Outline of Japanese Salmon Investigations in the Offshore Waters of the North Pacific Ocean in 1988

Yukimasa Ishida
Far Seas Fisheries Research Laboratory

September 1988
Fisheries Agency of Japan
1988年に北太平洋の沖合水域において行なった
日本のさけ・ます調査の概要

石田行正
（遠洋水産研究所）

本報告は、1988年6月から8月まで日本が北太平洋及びベーリング海の沖合水域において実施したさけ・ます調査の概要である。資料を現在分析中であり本報告は暫定的数値を含む。なお比較のために（）内で1987年の数値を示した。

I. さけ・ます調査

1. 母 船
1988年の母船式さけ・ます流し網漁業は、1母船（3、43）独航船（129）によって実施された。船団は6月1日に出港し、7月21日に帰港した。母船への水揚げは6月8日に開始され、7月14日に終了した。この間34回（90）の船団操業が実施された（表1）。母船上の魚体測定尾数は、ベニザケ2,749尾（7,886）、シロザケ1,037尾（2,713）、カラフトマス1,020尾（2,693）、ギンザケ0尾（896）、マスノスケ441尾（2,451）、計5,247尾（16,639）であった。

2. 調査 船
1988年に冲合水域において活動したさけ・ます調査船は11隻である（表2）。さけ・ます調査船が使用した漁具は流し網並びにはえならである（図2）。
流し網調査は6月7日に開始され、8月6日に終了した。流し網調査回数は6月94回、7月74回、8月3回、計171回（180）であった（図3～5）。
はえなら調査は6月4日に開始され、7月18日に終了した。はえなら調査回数は6月162回、7月64回、計256回（240）であった（図6～7）。
標識放流尾数は、ベニザケ274尾（210）、シロザケ4,930尾（3,146）、カラフトマス1,330尾（3,276）、ギンザケ1,020尾（879）、マスノスケ55尾（50）、スチール・ヘッド99尾（63）、計7,708尾（7,624）であった。

なお、スチール・ヘッド、ギンザケの脂鰭欠損魚から頭部標本を、またマスノスケ、ギンザケから寄生虫調査用の頭部標本を採集した。

3. 共同調査による科学者の乗船
第3秋季丸に技術者D. Welch、新里あす丸に米国技術者J. Light、S. Carver、おしよう丸に米国技術者M. Muto、K. Myers、O. Mathisen、P. Poeが乗船した。一方、加来調査船
II. 北西太平洋及びベーリング海におけるサケ科魚類の分布状況

調査船による10種類目合構成の非選択的調査用流し網（C網）による100反当り漁獲尾数を、馬群別、月別、1° x 5°海区別に図8〜25に示した。これらの資料と過去の長年平均（1972〜1987年）とを比較した（表3）。方法は高木（1986）に準じた。ただし、比較は月別・1° x 5°海区を基礎とした。

これによるとベニザケ、シロザケ、カラフトマスは各海域で過去の平均値より豊度が高かった。一方、ギンザケは北太平洋で豊度が低く、マスノスケはベーリング海で豊度が高かった。

文 献

高木 健治 1986.
1986年に北太平洋の沖合水域において行なった日本のさけ・マス調査の概要 36頁 水産庁 遠洋水産研究所。
Table 1. Japanese salmon mothership activities in 1988.

<table>
<thead>
<tr>
<th>Mothership</th>
<th>Gross tonnage</th>
<th>Number of catcher boats</th>
<th>Left Hakodate</th>
<th>Arrived fishing grounds</th>
<th>Left fishing grounds</th>
<th>Returned Hakodate</th>
<th>Days on fishing grounds</th>
<th>Days of fishing operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kizan maru</td>
<td>8,859.11</td>
<td>43</td>
<td>June 1</td>
<td>June 7</td>
<td>July 14</td>
<td>July 21</td>
<td>38</td>
<td>34</td>
</tr>
</tbody>
</table>

Table 2. Japanese salmon research vessel activities in 1988.

<table>
<thead>
<tr>
<th>Vessel</th>
<th>Cruise</th>
<th>Left Date</th>
<th>Port</th>
<th>Returned Date</th>
<th>Port</th>
<th>Duration 1st fishing</th>
<th>Last fishing</th>
<th>Number of set Gillnet</th>
<th>Longline</th>
<th>Tagging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hokushin maru</td>
<td>1</td>
<td>June 25</td>
<td>Kushiro</td>
<td>July 19</td>
<td>Kushiro</td>
<td>June 30</td>
<td>June 15</td>
<td>12</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Oshoro maru</td>
<td>1</td>
<td>June 6</td>
<td>Hakodate</td>
<td>Aug. 18</td>
<td>Hakodate</td>
<td>June 14</td>
<td>July 21</td>
<td>27</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Hokusei maru</td>
<td>1</td>
<td>June 1</td>
<td>Hakodate</td>
<td>June 15</td>
<td>Hakodate</td>
<td>June 7</td>
<td>June 12</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>June 20</td>
<td>Hakodate</td>
<td>July 4</td>
<td>Hakodate</td>
<td>June 24</td>
<td>June 27</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>July 11</td>
<td>Hakodate</td>
<td>Aug. 10</td>
<td>Hakodate</td>
<td>July 18</td>
<td>Aug. 6</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hokko maru</td>
<td>1</td>
<td>June 6</td>
<td>Onahama</td>
<td>July 15</td>
<td>Kushiro</td>
<td>June 9</td>
<td>July 10</td>
<td>31</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Iwaki maru</td>
<td>1</td>
<td>June 7</td>
<td>Hakodate</td>
<td>Aug. 3</td>
<td>Kushiro</td>
<td>June 13</td>
<td>July 20</td>
<td>12</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Hokuso maru</td>
<td>1</td>
<td>June 7</td>
<td>Hakodate</td>
<td>July 27</td>
<td>Hakodate</td>
<td>June 15</td>
<td>July 18</td>
<td>21</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>Kaiun maru</td>
<td>1</td>
<td>June 5</td>
<td>Kushiro</td>
<td>July 19</td>
<td>Kushiro</td>
<td>June 13</td>
<td>July 12</td>
<td>28</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Shin-Riasu maru</td>
<td>1</td>
<td>June 1</td>
<td>Miyako</td>
<td>July 21</td>
<td>Kushiro</td>
<td>June 4</td>
<td>July 17</td>
<td>0</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Etsuzan maru</td>
<td>1</td>
<td>June 1</td>
<td>Masaki</td>
<td>July 21</td>
<td>Kushiro</td>
<td>June 10</td>
<td>July 16</td>
<td>0</td>
<td>67</td>
<td>66</td>
</tr>
<tr>
<td>Kanki maru No.3</td>
<td>1</td>
<td>June 3</td>
<td>Yamada</td>
<td>July 7</td>
<td>Kushiro</td>
<td>June 8</td>
<td>July 2</td>
<td>0</td>
<td>47</td>
<td>47</td>
</tr>
</tbody>
</table>
Table 3. Comparison of relative abundance of salmon between 1988 and averages in the past.

<table>
<thead>
<tr>
<th>Area</th>
<th>Year</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sockeye</td>
</tr>
<tr>
<td>North Pacific</td>
<td>1988</td>
<td>65</td>
</tr>
<tr>
<td>West of 175°E</td>
<td>1972-1987</td>
<td>32</td>
</tr>
<tr>
<td>North Pacific</td>
<td>1988</td>
<td>79</td>
</tr>
<tr>
<td>East of 175°E</td>
<td>1972-1987</td>
<td>59</td>
</tr>
<tr>
<td>Bering Sea</td>
<td>1988</td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>1972-1987</td>
<td>62</td>
</tr>
<tr>
<td>Total</td>
<td>1988</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>1972-1987</td>
<td>46</td>
</tr>
</tbody>
</table>

* Data in even years were used for pink salmon.
Figure 1. Noon positions of Japanese salmon mothership on landing days in June and July, 1988.
Figure 2. Fishing locations of Japanese salmon research vessels by gillnets and longlines, 1988.
Figure 3. Gillnetting locations of Japanese research vessels in June, 1988.
Figure 4. Gillnetting locations of Japanese research vessels in July, 1988.
Figure 5. Gillnetting locations of Japanese research vessels in August, 1988.
Figure 6. Longlining locations of Japanese research vessels in June, 1988.
Figure 7. Longlining locations of Japanese research vessels in July, 1988.
Figure 8. CPUE distribution of sockeye salmon caught by the 100 tans of research gillnets in June, 1988.
Figure 9. CPUE distribution of sockeye salmon caught by the 100 tans of research gillnets in July, 1988.
Figure 10. CPUE distribution of sockeye salmon caught by the 100 tans of research gillnets in August, 1988.
Figure 11. CPUE distribution of chum salmon caught by the 100 tans of research gillnets in June, 1988.
Figure 12. CPUE distribution of chum salmon caught by the 100 tans of research gillnets in July, 1988.
Figure 13. CPUE distribution of chum salmon caught by the 100 tans of research gillnets in August, 1988.
Figure 14. CPUE distribution of pink salmon caught by the 100 tans of research gillnets in June, 1988.
Figure 15. CPUE distribution of pink salmon caught by the 100 tans of research gillnets in July, 1988.
Figure 16. CPUE distribution of pink salmon caught by the 100 tons of research gillnets in August, 1988.
Figure 17. CPUE distribution of coho salmon caught by the 100 tons of research gillnets in June, 1988.
Figure 18. CPUE distribution of coho salmon caught by the 100 tans of research gillnets in July, 1988.
Figure 19. CPUE distribution of coho salmon caught by the 100 tans of research gillnets in August, 1988.
Figure 20. CPUE distribution of chinook salmon caught by the 100 tans of research gillnets in June, 1988.
Figure 21. CPUE distribution of chinook salmon caught by the 100 tans of research gillnets in July, 1988.
Figure 22. CPUE distribution of chinook salmon caught by the 100 tons of research gillnets in August, 1988.
Figure 23. CPUE distribution of steelhead trout caught by the 100 tons of research gillnets in June, 1988.
Figure 24. CPUE distribution of steelhead trout caught by the 100 tons of research gillnets in July, 1988.
Figure 25. CPUE distribution of steelhead trout caught by the 100 tans of research gillnets in August, 1988.
OUTLINE OF JAPANESE SALMON INVESTIGATIONS IN THE
OFFSHORE WATERS OF THE NORTH PACIFIC OCEAN IN 1988

Yukimasa Ishida
Far Seas Fisheries Research Laboratory

Fisheries Agency of Japan
1988 September

THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:
Ishida, Yukimasa. 1988. Outline of Japanese salmon
investigations in the offshore waters of the North
Pacific ocean in 1988. (Document submitted to the
Annual Meeting of the International North Pacific
Fisheries Commission, Tokyo, Japan, 1988 October.)
4 p. Fisheries Agency of Japan, Far Seas Fisheries
Research Laboratory, 5-7-1 Orido, Shimizu, Japan 424
This report summarizes salmon investigations conducted by Japan in offshore waters of the North Pacific Ocean and Bering Sea during the period 1988 June to August. The data obtained from these investigations are still being analyzed and figures in this report are preliminary. Also, in the following text, comparative figures for 1987 are shown in parentheses ( ).

I. Research on Salmon

1. Mothership

The mothership salmon gillnet fishery in 1988 was conducted by one (3) mothership accompanied by 43 catcher boats (129). The mothership fleet left Hakodata on June 1 and returned to Hakodata on July 21. Landings to the mothership by catcher boats commenced on June 8 and terminated on July 14. Fleet operations totalled 34 (90) during this period (Table 1). A total of 5,247 (16,639) salmon were measured on board the mothership in 1988; sockeye 2,749 (7,886), chum 1,037 (2,713), pink 1,020 (2,693), coho 0 (896) and chinook 441 (2,451).

2. Research vessels

The 1988 Japanese research activities on salmon in offshore waters were carried out by 11 research vessels (Table 2). The fishing gear used by the research vessels were gillnets and longlines (Fig. 2).

Research activities with gillnets commenced on June 7 and terminated on August 6. Numbers of research operations with gillnets totalled 171 (180); 94 in June, 74 in July, and 3 in August (Figs. 3 to 5).

Research activities with longlines commenced on June 4 and terminated on July 18. Numbers of research operations with longlines totalled 256 (240); 162 in June, 64 in July (Figs. 6 to 7).
A total of 7,708 (7,621) salmon was tagged and released; sockeye 274 (210), chum 4,930 (3,146), pink 1,330 (3,276), coho 1,020 (879), chinook 55 (50) and steelhead 99 (63).

In addition, head samples were collected from steelhead trout and coho salmon that did not have an adipose fin, and head samples were collected from chinook and coho salmon for research on parasites.

3. Boarding of scientists in joint researches

A Canadian scientist, D. Welch, was placed on board the Ranki maru No. 3 and U.S. scientists J. Light and S. Carver were on board the Shinriasu maru. U.S. scientists M. Muto, K. Myers, O. Mathisen and P. Poe were placed on board the Oshoro maru. On the other hand, a Japanese scientist, M. Ogura, was placed on board the Ricker, a Canadian research vessel. Also, U.S.S.R. scientists were placed on board the Hokko maru as the Japan-U.S.S.R. joint research.

II. Distribution of salmonids in the northwestern Pacific and Bering Sea

The catch per 100 tan with non-selective research gillnets with 10 different mesh sizes ("C" nets) are shown in Figs. 8 to 25 by species, by month and by area of 1°x5°. These data were compared with the long-period averages (1972 - 1987) obtained in the past (Table 3). The method followed that of Takagi (1986), but comparisons were based on month and area 1°x5°.

According to the results, abundance of sockeye, chum and chinook salmon were higher than the average values obtained in the past in every area. On the other hand, abundance of coho salmon was low in the North Pacific Ocean and that of chinook was high in the Bering Sea.
Reference


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Reference Tables 1 to 3, and Figs. 1 to 25 are in English in the Japanese Document.