

# FINAL REPORT

## Pacific Salmon Commission (PSC) Project No. NP9, “Chum Fishery Stock Composition”, 2004.

### Funding Allocation:

The PSC financial allocation to Project No. NP9 is \$15,000.00 CDN.

### Project Description:

Commercial net fisheries operating in Statistical Areas 3 (Nass) and 4 (Skeena) will be sampled to obtain genetic tissue of chum salmon. Samples obtained from chum encounters would be submitted for laboratory analysis and compared to baseline data to determine region of origin and stock proportions.

### Statement of Work.

Chum salmon tissue samples for genetic analysis will be obtained from the Area 3 commercial net fishery operating in the Wales Island area. A total of 100 tissue samples will be collected per week for a total of five weeks, from July 11 to August 14, 2004.

The organization, collection and shipment of the tissue samples represent in-kind work contributed by Fisheries & Oceans Canada (DFO).

Tissue analysis by the Molecular Genetics Laboratory located at the DFO Pacific Biological Station, Nanaimo, B.C. represents the activity funded under PSC Project No. NP9.

### Project Deliverables:

|                 |   |
|-----------------|---|
| Objective # 1 : | Obtain genetic samples of chum salmon from commercial net fishery encounters in Statistical Area 3.   |
| Objective # 2 : | Laboratory analysis of genetic samples of chum salmon obtained from commercial net fishery encounters in Statistical Areas 3.                                       |
| Objective # 3 : | Stock I.D. analysis using information from the Pacific Region genetic baseline database.<br><br>Results will include identification and proportion of stock origin. |

Project Results:

|                         |   |             |            |            |            |
|-------------------------|---|-------------|------------|------------|------------|
| Objective # 1 :         | Genetic tissue samples of chum salmon encountered in 2004 Area 3 commercial net fisheries operating in Statistical Area 3 near Wales Island was collected by DFO. |             |            |            |            |
|                         | The Area 3 commercial net fishery near Wales Island was sampled in the following manner:  |             |            |            |            |
| <b>Year</b>             | 2004  | 2004        | 2004       | 2004       | 2004       |
| <b>Stat. Area</b>       | 3-3, 3-7  | 3-3, 3-7    | 3-3, 3-7   | 3-3, 3-7   | 3-3, 3-7   |
| <b>Gear</b>             | Seine   | Seine       | Seine      | Seine      | Seine      |
| <b>Location</b>         | Wales Isl.  | Wales Isl.  | Wales Isl. | Wales Isl. | Wales Isl. |
| <b>Date</b>             | July 12 - 15  | July 19 -22 | July 26    | Aug. 02    | Aug. 09    |
| <b>Statistical Week</b> | 073   | 074         | 075        | 081        | 082        |
| <b>Julian Day</b>       | 194 - 197   | 201 - 204   | 208        | 215        | 222        |
| <b>Sample Size</b>      | 100   | 100         | 100        | 100        | 100        |

|                 |  |
|-----------------|--|
| Objective # 2 : | Laboratory analyses of genetic samples of chum salmon obtained from commercial net fishery encounters in Statistical Areas 3 were analysed by the DFO Molecular Genetics Laboratory. |
|                 | A total of 500 chum salmon tissue samples were analyzed at a cost of \$30.00 CDN per sample, for a total cost of \$15,000.00 CDN.  |

|                 |  |
|-----------------|--|
| Objective # 3 : | Stock I.D. analysis of the Area 3 chum samples used information from the Pacific Region genetic baseline database.   |
|                 | Results from this analysis identified the origin of chum stocks encountered in this study.   |
|                 | The following table summarizes stock composition of chum salmon samples analyzed through funding supplied by PSC Project No. NP9 showing stock origin and stock proportions. |

Project Results cont:

Objective # 3 cont:

The following table represents chum stock composition results from genetic analysis of tissue samples by the DFO Molecular Genetics Laboratory:

145 populations, 8 chains, 5000 reps, 4000 burnin, screen max miss loci = 5

Gelman-Rubin diagnostic >1.2 regional estimate is suspect.

|        | Year               | 2004      |                | 2004      |                | 2004      |                | 2004      |                | 2004      |                | 2004      |                |      |       |      |
|--------|--------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|------|-------|------|
|        | Stat Area          | A3-7,3-3  |                | A3-7,3-3  |                | A3-7,3-3  |                | A3-7,3-3  |                | A3-7,3-3  |                | A3-7,3-3  |                |      |       |      |
|        | Gear               | Seine     |                | Seine     |                | Seine     |                | Seine     |                | Seine     |                | Seine     |                |      |       |      |
|        | Location           | Wales Isl | G-R diagnostic | Wales Isl | G-R diagnostic | Wales Isl | G-R diagnostic | Wales Isl | G-R diagnostic | Wales Isl | G-R diagnostic | Wales Isl | G-R diagnostic |      |       |      |
|        | Date               | Jul 12-15 |                | Jul 19-22 |                | Jul-26    |                | Aug-02    |                | Aug-09    |                |           |                |      |       |      |
|        | Julian Day         | 194-197   |                | 201-204   |                | 208       |                | 215       |                | 222       |                |           |                |      |       |      |
| Region | Sample Size        | 100       |                | 100       |                | 100       |                | 100       |                | 100       |                |           |                |      |       |      |
| Code   | N(screened out)    | 100(0)    |                | 100(0)    |                | 100(0)    |                | 98(2)     |                | 100(0)    |                |           |                |      |       |      |
| 15     | SE Alaska          | 10.6      | (5.2)          | 1.13      | 8.0            | (8.3)     | 1.99           | 10.0      | (5.7)          | 1.05      | 10.9           | (4.2)     | 1.01           | 3.8  | (3.2) | 1.04 |
| 20     | QCI west           | 0.3       | (1.0)          | 1.03      | 0.2            | (0.6)     | 1.01           | 1.3       | (2.3)          | 1.06      | 1.5            | (2.7)     | 1.72           | 0.2  | (0.8) | 1.07 |
| 21     | QCI east           | 0.2       | (0.7)          | 1.03      | 0.8            | (1.5)     | 1.02           | 0.3       | (1.0)          | 1.03      | 2.1            | (2.5)     | 1.07           | 3.2  | (2.3) | 1.01 |
| 22     | QCI north          | 0.0       | (0.2)          | 1.03      | 3.4            | (2.9)     | 1.09           | 0.0       | (0.2)          | 1.02      | 0.1            | (0.4)     | 1.04           | 0.3  | (0.9) | 1.01 |
| 25     | Area 3             | 27.8      | (8.8)          | 1.06      | 60.5           | (13.4)    | 1.51           | 42.2      | (10.1)         | 1.16      | 41.7           | (8.7)     | 1.13           | 80.1 | (6.1) | 1.03 |
| 26     | Skeena             | 1.3       | (2.6)          | 1.16      | 0.0            | (0.3)     | 1.10           | 0.1       | (0.5)          | 1.10      | 0.0            | (0.2)     | 1.03           | 0.0  | (0.1) | 1.02 |
| 27     | Area 5             | 0.0       | (0.1)          | 1.02      | 0.0            | (0.1)     | 1.02           | 0.1       | (0.4)          | 1.12      | 0.0            | (0.1)     | 1.03           | 0.0  | (0.1) | 1.01 |
| 28     | Area 6-7           | 44.5      | (9.3)          | 1.07      | 12.7           | (10.3)    | 1.29           | 41.8      | (10.8)         | 1.20      | 27.2           | (10.4)    | 1.29           | 3.4  | (4.7) | 1.17 |
| 29     | Area 8             | 0.8       | (1.5)          | 1.12      | 2.8            | (4.0)     | 1.08           | 0.5       | (1.4)          | 1.07      | 3.9            | (4.7)     | 1.74           | 0.7  | (1.7) | 1.06 |
| 30     | Area 9-10          | 10.7      | (6.4)          | 1.18      | 9.5            | (6.5)     | 1.53           | 1.4       | (2.6)          | 1.10      | 3.4            | (5.3)     | 2.51           | 5.4  | (4.9) | 1.93 |
| 31     | Johnstone St       | 0.7       | (1.7)          | 1.13      | 0.5            | (1.6)     | 1.07           | 1.0       | (2.0)          | 1.06      | 8.1            | (3.8)     | 1.02           | 1.5  | (1.7) | 1.02 |
| 35     | South Coast        | 0.2       | (0.6)          | 1.01      | 0.2            | (0.7)     | 1.06           | 0.2       | (0.7)          | 1.11      | 0.2            | (0.6)     | 1.03           | 0.2  | (0.6) | 1.03 |
| 38     | ECVI               | 0.4       | (1.0)          | 1.01      | 0.5            | (1.2)     | 1.03           | 0.3       | (0.9)          | 1.09      | 0.2            | (0.6)     | 1.06           | 0.3  | (0.8) | 1.04 |
| 39     | WCVI               | 2.3       | (3.3)          | 1.97      | 0.2            | (0.6)     | 1.06           | 0.5       | (1.3)          | 1.03      | 0.1            | (0.5)     | 1.05           | 0.1  | (0.4) | 1.02 |
| 42     | Fraser             | 0.2       | (0.6)          | 1.01      | 0.4            | (1.2)     | 1.09           | 0.3       | (0.9)          | 1.05      | 0.2            | (0.7)     | 1.02           | 0.3  | (0.8) | 1.04 |
| 45     | North Puget Sound  | 0.1       | (0.5)          | 1.07      | 0.1            | (0.3)     | 1.03           | 0.1       | (0.3)          | 1.02      | 0.2            | (0.7)     | 1.02           | 0.1  | (0.4) | 1.02 |
| 46     | South Puget Sound  | 0.0       | (0.2)          | 1.04      | 0.2            | (0.7)     | 1.03           | 0.0       | (0.1)          | 1.02      | 0.0            | (0.2)     | 1.06           | 0.0  | (0.1) | 1.02 |
| 47     | Hood Canal         | 0.0       | (0.2)          | 1.03      | 0.0            | (0.1)     | 1.10           | 0.0       | (0.2)          | 1.02      | 0.0            | (0.1)     | 1.02           | 0.0  | (0.2) | 1.01 |
| 48     | Juan de Fuca       | 0.0       | (0.1)          | 1.11      | 0.0            | (0.1)     | 1.05           | 0.0       | (0.1)          | 1.02      | 0.0            | (0.1)     | 1.04           | 0.0  | (0.1) | 1.07 |
| 49     | Coastal Washington | 0.0       | (0.2)          | 1.02      | 0.1            | (0.4)     | 1.08           | 0.0       | (0.2)          | 1.04      | 0.1            | (0.6)     | 1.06           | 0.6  | (1.3) | 1.52 |

## Conclusions:

Stock Separation analysis of chum salmon tissue samples obtained in the 2004 Area 3 commercial net fishery located near Wales Island have produced results indicating that this technique has excellent potential to identify aggregate stock origins of chum salmon encountered in this fishery. These results will provide important stock management information in support of chum conservation and management of Canadian domestic harvest plans and will stimulate further discussion in the Northern Boundary Technical Committee and the Northern Panel on the prospect for further Northern Boundary applications.

While acknowledging these initial analysis are uncertain because of the developing baseline, the initial results provide important information. The Area 9 and 10 proportions seem higher than expected and may reflect the need for further baseline sampling in these areas. The proportion of Alaskan is lower than expected. The Alaskan baseline is very poorly represented, with Naket enhanced stock being of particular interest. The lack of Area 8 chum in the Area 3 fishery in a year where there was a very large return to Area 8 is of significant interest to managers (baseline sampling is very good). The high proportion of Area 5 and 6 chum was expected (baseline sampling very good). The high proportion of Area 3 chum in the Area 3 fishery is important confirmation of the appropriateness of the Canadian domestic management measures - seine non-retention program (even though it is expected some of the chum classified as Area 3 may be reclassified to SE Alaska as the baseline improves).

The Northern Boundary Technical Committee will be reviewing these results at the next NBTC meeting.

These results fulfill contract deliverables for PSC Project No. NP9

## Disbursement of Funds:

Analysis costs of \$13.5K have been invoiced to the NP9 account. Once the final report is reviewed and the \$1.5K hold back is transferred to DFO, the final analysis costs will be paid.