Entry Site | Release Date | Recovery Date | Days Since Release | N-S Distance from Ocean Entry | Length at Recovery |
|-----------------|----------|------------|----------|----------|--------|----------------|------------------|--------------|---------------|--------------------|-------------------------------|--------------------|
| 45              | --       | Nehalem    | 79       | 5-7-57   | TULA   | Skykomish      | Mid Puget Sd.    | VI/81        | 30/V/82       | ~329-359           | (163 S)*                      | 399                |
| 22              | --       | Willapa    | 80       | 63-21-30 | WDF    | Deschutes/SQUA | So. Puget Sd.    | 7-8/VI/81    | 23/V/82       | 319-320            | (103 S)*                      | 444                |
| 41              | --       | Warrenton  | 79       | 63-21-30 | WDF    | Deschutes/SQUA | So. Puget Sd.    | 7-8/VI/81    | 28/V/82       | 324-325            | (136 S)*                      | 433                |
| 19              | --       | Grays Hbr. | 79       | 63-21-39 | WDF    | Green R.       | So. Puget Sd.    | 1/V/81       | 22/V/82       | 386                | (84 S)*                       | 460                |
| 104             | --       | Nehalem    | 79       | 63-23-13 | WDF    | Wild           | No. Puget Sd.    | V/81 - VI/81 | 14/VI/82      | ~379-410           | (163 S)*                      | 455                |
| 47              | --       | Nehalem    | 79       | 63-22-3  | WDF    | Washougal      | Columbia R.      | 27/V/81      | 30/V/82       | 368                | 35 S                          | 518                |
| 41              | --       | Warrenton  | 79       | 7-22-63  | ODFW   | Sandy          | Columbia R.      | 1/V/81       | 28/V/82       | 392                | 7 S                           | 480                |
| 171             | --       | Yachats    | 80       | 60-34-23 | OAF    | OAF            | Yaquina Bay      | 11/VIII/81   | 14/IX/82      | 13 mo.             | 17 S                          | 552                |

## Pigment marked 1981 Brood Coho Juveniles

|     |     |                                  |    |        |     |     |             |               |              |       |       |     |
|-----|-----|----------------------------------|----|--------|-----|-----|-------------|---------------|--------------|-------|-------|-----|
| 136 | 019 | <del>Quinnitt</del><br>Grays Hbr | 81 | Red    | OAF | OAF | Yaquina Bay | 1-2/VIII/82   | 5<br>7/IX/82 | 33-34 | 143 N | 189 |
| 154 | 005 | Tillamook Rk.                    | 81 | Red    | OAF | OAF | Yaquina Bay | 1-2/VIII/82   | 8/IX/82      | 37-38 | 79 N  | 193 |
| 154 | 049 | Tillamook Rk.                    | 81 | Red    | OAF | OAF | Yaquina Bay | 1-2/VIII/82   | 8/IX/82      | 37-38 | 79 N  | 166 |
| 150 | 042 | Cape Disapp.                     | 81 | Yellow | OAF | OAF | Yaquina Bay | 29-31/VIII/82 | 7/IX/82      | 9-11  | 103 N | 181 |
| 161 | 001 | Cape Lookout                     | 81 | Yellow | OAF | OAF | Yaquina Bay | 29-31/VIII/82 | 11/IX/82     | 11-13 | 43 N  | 155 |
| 162 | 002 | Cape Lookout                     | 81 | Yellow | OAF | OAF | Yaquina Bay | 29-31/VIII/82 | 11/IX/82     | 11-13 | 44 N  | 185 |

## Chinook

|     |     |              |    |          |      |             |               |                     |          |           |       |     |
|-----|-----|--------------|----|----------|------|-------------|---------------|---------------------|----------|-----------|-------|-----|
| 20  | 001 | Grays Hbr    | 80 | 63-23-7  | WDF  | Sol Duc     | Quillayute R. | 6/V/82              | 22/V/82  | 47        | 54 S  | 203 |
| 173 | 001 | Yachats      | 80 | 63-23-10 | WDF  | Cowlitz     | Columbia R.   | 1/IV/82             | 14/IX/82 | 166       | 116 S | 340 |
| 33  | 001 | Seaside      | 80 | 63-23-11 | WDF  | Cowlitz     | Columbia R.   | 1/IV/82             | 27/V/82  | 56        | 15 S  | 159 |
| 57  | 001 | Wecoma       | 80 | 5-6-59   | IDFG | Dworshak    | Columbia R.   | 16/IV/82            | 1/VI/82  | 46        | 74 S  | 183 |
| 86  | 006 | Ocean Park   | 80 | 10-24-12 | IDFG | McCall      | Columbia R.   | 10/IV/82            | 10/VI/82 | 61        | 15 N  | 168 |
| 34  | 001 | Seaside      | 80 | 19-24-13 | IDFG | McCall      | Columbia R.   | 10/IV/82            | 27/V/82  | 47        | 15 S  | 139 |
| 81  | 004 | Willapa Bay  | 80 | 10-24-13 | IDFG | McCall      | Columbia R.   | 10/IV/82            | 8/VI/82  | 59        | 26 N  | 140 |
| 62  | 002 | Yaquina      | 80 | 5-10-41  | YAKI | Leavenworth | Columbia R.   | 21/IV/82            | 1/VI/82  | 41        | 94 S  | 173 |
| 129 | 001 | Cape Lookout |    | 3-17-33  | NMFS | Wild        | Columbia R.   | VII/81              | 22/VI/82 | ~330      | 55 S  | 355 |
| 59  | 021 | Wecoma       | 80 | 7-21-41  | ODFW | Bonneville  | Columbia R.   | 9/XI/81             | 1/VI/82  | 204       | 74 S  | 306 |
| 89  | 010 | Breakers     | 80 | 7-21-43  | ODFW | Bonneville  | Columbia R.   | 17/III/82           | 11/VI/82 | 86        | 8 N   | 227 |
| 129 | 002 | Cape Lookout | 80 | 7-21-43  | ODFW | Bonneville  | Columbia R.   | 17/III/82           | 22/VI/82 | 97        | 55 S  | 284 |
| 56  | 003 | Wecoma       | 80 | 7-25-7   | ODFW | Bonneville  | Columbia R.   | 30/III/82<br>VII/81 | 31/V/82  | 62<br>305 | 75 S  | 289 |

## Chinook (cont.)

| Purse Seine Set | I.D. No. | Transect     | Brood Yr | Tag Code | Agency | Hatchery     | Ocean Entry Site | Release Date | Recovery Date | Days Since Release | N-S Distance from Ocean Entry | Length at Recovery |
|-----------------|----------|--------------|----------|----------|--------|--------------|------------------|--------------|---------------|--------------------|-------------------------------|--------------------|
| 91              | 001      | Breakers     | 80       | 7-20-54  | ODFW   | McKenzie     | Columbia R.      | 15/III/82    | 11/VI/82      | 88                 | 8 N                           | 280                |
| 34              | 016      | Seaside      | 80       | 7-25-18  | ODFW   | McKenzie     | Columbia R.      | 15/III/82    | 27/V/82       | 73                 | 15 S                          | 207                |
| 79              | 002      | Willapa Bay  | 80       | 7-24-19  | ODFW   | Oakridge     | Columbia R.      | 15/III/82    | 8/VI/82       | 85                 | 26 N                          | 247                |
| 86              | 001      | Ocean Park   | 80       | 7-24-19  | ODFW   | Oakridge     | Columbia R.      | 15/III/82    | 10/VI/82      | 87                 | 15 N                          | 287                |
| 87              | 003      | Ocean Park   | 80       | 7-24-22  | ODFW   | Oakridge     | Columbia R.      | 15-16/III/82 | 10/VI/82      | 86-87              | 15 N                          | 260                |
| 82              | 002      | Willapa Bay  | 80       | 7-25-24  | ODFW   | Oakridge     | Columbia R.      | 2-3/XI/81    | 10/VI/82      | 219                | 25 N                          | 150                |
| 86              | 002      | Ocean Park   | 80       | 7-25-25  | ODFW   | Marion Forks | Columbia R.      | 15/III/82    | 10/VI/82      | 87                 | 15 N                          | 210                |
| 82              | 003      | Willapa Bay  | 80       | 7-25-26  | ODFW   | Marion Forks | Columbia R.      | 16/III/82    | 10/VI/82      | 86                 | 25 N                          | 193                |
| 62              | 010      | Yaquina      | 80       | 7-25-27  | ODFW   | Marion Forks | Columbia R.      | 17/III/82    | 1/V/82        | 76                 | 94 S                          | 179                |
| 81              | 001      | Willapa Bay  | 80       | 7-25-27  | ODFW   | Marion Forks | Columbia R.      | 17/III/82    | 8/VI/82       | 83                 | 26 N                          | 165                |
| 35              | 010      | Seaside      | 80       | 7-25-28  | ODFW   | Marion Forks | Columbia R.      | 18/III/82    | 27/V/82       | 70                 | 15 S                          | 213                |
| 36              | 001      | Seaside      | 80       | 7-25-29  | ODFW   | Marion Forks | Columbia R.      | 19/III/82    | 27/V/82       | 69                 | 15 S                          | 186                |
| 87              | 004      | Ocean Park   | 80       | 7-25-29  | ODFW   | Marion Forks | Columbia R.      | 19/III/82    | 10/VI/82      | 83                 | 15 N                          | 228                |
| 34              | 002      | Seaside      | 80       | 7-23-50  | ODFW   | Round Butte  | Columbia R.      | 23/III/82    | 27/V/82       | 65                 | 15 S                          | 192                |
| 51              | 001      | Cape Lookout | 80       | 7-23-50  | ODFW   | Round Butte  | Columbia R.      | 23/III/82    | 31/V/82       | 69                 | 55 S                          | 191                |
| 59              | 020      | Wecoma       | 80       | 7-23-50  | ODFW   | Round Butte  | Columbia R.      | 23/III/82    | 1/VI/82       | 70                 | 74 S                          | 302                |
| 81              | 007      | Willapa Bay  | 80       | 7-23-50  | ODFW   | Round Butte  | Columbia R.      | 23/III/82    | 8/VI/82       | 77                 | 26 N                          | 287                |
| 22              | 010      | Willapa Bay  | 80       | 62-48-32 | Domsea | Domsea       | Siuslaw Bay      | XII/81       | 23/V/82       | ~143-174           | 150 N                         | 270                |
| 82              | 005      | Willapa Bay  | 80       | 62-48-32 | Domsea | Domsea       | Siuslaw Bay      | XII/81       | 10/VI/82      | ~161-191           | 150 N                         | 309                |
| 67              | 001      | Yachats      | 80       | 7-25-2   | ODFW   | Rock Creek   | Winchester Bay   | 3/III/82     | 2/VI/82       | 91                 | 40 N                          | 248                |
| 56              | 001      | Wecoma       | 80       | 7-25-36  | ODFW   | Elk R.       | Elk R.           | 27/IX/81     | 31/V/82       | 247                | 73 N                          | 316                |
| 36              | --       | Seaside      | 79       | 6-61-33  | CDPG   | Trinity R.   | Klamath R.       | VI/80        | 27/V/82       | ~696-726           | 260 N                         | 519                |

## Steelhead

|    |     |              |    |         |     |                            |        |         |         |    |       |     |
|----|-----|--------------|----|---------|-----|----------------------------|--------|---------|---------|----|-------|-----|
| 52 | 001 | Cape Lookout | 80 | 5-10-43 | HOH | <del>Hoh</del><br>Quinnitt | Hoh R. | 14/V/82 | 31/V/82 | 17 | 145 S | 185 |
|----|-----|--------------|----|---------|-----|----------------------------|--------|---------|---------|----|-------|-----|

<sup>1</sup>One CWT from a juvenile coho was lost and one CWT from an adult coho was unreadable.

\*Distance from Cape Flattery.