2003

Scientific Excellence • Resource Protection & Conservation • Benefits for Canadians
Excellence scientifique • Protection et conservation des ressources • Bénéfices aux Canadiens

Canadian Manuscript Report of

Fisheries and Aquatic Sciences 2003

DFO - Library / MPO - Bibliothèque
12022214

THE 1987 REPORT OF THE JOHNSTONE STRAIT COMMERCIAL NET CATCH VERIFICATION PROGRAM

by

Jim Lettic [1] and Al Gould [2]

SH
223
F55
#2003

[1] Timberlands Road
RR I
Ladysmith, B.C.
V0R 2E0

[2] Department of Fisheries and Oceans
South Coast Division
3225 Stephenson Point Road
Nanaimo, B.C.
V9T 1K3

Fisheries and Oceans Pêches et Océans

Canada

Canadian Manuscript Report of Fisheries and Aquatic Sciences

Manuscript reports contain scientific and technical information that contributes to existing knowledge but which deals with national or regional problems. Distribution is restricted to institutions or individuals located in particular regions of Canada. However, no restriction is placed on subject matter, and the series reflects the broad interests and policies of the Department of Fisheries and Oceans, namely, fisheries and aquatic sciences.

Manuscript reports may be cited as full publications. The correct citation appears above the abstract of each report. Each report is abstracted in *Aquatic Sciences and Fisheries Abstracts* and indexed in the Department's annual index to scientific and technical publications.

Numbers 1 900 in this series were issued as Manuscript Reports (Biological Series) of the Biological Board of Canada, and subsequent to 1937 when the name of the Board was changed by Act of Parliament, as Manuscript Reports (Biological Series) of the Fisheries Research Board of Canada. Numbers 901 1425 were issued as Manuscript Reports of the Fisheries Research Board of Canada. Numbers 1426 1550 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Manuscript Reports. The current series name was changed with report number 1551.

Manuscript reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page. Out-of-stock reports will be supplied for a fee by commercial agents.

Rapport manuscrit canadien des sciences halieutiques et aquatiques

Les rapports manuscrits contiennent des renseignements scientifiques et techniques qui constituent une contribution aux connaissances actuelles, mais qui traitent de problèmes nationaux ou régionaux. La distribution en est limitée aux organismes et aux personnes de régions particulières du Canada. Il n'y a aucune restriction quant au sujet; de fait, la série reflète la vaste gamme des intérêts et des politiques du ministère des Pêches et des Océans, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports manuscrits peuvent être cités comme des publications complètes. Le titre exact paraît au-dessus du résumé de chaque rapport. Les rapports manuscrits sont résumés dans la revue *Résumés des sciences aquatiques et halieutiques*, et ils sont classés dans l'index annuel des publications scientifiques et techniques du Ministère.

Les numéros 1 à 900 de cette série ont été publiés à titre de manuscrits (série biologique) de l'Office de biologie du Canada, et après le changement de la désignation de cet organisme par décret du Parlement, en 1937, ont été classés comme manuscrits (série biologique) de l'Office des recherches sur les pêcheries du Canada. Les numéros 901 à 1425 ont été publiés à titre de rapports manuscrits de l'Office des recherches sur les pêcheries du Canada. Les numéros 1426 à 1550 sont parus à titre de rapports manuscrits du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 1551.

Les rapports manuscrits sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

821-835

Canadian Manuscript Report of

Fisheries and Aquatic Sciences 2003

THE 1987 REPORT OF THE JOHNSTONE STRAIT COMMERCIAL NET CATCH VERIFICATION PROGRAM

by

Jim Lettic [1] and Al Gould [2]

Department of Fisheries & Oceans
DEC 21 1992
Ministère des Pêches et des Océans
OTTAWA

[1] Timberlands Road
RR 1
Ladysmith, B.C.
V0R 2E0

[2] Department of Fisheries and Oceans
South Coast Division
3225 Stephenson Point Road
Nanaimo, B.C.
V9T 1K3

(c) Minister of Supply and Services Canada 1988

Cat. No. Fs 97-4/2003E ISSN 0706-6473

Correct citation for this publication:

Lettic, J. and A. Gould. 1988. The 1987 Report of the Johnstone Strait Commercial Net Catch Verification Program. Can. MS. Rep. Fish. Aquat. Sci. NO.2003: 45p.

ABSTRACT

Sales receipt data from the 1987 Johnstone Strait pink and sockeye commercial net fishery were processed in-season, using microcomputers, to verify catch and to project final catch for the target and incidental species. This report, the third in a series (1985-87), summarizes the activities of the 1987 Johnstone Strait Commercial Net Catch Verification Program (JSCNCVP). Electronic data processing procedures and results are presented, and two methods of in-season catch estimation (JSCNCVP vs DFO Hails) are compared. These in-season estimates were also compared with the post-season catch estimates from the Pacific Region Catch Reporting System (PRCRS).

The focus of this report is the various methods for projecting final catch from incomplete data. Emphasis is given to those variables that may affect in-season predictions of final catch. This report assesses (1) veracity in reporting, (2) the roles of PRCRS, DFO (e.g. Fishery Officers and biological management) and Industry personnel, and (3) legislation governing the reporting of catch from commercial salmon harvest.

RÉSUMÉ

On a traité en cours de saison les données des reçus de vente tirées de la pêche commerciale au filet du saumon rouge et du saumon rose dans le détroit de Johnstone en 1987, au moyen de microordinateurs, pour vérifier les prises et pour prévoir les prises définitives des espèces recherchées et des espèces accessoires. Ce rapport, le troisième d'une série (1985-1987), résume les activités du Programme de vérification des prises commerciales au filet dans le détroit de Johnstone (PVPCFDJ). On présente les procédures et les résultats du traitement électronique des données et on compare deux méthodes d'estimation des prises en cours de saison (PVPCFDJ par opposition aux rapports radio des prises du MPO). Ces estimations en cours de saison ont également été comparées à celles des prises après saison tirées du Système de déclaration des prises dans la région du Pacifique (SDPRP).

Le présent rapport est axé sur diverses méthodes permettant de prévoir les prises définitives à partir de données incomplètes. L'accent est mis sur ces variables qui peuvent influer sur les prévisions en cours de saison des prises définitives. On évalue dans le rapport (1) la véracitè dans la déclaration des prises, (2) les rôles du SDPRP, du MPO (par ex. les agents des pêches et les biologistes) et des employés de l'industrie ainsi que (3) les mesures législatives régissant la déclaration des prises dans le cadre de la pêche commerciale du saumon.

Table of Contents

List of Tables.....v

1 BACKGROUND REVIEW.....1

2 PROGRAM STATUS.....2

3 PROCEDURES.....2

4 ERROR HANDLING.....3

5 WEEKLY AND SEASONAL COMPARISONS.....5

6 SEASON SUMMARY.....8

7 POST SEASON COMPARISONS WITH REGIONAL STATISTICS BRANCH.....9

8 JSCNCVP ENFORCEMENT.....11

8.1 Concept of Original Proposal.....11

8.2 Enforcement of Licensing Regulations.....11

8.3 Enforcement of Fishing Regulations.....12

8.4 Enforcement of Compliance in Reporting.....12

8.5 Conclusions.....13

9 Acknowledgements.....14

10 TABLES.....15

List of Tables

Table 1. Status of recommendations from the 1985 JSCNCVP pilot project. 15
Table 2. JSCNCVP EDP procedures for 1987. 17
Table 3. Frequency of sales receipt error by type. 19
Table 4a. Summaries for week 8-1. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP. 20
Table 4b. Summaries for week 8-1. Comparison of vessel catch averages for Hails vs JSCNCVP. 21
Table 4c. Summaries for week 8-1. Delivery averages. 22
Table 4d. Summaries for week 8-1. Average number of deliveries. 23
Table 5a. Summaries for week 8-2. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP. 24
Table 5b. Summaries for week 8-2. Comparison of vessel catch averages for Hails vs JSCNCVP. 25
Table 5c. Summaries for week 8-2. Delivery averages. 26
Table 5d. Summaries for week 8-2. Average number of deliveries. 27
Table 6a. Summaries for week 8-3. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP. 28
Table 6b. Summaries for week 8-3. Comparison of vessel catch averages for Hails vs JSCNCVP. 29
Table 6c. Summaries for week 8-3. Delivery averages. 30
Table 6d. Summaries for week 8-3. Average number of deliveries. 31
Table 7a. Summaries for week 8-4. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP. 32
Table 7b. Summaries for week 8-4. Comparison of vessel catch averages for Hails vs JSCNCVP. 33
Table 7c. Summaries for week 8-4. Delivery averages.

.....34
Table 7d. Summaries for week 8-4. Average number of deliveries.
.....35
Table 8a. Summaries for week 9-1. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP.
.....36
Table 8b. Summaries for week 9-1. Comparison of vessel catch averages for Hails vs JSCNCVP.
.....37
Table 8c. Summaries for week 9-1. Delivery averages.
.....38
Table 8d. Summaries for week 9-1. Average number of deliveries.
.....39
Table 9. Seasonal comparisons of Hails vs JSCNCVP catch estimates by in-season programs. Summary of catches from weeks 8-1 until 9-1.
.....40
Table 10. Weekly gear counts and deliveries from Regional Statistics Branch (RSB).
.....41
Table 11. Seasonal gear counts and deliveries.
.....43
Table 12. In-season vs Regional Statistics Branch (RSB) catch estimates. Summary of catches from weeks 8-1 until 9-1.
.....44
Table 13. Weeky gear count and days open for areas 11-13 for 1987.
.....45

1 BACKGROUND REVIEW

The Johnstone Strait Commercial Net Catch Verification Program (JSCNCVP) was conceived and developed as an independent in-season means of reviewing commercial sales receipt data in order to (1) verify incidental catch of chinook salmon in a pink and sockeye target fishery, and (2) assist in an estimation of catch for all salmon species. Impetus for this program was provided by the fact that Annual Reports with 'final' seasonal catch summaries prepared by the Regional Statistics Branch (RSB) of the Department of Fisheries and Oceans (DFO) were not available to management biologists until six to ten months after the commercial fishing season. In addition to this delay, the published data lacked credibility. A consensus among users of these catch statistics was that its untimeliness made it impractical for use in verifying catch reports. Additionally, the need for high quality and timely in-season information for international issues amplified the need for evaluation of the catch reporting system.

For the third consecutive season the JSCNCVP was implemented to provide an in-season analysis of catch and effort from commercial sales receipt data. As in 1985 and 1986, sales receipts from the commercial pink and sockeye fishery in Johnstone Strait were intercepted after collection and summarization by Fisheries Officers, but prior to processing by RSB. Data processing was conducted on-site within Statistical District 5 with only minor revisions in methods and objectives from previous programs. The primary objectives were: (1) to scrutinize sales receipts for errors (e.g. area, gear type, species code) and illegibility prior to shipment to a Pacific Region Catch Reporting System (PRCRS) processing centre, (2) to provide an independent in-season estimate of weekly catch for target and incidental species, (3) to provide an indication of trends by gear and area, (4) to verify in-season estimates from hails by Fishery Officers, and (5) to scrutinize registration information and detect CFV licensing violations. One major change from the 1986 program was the lack of a Vancouver waterfront collection of sales receipts. This negatively impacted the utility of the 1987 program.

This report discusses the evolution of the JSCNCVP (1985-1987), articulates the difficulties associated with remote sales receipt processing, and summarizes the results of data processing for the 1987 commercial salmon season (weeks 8-1 until 9-1). It also comments on the relationship between the JSCNCVP and DFO in-season catch monitoring programs and the final statistics of PRCRS.

2 PROGRAM STATUS

Initially, the 1985 pilot project disclosed disparities and difficulties associated with collecting and processing catch information. Recommendations were presented to DFO after the 1985 program suggesting (1) fundamental changes to the catch reporting and vessel licensing systems, and (2) improvements in the legislation governing conservation of salmon resources. Since 1985, the JSCNCVP has been asked to justify its cost by demonstrating its effectiveness in highlighting discrepancies between the results it obtains and the other two methods of obtaining catch statistics.

Comments and recommendations from the 1985 program summary regarding the reporting of salmon catch data are summarized in Table 1. These recommendations were presented to personnel involved with catch reporting and biological management. Only a limited number of the recommendations have been implemented to date. There was a continuation of the in-season program (Recommendation 1) for the 1986 and 1987 seasons, and the DFO system of hails underwent minor renovation (Recommendation 18).

Some alterations have been made to PRCRS since 1985. It appears that parallel to the restructuring of the commercial sales receipt data processing mechanism (contracting of coding and keypunching) is an interest in-season data processing to serve the acute requirements of managers and the long range requirements of RSB. Only if the objectives of each end user are better achieved will in-season processing be eventually endorsed and supported by PRCRS.

3 PROCEDURES

Table 2 details the chronology of data processing procedures during any one week fishery from the receipt of delivery receipts to production of weekly in-season catch statistics. Procedures 1-2 require the greatest resources. Traditionally, Fishery Officers have collected sales receipts and tallied catch totals for use in generating a 'hailed' estimate of total weekly catch. Although on-site microcomputers have been used to process sales receipts and produce independent estimates of catch for three years, hailed catch estimates have continued. This redundancy should be discontinued if computerized data processing continues.

Procedures 3-10 outline the computer analysis of sales receipt data. Data entry was accomplished in each District 5 subdistrict office and the files transmitted to District office using telecommunications. Raw data was then screened for error, and the declaration of gear type on each sales receipt was cross referenced with licensing files from DFO Licensing Branch. Procedure 11 ensures that the declaration of gear on the sales

receipt matches the gear type on file with the vessel licence information.

Procedures 12-14 outline the generation of reports for scrutiny by District 5 and biological managers. They are detailed in subsequent sections discussing the presentation and analysis of weekly catch data. A significant change from the 1985 pilot project methodology was the projection of final catch from the subset of data collected during the fishery. The projection algorithm was employed and refined in an attempt to preempt the annual catch summaries issued from the PRCRS, an important objective in consideration of the International obligation for Fraser sockeye and pink catch accounting. These projections were used in-season by biological managers to validate hail estimates. Hail estimates took precedence when major discrepancies occurred.

4 ERROR HANDLING

The findings of the Commission on Pacific Fisheries Policy challenged the integrity and credibility of the PRCRS. The indictment concerned the general veracity of sales receipt information as well as the failure of this type of system to account for unreported catches and landings. As an in-season catch processing program, the JSCNCVP sought to identify and correct sales receipt errors close to the point of generation, since time and distance tend to make the resolution of errors more difficult. Emphasis for 1987 was on the verification of information reported on the sales receipt rather than on catches and landings that entirely circumvented the catch reporting system. After three years of operation, it appears that the use of an in-season catch monitoring program dependent on sales receipt processing to detect unreported catch, primarily chinook, salmon is not feasible within the narrow scope of JSCNCVP.

Concern focused on discernible and correctable errors. Errors were assigned to one of three categories: (1) fishing vessel licence validity or CFV/name mismatch, (2) gear type incorrect or undeclared, and (3) miscellaneous less fatal errors dealing with dates, areas, packer identification, missing sales receipt number or other administrative/clerical errors. Priorities for error correction were (1) Gear, (2) CFV and (3) Other. Errors in category (1) had to be resolved before catch data could be processed while category (2) did not require immediate attention. Errors in category (3) were usually easier to resolve and did not generally interfere with processing. Error correction was carried out with the primary objectives of the program in mind, i.e. to assign (1) an accurate count in pieces to the appropriate species (target and incidental), (2) the appropriate gear and area, and (3) the appropriate week of opening. Therefore, enforcement of licensing regulations was

pursued only to the point of flagging suspected violations.

Table 3 summarizes (by week and category) errors encountered during sales receipt processing. Totals indicate that for 4609 deliveries (sales receipts) there were 1876 errors. The nature and severity of these errors is discussed below but the volume of receipts with errors disrupting processing (40.7%) is clearly significant. Note that sales receipts often contained errors from more than one category, but the error count in Table 3 does not consider multiple errors.

A brief explanation of the characteristics and frequency of errors in each category provides a perspective for understanding the nature of the problem. Errors in gear assignment include omission of gear type from the sales receipt as well as incorrect gear declaration. Most errors were of the former nature. Sales receipt design contributed to this problem since some companies did not include a category for gear type. Packer and industry personnel responded well when prompted for gear type. Although there may be some motivation for false declaration of gear type at the time of landing, it is assumed that these errors were clerical. About 97% gear errors were of this nature and were resolved through DFO Licensing Branch, the Directory of Licensed Commercial Fishing Vessels In British Columbia, and by processing software which verified CFV's declared on sales receipts. Since gear assignment must be resolved before processing catch data, unresolved errors in Table 3 do not include errors in gear assignment. The assignment of catch by gear has assumed a greater importance since catch allocation was introduced.

One of the primary objectives of the JSCNCVP proposal was to provide a timely source of information regarding licensing violations and to make this information available to Enforcement personnel for subsequent investigation. However, since the verification of this type of sales receipt error is not required before providing an in-season estimate of catch, information on potential violations was stored for future reference. Vessel name/CFV number mismatch and unrecorded or invalid CFV's that remained unresolved at the end of each week's processing were forwarded to Licensing Branch for their consideration. Most of the unresolved errors concerning CFV's were from either recent amendments to licensing applications (information not available to in-season management) or from data entry or interpretation error by program personnel. Potentially serious violations were investigated by Licensing and Enforcement personnel.

Investigation by JSCNCVP personnel regarding this type of sales receipt error/violation was given a low priority for two reasons. Reference information on commercial fishing vessel licenses is often quickly obsolete. Late registration, alterations to vessel licensing, licence transfer and new

licenses can occur after the deadline for publication of the licence directory. Further, the computer resident file of licensed vessels is usually not current due to a processing delay after a licensing application. Therefore, during at least the first part of the commercial fishery, questions of validity were deferred. Under these conditions of insufficient information it was most expedient to only to remit a catalogue of potential offenses to the designated authorities.

Miscellaneous administrative and minor clerical errors, were frequent but had little impact on data processing. Consultation with guardians, patrolmen or Fishery Officers usually resolved questions regarding dates, area, days fishing or other non-catch related data. Note that false declaration of catch to area within the District was not of major concern, however, care was taken to prevent catches from other Districts being recorded in District 5 totals. It was not possible to determine if catch from District 5 was being declared as from other Districts.

Summary totals in Table 3 indicate that 97.2% of sales receipt errors were resolved to the degree that they could confidently be used for in-season processing. The remaining receipts with unresolved errors (2.8%, 53 deliveries) under investigation have to date been reduced to 12 receipts involving possible licensing violations.

5 WEEKLY AND SEASONAL COMPARISONS

A summary of JSCNCVP gear and catch data was presented to District 5 and South Coast biological management personnel at the end of each week of the fishery, and prior to the next fishery. The JSCNCVP data provided a comparison of the hailed DFO estimate of the weekly gillnet and seine catch with the data generated by compiling a larger subset of the scales receipt data. The meeting reviewed assumptions regarding the generation of hail estimates and potential anomalies in the data. Tables 4-8 summarize the results of weekly data processing and analysis for each of the five weeks of the Johnstone Strait commercial pink and sockeye season. The tables are organized by statistical area, gear and species, as necessary to facilitate an in-season evaluation of the impact of the weekly harvest. Tables 4-8 present: (1) the results of sales receipt data processing, (2) catch projection, and (3) comparison of DFO hails and JSCNCVP for forecasting final catch. Although these data were not presented formally until sales receipt processing was completed, some data were made available earlier upon request.

The estimated numbers of vessels fishing and corresponding deliveries determined from DFO hail estimates include sales receipt data and assumptions about the unsampled vessels and deliveries. DFO hail estimates incorporate gear count

overflights throughout the fishery, observations of vessel identity and abundance on the fishing grounds, and limited verification using sales receipts. The number of vessels and deliveries from JSCNCVP is from sales receipt data processing only. Since these data are derived from an unknown portion of the sales receipts generated on the grounds, the weekly totals for vessels fishing and total deliveries is an underestimate in most cases. To compensate for unaccounted deliveries, the JSCNCVP estimate was expanded to correspond to the overflight estimate of gear in each area. The accuracy of the JSCNCVP obviously depends on the veracity of gear count, which particularly for gillnets in 1987 was an underestimate. A comparison of these data sets will indicate the nature of DFO predictions in relation to verifiable results of data processing.

DFO hail estimates of total weekly catch are a product of the average catch per delivery or hailed catch and the number of deliveries expected per week combined with the overflight estimation of gear. Potential DFO catch estimation errors can occur primarily if enumeration of gear or expected deliveries per vessel are incorrect. DFO hail estimates were produced from projections of the total number of vessels delivering, the total number of deliveries and total catch for all vessels fishing. These numbers are presumed to be an accurate estimate of harvest during the current opening and represent the Department's estimate of weekly catch until the sales receipt data is processed. This factoring of estimates provided insight into undocumented elements of in-season DFO estimates. Presentation of hail data in this manner served to reduce the estimate to its primary components and provided the basis for evaluating validity, especially in the case of average catch per delivery by area, gear and species. JSCNCVP produced catch averages per vessel and catch averages per delivery receipt by area from those vessels enumerated by the program.

The presentation of weekly data summaries allowed for an analysis of variation between each of the in-season estimates. Projection of final catch from JSCNCVP data provided an additional set of numbers for comparison and detection of obvious anomalies. With one set of observed data and two sets of projected estimates, fishery managers were able to judge each estimate. Unfortunately, direct baseline observations used in the DFO estimates were missing.

Week 8-1 (Table 4) illustrates the process by which hails and JSCNCVP estimates were compared. Tables 4a-d indicate that DFO estimated 94 gillnetters fishing and delivering in Area 11, and 284 gillnetters and 131 seiners fishing and delivering in Area 12. The JSCNCVP identified 118 gillnetters in Area 11 and 333 in Area 12. Only 46 seine sales receipts were recovered from the Area 12 fishery. The difference between the DFO seine

estimate (131) and the JSCNCVP estimate of 46 seiners fishing and delivering in Area 12 is consistent with an expected delay in seine deliveries or missed sales receipts. However the fact that JSCNCVP recorded 24 and 49 more gillnetters fishing and delivering in Areas 11 and 12 respectively, illustrates a perplexing anomaly.

The unexpectedly low DFO gear count for Area 11 and 12 gillnetters is explained by the restricted ability of the current DFO aerial enumeration to accurately census gillnetters. A review of Table 4a, however, suggests the DFO hail estimate of catch for Areas 11 and 12 is 10800 greater although from 73 fewer gillnets. The problem illustrates not only the need for enhanced gillnet enumeration but also a review of past assumptions regarding gillnet delivery patterns. Historically, gillnets delivered daily, the DFO hail catch projection for Area 11 and 12 reflects this historic understanding. However closer examination by JSCNCVP suggests gillnetters do not deliver daily and although more vessels were enumerated a lower total catch is calculated.

Comparison of vessel and delivery averages for Area 11 and 12 gillnetters in Tables 4b and 4c indicated DFO hails have fewer vessels making a substantially greater number of deliveries of less catch than shown by JSCNCVP. On the basis of these contrasts, and including the comparison of average number of deliveries per vessel for each area and gear (Table 4d), the in-season estimate of gillnet catch by DFO would seem to require more verification to establish credibility. In this type of situation (higher hail catch from lower gear counts) catch projections used the baseline total from JSCNCVP data as the in-season estimate of catch.

Note that Area 13 does not experience the large gillnet fleet size nor does it have the range of area to be patrolled therefore escaping most of the above difficulties.

Although the difference between the DFO seine enumeration (131) for week 8-1 and the JSCNCVP sample of 46 seiners fishing and delivering in Area 12 is not unexpected, the DFO estimate of the number of deliveries and catch seems low. JSCNCVP calculated there were 59 deliveries from 46 vessels. Also, Table 4b indicates vessel averages for Area 12 seiners were 687 sockeye from 131 vessels (DFO) compared with 906 sockeye from 46 vessels (JSCNCVP). Further comparison of delivery averages for Area 12 in Table 4c indicates a hail average estimate for sockeye deliveries lower than the JSCNCVP average by 19 fish.

The algorithm for the JSCNCVP catch projection was developed during 1986 to account for unsampled catch. An example appears below, but simply stated, if DFO vessel counts are larger than from sales receipts (which should usually be the case), then

JSCNCVP catch was divided by the JSCNCVP vessel count and multiplied by the DFO gear count. In cases where the JSCNCVP count of vessels fishing was greater than that of DFO, the catch recorded from JSCNCVP data processing was used as a final estimate. This estimate, particularly for gillnets, was expected to be conservative as the program was unlikely to be a complete census.

In the case of estimates of Area 12 seine catch, with hail gear count higher than JSCNCVP gear count and vessel and delivery averages lower than JSCNCVP, the formula for projection: (DFO vessel count)*(JSCNCVP catch)/(JSCNCVP vessel count) prevailed and brought the catch estimate from sales receipts processing to 118,683 from a baseline of 41,675. This estimate is 28,656 higher than the hails estimate, representing an increase of 32% over the hail estimate. Considering that processing sales receipts from 35% of the DFO gear count produced a vessel average 32% higher than hails, there is reason to question the hails estimate of catch and to accept the JSCNCVP estimate as more accurate.

An alternate method of projecting baseline results of sales receipts was also considered. Instead of multiplying the JSCNCVP vessel average: (JSCNCVP catch)/(JSCNCVP vessel count) by hail vessel count (905*131), another formula would have the hail vessel count (131) multiplied by the average number of deliveries as determined from sales receipts processing (1.3) to produce an estimate of 131*1.3 or 170 deliveries. The predicted 170 deliveries would then be multiplied by the JSCNCVP delivery average (706) to produce an estimated catch of 120,231 sockeye. Since the difference between these two estimates based on JSCNCVP projection was relatively small (1500+), the vessel average method of projection was used.

6 SEASON SUMMARY

Table 9 serves to express JSCNCVP in-season totals in relation to DFO in-season totals. These comparisons will articulate some of the concerns for the ability of in-season catch monitoring programs to accurately predict the catch of target and incidental species and proportion of catch by gear. Using estimates of sockeye catch as a reference for comparing each in-season system, catch totals for all areas and both gears differ by less than 1% for five weeks of catch predictions. The variance between the individual totals (3 areas x 2 gears) ranges from hail estimates approximately 15% higher than JSCNCVP for Area 11 gillnets to approximately 5% lower for Area 12 seines. The hail estimates were higher for gillnet and lower for seine. In general the hail estimates were lower than JSCNCVP estimates for gillnet (14 of 21), while the majority of seine estimates were also lower (13 of 14), for a total of 22 of 35 hail

estimates lower than JSCNCVP predictions.

With margins less than 1% for sockeye and approximately 7% for pink, the catch estimate for incidental species ranged from a margin of approximately 8% more for coho to approximately 60% less for jack chinook. Of particular importance JSCNCVP predicted in-season the catch of chinook adults to be 19% larger than by hails. Given that each system uses the same subset of sales receipt data for projection, the reason for this greater variance between predicted catch for incidental species is not apparent. A factoring of DFO estimates into sales receipt and pure hail data would be necessary to determine if the sources of each part of the estimate have similar characteristics (vessel and delivery averages). A possible cause for this pattern is exaggeration of effort on the target species at the expense of effort on incidental catch.

Another observation from this comparison is the variance of estimates between areas. Hail estimates of total catch (excluding jack and steelhead) for Area 12 average approximately 16% less than JSCNCVP estimates for the same Areas while catch estimates (excluding jack and steelhead) for Area 13 average approximately 9% less (Table 9). Factors contributing to this greater variance in the Upper Johnstone Strait are undoubtedly greater fleet size, especially gillnet, the expanse of the fishing area, and the ratio of DFO staff to vessels and fishing area. A comparison of each in-season estimate with final post-season sales receipt processing is necessary to determine if these results are significant, or if they simply illustrate the uncertain nature of the catch estimators. Such a comparison should also evaluate the need for apparently redundant methods of sales receipt processing.

7 POST-SEASON COMPARISONS WITH REGIONAL STATISTICS BRANCH

The objectives of the JSCNCVP was to verify incidental (non-target) catch and compare in-season estimators. Weekly processing and the tabular data presentations discussed previously served these in-season requirements. As the program evolved, an additional objective was the development of an algorithm to project total catch. JSCNCVP personnel were confident these objectives were attainable.

Although proclaimed to be potentially permeated with error and misrepresentation, the PRCRS is generally accepted as the benchmark for statement of commercial catches. Since the statements from PRCRS prevail in cases of discrepancy between in-season and post-season systems, JSCNCVP is primarily useful for an evaluation of in-season accuracy. Statements of the three essential components of each fishery from each system were compared to evaluate the efficacy of in-season projections. A

comparison of in-season with post-season estimates illustrates the relationship between all methods. While it was anticipated that the JSCNCVP statements regarding the number of vessels fishing and the number of deliveries would not be accurate, equivalent DFO estimates were presumed accurate.

Tables 9 and 10 compare estimates from RSB, DFO hails and JSCNCVP for all weeks (8-1 until 9-1) of the 1987 season. The RSB estimates come from a March 1988 run of sales receipt data. Judging from the number of vessels fishing and deliveries for each week, it is assumed that most sales receipts were processed by RSB. Some errant receipts and adjustments by week or area may alter the final estimate, but it is assumed that receipts yet to be received will not appreciably change total estimates.

Regarding the ratio of the in-season to post-season number of sales receipts processed, assuming DFO had access to the same information as JSCNCVP, then each in-season estimate utilized data from about 57-70% of the gillnet deliveries, and about 50-67% of the seine deliveries, in order to project catch. This is also apparent from a comparison of deliveries per vessel for each week between the RSB and JSCNCVP estimates. Uncollected and unprocessed sales receipts have underestimated the average number of deliveries per vessel in the in-season estimate.

Table 11 compares the above estimates for the season (excluding DFO hails). RSB records show a greater vessel count for gillnetters for all five weeks of the fishery. Underestimation of the number of gillnetters by DFO ranges from 91 (week 8-4) to 282 (week 8-3). The seine vessel count exceeded that of RSB for two of the five weeks fished, with DFO estimates ranging from 26 less, to 30 more, than reported by RSB. DFO failed to account for a net total of 825 gillnetters and 46 seiners for all weeks fishing, and their estimates of the number of vessels fishing accounted for 67.7% of gillnet gear and 96.4% of seine gear active in the five week fishery. JSCNCVP gear counts range from 75.5% of the gillnet gear to 64.9% of the seine gear, reflecting the unavailability of some sales receipts during the fishery. Further, in-season estimates were predicated on 64.4% of gillnet deliveries and 56.6% of seine deliveries. For the season, Table 11 indicates that only 4609 sales receipts were processed in-season to predict a reported catch from 7433 deliveries (about 62%).

It should be understood that RSB vessel counts in Table 11 may include deliveries in more than one Statistical Area. Therefore, gear counts may not be directly compared with the in-season estimates. Although total catch is recorded by Statistical Area, in-season estimates assign only one Statistical Area to each vessel within each gear type. This may interfere with the hails projection formula.

Since there is evidence that a portion of vessels fishing were omitted from gear counts, and that about one-third of deliveries were not observed by DFO or JSCNCVP, the inference is that total catch projected by either in-season estimate would only coincidentally be similar to RSB results. Limiting the collection of sales receipts for the JSCNCVP to the Johnstone Strait area exacerbated the situation. A three-way comparison between RSB, DFO and JSCNCVP results shows that for the target species (sockeye) in-season estimates were within 1% of each other, varying less than 9000 fish (Table 12). However, a comparison of each in-season estimate with RSB results shows an underestimation by DFO hails and JSCNCVP of about 10% or 143,000 fish. Gear counting errors, unavailability of a portion of sales receipts, and weaknesses in the projection algorithm probably contributed to the this discrepancy. Comparisons for pink salmon suggest the JSCNCVP in-season estimate was within 2% of the RSB results; DFO estimate 9%. Non target estimations for chinook and chum show a similar trend.

8 JSCNCVP ENFORCEMENT

8.1 Concept of Original Proposal

The original concept of an in-season catch monitoring system using commercial sales receipts was designed to provide some benefit for personnel engaged in enforcing the Fisheries Act and related regulations. Conceptually this was to remove some of the random activity associated with the enforcement by isolating specific regulation problems. This was to be accomplished by (1) validating licence and catch information from sales receipts, (2) verifying gear type, (3) detecting anomalous catches, and (4) tracking vessel movements to detect illicit catch. The program was also intended to assist enforcement of Section 48 of the Fisheries Act, requiring a true report of catch from all parties involved in commercial salmon fishing.

In retrospect, personnel providing impetus to the original proposal must have assumed that (1) all receipts generated during a commercial opening would be available for immediate processing, (2) an analysis of information from sales receipts would provide an indication of infractions, and (3) Enforcement Branch personnel would respond to such submissions. The fact that this type of in-season sales receipt processing effort has been less than successful as an enforcement aid needs to be discussed in terms of inherent program restrictions, and the nature of established licensing and enforcement procedures.

8.2 Enforcement of Licencing Regulations

Design of the in-season catch monitoring program was likely based on a high expectation for the availability of receipts, evidence of infractions, and cooperation with enforcement. This

expectation was enhanced by the computerized matching of CFV's reported on receipts to current vessel licenses. This permitted documentation of suspected licensing violations. Even though Licensing Branch personnel were helpful, the process of resolving possible infractions was obstructed by delays in updates to the vessel licence files of up to six weeks. These delays were due to the nature of the data storage and information interchange service currently used by DFO. In instances when (1) the CFV number was not on file, or the vessel name on file did not match the name on the sales receipt, there was often no way to declare this occurrence an infraction. Errors in the completion of the sales receipt by the buyer or during data processing, or deliberate attempts to deceive were generally indistinguishable. Unresolved and uninvestigated licencing errors remain a very low percentage of the total sales receipts. The program methodology does provide an approach for focusing licencing investigation.

The licensing data system is currently (1987-88) being revised to avoid delays in application processing, and to provide the information necessary for in-season enforcement. This includes a conversion from contracted data services to an in-house system.

8.3 Enforcement of Fishing Regulations

Catch information for each vessel collected during the fishery was used to rank catches, according to volume, for target (pink and sockeye) and incidental (chinook) species. The objective was to isolate catch anomalies for management and enforcement review (e.g. chinook salmon targeting). Several difficulties were encountered including, but not limited to, (1) all or portions of delivery information being unavailable for certain vessels and (2) the reporting of catch by the same vessel in different areas. Distorted catch statistics causes vessels to appear artificially low or high in rank. Limited ability to use in-season catch statistics to apprehend violators using illegal gear (e.g. deep or monofilament nets) is perhaps the most important result of this distortion.

8.4 Enforcement of Compliance in Reporting

The use of in-season sales receipt processing to monitor compliance in catch reporting has not been a priority during previous operations, primarily because of the expected delays in reporting. Pursuit of a suspected violation requires all groups involved in the recording and analyzing of catch declarations (Fishery Officers, RSB, JSCNCVP). It also involves the sensitive task of requesting catch information from proprietary industry records. Current methods of monitoring vessels during each opening in District £5 are not conducive to focusing on a individual vessel, and the subsequent cross referencing of hails

and actual deliveries.

8.5 Conclusions

After three years of JSCNCVP, there is no concrete evidence that analysis of sales receipts during or immediately after a fishery directly facilitates enforcement. The promise that JSCNCVP would focus the search for illegal activities has not been fulfilled. Failure to augment detection and apprehension of possible violators is due primarily to insufficient information on vessel catches and vessel licensing mentioned previously, as well as an apparent reticence of Enforcement personnel to abandon conventional tactics.

Informal in-season and post-season discussions with enforcement personnel suggest several solutions to problems encountered by Fishery Officers charged with upholding licensing and reporting regulations. Although catch reporting is required by Section 48 of the Fisheries Act, no reporting format, nor any other stipulations requiring a true report of catch are documented. The onus to report accurately remains with vessel owners, operators, packers and buyers. This tends to diminish the incentive of any and all parties to ensure accurate reporting.

Attempts to modify this federal legislation are continuing, however attention has been shifted to provincial regulations governing the purchase of commodities by registered buyers (in this case buyers of fish). This approach requires all buyers to have valid identification, including vessel licence/registration from sellers. It will also encourage sellers of fish products to be properly registered. In the event of errors or fraudulent sales receipts, the buyer would be held responsible for violations involving the reporting of purchased catch. This type of regulation governing the sale and purchase of salmon should discourage parties from falsifying catch reports, but such procedures will not completely eliminate illegal fishing activities. Poaching, fishing without proper registration or other illegalities cannot be detected by simple analysis of sales receipts.

Acknowledgments

The extensive field collection of sales receipts were accomplished under the direction of Alvin Sewid with the assistance of all DFO vessel and charter staff.

Barry Smith and Leroy HopWo aided in the compilation and editing of the final version of the report.

10 TABLES

Table 1. Status of recommendations from the 1985 JSCNCVP pilot project.

Recommendation	Action taken	Comments
1. Continuation of JSCNCVP	Y	1986/87 with reservations
2. Compatibility with RSB	N	Some industry cooperation
3. Area networking system implement in non-study areas	N	
4. Availability of sales receipts to JSCNCVP	Y/N	Greater effort by JSCNCVP
5. Request for cooperation from industry re: catch reporting	N	
6. 48 h deadline for industry submission of sales receipts	N	Impractical
7. Packers relinquish receipts before leaving grounds	N	Conflict with Fisheries Officer's schedules
8. Thorough investigation of PRCRS	N	
9. JSCNCVP data used by Fisheries Officers to enhance in-season work	N	See comment 18
10. Piece count audit by Fisheries Officers at delivery sites	N	Insufficient manpower
11. Piece count spot checks at delivery sites	N	Insufficient manpower
12. Request industry help, but proceed with 8 anyway	N	

-more-

Table 1 (cont'd). Status of recommendations from the 1985 JSCNCVP pilot project.

13. Request industry record number of pieces on sales receipts	N	Impractical
14. Request industry record number of pieces in annual summaries	N	Impractical
15. Conditions of licensing be amended to require a true report of catch	N	How enforced?
16. Inform industry of the importance of accurate catch reporting	N	
17. Personalized ID cards assigned to CFV owners	N	Some exist - some problems
18. DFO hail system reviewed and revised	Y/N	There is a mandate to proceed
19. Further studies on the use of sales receipts	N	But still under consideration

Table 2. JSCNCVP EDP procedures for 1987.

1. Collection from packer or plant by Fisheries Officers, patrol vessels or guardians.

2. Calculations by Fisheries Officers for hails verification and in-season estimates.

3. JSCNCVP data entry personnel receive receipts from DFO or private collection agencies (i.e. J.O. Thomas & Associates).

4. Purging and sorting:
   a. Remove receipts from Areas other than 11, 12 or 13.
   b. Remove receipts from troll deliveries.
   c. Remove receipts for landing status other than 01-12.

5. Screening and sorting:
   a. Sorting receipts by gear, area and packer.
   b. Isolate receipts with errors (omission of area, CFV, date, gear, etc.).

6. Data entry:
   a. Entry log to record volume of receipts processed and associated errors.
   b. Entry session stored on disk.
   c. Verification of CFV on receipt against licensing file.

7. Compressing for telecommunications transmission:
   a. Microcomputer compression (archiving) utility.
   b. Individual files compressed and stored in one file for transmission.

8. Telecommunication to central processing unit in District 5 office:
   a. PC - PC connection (using modem/telephone connection).
   b. Software with file transfer utility for transmission.

9. Data decompression and appending to master file:
   a. Expand data files to original structure.
   b. Incorporate all files (from subdistrict processing) to one file for each week.

10. Test raw data for gross errors and bad records:
   a. Empty records (result of system failure).
   b. Catch (in pieces) out of range.

-more-

Table 2 (cont'd). JSCNCVP EDP procedures for 1987.

11. Cross reference with licensing/CFV file:
    a. Proper gear assignment.
    b. CFV validity (produce list of CFV's not on record).

12. Weekly reports:
    a. Summary of catch and effort by area, gear and species.
    b. Projection of catch from most recent data).

13. Weekly submission to biological managers:
    a. Catch estimate (raw & projected).
    b. Comparison with hail estimate.
    c. Comparison of delivery and weekly vessel averages (JSCNCVP and DFO hails).

14. Respond to queries from biological managers:
    a. Validity of catch projections.
    b. Further analysis of raw data.

15. Final Report:
    a. Seasonal summary (including weekly tables).
    b. Comparison with DFO catch estimates (RSB and DFO hails).
    c. Analysis of effort (gear counts, etc.).
    d. Documentation of problem areas.
    e. Recommendations for future considerations.

Table 3. Frequency of sales receipt error by type.

Week	Number of vessels	Number of deliveries	Number by error type			Total	Percent with errors	Percent resolved
			CFV	Gear	Other			
8-1	577	921	134	188	74	396	43.0	97.7
8-2	705	1371	102	321	145	568	41.4	96.3
8-3	741	1146	88	265	123	476	41.5	98.5
8-4	492	734	47	113	87	247	33.7	98.0
9-1	362	437	24	110	55	189	43.2	94.2
Grand Total								
	2877	4609	395	997	484	1876	40.7	97.2

Table 4a. Summaries for week 8-1. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, pJSP = projected JSCNCVP, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	25107	695	6801	949	316	87	14
		DFO:	34048	1153	10204	1506	246	9	13
		pJSP:	25107	695	6801	949	316	87	14
12	GN	JSP:	73599	2110	30251	1737	841	396	66
		DFO:	75490	2166	37034	1421	688	33	40
		pJSP:	73599	2110	30251	1737	841	396	66
	SN	JSP:	41675	1098	38472	811	776	107	9
		DFO:	90027	3334	85996	820	1261	142	17
		pJSP:	118683	3127	109562	2310	2210	305	26
Subtotal		JSP:	115274	3208	68723	2548	1617	503	75
Subtotal		DFO:	165517	5500	123030	2241	1949	175	57
Subtotal		pJSP:	217389	5932	146614	4996	3367	788	106
13	GN	JSP:	1828	43	727	17	55	12	1
		DFO:	3253	72	1289	23	26	5	1
		pJSP:	2507	59	997	23	75	16	1
	SN	JSP:	34262	467	37912	289	476	27	0
		DFO:	46480	709	50272	379	562	16	0
		pJSP:	59387	809	65714	501	825	47	0
Subtotal		JSP:	36090	510	38639	306	531	39	1
Subtotal		DFO:	49733	781	51561	402	588	21	1
Subtotal		pJSP:	61894	868	66711	524	900	63	1
Total		JSP:	176471	4413	114163	3803	2464	629	90
Total		DFO:	249298	7434	184795	4149	2783	205	71
Total		pJSP:	279284	6800	213325	5520	4267	851	107

Table 4b. Summaries for week 8-1. Comparison of vessel catch averages for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	213	6	58	8	3	0.74	0.12
		DFO:	362	12	109	16	3	0.10	0.14
12	GN	JSP:	221	6	91	5	3	1	0.20
		DFO:	266	8	130	5	2	0	0.14
	SN	JSP:	906	24	836	18	17	2	0.20
		DFO:	687	25	656	6	10	1	0.13
13	GN	JSP:	52	1	21	0.49	2	0.34	0.03
		DFO:	68	2	27	0.48	1	0.10	0.02
	SN	JSP:	761	10	842	6	11	0.60	0
		DFO:	596	9	645	5	7	0.21	0

Table 4c. Summaries for week 8-1. Delivery averages. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	163	5	44	6	2	0.56	0.09
		DFO:	113	4	34	5	0.80	0.03	0.04
12	GN	JSP:	119	3	49	3	1	0.64	0.11
		DFO:	108	3	53	2	1	0.05	0.06
	SN	JSP:	706	19	652	14	13	2	0.15
		DFO:	687	25	656	6	10	1	0.13
13	GN	JSP:	48	1	19	0.45	1	0.32	0.03
		DFO:	43	1	17	0.31	0.30	0.07	0.01
	SN	JSP:	659	9	729	6	9	0.52	0
		DFO:	596	9	645	5	7	0.21	0

Table 4d. Summaries for week 8-1. Average number of deliveries. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Number of Vessels	Number of deliveries	Mean deliveries per vessel	JSP:DFO ratio Vesssels	JSP:DFO ratio Deliveries
11	GN	JSP:	118	154	1.3	1.26	0.51
		DFO:	94	300	3.2		
12	GN	JSP:	333	618	1.9	1.17	0.88
		DFO:	284	700	2.5		
	SN	JSP:	46	59	1.3	0.35	0.45
		DFO:	131	131	1.0		
13	GN	JSP:	35	38	1.1	0.73	0.51
		DFO:	48	75	1.6		
	SN	JSP:	45	52	1.2	0.58	0.67
		DFO:	78	78	1.0		
Totals		JSP:	557	921		0.90	0.72
		DFO:	635	1284			

Note : Number of Vessels count from first day DFO overflight.

Table 5a. Summaries for week 8-2. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, pJSP = projected JSCNCVP, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	26396	924	8272	847	184	91	28
		DFO:	23076	1046	8264	1304	144	5	18
		pJSP:	26396	924	8272	847	184	91	28
12	GN	JSP:	80711	4968	33046	2646	556	267	180
		DFO:	87841	5123	30290	1917	575	20	43
		pJSP:	80711	4968	33046	2646	556	267	180
	SN	JSP:	265774	2805	166116	5151	1377	220	9
		DFO:	328182	3198	187847	5897	1436	165	28
		pJSP:	326177	3443	203870	6322	1690	270	11
Subtotal		JSP:	346485	7773	199162	7797	1933	487	189
Subtotal		DFO:	416023	8321	218137	7814	2011	185	71
Subtotal		pJSP:	433284	9335	245188	9815	2430	628	219
13	GN	JSP:	4351	125	852	21	55	28	0
		DFO:	3794	99	697	24	42	0	0
		pJSP:	4351	125	852	21	55	28	0
	SN	JSP:	91492	562	57199	277	521	76	0
		DFO:	110927	765	69836	346	419	0	0
		pJSP:	102582	630	64132	311	584	85	0
Subtotal		JSP:	95843	687	58051	298	576	104	0
Subtotal		DFO:	114721	864	70533	370	419	0	0
Subtotal		pJSP:	106933	755	64984	332	584	113	0
Total		JSP:	468724	9384	265485	8942	2693	682	217
Total		DFO:	553820	10231	296934	9488	2616	190	89
Total		pJSP:	540217	10090	310172	10146	3069	741	219

Table 5b. Summaries for week 8-2. Comparison of vessel catch averages for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	284	10	89	9	2	0.98	0.30
		DFO:	372	17	133	21	2	0.08	0.29
12	GN	JSP:	178	11	73	6	1	1	0.40
		DFO:	205	12	71	4	1	0	0.10
	SN	JSP:	2416	26	1510	47	13	2	0.08
		DFO:	2431	24	1391	44	11	1	0.21
13	GN	JSP:	272	8	53	1	3	2	0
		DFO:	237	6	44	2	3	0	0
	SN	JSP:	2772	17	1733	8	16	2	0
		DFO:	2998	21	1887	9	11	0	0

Table 5c. Summaries for week 8-2. Delivery averages. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	159	6	50	5	1	0.55	0.17
		DFO:	112	5	40	6	0.70	0.02	0.09
12	GN	JSP:	85	5	35	3	0.60	0.28	0.19
		DFO:	72	4	25	2	0.50	0.02	0.04
	SN	JSP:	1563	17	977	30	8	1	0.05
		DFO:	1585	15	907	28	7	1	0.14
13	GN	JSP:	128	4	25	0.62	2	0.82	0
		DFO:	146	4	27	0.92	2	0	0
	SN	JSP:	1605	10	1003	5	9	1	0
		DFO:	1479	10	931	5	6	0	0

Table 5d. Summaries for week 8-2. Average number of deliveries. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Number of vessels	Number of deliveries	Mean deliveries per vessel	JSP:DFO ratio Vessels	JSP:DFO ratio Deliveries
11	GN	JSP:	93	166	1.8	1.50	0.81
		DFO:	62	206	3.3		
12	GN	JSP:	453	944	2.1	1.06	0.77
		DFO:	428	1220	2.9		
	SN	JSP:	110	170	1.5	0.82	0.82
		DFO:	135	207	1.5		
13	GN	JSP:	16	34	2.1	1.00	1.31
		DFO:	16	26	1.6		
	SN	JSP:	33	57	1.7	0.89	0.76
		DFO:	37	75	2.0		
Totals		JSP:	705	1371		1.04	0.79
		DFO:	678	1734			

Note : Number of Vessels count from first day DFO overflight.

Table 6a. Summaries for week 8-3. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, pJSP = projected JSCNCVP, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	4505	427	2483	347	126	39	17
		DFO:	12570	950	5490	1010	303	6	6
		pJSP:	8399	796	4629	647	235	73	32
12	GN	JSP:	34468	1968	19756	1679	455	155	27
		DFO:	30640	1855	12668	1511	295	6	23
		pJSP:	34468	1968	19756	1679	455	155	27
	SN	JSP:	66753	1877	126791	4083	924	97	1
		DFO:	83298	2482	151247	2978	1111	61	17
		pJSP:	84783	2385	161080	5187	1174	155	1
Subtotal		JSP:	101203	3845	146547	5762	1379	97	28
Subtotal		DFO:	113938	4337	163915	4489	1406	61	40
Subtotal		pJSP:	127650	5149	185466	7513	1864	123	60
13	GN	JSP:	4321	171	1931	110	63	252	4
		DFO:	4208	164	1881	108	67	67	0
		pJSP:	4321	171	1931	110	63	351	4
	SN	JSP:	68485	770	88801	595	542	25	1
		DFO:	153700	1775	187345	1396	978	0	0
		pJSP:	159442	1793	206740	1385	1262	25	2
Subtotal		JSP:	72806	941	90732	705	605	39	5
Subtotal		DFO:	157908	1939	189226	1504	1045	418	0
Subtotal		pJSP:	163763	1964	208671	1495	1325	116	6
Total		JSP:	178514	5213	239762	6814	2110	355	50
Total		DFO:	284416	7226	358631	7003	2754	491	46
Total		pJSP:	291413	7112	394137	9008	3189	467	66

Table 6b. Summaries for week 8-3. Comparison of vessel catch averages for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	76	7	42	6	2	0.66	0.29
		DFO:	114	9	50	9	3	0.05	0.05
12	GN	JSP:	81	5	46	4	1	0	0.06
		DFO:	128	8	53	6	1	0	0.10
	SN	JSP:	420	12	797	26	6	1	0.01
		DFO:	412	12	749	15	6	0	0.08
13	GN	JSP:	127	5	57	3	2	0.74	0.12
		DFO:	164	6	73	4	3	0	0.00
	SN	JSP:	1070	12	1388	9	8	0.61	0.02
		DFO:	1032	12	1257	9	7	3	0

Table 6c. Summaries for week 8-3. Delivery averages. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	45	4	25	3	1	0.39	0.17
		DFO:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	GN	JSP:	48	3	28	2	1	0.22	0.04
		DFO:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SN	JSP:	400	11	759	24	6	0.58	0.01
		DFO:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	GN	JSP:	46	2	21	1	1	0.27	0.04
		DFO:	45	2	20	1	1	0	0
	SN	JSP:	951	11	1233	8	8	0.54	0.01
		DFO:	2440	28	2974	22	16	7	0

Table 6d. Summaries for week 8-3. Average number of deliveries. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Number of vessels	Number of deliveries	Mean deliveries per vessel	JSP:DFO ratio Vessels	JSP:DFO ratio Deliveries
11	GN	JSP:	59	100	1.7	0.54	N/A
		DFO:	110	N/A	N/A		
12	GN	JSP:	283	713	2.5	1.18	N/A
		DFO:	239	N/A	N/A		
	SN	JSP:	159	167	1.1	0.79	N/A
		DFO:	202	N/A	N/A		
13	GN	JSP:	34	94	2.8	1.33	1.00
		DFO:	26	94	3.7		
	SN	JSP:	64	72	1.1	0.43	1.14
		DFO:	149	63	0.4		
Totals		JSP:	741	1146		1.02	N/A
		DFO:	726	N/A			

Note : Number of Vessels count from first day DFO overflight.

Table 7a. Summaries for week 8-4. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, pJSP = projected JSCNCVP, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	1051	74	796	105	38	11	1
		DFO:	1612	113	1017	174	28	3	0
		pJSP:	1635	115	1238	163	59	17	2
12	GN	JSP:	19833	1471	40635	958	572	117	95
		DFO:	32388	2162	24000	1662	539	28	131
		pJSP:	19833	1471	40635	958	572	117	95
	SN	JSP:	57858	3000	144381	2657	1586	165	34
		DFO:	79820	5001	188653	2635	2199	27	3
		pJSP:	81654	4234	245637	3750	2238	233	48
Subtotal		JSP:	77691	4471	185016	3615	2158	282	129
Subtotal		DFO:	112208	7163	212653	4297	2738	55	134
Subtotal		pJSP:	103112	5820	245637	4871	2869	367	145
13	GN	JSP:	2968	85	2523	74	43	9	1
		DFO:	2264	79	1349	45	19	0	0
		pJSP:	2968	85	2523	74	43	9	1
	SN	JSP:	32936	1150	62985	484	478	52	0
		DFO:	36847	1004	62730	522	434	16	0
		pJSP:	32936	1150	62985	484	478	52	0
Subtotal		JSP:	35904	1235	65508	558	521	61	1
Subtotal		DFO:	39111	1083	64079	567	453	16	0
Subtotal		pJSP:	35904	1235	65508	558	521	61	1
Total		JSP:	114646	5780	251320	4278	2717	354	131
Total		DFO:	152931	8359	277749	5038	3219	74	134
Total		pJSP:	139026	7055	311145	5429	3390	428	146

Table 7b. Summaries for week 8-4. Comparison of vessel catch averages for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	58	4	44	6	2	0.61	0.06
		DFO:	58	4	36	6	1	0.11	0
12	GN	JSP:	78	6	160	4	2	0	0.37
		DFO:	134	9	100	7	2	0	0.54
	SN	JSP:	467	24	1164	21	13	1	0.27
		DFO:	456	29	1078	15	13	0	0.02
13	GN	JSP:	76	2	65	2	1	0.23	0.03
		DFO:	323	11	193	6	3	0	0
	SN	JSP:	578	20	1105	8	8	0.91	0
		DFO:	670	18	1141	9	8	0.29	0

Table 7c. Summaries for week 8-4. Delivery averages. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	36	3	27	4	1	0.38	0.03
		DFO:	62	4	39	7	1	0.12	0
12	GN	JSP:	49	4	101	2	1	0.29	0.24
		DFO:	64	4	47	3	1	0.06	0.26
	SN	JSP:	338	18	844	16	9	0.96	0.20
		DFO:	411	26	972	14	11	0.14	0.02
13	GN	JSP:	51	1	44	1	0.70	0.16	0.02
		DFO:	46	2	28	0.92	0.40	0	0
	SN	JSP:	457	16	875	7	7	0.72	0
		DFO:	512	14	871	7	6	0.22	0

Table 7d. Summaries for week 8-4. Average number of deliveries. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Number of vessels	Number of deliveries	Mean deliveries per vessel	JSP:DFO ratio Vessels	JSP:DFO ratio Deliveries
11	GN	JSP:	18	29	1.6	0.64	1.12
		DFO:	28	26	0.9		
12	GN	JSP:	254	404	1.6	1.05	0.79
		DFO:	241	509	2.1		
	SN	JSP:	124	171	1.4	0.71	0.88
		DFO:	175	194	1.1		
13	GN	JSP:	39	58	1.5	5.57	1.18
		DFO:	7	49	7.0		
	SN	JSP:	57	72	1.3	1.04	1.00
		DFO:	55	72	1.3		
Totals		JSP:	492	734		0.97	0.86
		DFO:	506	850			

Note : Number of Vessels count from first day DFO overflight.

Table 8a. Summaries for week 9-1. Comparison of the number of vessels fishing and the number of deliveries for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, pJSP = projected JSCNCVP, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	----------						
		DFO:	CLOSED						
		pJSP:	----------						
12	GN	JSP:	2717	1019	6762	553	199	60	5
		DFO:	3120	1820	9620	1040	312	5	2
		pJSP:	2717	1019	6762	553	199	60	5
	SN	JSP:	9891	3690	110151	1715	834	105	2
		DFO:	14160	5664	171159	2478	1239	89	0
		pJSP:	14589	5443	162473	2530	1230	155	3
Subtotal		JSP:	12608	4709	116913	2268	1033	165	7
Subtotal		DFO:	17280	7484	180779	3518	1551	94	2
Subtotal		pJSP:	17306	6462	169235	3083	1429	215	8
13	GN	JSP:	698	225	2062	47	36	12	0
		DFO:	1737	237	1557	31	37	0	0
		pJSP:	698	225	2062	47	36	12	0
	SN	JSP:	8228	1723	73621	606	334	56	0
		DFO:	10528	2334	93006	800	336	43	0
		pJSP:	10820	2266	96817	797	439	74	0
Subtotal		JSP:	8926	1948	75683	653	370	68	0
Subtotal		DFO:	12265	2571	94563	831	373	43	0
Subtotal		pJSP:	11518	2491	98879	844	475	86	0
Total		JSP:	21534	6657	192596	2921	1403	233	7
Total		DFO:	29545	10055	275342	4349	1924	137	2
Total		pJSP:	28825	8953	268113	3927	1904	301	8

Table 8b. Summaries for week 9-1. Comparison of vessel catch averages for Hails vs JSCNCVP. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	----------	----------	----------	CLOSED	----------	----------	----------
		DFO:	----------	----------	----------	CLOSED	----------	----------	----------
12	GN	JSP:	19	7	48	4	1	0	0.04
		DFO:	24	14	74	8	2	0	0.02
	SN	JSP:	82	31	918	14	7	1	0.02
		DFO:	80	32	967	14	7	1	0
13	GN	JSP:	26	8	76	2	1	0.44	0
		DFO:	102	24	92	2	2	0	0
	SN	JSP:	113	24	1009	8	5	0.77	0
		DFO:	110	24	969	8	4	0.45	0

Table 8c. Summaries for week 9-1. Delivery averages. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP:	----------	----------	----------	CLOSED	----------	----------	----------
		DFO:	----------	----------	----------	CLOSED	----------	----------	----------
12	GN	JSP:	13	5	33	3	1	0.29	0.02
		DFO:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SN	JSP:	79	29	874	14	7	0.83	0.02
		DFO:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	GN	JSP:	21	7	61	1	1	0.35	0
		DFO:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SN	JSP:	113	24	1009	8	5	0.77	0
		DFO:	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 8d. Summaries for week 9-1. Average number of deliveries. (JSP = JSCNCVP, DFO = DFO Hails, GN = gillnet, SN = seine net)

Area	Gear		Number of vessels	Number of deliveries	Mean deliveries per vessel	JSP:DFO ratio Vessels	JSP:DFO ratio Deliveries
11	GN	JSP:	----------	---------- CLOSED	----------		
		DFO:	----------	---------- CLOSED	----------		
12	GN	JSP:	142	204	1.4	1.09	N/A
		DFO:	130	N/A	N/A		
	SN	JSP:	120	126	1.1	0.68	N/A
		DFO:	177	N/A	N/A		
13	GN	JSP:	27	34	1.3	1.59	N/A
		DFO:	17	N/A	N/A		
	SN	JSP:	73	73	1.0	0.76	N/A
		DFO:	96	N/A	N/A		
Totals		JSP:	362	437		0.86	N/A
		DFO:	420	N/A			

Note : Number of Vessels count from first day DFO overflight.

Table 9. Seasonal comparisons of Hails vs JSCNCVP catch estimates by in-season programs. Summary of catches from weeks 8-1 until 9-1. (JSP = JSCNCVP, DFO = DFO Hails, pJSP = projected JSP, pJ/D = pJSP/DFO, GN = gillnet, SN = seine net)

Area	Gear		Sockeye	Coho	Pink	Chum	Chinook	Jacks	S'head
11	GN	JSP	57059	2120	18352	2248	664	228	60
		DFO	71306	3262	24975	3994	721	23	37
		pJSP	61537	2530	20941	2606	794	268	75
		pJ/D(%)	86.3	77.6	83.8	65.3	110.1	1164.4	203.4
12	GN	JSP	211328	11536	130450	7573	2623	995	373
		DFO	229479	13126	113612	7551	2409	92	239
		pJSP	211328	11536	130450	7573	2623	995	373
		pJ/D(%)	92.1	87.9	114.8	100.3	108.9	1081.5	156.1
	SN	JSP	441993	12470	585911	14417	5497	694	55
		DFO	595487	19679	784902	14808	7246	484	65
		pJSP	625887	18631	840748	20098	8542	1086	89
		pJ/D(%)	105.1	94.7	107.1	135.7	117.9	224.3	136.7
Subtotal		JSP	710320	26126	734713	24238	8784	1917	488
Subtotal		DFO	896272	36067	923489	26353	10376	599	341
Subtotal		pJSP	898752	32697	992138	30277	11959	2349	537
		pJ/D(%)	100.3	90.7	107.4	114.9	115.3	392.1	157.5
13	GN	JSP	14166	649	8095	269	252	86	6
		DFO	15256	651	6773	231	191	5	1
		pJSP	14845	665	8365	275	272	90	6
		pJ/D(%)	97.3	102.1	123.5	119.2	142.6	1809.1	637.1
	SN	JSP	235403	4672	320518	2251	2351	250	1
		DFO	358482	6587	463189	3443	2729	493	1
		pJSP	365167	6648	496388	3478	3588	348	2
		pJ/D(%)	101.9	100.9	107.2	101.0	131.5	70.7	232.8
Subtotal		JSP	249569	5321	328613	2520	2603	336	7
Subtotal		DFO	373738	7238	469962	3674	2920	498	2
Subtotal		pJSP	380012	7313	504753	3753	3861	439	9
		pJ/D(%)	101.7	101.0	107.4	102.1	132.2	88.1	435.0
Total		JSP	959889	31447	1063326	26758	11387	2253	495
Total		DFO	1270010	43305	1393451	30027	13296	1097	343
Total		pJSP	1278764	40010	1496891	34030	15820	2787	546
		pJ/D(%)	100.7	92.4	107.4	113.3	119.0	254.1	159.1

Table 10. Weekly gear counts and deliveries from Regional Statistics Branch (RSB). (DFO = DFO Hails, JSP = JSCNCVP, GN = gillnet, SN = seine net)

Week:			8-1			8-2			8-3	
Area	Gear		RSB	JSP	DFO	RSB	JSP	DFO	RSB	JSP	DFO
11	GN	Counts:	146	94	118	153	62	93	110	110	59
		Deliveries:	271	300	154	321	206	166	228	N/A	100
		Ratio:	1.9	3.2	1.3	2.1	3.3	1.8	2.1	N/A	1.7
12	GN	Counts:	405	284	333	504	428	479	471	239	283
		Deliveries:	877	700	618	1252	1220	944	1185	N/A	713
		Ratio:	2.2	2.5	1.9	2.5	2.9	2.1	2.5	N/A	2.5
	SN	Counts:	106	131	46	153	135	110	224	202	159
		Deliveries:	126	131	59	311	207	170	253	N/A	167
		Ratio:	1.2	1.0	1.3	2.0	1.5	1.5	1.1	N/A	1.1
13	GN	Counts:	55	48	35	26	16	16	76	26	34
		Deliveries:	85	75	38	54	26	34	123	94	94
		Ratio:	1.5	1.6	1.1	2.1	1.6	2.1	1.6	3.6	2.8
	SN	Counts:	73	78	45	44	37	33	144	149	64
		Deliveries:	78	78	52	82	75	57	153	63	72
		Ratio:	1.1	1.0	1.2	1.9	2.0	1.7	1.1	0.4	1.1
For GN:											
Total Count			606	426	486	683	506	588	657	375	376
RSB-DFO				-180	-120		-177	-95		-282	-281
Percent Difference				-30	-20		-26	-14		-43	-43
Total Deliveries			1233	1075	810	1627	1452	1144	1536	N/A	907
Percent				87	67		89	70		N/A	59
For SN:											
Total Count			179	209	91	197	172	143	368	351	223
RSB-DFO				30	-88		-25	-54		-17	-145
Percent difference				17	-49		-13	-27		-5	-39
Total Deliveries			204	209	111	393	282	227	406	63	239
Percent				102	54		72	58		16	59

-more-

Table 10 (cont'd). Weekly gear counts and deliveries from Regional Statistics Branch (RSB). (DFO = DFO Hails, JSP = JSCNCVP, GN = gillnet, SN = seine net)

Week:			8-4			9-1		
Area	Gear		RSB	DFO	JSP	RSB	DFO	JSP
11	GN	Counts:	41	28	18	----------		
		Deliveries:	72	26	29	ù CLOSED ù		
		Ratio:	1.8	0.9	1.6	----------		
12	GN	Counts:	281	241	254	204	130	142
		Deliveries:	639	509	404	335	N/A	204
		Ratio:	2.3	2.1	1.6	1.6	N/A	1.4
	SN	Counts:	178	175	124	198	177	120
		Deliveries:	342	194	171	220	N/A	126
		Ratio:	1.9	1.1	1.4	1.1	N/A	1.1
13	GN	Counts:	45	7	39	38	17	27
		Deliveries:	75	49	58	57	N/A	34
		Ratio:	1.7	7.0	1.5	1.5	N/A	1.3
	SN	Counts:	78	55	57	83	96	73
		Deliveries:	147	72	72	87	N/A	73
		Ratio:	1.9	1.3	1.3	1.0	N/A	1.0
For GN:								
Total Count			367	276	311	242	147	169
RSB-DFO				-91	-56		-95	-73
Percent Difference				-25	-15		-39	-30
Total Deliveries			786	584	491	392		238
Percent				74	62			61
For SN:								
Total Count			256	230	181	281	273	193
RSB-DFO				-26	-75		8	-88
Percent difference				-10	-29		3	-31
Total Deliveries			489	266	243	307		199
Percent				54	50			65

Table 11. Seasonal total gear counts and total deliveries. (RSB = Regional Statistics Branch, DFO = DFO Hails, JSP = JSCNCVP, GN = gillnet, SN = seine net)

Area	Gear	Number of	RSB	DFO	JSP	Percent of RSB DFO	Percent of RSB JSP
11	GN	Vessels:	450	294	288	65.3	64.0
		Deliveries:	892	532	449	59.6	50.3
		Ratio (D/V):	1.98	1.81	1.56	91.4	78.8
12	GN	Vessels:	1865	1322	1491	70.9	80.0
		Deliveries:	4288	2429	2883	56.6	67.2
		Ratio (D/V):	2.30	1.84	1.93	80.0	83.9
	SN	Vessels:	859	820	559	95.5	65.1
		Deliveries:	1252	532	693	42.5	55.4
		Ratio (D/V):	1.46	0.65	1.24	44.5	84.9
13	GN	Vessels:	240	114	151	47.5	62.9
		Deliveries:	394	244	258	61.9	65.5
		Ratio (D/V):	1.64	2.14	1.71	130.5	104.3
13	SN	Vessels:	422	415	272	98.3	64.5
		Deliveries:	547	288	326	52.7	60.0
		Ratio (D/V):	1.30	0.69	1.20	53.0	92.3
Total GN:			2555	1730	1930	67.7	75.5
RSB-DFO:				-825	-625		
Percent difference:				-25.9	-17.4		
Total GN deliveries:			5574	3205	3590	57.5	64.4
Ratio (D/V):			2.18				
Total SN:			1281	1235	831	96.4	64.9
RSB-DFO:				-46	-450		
Percent difference:				-3.6	-35.1		
Total SN deliveries:			1799	820	1019	45.6	56.6
Ratio (D/V):			1.40				

Table 12. In-season vs Regional Statistics Branch (RSB) catch estimates. Summary of catches from weeks 8-1 until 9-1. (DFO = DFO hails, JSP = JSCNCVP, GN = gillnet, SN = seine net)

AREA	GEAR		SOCKEYE	COHO	PINK	CHUM	CHINOOK
11	GN	DFO:	71306	3262	24975	3994	721
		JSP:	61537	2530	20941	2606	794
		RSP:	81706	2797	23582	4012	763
12	GN	DFO:	229479	13126	113612	7551	2409
		JSP:	211328	11536	130450	7573	2623
		RSP:	231329	13887	105032	8431	2834
	SN	DFO:	595487	19679	784902	14808	7246
		JSP:	625887	18631	840748	20098	8542
		RSP:	706547	23650	905954	20330	9541
13	GN	DFO:	15256	651	6773	231	191
		JSP:	14845	665	8365	275	272
		RSP:	23747	931	14631	430	363
	SN	DFO:	358482	6587	463189	3443	2729
		JSP:	365167	6648	496388	3478	3588
		RSP:	378380	7358	485083	4480	3657
TOTAL							
	GN	DFO:	316041	17039	145360	11776	3321
		JSP:	287710	14731	159756	10455	3689
		RSP:	336782	17615	143245	12873	3960
	SN	DFO:	953969	26266	1248091	18251	9975
		JSP:	991054	25279	1337136	23576	12131
		RSP:	1084927	31008	1391037	24810	13198
	TOTAL	DFO:	1270010	43305	1393451	30027	13296
		JSP:	1278764	40010	1496891	34030	15820
		RSP:	1421709	48623	1534282	37683	17158

Table 13. WEEKLY GEAR COUNT AND DAYS OPEN FOR AREAS 11-13 FOR 1987.

	AREA 11		AREA 12				AREA 13			
	VESSEL	DAYS	£ OF VESSEL		DAYS OPEN		£ OF VESSELS		DAYS OPEN	
WEEK	GN	GN	GN	SN	GN	SN	GN	SN	GN	SN
7/1										
7/2										
7/3										
7/4										
7/5										
8/1	99	2.5	233	131	2.5	1.0	48	78	2.5	1.0
8/2	25	2.5	428	135	2.5	2.0	16	37	2.5	2.0
8/3	97	2.5	239	202	2.5	1.0	7	148	2.5	1.0
8/4	28	2.5	241	175	2.5	2.0	7	55	2.5	2.0
9/1	CLOSE	CLOSE	130	181	1.5	1.0	17	96	1.5	1.0
9/2										